Technology and Elections in Developing Countries: Challenges and Opportunities for Democratic Consolidation

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Abstract

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This dissertation looks at the intersection of technology and politics in developing countries. Specifically, I examine how the dissemination of innovative technologies has influenced public opinion and political engagement in and around elections. Following an introduction, the second chapter details how the adoption of information and communications technologies (ICTs) has upended the usefulness of fraudulent elections in non-democracies. Drawing on evidence from Nicaragua's illegitimate 2021 presidential election, I detail how ICTs enable citizens to circumvent the intended signals from the FSLN by providing access to external information. I find that access to ICTs reduced the overall levels of perceived support for the ruling FSLN as well as incumbent President Daniel Ortega.

In my third chapter, I examine the role of new technologies in the amplification of political misinformation related to electoral legitimacy along with the efficacy of digital interventions aimed at reducing its influence. First, I examine social media posts collected throughout Kenya's contentious 2022 presidential election campaign to illustrate the extent of the challenge posed by political misinformation to perceptions of the legitimacy of the vote. In doing so, I detail the deficiencies of current fact-checking efforts while generating novel insights regarding the challenge of political misinformation in sub-Saharan Africa. Next, I test a new method that incorporates insights from regional organizations to counter misinformation. I find evidence that "social truth queries" may be effective as a user-driven method for addressing misinformation that exists beyond the bounds of current fact-checking efforts in developing countries.

The fourth chapter addresses the consequences of a ruling party's failure to deliver energy to the public. Drawing on a unique spatial dataset and electoral data collected from a variety of government sources in South Africa, I examine whether the dominance of the ANC has minimized the efficacy of electoral accountability mechanisms despite the party's association with the failure of the country's once admired national electricity grid. Specifically, I detail how salient governance provision failures, as proxied by "load shedding" in South Africa, reduce support for incumbent political parties while inducing both voter apathy and preference for alternative forms of government in a manner largely consistent with theories of electoral accountability. Collectively, my research details the influential consequences of technological diffusion and decay in developing countries while providing new evidence related to the potential of select digital interventions as well as the potential consequences of inadequate maintenance of existing technologies.

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DEDICATION

to my parents

Chapter 1

Introduction

From the collective rationality of the Luddite destruction of new sewing machines (Jones 2013) to the advent of the printing press (Woodberry & Shah 2004; Coşgel, Miceli, & Rubin 2012) and the internet (Persily 2017), technologies are rarely apolitical. Several scholars have emphasized the potential of "liberation" technologies, which are seen as endowed with the potential to upend extant political institutions (Diamond 2010; Morozov 2011), while others have noted the role new technologies play in bolstering the capacity of incumbent politicians and institutions (Feldstein 2021; Garbe et al. 2023). My dissertation extends this work by detailing the opportunities and challenges presented by mass communications and mobilization technologies for the conduct of modern elections. As the majority of work on political misinformation and elections have been conducted in Europe and the United States (Bradshaw & Howard 2018; Ceron et al. 2021; Porter & Wood 2021), I ensure the insights generated address countries outside of these regions by focusing specifically on developing countries in sub-Saharan Africa and Latin America. Collectively, the chapters included in my dissertation detail the opportunities new technologies present to pro-democracy movements as well as their potential to undermine extant democratic regimes during election periods.

Chapter 2 first details the potential for new technologies to undermine the influence of traditional authoritarian strategies to utilize elections to solidify perceptions of public support. The puzzle of authoritarian elections has remained a central focus of political science scholarship since they became ubiquitous in the latter half of the twentieth century (Swearer 1961; Ames 1970). Amidst the rise of authoritarian elections, a consensus developed around their usefulness for incumbents, with various scholars arguing that they enabled ruling politicians to root out underperforming party members and gain knowledge of citizen opinions (Magaloni 2006; Brownlee 2007). Building on these internal benefits, a secondary strand of the literature on authoritarian elections has detailed their usefulness as a tool for government to signal widespread

domestic support (Simpser 2005; Malesky & Schuler 2008), particularly in the hope that this may deter attempted coups and pro-democracy movements (Kuran 1997; Soest & Grauvogel 2017).

While these theories are now widely supported, along with my co-author Nicolas Wittstock, we develop a novel theory that details how the dissemination of information and communication technologies (ICTs) throughout non-democracies in developing countries may overturn the direction of this long-standing effect. We argue that access to ICTs provide citizens with alternative sources of information to counter the signal provided by government-run election results. Previously, where external information was difficult to obtain, citizens were more likely to take election results at face value, if not to at least update their preconceptions regarding wider domestic support for the regime (Simpser 2013). Where outside information is available, illegitimate election results may not only be canceled out by details of the government's efforts to minimize the legitimacy of the election, but may in fact backfire where posted election results stand in stark contrast to several other data points suggestive of their inauthenticity.

To test this hypothesis, we rely on the deployment of a novel cross-sectional survey of Nicaraguan citizens prior to and following the state's 2021 Presidential Election. As predicted by the novel contingent theory detailed in the chapter, results from the survey suggest that the election did not lead to upweighted perceptions of public support for the ruling Frente Sandinista de Liberación Nacional (FSLN) nor incumbent President Daniel Ortega. In contrast, the availability of ICTs is associated with a sharp *decrease* in perceived support for the state as measured across a range of perceptions regarding the domestic population's willingness to engage in various anti-incumbent acts. As one of the first surveys to track the role of ICTs on election perceptions in non-democratic contexts, this chapter of my dissertation provides novel evidence regarding the role of outside information in altering the influence of government signaling through election results.

Whereas the chapter on Nicaragua's election details a potential opportunity ICTs present to prospective democrats, *Chapter 3* focuses on the role of ICTs in enabling the spread of illegitimate information related to the legitimacy of elections in one of sub-Saharan Africa's most politically and economically important nascent democracies. The use of ICTs to amplify the speed of dissemination and spread of misinformation has become a primary concern of global politicians and

activists (Lazer et al. 2018; Kuru et al. 2022). Several studies from Europe and North America have detailed how misinformation can influence citizen perceptions and political behavior, including willingness to vote (White et al. 2006; Valenzuela et al. 2019; Ohme et al. 2021) trust in incumbents (Del Vicario et al. 2016; Törnberg 2018; Azzimonti & Fernandes 2023), and the perceived legitimacy of democratic processes (Allcott & Gentzkow 2017; Tambini 2018; Lee 2019). However, few of these studies have been conducted in developing countries (Posetti & Bontcheva 2020; Abhishek 2021; Rossini et al. 2021). As a consequence, several of the promising interventions aimed at minimizing the influence of misinformation on political outcomes that have been shown to be effective in lab and field studies in the United States and Europe, including fact-checking (Walter et al. 2020; Carey et al. 2022) and pre-bunking initiatives (McGuire, 1964; Compton 2013; Scherer & Pennycook 2020), may not be generalizable for use in the protection of electoral legitimacy (Ceron et al. 2021; Porter & Wood 2021).

In order to address the potential deficiencies with contemporary interventions, I collectively *i.*) contribute new evidence regarding the prevalence of electoral misinformation in developing country contexts, *ii.*) assess the coverage of current efforts to counter their influence, and *iii.*) test the efficacy of a novel strategy for addressing misinformation specifically in the online contexts common in developing countries. I first use a collection of over two million social media posts scraped throughout Kenya's 2022 presidential election campaign to contextualize the threat of misinformation to perceptions of the election's legitimacy. Using a coding scheme developed specifically to assess the challenge of electoral misinformation in similar developing country contexts, I then detail the content of the misinformation prevalent on Twitter in the months surrounding the election. Results from this initial analysis reveal the inadequacy of current funding efforts as well as the need for alternative solutions. Specifically, the results of this audit of online misinformation and the reach of domestic fact-checking efforts details the limited reach of current interventions.

In an attempt to contribute to the development of novel solutions I build on laboratory studies that have utilized "social truth queries" (STQs) to combat misinformation (Jalbert et al. 2023). Drawing from my own collaboration with the Centre for Analytics and Behavioral Change

(CABC), a research institute based out of the University of Cape Town, I help conceptualize and test the use of STQs as a user-based strategy for countering online misinformation in developing countries. In order to test this in a real-world setting, I use this foundational research to assess whether STQs can be used to counter the influence of political misinformation contained in online posts that question the legitimacy of Kenya's contentious election 2022 election. While the effect sizes are not as large as hoped for in the wider sample, when focusing on the individuals most susceptible to misinformation I find that STQs have a substantial impact on respondent perceptions of content accuracy, their propensity to share the information, and their trust in the poster. Moreover, these results do not appear to be limited by partisanship nor content constraints. The results from the study provide evidence that STQs may serve as a valuable alternative to fact-checks in the many instances in which they are unavailable or inapplicable in the context of political misinformation. Importantly, STQs can be applied by a wider set of online users and on the encrypted messaging applications, such as WhatsApp and Signal, that are becoming increasingly popular in developing countries.

Chapter 4 of my dissertation expands the insights generated in the first two chapters to assess the role of technology in altering the expected role of elections providing accountability for elected representatives. Though ICTs have been the focus of recent research on technology and democracy outside of North America and Europe, less attention has been given to the politics of investment and maintenance of the state energy infrastructure that remains critical to investment in and the efficiency of domestic technologies (Min 2015). Seminal works on public goods, which include the production and provision of electricity, have illustrated their centrality to the legitimacy of democratic institutions, particularly when these institutions are in their infancy (Tilly 1975; Ostrom et al. 1994; Wimmer 2002). Most of this work has looked at the at times counterintuitive role of improved goods provision on party and regime legitimacy (Moreno-Jaimes 2007; de Kadt & Lieberman 2017; Hassell, Holbein, & Baldwin 2020), particularly in developing countries (Booth 2011; Bardhan 2014). Yet while improvements are expected over time, the decay of state-run technologies may also present a challenge to democratic consolidation where the government fails

to manage the extant infrastructure that sustains both the use of and investment in advanced technologies.

South Africa presents a novel environment to analyze the (non)applicability of electoral accountability due to its unique federal government structure (Richard 1998) and the continued electoral dominance of the African National Congress (ANC) (Giollabhuí 2011). Drawing on two original datasets and survey data from South Africa, I assess whether salient governance failures that undermine technology use and adoption affect the function and legitimacy of electoral accountability in the state. Moreover, I examine whether the reactions of voters to governance failures could portend longer-term democratic decline by linking these failures to data on voter participation and populist party support. To accomplish these outcomes I draw on original data sourced from local by-elections and municipal electric grids as well as a geolocated survey. Using the random shock of electricity outages coordinated by the state's public electric utility Eskom (known locally as "load shedding") this randomized design enables me to assess voter reactions to governance provision failures. These data sources are paired with voting results from the South African Independent Electoral Commission (IEC) as well as survey results from a provincial survey on voter attitudes to leverage the severity of Eskom's electricity crisis.

Across each of the analyses, results from the study suggest that even in dominant party states with noncompetitive national political environments, local elections provide an incentive for investment in public services and sustainable technologies. In the context of South Africa, this is illustrated by detailing how the occurrence of more severe instances of load shedding prior to elections leads to a substantial decline in the vote share of the incumbent African National Congress (ANC). Evidence from these analyses also suggests that the party that has gained the most due to these incumbent failures is the party that has campaigned most heavily on public goods and service improvements in contrast with parties that emphasize populist appeals. As a final note of caution for South African democracy, the analyses reveal the potential for substantial decreases in voter turnout where the ANC's failures are more pronounced.

Collectively the chapters contained in this dissertation serve to update and extend notable theories of elections and democratic governance by incorporating the role of new technologies in

developing countries. As the quintessential democratic institution, it is unsurprising that elections have become a stage for the use of new technologies by both pro- and anti-democratic actors. Yet these pressures are more acute in developing country contexts, which often possess lower governmental capacity to manage technological change (Castells 2015; Tayo, Thompson, & Thompson 2016; Feldstein 2021). Thus despite the continued emphasis of political scientists on the role of elections across regime types, the rapid diffusion of new technologies has yet to be fully integrated into classic theories of democracy. I argue that contemporary research on elections needs to be updated to account for the fundamental shifts in the forms of political engagement that have been enabled by the recent global dissemination of ICTs and the grids that sustain their function. In addressing these questions I contribute to the literature on the politics of misinformation, the conduct of elections, and the management of governance failures in developing countries.

Though the influence of new technologies on economic development is widely known, the disparate results of technological change in states with nascent institutions is less clear (Ejiaku 2014; Darko & Chan 2018). This gap has limited work on the influence of these technologies on election processes, institutions, and results have often failed to engage with extant impediments to the potential use by both states and activist organizations. My first theoretical contribution examines in detail how new technologies may serve to upend well-founded and widely supported theories of the function of elections. In non-democratic contexts, my work illustrates how ICTs may require the recalculation of the cost-benefit analysis underpinning the decision by dictators and repressive states to hold elections. Using the concept of "contingent legitimacy", I extend recent work on the spread of ICTs to illustrate how new ICTs may threaten extant incumbent strategies to manage public opinion using elections.

In addition to the potential benefits provided by new technologies to pro-democracy proponents in illiberal contexts, I also detail the challenges digital technologies pose to the consolidation of democracy. Whereas in authoritarian contexts outside information can shift perceptions toward truth points previously altered by illiberal states, I note how in democracies these same tools can serve to shift perceptions away from underlying truths. While it is often assumed that the efficacy of misinformation interventions are globally generalizable, I build on

evidence from an audit of Kenyan election misinformation in my third chapter to illustrate the deficiencies of ongoing interventions.

Alongside contributions related to new technologies and election perceptions, I also contribute to the wider field of public goods provisions on democratic consolidation by introducing the role of technology failures in driving anti-democratic sentiment and behavior. Specifically, I incorporate expectations from long-standing theories of electoral accountability to assess their (non)persistence in the context of public technology failures in a dominant party state. Results from the South African case provide novel evidence regarding the benefits of local elections when national elections are non-competitive. Moreover, the causal identification strategy used allows me to comment on shifts in voter support where failures are salient, building on dominant theories of populist political theory and opposition politics.

Next to these theoretical contributions, the conduct of my dissertation during a global pandemic required the deployment of methodological alternatives to supplement traditional fieldwork. In order to integrate citizen perceptions into each of the chapters involved in my dissertation I relied on several innovative strategies for reaching domestic populations, including online surveys and the integration of spatial data. Building on the methodological survey structure organized by Rosenzweig et al. (2020), my surveys conducted in Kenya illustrate the potential of social media as a cost-efficient method for reaching specific populations. In addition, my survey sampling in Nicaragua represents one of the few surveys conducted amongst citizens in non-democracies. While fieldwork in such settings place respondents at risk of surveillance and retribution, as well as the survey team, my work suggests that online methods can not only serve as a substitute for in-person surveys but as a tool for reaching otherwise unreachable populations of interest. Finally, in collecting data on the electric grids supporting infrastructure in South Africa, I demonstrate the potential of spatial data to provide causal frameworks for addressing political questions. By exploiting the independent construction of electric grids across municipalities this design enables the assessment of electricity failures at the local level. Collectively, these methodological efforts provide novel evidence regarding the potential of online survey methods while contributing new data on hard-to-reach individuals residing in developing countries.

Finally, in addition to theoretical and methodological contributions, this dissertation also has several practical implications for policymakers, aid organizations, and politicians interested in harnessing the potential of new technology to amplify economic growth while improving the integrity of global elections. One recurring insight from this work relates to the need for further research into the contextual factors that can alter the impact and influence of new technologies on a range of political outcomes. As illustrated through the Nicaraguan case in *Chapter 2*, though states can mobilize around ICTs to advance incumbent agendas, when unconstrained these technologies can serve to recontextualize the wider citizenry's conceptions of state support. Similarly in *Chapter 3*, I illustrate that although interventions to limit the influence of misinformation on elections may be aided through the investments in fact-checking by well-funded media outlets in the U.S. and Europe, several factors limit the efficacy of this strategy in Kenya and likely in several other countries. Prior to extending fact-checking efforts and exporting alternative strategies for countering misinformation and digital threats to election integrity, interventions should be tested locally to account for both their efficacy and scope. Ideally, interventions can be sourced from organizations and researchers which are aware of both local complications and opportunities. Lastly, *Chapter 4* underscores the importance of long-term planning related to technology investment. Where minimal competition results in short-sighted planning, incumbents will put themselves at risk not only of losing their advantages but also threatening the consolidation of democratic institutions. Further policy implications are detailed at the conclusion of each chapter.

Chapter 2

To the Loser goes the Spoils: Examining the Effects of Illegitimate Election Victories in the Digital Era

(with Nicolas Wittstock)

I. Introduction

In recent years commentators have voiced concerns that democracy is in decline around the world (Hellmeier et al. 2021; International IDEA 2021). Actors with a diverse set of ideologies and motivations have sought to subvert liberal democratic institutions to advance their own positions. Nonetheless, countries that have experienced substantial democratic backsliding, as well as many non-democracies, often continue to hold popular elections that are decidedly neither free nor fair. These dynamics have been particularly evident amongst populist regimes, which often challenge liberal democratic norms and institutions in favor of the *volonte generale* to ideologically justify their actions (Mudde & Kaltwasser, 2017). Given the persistence of these trends, it is imperative to understand what role elections play within more illiberal institutional settings, whether the integrity of these elections matters, and if so, how.

Discerning why politicians in non-democracies risk their grip on power and international reputation to hold fraudulent elections has sustained a robust academic literature. Proposed benefits of elections to illiberal leaders include the gathering of information about public preferences and incumbent performance (Linz 2000; Schedler 2002), distributing patronage to supporters (Lust-Okar 2006), and discouraging elites from challenging the power of ruling coalitions by providing public signals of widely shared regime support (Simpser 2013). According to these seminal pieces, electoral institutions supposedly provide a veneer of legitimacy to illiberal regimes while ensuring that incumbents are able to secure power and wield it more efficiently (Levitsky & Way 2002; 2010a).

When ambitious politicians subvert liberal institutions to concentrate power in a process of democratic backsliding, it may be too brazen to simply eliminate elections altogether (Lust-Okar 2006). Rather, politicians often select a second-best option, and choose to rig elections instead.

Nonetheless, most explanations for the persistence of elections in illiberal regimes posit that unfree elections provide some form of legitimacy in the eye of the public, as they allow the winner to claim high levels of public support. Yet, it is unclear why elections would increase perceptions of public regime support where the underlying electoral processes and outcomes are so obviously flawed that their illegitimacy is easily discernible to the wider populace. Given the global spread of information and communications technologies (ICTs), the persistence of illiberal elections becomes even more perplexing. Building on this work, in this article we ask what effect contemporary elections have on public perception of regime support in illiberal institutional settings by extending extant theories to integrate the role played by outside information as a modifier. Using survey results we provide evidence that growing access to outside information may alter the impact of illiberal elections to favor the opposition.

II. The Function of Elections in Illiberal States

The literature on illiberal elections coalesces around the idea that elections serve as a supply-side tool for illiberal leaders to tighten their grip on power. This focus on the instrumental benefits that elections confer to illiberal governments has minimized attention on what impact, if any, unfree or rigged elections have on citizen perceptions of public regime support. Though recent studies have begun to interrogate this gap (Williamson 2021), it remains an open question as to whether rigged elections affect public perceptions of regime support at all. Determining whether rigged elections serve as a signal to the public about regime support is important to researchers, policymakers, and activists as perceptions of broader regime support interact with several theories of democratization and rebellion and speak directly to the proffered theories of scholars interested in determining why non-democratic leaders hold fraudulent elections in the first place.

Aiming to update these theories, we first note that much of the extant literature implicitly assumes that elections in part serve as signals of regime strength to the populace. Yet, arguably, the efficacy of the signal sent by electoral outcomes depends on the extent to which citizens have access to outside information. Kuran (1991; 1997) postulates that although citizens may observe obvious electoral manipulation, they often have no reliable way to independently ascertain public support

for the electoral winner. Thus, even when official election results may draw skepticism, these results may nevertheless lead citizens to upwardly adjust their impression of public support, thereby reducing their likely willingness to speak out publicly, join opposition movements, or even rebel against the state (Simpser 2013).

However, when citizens do have access to information sources that are not controlled by the regime, as has been made possible by the proliferation of ICTs, then this mechanism may no longer deliver consistent outcomes. Rather, elections may instead highlight the illiberal actions of regimes, subsequently encouraging opposition movements, protests, and rebellion. As China's efforts to "flood" online spaces with pro-regime messages have illustrated, some governments are already acting on the belief that ICT access can inform public perceptions of regime support (Roberts 2018). Of course, not all illiberal regimes have the capacity to subvert digital information technologies into covert vehicles of state propaganda. The efficacy of the Chinese state to control information spread online is both unrivaled and nonetheless incomplete (Roberts 2018). That is to say, most of the time digital information environments are harder to control for illiberal regimes, offering a potential source of uncensored information. As ICTs have spread remarkably fast around the globe, a growing number of citizens in illiberal regimes now have access to more outside information through everything from international news sources to social media platforms and encrypted messaging applications.

Thus, despite previous work detailing the benefits of elections to illiberal regimes, it is unclear how fraudulent elections impact citizens' perceptions in contemporary high-information environments. To assess what signal is projected by fraudulent elections, this chapter presents evidence from an online survey experiment conducted during Nicaragua's 2021 General Election. The results from our cross-sectional survey suggest that contrary to much of the existing literature, fraudulent elections conducted in high-information environments may actually serve to lower public perception of regime support. More intriguingly, our results show that the fraudulent conduct of the ruling FSLN raised citizen perceptions of opposition strength as well as the expected willingness of the public to engage with opposition movements. Moreover, the results from our

case study indicate that the election credibility may act as important modifiers in determining how election victories in illiberal regimes impact citizen perception of regime support.

This article contributes to the literature on elections in illiberal polities by providing evidence that elections serve to signal levels of regime support to the public and reinforcing theories that suggest that this signal need not always serve to bolster perceived support for incumbents. This may place illiberal leaders in a bind: Although leaders with low levels of public support may receive some benefits from electoral contests, when elections are widely condemned as illiberal and there is widespread access to outside information, citizens may reassess the opposition's strength and be more willing to engage with opposition forces or join protests against incumbents. Additionally, this study draws attention to the need to study the signaling effects of elections across diverse informational and institutional contexts, as it may be that certain settings enable authoritarian leaders to harness the signaling power of elections to exacerbate the gap between citizen perceptions and true levels of regime support in the way the existing literature hypothesizes.

III. Classic Theories on Elections in Illiberal States

For the purposes of this chapter, we are interested in elections for the highest executive or legislative offices in countries that do not hold free and fair elections. These countries create a faux direct electoral connection between high-level government and voters. This arrangement may arise as formerly more democratic countries "backslide", but also when non-democracies introduce elections for high office without providing genuinely free and fair conditions. The electoral playing field is uneven when: "(1) state institutions are widely abused for partisan ends, (2) incumbents are systematically favored at the expense of the opposition, and (3) the opposition's ability to organize and compete in elections is seriously handicapped" (Levitsky & Way 2010a: 10).

Given that politicians remove, subvert, or circumvent other liberal institutions for political convenience, it is puzzling that strategic politicians would conduct elections despite risking potential loss of power and inviting public scrutiny (Magaloni 2006). Both presidential and legislative elections can serve as catalyzing events with the potential to showcase active government measures to prevent opposition forces from competing, ban press outlets, engage in intimidation,

vote-buying, and outright rigging to ensure that the incumbent wins. Moreover, these electoral exercises are costly (Swearer 1961), raising the question as to why such regimes nevertheless continue to hold public elections. Ghandi and Lust-Ockar (2009) suggest that there are a multitude of reasons illiberal regimes hold elections that importantly differ by institutional context. That said, elections can serve a variety of instrumental purposes across different illiberal institutional settings. Of course, eliminating elections altogether may be especially politically costly. Hence, incumbent regimes may decide that it is easier to simply uphold the institution but manipulate the outcome of elections.

Others have suggested that elections allow illiberal rulers to ascertain their own popularity and to identify their base, as well as areas of discontent (Ames 1970; Magaloni 2006; Brownlee 2007). Several authors have interrogated why illiberal rulers manipulate elections to the extent that they do by noting that rather than simply fixing elections in a manner that ensures victory, illiberal rulers often cheat their way to substantial winning margins, often reporting margins of over 70% (Swearer 1961; Magaloni 2006; Simpser 2013). Simpser (2013) asserts that such dramatic victories show the strength of the regime and discourage the opposition from engaging politically. Relatedly, high electoral victories convince bureaucrats to continue working for the regime and deter political elites from opposing the ruling party or from even entering politics (also see Geddes 2005; Simpser 2005; Magaloni 2006; Malesky & Schuler, 2008). High electoral victories via manipulation can also increase the manipulator's post-electoral bargaining power vis-a-vis other political and social groups such as labor unions and other political parties.

A final set of hypotheses has emphasized the instrumental role of elections, noting that beyond these instrumental benefits, holding elections might also confer legitimacy to illiberal leaders. Levitsky and Way (2002; 2010a) argue that holding elections produces international political and economic benefits for leaders, as membership in international bodies or access to economic aid is often tied to adherence to formal democratic procedures. Schedler (2006) argues that elections provide an allure of legitimacy for domestic audiences by suggesting that rulers are supported by popular consent. Soest and Grauvogel (2017) suggest that electoral autocracies use procedures like elections to increase the regime's public legitimacy, mimicking the democratic

connections between rulers and the ruled. Collectively, these seminal works continually remark on the positive role elections serve in bolstering the survival and prominence of illiberal regimes by boosting public legitimacy.

Thus, we surmise that much of the extant literature discussed above implicitly assumes that even when citizens do not fully trust election results, they may nevertheless rely on them as a cue to upwardly adjust their assessment of support for the regime. If elections are indeed meant to confer legitimacy in the eye of the public, one central mechanism for doing so is by inflating the outcome of election results beyond that which citizens previously deemed to be the underlying level of public regime support. In Timur Kuran's canonical description of "preference falsification" one of the more powerful tools used by illiberal leaders and parties to dissuade opposition actions serves to distort information about true levels of regime support among the populace (1991; 1997). When citizens are given the impression that support for a regime is high, they are less likely to join opposition movements or even pay serious attention to political alternatives, minimizing the risk of calls for liberal democracy, protests, and coup attempts for incumbents (Kuran, 1991; 1997, also see Simpser, 2013). Relatedly, an apparently strong regime discourages opposition organization and incentivizes interest groups to work within the regime, rather than against it (Simpser, 2013). Relatedly, publicly reported election results may also be effective in dissuading citizens from joining the opposition because they can serve as a falsified signal of revealed public preferences. While citizens may notice public discontent, strong elections results in favor of the regime may convince them that talk is cheap, and that most citizens still act in favor of the government. Hence, election results may convey to the public that most citizens are unwilling to act against the regime.

However, we argue that the notion that elections confer legitimacy in the eye of citizens turns on whether obviously manipulated election results actually change anyone's opinion about public support for the regime. The results of elections, which are widely disseminated, have the potential to serve as a powerful signal to potential dissenters about the extent of incumbent support. Yet despite this potential benefit, the distribution of outside information regarding the fairness of the election could easily have the opposite effect. For instance, if manipulated elections are to increase perceived public support of the regime by serving as a signal of true support, citizen's

access to news sources that are independent of the government (and thus likely to report on irregularities and unfair playing fields) should be relatively limited. Logically, the theories developed in the 1990s and 2000s on elections in illiberal polities strongly hinge on the availability of outside information to voters. Elections supposedly do not just raise regime support - they are also assumed to de-motivate opposition support and collective action against the regime (Simpser 2013; Kuran 1997). This implies that the election itself, as well as the reported result perform a crucial function of information dissemination. Otherwise, elections and their results in themselves would not disseminate information that citizens cannot otherwise access. If citizens believe support for the regime to be high among the populace, because they observe strong election results for the regime, they are less sure that opposition support is widely shared, and will likely assume that supporting the opposition themselves is futile.

Counter to this underlying theme, in this chapter we note how changing communications technology environments may undermine the expectation that elections increase the legitimacy of illiberal leaders in the eyes of their citizens. Given the widespread access to the internet, it is significantly easier for people to access information on issues like turnout or international reactions to the election results. Further, given the dramatic increase in the availability of political information and ease of access, citizens are likely much better informed about general public sentiment, potentially making the signal of elections less relevant. In this higher information environment, it may be the case that the positive signaling effect of elections for illiberal leaders still holds. It may also be the case that for people that have more information, an implausibly high election result results in depreciated perceptions of public support of the government. Simply put, public support is more difficult to falsify where access to outside information is provided to the public through use of ICTs.

In order to limit access to true reflections of the citizenry's support, illiberal regimes often seek to minimize the freedom of the press - as well as the freedom of other venues that may independently spread information, criticism, or dissent (Geddes & Zaller, 1989). The spread of ICT, which allows decentralized distribution of information, presents a profound challenge to the ability of illiberal rulers to suppress criticism and to uphold favorable news coverage (Roberts 2018). Social

media in particular has been credited with enabling the fomentation of pro-democracy movements, including the Arab Spring revolutions (Kondhker 2011). A narrative regarding the internet has developed related to the conception that access makes it easier to share and obtain information, or even to expose illiberal government action or facilitate opposition organization (Diamond & Plattner, 2012).

Although theories of illiberal elections interrogate the role of information access, the global information ecosystem has been radically transformed since the publication of these seminal works (see *Figure 2.1*).

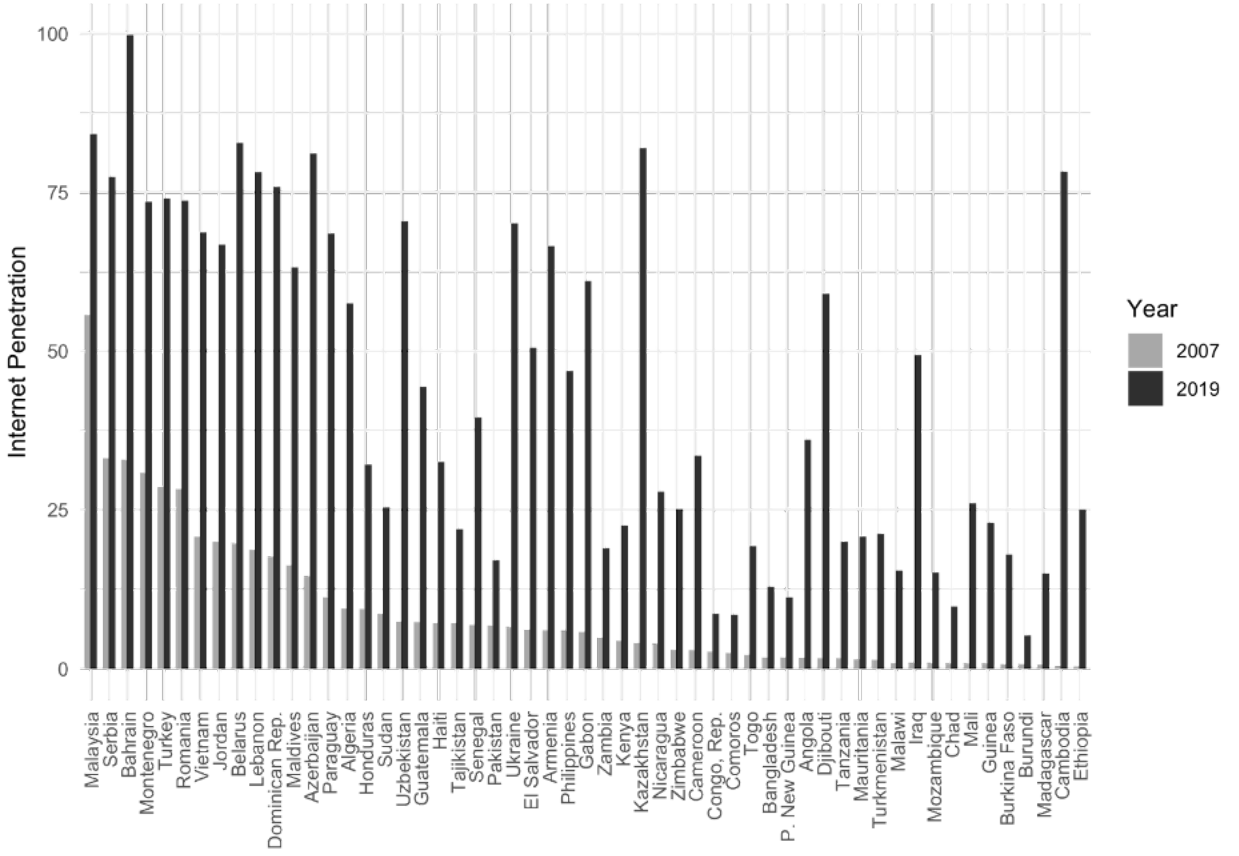

Figure 2.1: *Internet Penetration Among States Holding Low-Quality Elections: 2007-2019*

Indeed, across the collection of countries holding at least one low-quality election between 2007 and 2019 as determined by the Perceptions of Election Integrity (PEI) database (Norris & Grömping 2019), the mean rate of internet penetration has risen from just 9% to 44% in just over a decade (an increase of 389%). Thus while traditional media sources played a role in disseminating information

regarding underlying support for incumbents throughout the twentieth century, the unparalleled dissemination of information access enabled by ICTs give cause to reexamine the role of signaling events, such as elections, in biasing public perceptions in favor of illiberal regimes. Given these changes, we expect this disruption in the signaling capacity of rulers to result in a reduction in the gap between perceived beliefs and true beliefs as well as subsequent protests and rebellions.

Indeed, Ruijgrok (2017) shows that internet use increased the expected number of protests in authoritarian countries between 1990 - 2013, arguing that freer access to information on the internet changes people's minds, but also reduces uncertainty about other's preferences along the lines suggested by Kuran (1993; 1997). While evidence from other contexts is less definitive, including research related to the role of ICT and internet access in the occurrence of the Arab Spring (Kondhker 2011; Stepanova 2011), other studies have reiterated the central position held by the proliferation of ICTs in sustaining high rates of contemporary global protest (Ang, Dinar, & Lucas 2014; Scherman, Arriagada, & Valenzuela 2015).

Perhaps the most compelling evidence in favor of this hypothesized rise in the costs associated with biased signaling comes from the reaction of illiberal leaders themselves, which has been characterized by further embrace of a diversity of censorship tactics (Deibert et. al 2010). Most likely based on the belief that ICTs and other forms of information access can threaten the rule and legitimacy of non-democratic leaders, authoritarian governments have invested in plans to limit the role of ICTs in domestic politics, including efforts to co-opt channels of communication by "flooding" platforms with pro-regime propaganda (Roberts 2018), and by creating extensive digital blockades to filter out potentially threatening information (Liang & Lu 2010). While these efforts have been shown to reduce access to outside information (Xu & Feng 2015) and experimental evidence suggests they can feasibly alter perceptions of regime support (Tannenberg et al. 2021), their effective deployment is typically contingent on traditional levels of state capacity (Feldstein 2021). Yet even in high-capacity contexts, these efforts are not perfectly successful.

Governments of differing capacity levels have resorted to differential tactics to limit the influence of ICT, with lower capacity states resorting to blunt strategies more likely to lead to social protest and international sanctions (such as internet shutdowns), while higher capacity states often

rely on sophisticated filtering technologies and targeted removals to prevent unwanted online content from reaching their citizens (Feldstein 2021). As a result of the resources and technical prowess required to enact effective censorship programs, most authoritarian governments are unable to effectively undermine the emancipatory potential of ICTs, with China (Roberts 2017), Russia (Nisbet, Kamenchuck, & Dal 2017), and North Korea (Ma 2016) being notable exceptions. Nicaragua falls into the camp of countries unable to fully restrict domestic access to outside information, as do the vast majority of contemporary illiberal regimes (Feldstein 2021). This was not always the case, as traditional forms of media, including television and radio, require monitoring of far fewer points of entry and enable centralized forms of distribution (Warf 2011).

IV. Theory & Hypotheses

With the advent and expansion of the internet, the majority of illiberal countries now find themselves unable to control their image in a constantly changing information environment. Returning to elections, we theorize that as signals meant to bolster perceptions of regime support, ICTs fundamentally alter their worth to illiberal leaders unable to manage online environments. Moreover, where ICTs enable citizens to access more objective information about the conduct and legitimacy of elections, this not only undermines the pro-regime signal of elections, but may cause the false claims and undemocratic strategies that accompany illiberal elections to backfire, resulting in downwardly affecting perceptions of underlying regime support (as well as state capacity). In turn, citizens might actually be motivated to join the opposition when being confronted with reports of election fraud and official declarations of election results. Specifically, where citizens have access to news sources (encompassing both individuals and traditional media outlets) that are independent of the regime, elections may demonstrate illiberal practices of rulers rather than convince citizens of widespread support. This underlying logic is depicted in *Figure 2.2*.

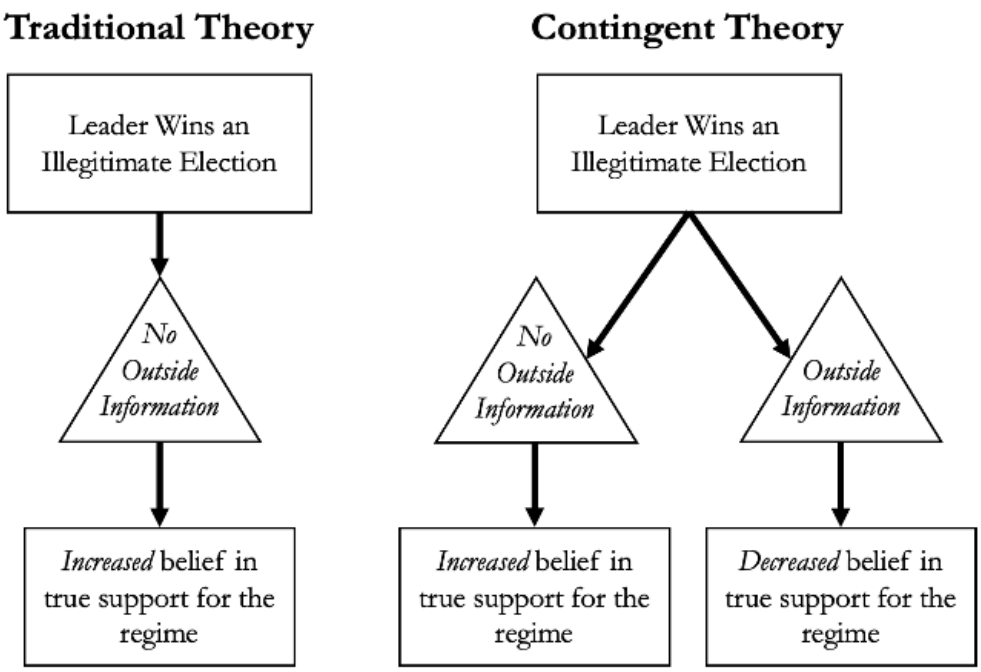

Figure 2.2: *Theories of Projected Regime Support*

This informs the two central hypotheses guiding our study:

> ***Hypothesis One (H1):*** *In illiberal states, citizens with access to uncensored information regarding the legitimacy of their government's election should decrease their perceptions of societal support.*

> ***Hypothesis Two (H2):*** *In illiberal states, citizens with access to uncensored information regarding the legitimacy of their government's election should increase their perception of the willingness of their fellow citizens to engage with the opposition.*

To further examine existing beliefs and their relationship with the availability of ICTs at the domestic level, we utilize an *AmericasBarometer* survey conducted following the 2016 Nicaraguan election. The question asked Nicaraguans about their trust in the prior election's results, with responses recorded on a scale between one and seven. *Figure 2.3* shows the predicted trust in elections at various levels of Facebook use (which is used as a proxy for ICT use more generally). Specifically, controlling for, income, education, age, sex, levels of support for the government, and whether the respondent lives in an urban setting, the regression displayed in *Figure 2.3* shows that

moving from no use of social media (1) to daily use of social media (5) is associated with roughly a 5% decrease in trust in the country's elections.

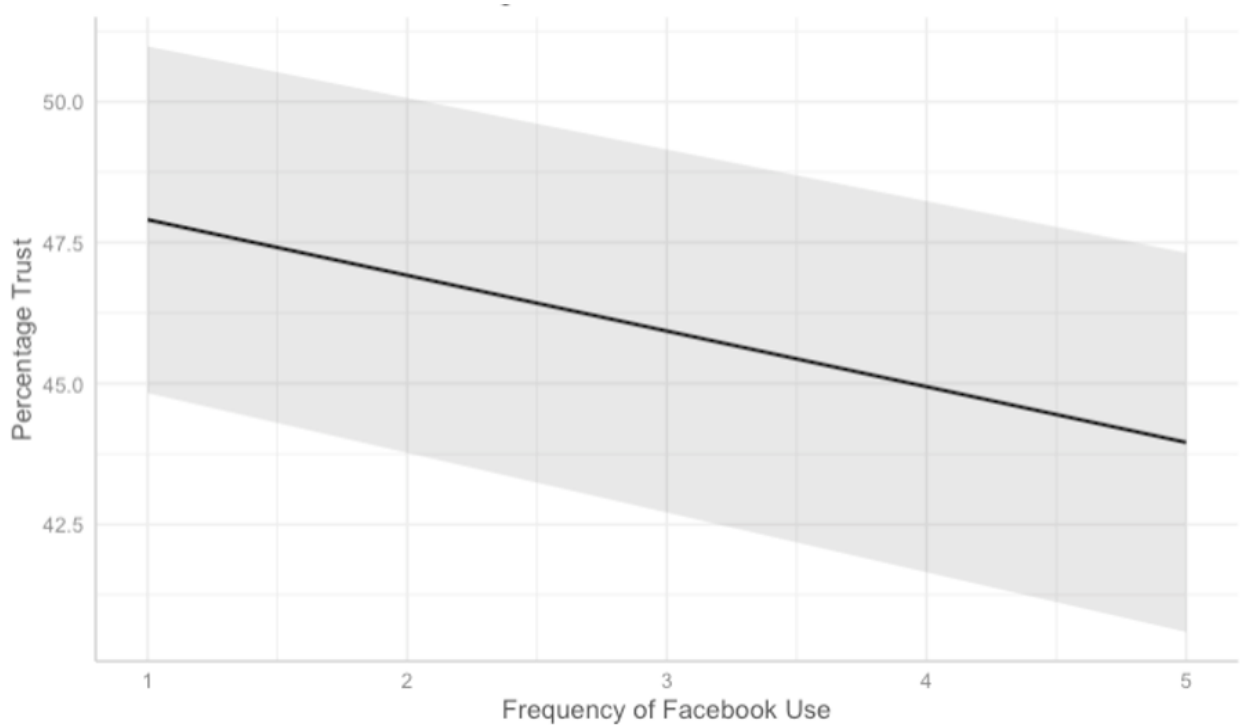

Figure 2.3: *Predicted Effect of Facebook Use on Trust in Nicaragua's 2016 Election*

This analysis suggests that Nicaraguans with access to Facebook are indeed more skeptical of the legitimacy of national elections, with results significant at the 90% confidence level.[1] Though this provides some evidence that internet access (and thus easier means of access to non-governmental information) can reduce support for the integrity of the nation's election, we interrogate this relationship further using a two-stage survey experiment based around the November 2021 General Election.

V. Context: Nicaragua's 2021 Presidential Election

On July 5th, 2021 leader of Nicaragua's campesino movement, Medardo Mairena, was arrested alongside several other members and accused of ill-defined crimes allegedly violating the "Defense of the Rights of the People to Independence, Sovereignty, and Self-Determination for Peace"

[1] *See Appendix A.1 for corresponding regression results.*

(IACHR 2021: 51). Medardo, who was later found guilty of conspiracy to undermine National Integrity, was the sixth candidate arrested in the lead up to Nicaragua's general election in November of 2021, prompting several countries to withdraw ambassadors and decry the legitimacy of the vote (CIVICUS 2022). Despite the subsequent arrest of two additional candidates, the expulsion of at least two other candidates into exile, and the international community's widespread condemnation of the election as a "sham" (White House 2021), the elections for Nicaragua's president and legislature were undertaken as usual on November 7th, 2021. Unsurprising to observers, incumbent Frente Sandinista de Liberacion Nacional (FSLN) leader Daniel Ortega was reelected with 75% of the officially recorded votes.

Though considered by many organizations and researchers a partial democracy well into the 2010s, the decline of Nicaragua's institutions has been a gradual process. Following former liberation fighter Daniel Ortega's election in 2006 both domestic and international observers were cautiously optimistic that this might spur further democratization through greater public participation and an opening of electoral institutions. Yet in the 15 years since, Ortega's party, the FSLN, has co-opted elite supporters, alienated large swaths of the population, and cemented its grip on political and economic power (OAS 2018). To ensure their continued rule, Ortega and his allies have relied on tried and true illiberal methods, including amending the constitution to alter vote share minimums and lift term limits, the purchase of private media companies by state-run entities, and more recently the silencing of vocal dissent and expulsion of opposition candidates from elections described above. Rather than relying on a broad coalition of support, the FSLN has become increasingly aligned with organizations such as the Superior Council for Private Enterprise (COSEP), which represents the country's wealthy elite. As a result of these recent developments, Nicaragua under the FSLN and Ortega has been used as a paradigmatic example of democratic backsliding (Puig & Serra 2020; Haggard & Kaufman 2021).

Despite these heavy-handed repression tactics, the relative popularity of Ortega's social programs, which championed economic stability and urban peace, allowed him to retain power in the 2016 election despite the warnings of observer groups and condemnations from the international community regarding the conduct of the election and gradual degradation of

democratic norms (Thaler 2017). Yet the discrepancy between representation and support became evident in 2018, when protests sparked by proposed reform to the country's social security program saw individuals protest for the removal of Ortega from the Presidency throughout the country. Ortega cracked down on the protests, declaring them illegal and responding with force, with subsequent clashes between protesters and state police and paramilitaries making it the deadliest civil conflict to occur in the country since the Nicaraguan Revolution (Robles 2018).

In the aftermath of the protests Ortega and the FSLN's veneer of legitimate rule has cratered in the eyes of the international community as the government has continued to depose potential rivals and hollow out remaining independent institutions. Given this recent context, the Draconian behavior of the FSLN in the build-up to the 2021 General Election has been unsurprising. In addition to the arrest or disqualification of eleven opposition candidates, dozens of opposition party activists have been targeted by the state for arrest and harassment, causing many to flee into exile (Solomon 2021). Foreign press and election observers were shortly after barred from entering the country in the build-up to the November election date (OAS 2021).

The response from the international community to these illiberal tactics has been far more direct than in 2016, with US President Joe Biden describing the elections as "pantomime" elections that were "neither free nor fair, and most certainly not democratic" (White House 2021). Several countries from Latin America and beyond have echoed this sentiment, including representatives from the European Union (EU), Colombia, Costa Rica, Spain, and the Organization of American States (OAS). Despite this, several non-democracies openly recognized Ortega and the FSLN as the legitimate winners of the election, including representatives from Venezuela, Cuba, Russia, and Bolivia.

VI. Data & Survey Design

Studying the role of technology on electoral perceptions is methodologically challenging. Elections are relatively rare events, political contexts across illiberal regimes vary considerably, and gathering data on citizen's opinions in these political contexts is particularly complex and potentially dangerous for survey respondents. To get at opinions in a context of illiberal elections we

specifically focus on Nicaragua, which is representative of several former democracies where elections have become a vestigial reminder of a bygone era of liberal politics. As noted, the country was a fledgling democracy until 2010, but Ortega's FSLN has systematically undermined the freedom of elections. Ongoing protests suggest the unpopularity of the regime which seeks to entrench its political position. This makes Nicaragua an especially interesting case to test the proposition that unfree elections can raise the perceived legitimacy and public support for the government. Also, there was significant international commentary on the quality of the election - which Nicaraguans should have been able to access via ICT. In an effort to test whether Nicaragua's election served as a signal to the population of popular support for Ortega, we implemented a cross-sectional online survey prior to and following Ortega's reelection. Though the context and execution of the election were highly distinct, the survey was designed to identify shifts in support plausibly linked to the election itself.

The survey was piloted in late September on a group of fifteen Nicaraguans. As with the final survey, recruitment for participation proceeded through Facebook, which an estimated 56% of the country's residents use on a regular basis. As previously noted, although this recruitment strategy did not yield a representative sample of the population, it allowed us to target the highly educated and digitally connected individuals most likely involved in the organization of and participation in opposition movements (Della Porta & Mattoni 2014).

Following this initial pilot, we used the results to inform the collection strategy for the final survey commencing on October 20th.[2] The resulting pre-election version of the survey received 535 responses until November 6th (the day before the election). The post-election survey, for which we recruited respondents between November 9th and November 22nd, received 266 responses. Unfortunately, as will be discussed in more detail in the discussion section, completion rates hovered around 50% for both the pre- and post-election surveys, resulting in fewer responses than we anticipated (342 total respondents). Collection was also halted on Election Day (November 7th)

[2] *For more information on our recruitment strategy see Appendix A.2.*

and the day after (November 8th) while votes were tallied. The full study timeline is detailed in *Figure 2.4* below:

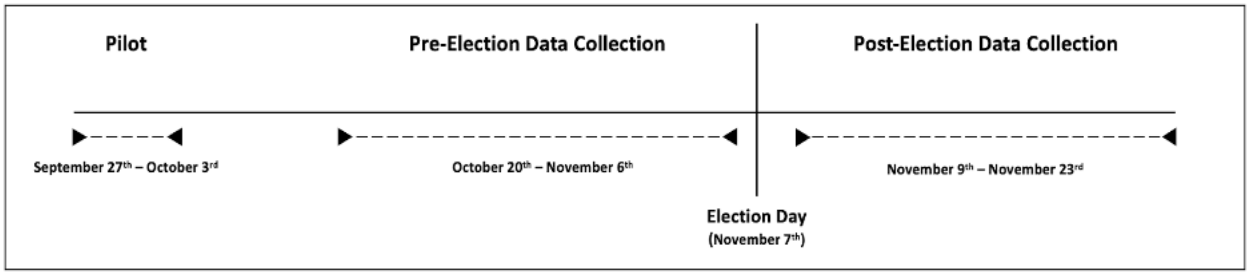

Figure 2.4: *Data Collection Timeline*

One of the primary challenges in empirically testing theories regarding authoritarian governments pertains to their desire to control media sources and censor oppositional content as well as the inherent risk of eliciting opinions from citizens in a highly contentious context. To get around these issues we employ several strategies to protect participants. First, we removed all direct questions related to respondents' support for Ortega and the FSLN as well as questions related to political participation or activism. Instead, we rely on questions focused on respondent perceptions of nation-wide support for various parties and politics-adjacent activities. Second, by shifting our survey from in-person to online, we are able to collect response data while never linking specific respondents' biodata and geographic data to our questionnaire. While ideally we would have been able to conduct a panel including the same participants pre- and post-election, this would have required us to save information that could have put participants at risk, resulting in our decision in favor of a cross-sectional panel design. Fortunately, the pre- and post-election groups show no significant differences in observable characteristics like education, economic status, or media consumption.

Our primary variables of interest measure both perceived support for the FSLN as well as perceived support for opposition mobilization and activism. The first of these questions, linked to our first hypothesis, was worded as follows:

- *If we selected 100 Nicaraguans from the population, and they all voted in a free and fair election based on their true beliefs, how many would vote for Daniel Ortega?*

The next two questions were included to elicit perceived support for opposition mobilization and activism efforts, proxies for our second hypothesis, within the wider Nicaraguan public:

- *If we selected 100 Nicaraguans from the population, how many of them would be willing to attend a meeting of an opposition party?*

- *If we selected 100 Nicaraguans from the population, how many of them would be willing to talk to opposition candidates about their political ideas in a phone conversation?*

Collectively, we expect answers to these questions to probe respondents for their expected weighting of general support for the FSLN and its domestic opposition prior to and following the election.

In addition to these questions, we collect data to control for a range of factors that may influence respondent answers. These controls include information on age, sex, educational attainment, region of residence, media consumption, and a composite of economic indicators. Collectively, the inclusion of these controls bolster the reliability of our results and show that there are no systematic differences between our pre-election and post-election respondent groups. *Table 2.1* below shows the demographic breakdown of both pre- and post-election groups:

	Pre-Election Group Statistics				Post-Election Group Statistics			
	Mean	***Median***	***SD***	***SE***	***Mean***	***Median***	***SD***	***SE***
Age	32.96	31	12.19	0.96	36.87	36.5	13.07	1.16
Sex	1.47	1	0.5	0.04	1.44	1	0.5	0.04
Education	College Graduate	College Graduate	1.8	0.14	College Graduate	College Graduate	1.72	0.15
Income	2.11	2	0.58	0.05	2.06	2	0.58	0.05
TV Usage	3.32	One/Two Times a Week	0.78	0.06	3.44	Most Days	0.87	0.08

Table 2.1: *Descriptive Statistics: Pre- and Post-Election*

Compared to a representative Latinobarometer survey conducted in the country in 2018, our sample was more educated and wealthier than the wider population, though it was consistent across gender and age reports (Latinobarometer 2016).

VII. Information Environment

In all, though our sample is not representative of the larger population, it is reflective of the population of Facebook users in the country. All respondents in our sample should in principle be able to access international news media - and thus be able to independently assess the extent to which FSLN and Ortega have curtailed rights of the opposition, and otherwise bent rules in their favor. They should also be able to observe the criticism over the fairness of the election, articulated by highly impactful people like U.S. President Joe Biden (White House 2021). Given the noted role of social media platforms in the transmission of political information and perceptions of public attitudes (Kleinnijenhuis, Van Hoof, & Van Atteveldt 2019), we see our survey as relevant in its focus on the active community of online users who are more likely to participate in pro-democracy activism (Della Porta & Mattoni 2014) and revolution (Breuer, Landman, & Farquhar 2015). It is likely these influential users play an outsized role in both interpreting and promulgating changes in public support for the incumbent and willingness to participate with the opposition. Thus, our sample allows us to ascertain the signaling effect of the election and its reported result on the perception of public regime support on those people who have access to outside information.

To get additional information on respondent's likely information environment, as well as their partisanship without requiring respondents to self-report, we ask a question about their perceived trust in three separate locally-available television channels: La Prensa, El Canal 4, and Univision. Both La Prensa and Univision are known locally for being relatively independent, whereas El Canal, which is run by the state, is seen as tending to espouse similar views as those of the FSLN. The inclusion of this question allows us to proxy for regime support without asking outright and risking both response bias and potential strain for respondents, which remain concerns when conducting surveys in illiberal environments.

VIII. Survey Results

The results of all three critical questions provide evidence that the Nicaraguan election substantially reduced the perceived public support for Ortega's FSLN while inducing an increase s in the expected willingness of the public to engage with the opposition. The first question, which tests our first hypothesis, prompted respondents to record their perception of what Ortega's vote share would be if a randomly selected group of Nicaraguans voted in a free and fair election. *Figure 2.5* shows the average response across pre- and post-election periods, with estimated support dropping from 43% to 36% when holding at their mean levels of social trust, education, income, and regime support. The results are significant at the 95% confidence level.[3] These estimates were far lower than the 75% tally Ortega officially claimed on November 7th.

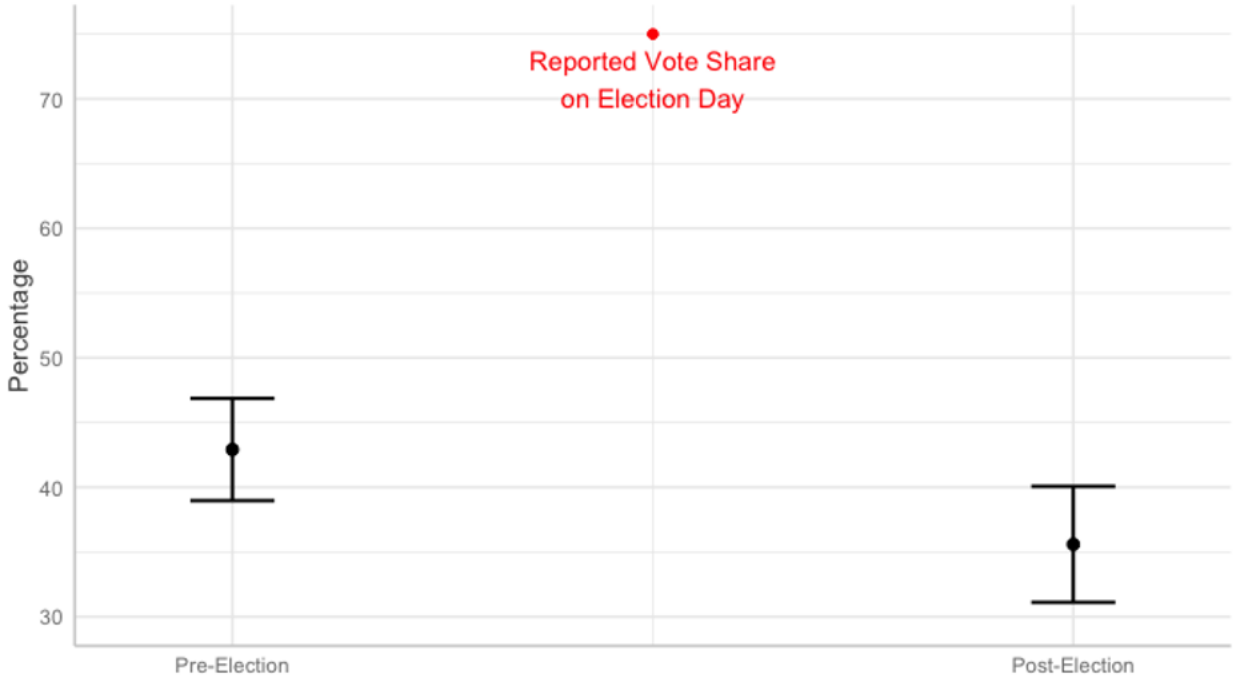

Figure 2.5: *Estimated Popular Support for Daniel Ortega*

While the illiberal actions of the government and the antidemocratic circumstances which surrounded the Nicaraguan election may have contributed to these depressed levels of perceived

[3] *See Appendix A.3 for OLS regression results (Column 3)*

support, these actions began long before the election and did not pick up in any significant way in the weeks prior to the election.[4]

The second and third critical questions, which test our second hypothesis, prompted respondents to consider their expectations for public participation in two activities with the opposition: attending a meeting and discussing political ideas over the phone. As with the question regarding support for the incumbent, both questions elicited statistically significant and substantial results at the 95% confidence level. *Figure 2.6* details the estimates of the Nicaraguan public's willingness to hold a phone call with the opposition regarding their platform, controlling for the same set of controls.[5]

Figure 2.6: *Estimated Willingness to Speak with the Opposition*

As with the first question, post-election assessment shifts in the direction of our hypothesized effect. Specifically, *Figure 2.6* shows that the predicted response shifts from 44% to 54% in the post-election period. This importantly represents a shift from an estimate just below the majority to an estimate significantly above it. Importantly, given that the FSLN was reported to have

[4] *See Appendix A.4 for more information on longitudinal trends*
[5] *See Appendix A.3 for OLS regression results (Column 2)*

received 75% of the vote, our estimates emphasize the gaps between this reported output and the underlying beliefs of our participants.

Lastly, *Figure 2.7* shows the perceived willingness of the Nicaraguan public to meet with the opposition. As with the question regarding conversations, there is a definitive and statistically significant increase in the assessment of the public's willingness to meet with opposition candidates.[6]

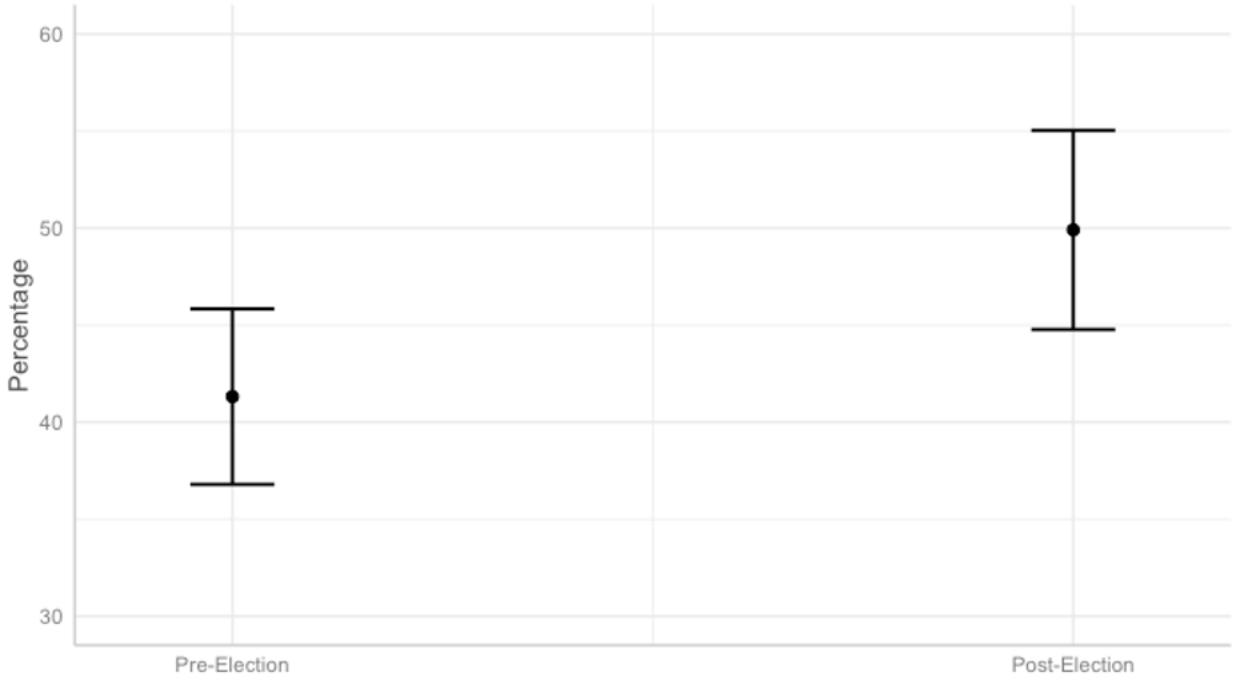

Figure 2.7: *Estimated Willingness to Meet with the Opposition*

Specifically, *Figure 2.7* shows predicted shifts from 41% agreement pre-election to 50% in the post-election period. The change in the responses to all three questions collectively suggests that the election served to undermine Ortega and the FSLN's grip on the public and increased the willingness to engage with the opposition.

Alongside these findings, when we subset the results by respondent trust in government-affiliated news organizations (our proxy for tacit FSLN support) the final data show distinct patterns between non-FSLN/Ortega aligned respondents. This split, which sees individuals

[6] *See Appendix A.3 for OLS regression results (Column 1)*

who prefer non-government run stations adjusting their expectations more drastically in response to the election, suggest that the results were particularly emboldening to respondents more inclined to side with the opposition. The following plots (*Figure 2.8*) show differences in pre- and post-election expected rates of support (*H1*) and participation (*H2*) between groups preferring pro-government and anti-government television channels.

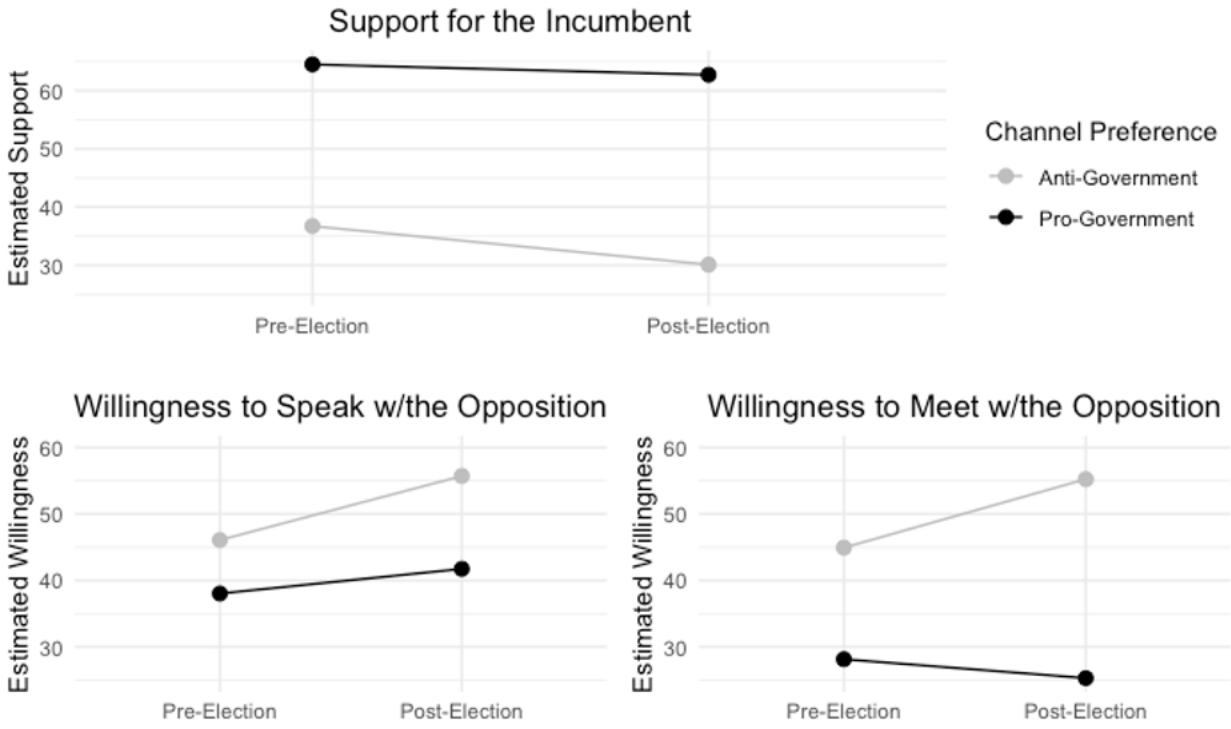

Figure 2.8: *Estimates by Supporter Groups*

Each output presents differences in the rates of change between groups. Importantly, even presumed supporters of the FSLN reported average public regime support estimates below the official election tally of 75%. Further, both regime supporters and opponents down-weighted their estimates of public support after the election.

Collectively, these subset plots suggest that the election served as a more powerful signal for opponents of the regime (those most likely to be spurred to action against the regime) than for supporters. Given that we initially posited that unfree elections likely would not convince opposition supporters, these results should be particularly enheartening for pro-democracy

proponents. Our results suggest that access to outside information can plausibly drown out the signal that strong winning margins reported by illiberal leaders are intended to send. Citizens sympathetic to the opposition were undeterred by the election results, and rather appear to have upwardly adjusted their assessment of opposition strength as viewed through their perceptions of the public's willingness to engage with other opposition members. Conversely, for supporters of the regime, it appears that the election did not greatly impact their beliefs. It is nonetheless worthwhile to point out that these respondents did not upwardly adjust their assessment of public regime support and indeed slightly increased their perceptions of the public's willingness to speak with the opposition. These subset analyses should be interpreted as a cautious first step in identifying the exact mechanism underlying these shifts in perceived support and are limited by our use of imperfect proxies for regime and opposition alignment.

IX. Discussion & Conclusion

Our survey results deviate from classic predictions derived from the extant literature on the signaling effect of elections under illiberal rule. In the case of Nicaragua, the election result appears to have reduced the perception of regime support among the populace and increased respondent's willingness to engage with the opposition (at least in the short term). It appears that the availability of online information regarding the manipulation of Nicaragua's elections via international news media outlets and other online sources are an important explanatory factor in this new information ecosystem. In all, our survey results provide evidence for our theory that the conduct of fraudulent elections can downwardly affect public perceptions of regime support where citizens have access to outside information. Collectively, these results suggest that manipulated elections may actually amplify oppositional zeal under certain conditions. That is, as we hypothesized, where external information is available to citizens, elections may embolden the opposition rather than intimidate them.

Despite these encouraging results, the generalizability of our findings is hampered by our substantial methodological limitations. For one, as with all elections, the results are specific to the domestic climate and political history of Nicaragua. It is likely that in other settings these results

could be diminished or even reversed depending on how election results are broadcast and interpreted. Additionally, it is difficult to ascertain what exactly drove citizens to reduce their assessment of public regime support, while the easier access to outside information would certainly mediate the effect of other factors. Moreover, our central limitation remains the small sample collected for our analyses, and that safety concerns precluded us from surveying the same group of people twice. Though the effect sizes were large enough to reach statistical significance despite low rates of response and completion, future studies should invest in the collection of larger survey populations where possible, though this remains challenging to do in illiberal polities. As it stands, while the respondents of our surveys are highly similar across observable characteristics, it remains possible that opponents of Ortega's FSLN were more likely to voice their opinion in the aftermath of the election - or that an undetermined form of selection bias is driving our results.

In future work, scholars should continue to examine the effect of elections on perceived public regime support. It is impossible to hold constant the substantial amount of varying factors that accompany any single election, making it necessary to gather more information across countries and elections. At this point, it is difficult to ascertain whether idiosyncratic factors drove the effect of Nicaragua's 2021 election on the public evaluation of regime support or whether we are observing a general trend of illegitimate elections in high information environments.

Importantly, despite these limitations, the results of our study help inform discussions of electoral legitimacy and authoritarian institutions. While debate has continued regarding the role of elections in signaling support in non-democratic contexts, we provide evidence that in at least some contexts, among an influential subset of the population, elections can indeed affect public perceptions and serves as a signal to citizen where unbiased information is widely available. Moreover, as most of the literature documents a litany of benefits to incumbents, we provide evidence that unfree elections may pose more inherent risk to authoritarian governments than has previously been acknowledged. Further research should examine the conditions and contexts in which elections serve to either bolster or undermine perceptions of incumbent support and participation in oppositional activities as well as how internet use and information access serve as modifiers when investigating the impact of elections on public perceptions.

Chapter 3

Beyond Fact-Checking: Examining the Reach of Current & Future Efforts to Counter Electoral Misinformation in Developing Countries

I. Introduction

The dissemination of information and communications technologies (ICTs) has transformed the electoral landscape in developing countries, allowing previously marginalized individuals to engage with politics from areas previously disconnected from digital networks at a fraction of prior costs. Yet the benefits of ICTs have also facilitated the spread and amplification of political misinformation targeting politicians, political parties, and the integrity of elections (Guess & Lyons 2020; Garbe et al. 2023). Despite high awareness of this "misinfodemic" the impact of these narratives on political outcomes, such as voting intentions and election results, remain understudied, particularly in developing countries (Posetti & Bontcheva 2020; Abhishek 2021; Rossini et al. 2021). Nascent democratic institutions may be particularly vulnerable to online misinformation and its influence over citizen perceptions, behavior, and public debates due to deficits in citizen trust and the absence of reliable alternatives (Lazer et al. 2018; Kuru et al. 2022). While recent work has attempted to imbue democratic institutions and actors with resources and tactics to counter misinformation these efforts remain in their infancy. Growing concern over the role of misinformation in hampering democratic processes and perceptions of election integrity in developing countries has increased the saliency of the following question: *Which strategies are the most appropriate to counter the spread of electoral misinformation in new democracies?*

To reduce the potential deleterious effects of misinformation in democracies, which include challenges to equitable political participation (White et al. 2006; Valenzuela et al. 2019; Ohme et al. 2021), the polarization of the electorate (Del Vicario et al. 2016; Törnberg 2018; Azzimonti & Fernandes 2023), and reduced trust in the legitimacy of electoral outcomes (Allcott & Gentzkow 2017; Tambini 2018; Lee 2019), several strategies have been proposed. These efforts range from debunking efforts that include professional fact-checks produced to address specific misinformation

narratives to pre-bunking initiatives such as trainings designed to improve societal media literacy or to aid in the capacity of the public to spot potentially misleading information. Positive results from laboratory and field studies conducted primarily in the United States have raised hopes that sustained fact-checking efforts may be able to minimize belief in online misinformation (Walter et al. 2020; Carey et al. 2022). However, related interventions have only begun to be tested in developing countries, leaving questions regarding their efficacy in addressing local forms of misinformation (Bradshaw & Howard 2018; Ceron et al. 2021; Porter & Wood 2021).

Even where these interventions have been successful several contextual factors raise concerns regarding their sustainability. For one, there is limited funding in developing countries to sustain the robust fact-checking efforts necessary to counter regional misinformation, which often involves details specific to local political conditions and a greater number of languages than is often considered in studies conducted in the United States and Europe (Wasserman & Madrid-Morales 2019; Vraga et al. 2020; Bowles et al. 2022). Moreover, information in developing countries is increasingly circulated on encrypted messaging applications (EMAs) such as WhatsApp, Telegram, and Signal (Liu et al. 2021; Gursky & Woolley 2021; Kazemi et al. 2022). Thus, even where fact-checks exist to address a particular claim, it is unlikely that any one false narrative will be identified in time for the processes of assessment and distribution required to reach those spreading viral misinformation. Despite these constraints, the activists and non-governmental organizations active on private channels have attempted to use their networks to limit the influence and spread of misinformation on these channels (Bowles et al. 2020). While recent efforts to label misinformation have been shown to reduce user propensity to believe and share targeted posts (Bode & Vraga 2018; Van Der Meer & Jin 2020), these efforts remain constrained by their reliance on the existence of official fact-checks (Tully et al. 2020; Vijakumar 2022; Badrinathan & Chauchard 2023). Additionally, there is limited work testing how these efforts perform under the unique conditions in which misinformation is disseminated in developing countries, which include complications with linguistic diversity, the prevalence of encrypted messaging applications, deficient funding, and low rates of trust in traditional media outlets. These constraints leave two primary questions unanswered:

1. *How comprehensive are current efforts to provide activists, organizations, and ordinary individuals with electoral fact-checks in developing countries?*

2. *How can misinformation be effectively countered in developing countries when fact-checks are either not available or not applicable?*

To address these questions this chapter relies on data from Kenya's contentious 2022 presidential election. Only fifteen years and two elections removed from the extensive electoral violence that defined Kenya's 2007 Presidential Election (Gibson & Long 2009), the 2022 vote was viewed with both anticipation and trepidation. Prior to the election, five-time candidate and democracy advocate Raila Odinga was seen as a heavy favorite over incumbent Deputy President William Ruto. William Ruto's surprising victory was immediately questioned and the resultant court cases claiming fraud were eventually struck down by the Kenyan Supreme Court. Despite their ruling, suspicion of the election's legitimacy has lingered due in part to Raila Odinga's continued claims of electoral fraud. This sustained hesitation to trust the results of the election enabled the conduct of this analysis within what has become a common state of electoral hesitation in the aftermath of global elections.

Challenges to William Ruto's election occurred in a domestic digital environment that stands out from the rest of the region for its diversity of viewpoints and distributors (Tully 2021). Kenya's pluralistic media ecosystem is capable of hosting several prominent fact-checking organizations, including PesaCheck and AfricaCheck, which dedicate resources and personnel to the investigation of the origins and veracity of public statements and popular narratives (Siwakoti et al. 2021). Given this background, Kenya can be viewed regionally as a "most likely" case for the identification of positive effects linked to domestic fact-checking efforts. To establish the reach of these contemporary Kenyan fact-checking efforts, I first code a subset of the 2,000,000 Twitter posts collected through the electoral period to classify misinformation. Results from this qualitative coding process suggest that within the election-related discussion aimed at damaging perceptions of election integrity, only 39% of these posts contained information applicable to current fact-checking

methods. That is, the majority of the electoral misinformation identified by coders could not have been fact-checked even if targeted by official fact-checking organizations due to complications with the included claim. Moreover, in an analysis of the fact-checks released during the election period by fact-check organizations as well as official government releases, less than 15% of the posts containing misinformation in my sample were found to overlap with any debunked narratives. Most troubling of all, there is no evidence that any of these fact-checks were in reality used to counter misinformation within the larger Twitter sample. That is, I find no evidence that *any* fact-checks produced during the election campaign were cited online to counter untrue narratives about the election's legality or the legitimacy of the results. These results reiterate that countering misinformation requires new strategies that can fill the gaps left by current fact-checking and platform moderation efforts.

To fill this gap I draw on recent collaborative research conducted with the Centre for Analytics and Behaviour Change (CABC) to test a novel method for outsourcing efforts to address misinformation I have termed "social truth queries" or STQs (Jalbert et al. 2023). As with the research from Pennycook and Rand (2022) on accuracy prompts, this strategy is aimed at prompting users of social media and encrypted messaging platforms to consider the content of the post prior to taking action by having a wide set of users question various aspects of the posted information in the comments. For instance, when encountering a post containing a false statement about the election's outcome, use of a STQ could take the form of a user replying to the post to probe the veracity of the information by asking about its source (i.e. "*where did you hear this?*") or its wider social congruence (i.e. "*Do many Kenyans believe this?*"), among other strategies.

Drawing on misinformation collected via crowdsourcing methods that included the identification of misinformation across EMAs and mainstream platforms by local non-profits and citizen volunteers during the 2022 Kenyan Presidential Election, I supplement the aforementioned textual analysis with an online survey experiment containing 4,011 participants to assess whether these STQs can serve as an alternative to fact-checking in developing countries in efforts to counter public perceptions of false information, intention to share, and trust in purveyors of misinformation. Results from the analyses suggest that STQs may be most impactful when targeted

at users that are highly susceptible to political misinformation as defined by their willingness to believe and share posts containing false claims. The results of both the classification process and survey analyses have implications for any individuals, organizations, or platforms interested in improving efforts to address online misinformation throughout developing countries.

First, these analyses provide novel evidence regarding the constrained reach of extant fact-checking efforts in one of Africa's largest and most influential democracies. Where previous scholarship has emphasized research on the efficacy of fact-checking efforts (Margolin, Hannak, & Weber 2018; Walter et al. 2020), the evidence provided should serve to recontextualize recent work by refocusing efforts on the reach of these efforts paired with studies on their decontextualized influence (Dias & Sippitt 2020; Nyhan et al. 2020; Sultana & Fussell 2021). Specifically, I identify gaps in current efforts that reiterate the need for investment in supplementary strategies to counter electoral misinformation that can mitigate barriers to impact prevalent in developing countries. This includes the challenge posed by the prevalence and popularity of EMAs (Liu et al. 2021; Gursky & Woolley 2021; Kazemi et al. 2022; Badrinathan & Chauchard 2023) as well as complications related to linguistic diversity (Wasserman & Madrid-Morales 2019; Vraga et al. 2020). In addition to these known barriers, I also provide novel evidence from an audit of Kenya's online political environment that illustrates how extant efforts to distinguish between true and false information are hindered by low rates of trust in traditional media outlets.

Second, I contribute to a growing literature on the distinctive characteristics and effects of political misinformation in developing country contexts (Ceron et al. 2021; Porter & Wood 2021; Tully et al. 2020). Central to this contribution is the development of a new coding scheme tailored to differentiate between the types of electoral misinformation prevalent during electoral periods in similar environments. The final typology, which distinguishes between the fact-checkable misinformation typically targeted by media outlets and two adjacent forms (*unspecified* and *unprovable* misinformation), helps to clarify what types of misinformation are currently unaddressed during electoral periods. Further work utilizing this coding scheme should enable informed investment in alternatives capable of complementing the benefits of official fact-checking efforts.

Finally, I test for the first time a novel intervention for responding to the vast majority of political misinformation that cannot be addressed with formal fact-checking methods. These results provide evidence for further investment in local solutions to the management of misinformation that can be flexibly deployed by a larger cohort of active citizens. Specifically, the efficacy of STQs in this quasi-experimental context provides information regarding the role individuals can play in countering political misinformation online. Though further attention will be needed to determine the generalizability of these findings, the comparative scalability (in terms of potential users), flexibility (in terms of applicable platforms), and cost (in comparison to fact-checking methods), collectively suggest that STQs could provide fact-checking organizations and media outlets with a much needed additional tool to combat electoral misinformation in developing country contexts.

The rest of the chapter proceeds as follows. First, I provide more information regarding the efficacy of current efforts to address misinformation in developing countries. Next, I detail the context of the study and explain why the conditions present prior to and following Kenya's contentious 2022 presidential election provide the study with additional generalizability related to elections in nascent institutions and online misinformation in developing countries. Third, I outline the research design, data, and estimation strategy, which employs both a novel collection of social media data as well as evidence from an online survey experiment. I first present the results of the social media audit before explaining the survey design and results. Finally, I conclude by suggesting additional areas for research and detailing the policy implications of the study for political misinformation in nascent democracies.

II. The State of Political Fact-checking & Debunking Efforts

Fear that misinformation will undermine democratic governance is rooted in the related contingency that false information must both reach *and* influence voters. The first contingency – that political misinformation is prevalent during elections – has been widely tracked in developing countries (Grinberg et al. 2019; Ncube 2019; Mutahi 2020). Evidence of its impact, however, is less widely accepted. Skeptics have noted the limited reach of intentional misinformation (or "disinformation") in analyses of state propaganda efforts (Cinelli et al. 2020; Eady et al. 2023).

Others have argued that even when misinformation reaches voters the partisan nature of politics limits its influence on political attitudes and behaviors (Guess et al. 2020).

At the same time, research from several democracies around the world has linked the contact with misinformation to several detrimental consequences for elections. Starting in the U.S., evidence from the 2008 presidential election based on survey data has shown that endorsement of rumors altered the likelihood of voting for Barack Obama (Weeks & Garrett 2014). Similar evidence from Washington State (Reedy et al. 2014) or Oregon (Gastil et al. 2018) utilizing cross-sectional and panel data, respectively, revealed that disinformation influenced voter support for ballot measures on each state's electoral ticket. Similarly, in Italy researchers have used variation in local languages to link political misinformation to increased support for populist parties (Cantarella, Fraccaroli, & Volpe 2023).

Though research on the influence of misinformation on electoral outcomes from developing countries is limited, the work that has been done suggests that the consequences could be particularly impactful due in part to lower levels of partisanship (Mainwaring & Scully 1999; Samuels & Zucco 2018) and digital literacy (Cruz-Jesus, Oliveira, & Bacao 2018; Guess & Munger 2022), along with the comparative breadth of local political misinformation (Jalli & Karlina Idris 2019; Resende et al. 2019; Madrid-Morales et al. 2020) as well as its widespread circulation on EMAs (Machado et al. 2019; Badrinathan & Chauchard 2023). Evidence reflects these worries, with political misinformation having been linked to the occurrence of violence (Banaji et al. 2019; Akinyetun, Odeyemi, & Alausa 2021), support for populist candidates (Ricard & Medeiros 2020; Ong & Tapsell 2022) and the perpetuation of xenophobic attitudes and policies (Chenzi 2021; Nkabane & Mutereko 2021). As a result of these potential consequences, recent efforts have attempted to connect electoral studies to interdisciplinary work on the underlying drivers of misinformation.

In spite of the recent centrality of misinformation to discussions of politics detailed above, individuals remain generally trustworthy of the online information, particularly when the information they encounter is congruent with their worldviews (Gains et al. 2007; Leeper & Slothuus 2014). Amidst this backdrop, recent approaches have attempted to undermine this hard

wiring through the use of interventions that interrupt this default form of information processing (Jahanbakhsh et al. 2021; Roozenbeek et al. 2021). Initiatives for countering the spread and influence of misinformation are typically separated by their proximity to larger pre-bunking or debunking strategies (Tay et al. 2021). Pre-bunking initiatives take a medical approach to countering misinformation. This often involves attempts to "inoculate" individuals from misinformation by reducing the persuasiveness of false content before it is internalized (Compton, 2013; McGuire, 1964). These interventions can include efforts to improve baseline rates of media and digital literacy (Scherer & Pennycook 2020; Jones-Jang et al. 2021) as well as efforts to help the public identify common tropes and terms included to promote unverified content (Van Der Linden 2022).

In contrast, debunking initiatives focus on limiting the influence of existing rumors by minimizing spread, belief, and sharing intent (Berinsky 2017). Common strategies for debunking misinformation include fact-checking (Walter et al. 2019) and post hoc crowdsourcing efforts to identify misleading posts (Allen at al. 2021). Recent work has extended these efforts by testing the use of labels that draw attention to the accuracy of the associated content (Brashier et al. 2021; Pennycook et al. 2021), such as Twitter's application of "community notes" (previously "birdwatch"). Research suggests that inducing skepticism in the veracity of a claim can reduce belief in false information (Jalbert et al. 2020) as well as propensity to share the accompanying posts (Fazio 2020). Recent work has also incorporated the use of accuracy "nudges" as a strategy for addressing the quality of online information by shifting attention to accuracy by asking users to assess the underlying truth of a specific headline or statement. Accuracy nudges have been found to reduce the intent to share false headlines and limit further sharing of misinformation (Jalbert et al. 2020; Pennycook et al. 2020).

Due in part to deficient investment by global platforms in the moderation of local content, current efforts to implement debunking initiatives in developing countries have also revolved primarily around official fact-checking efforts, which involve the employment of trained professionals who investigate the source and veracity of select claims (Graves 2018; Schiffrin & Cunliffe-Jones 2022). Preliminary evidence has noted the potential of this work in counter belief in

rumors and conspiracy theories across a diverse set of cultural and political contexts (Nyhan & Reifler 2010; Amazeen 2020; Porter & Wood 2021). At the same time, studies from developing countries have shown that the effectiveness of corrections can depend on factors such as the source of the correction, the wording of the correction, and the preexisting beliefs of the individuals being corrected (Van Der Linden et al., 2015; Ecker et al., 2017). Despite these limitations, the lack of existing alternatives has resulted in their growing prominence in the fight against misinformation, with the Duke Reporters' Lab reporting knowledge of 421 active fact-checking organizations by the end of 2021; a tenfold increase since their data collection commenced in 2014 (DRL 2023). As *Figure 3.1* shows, though the initial investments were primarily based in the United States and Europe, there has been extensive investment in the development of global fact-checking organizations based in Africa, Latin America, and Asia in recent years.

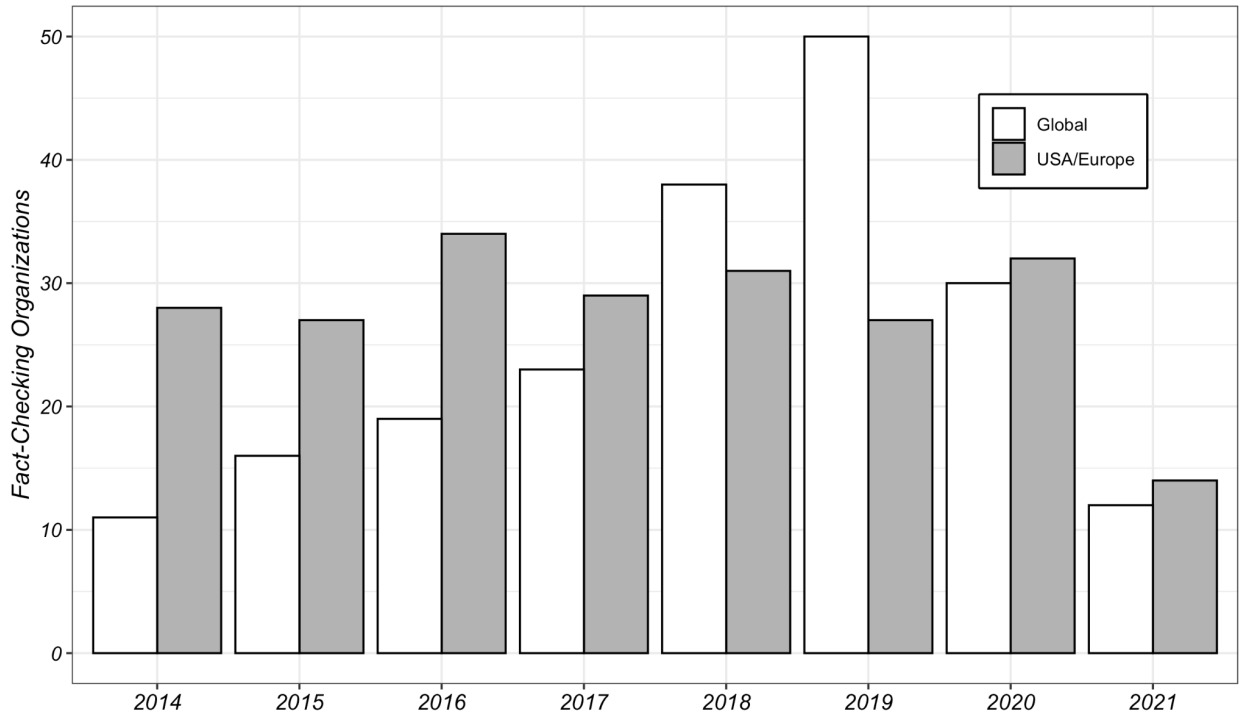

Figure 3.1: *New Fact-Checking Organizations by Year*[7]

While the fact-checks dispensed by these organizations continue to play an important role in the mitigation of online misinformation, their influence remains limited by several interrelated

[7] *Appendix B.1 contains cumulative totals and further information on the reach of global fact-checking organizations.*

structural, temporal, and financial factors. Firstly, fact-checking is costly (Karagiannis et al. 2020; Jolly 2022). While millions have been spent funding fact-checking efforts, the diversity of social media platforms, local languages, and shere volume of online communications require fact-checking organizations to cover vast spheres of influence (Graves 2018; Nielsen & McConville 2022). Moreover, the misinformation that poses the greatest offline threat are those that are not obviously false (Barrera et al. 2020; Hameleers 2022), which requires substantial investigative work by highly trained staff to ensure fact-checks are correct and institutional credibility is maintained (Graves & Cherubini 2016). Not only does this take substantial financial backing, but it also requires time, which can minimize the efficacy of fact-checking efforts where even well-formulated and distributed corrective information is not disseminated prior to the initial spread of the misinformation (Brashier et al. 2021; Humprecht 2020). Relatedly, even when quality fact-checks are produced quickly, it is often difficult to reach audiences on existing social media platforms given the stochastic nature of online engagement (Graves & Amazeen 2019), growing use of video communications (Donzelli et al. 2018; Zade et al. 2022), and the cross-platform mobility of viral rumors (Saltz et al. 2021). Finally, the embrace of EMAs in developing countries has further complicated traditional fact-checking efforts by limiting public knowledge of the trajectory of misinformation narratives (Reis et al. 2020; Badrinathan et al. 2022).

To address some of these issues, recent work has been done to extend the reach of fact-checking efforts, including both the advent and rollout of algorithmic correction methods (Graves 2018; Karadzhov et al. 2017; Zeng 2021) as well as peer correction or social correction methods (Bode & Verba 2018; Van Der Meer & Jin 2020). Currently, algorithmic methods, which often utilize machine learning to identify and apply relevant fact-checks (Alhindi et al. 2018), are still in their infancy and remain unable as of now to address misinformation outside of public social media platforms (Reis et al. 2020; Guo et al. 2022). Of these methods, social corrections have shown the most promise as a flexible addition to fact-checking efforts with real world use cases that include misinformation on EMAs (Cook et al., 2018; Banidathran & Chaurard 2023). Put simply, social corrections are community-sourced disseminations of fact-checks through which individuals can minimize the spread of misinformation by linking to verified information in the comments

below posts containing misinformation (Bode & Vraga 2018). Social corrections are believed to work by challenging people's confidence in their false beliefs, making them more open to considering the corrections (Kunda & Todorov 2014). Additionally, social corrections can foster a sense of community and shared norms around truth-seeking, which can incentivize people to seek out accurate information and avoid spreading misinformation (Brossard & Scheufele 2013).

Yet while these efforts extend the range of current fact-checking work in both their breadth and depth on the internet, in order to provide a social correction users are still reliant on the initial production of a reliable fact-check. As a result, in elections, as with other crises and highly uncertain events, social corrections are unavailable in a timely enough manner to limit the spread of potential harmful misinformation (Starbird 2017; Brashier et al. 2021). Moreover, in cases in which the veracity of the information in question cannot be wholly determined, fact-checks and social corrections may remain unavailable indefinitely. Thus while the combination of fact-checks and social corrections are able to address falsifiable misinformation across a variety of contexts, my aim here is to test a related alternative with the potential to add to this debunking arsenal for use in cases that remain beyond the reach of current debunking strategies.

The latter half of this chapter attempts to address these deficiencies through the introduction of a new strategy for countering misinformation called "social truth queries" or STQs. Research on judgment suggests that people utilize a limited set of truth criteria when deciding whether or not a claim is true, such as assessing the compatibility of the claim with adjacent beliefs or whether there is social consensus around the claim's accuracy. Based on this work and the efforts of researchers at South Africa's Centre for Analytics and Behavioural Change (CABC), STQs rely on individuals present in online communities to counter misinformation by commenting on posts containing potential misinformation with probing questions that prompt other readers to consider the veracity of the post when it is encountered. For example, a user might reply "*where did you learn about this?*" to a post containing misinformation. STQs hold several advantages over existing methods. These advantages include flexibility in their content, the speed with which they can be applied to potentially problematic content, their applicability to EMAs, and, perhaps most importantly, the ease with which individuals and organizations can deploy them. Moreover, as they

are not linked to specific outlets or organizations they should not be as affected by deficiencies in social trust in local media. For each of these components the Kenyan election provides an opportunity to assess the reach of current and potential efforts during a hotly contested campaign.

III. Study Context: Electoral Politics and Misinformation in Kenya

The salience of election misinformation is heightened in Kenya, where rumors of variable veracity regarding the conduct and outcome of the country's 2007 election contributed to the violence that killed an estimated 1,200 people and displaced up to 500,000 (Gibson & Long 2009). Sporadic violence in the 2013 election and the unprecedented annulment of the August 2017 presidential election by the Supreme Court of Kenya have incentivized further investment in local fact-checking efforts and management of online misinformation (Tully 2022; McKay 2022). As an early adopter of digital technologies and a local cell phone penetration rate of 98% (Kharono et al. 2022), these fact-checking efforts have been promoted as a potential answer to misinformation that has been seen as a primary driver of polarization and instability in the region.

These concerns persisted in the build-up to the 2022 electoral contest, which pitted acting Deputy President William Ruto of the Kenya Kwanza Alliance against longtime democracy advocate and five time presidential candidate Raila Odinga of the One Kenya-Amizio la Umoja coalition. Misinformation online was rampant in the build up to the election on several platforms including in traditional forms of media such as newspapers and radio (Smalley 2022) as well as of calls for violent action widely documented on new online platforms such as Twitter, Facebook, WhatsApp, and TikTok (McKay 2022; Njanja 2022; Wadekar 2022). The breadth of these efforts have become common during recent electoral campaigns (Ogola 2010; Tully & Ekdale 2014) and remains consistent with recent surveys revealing high perceptions of false information online in the Kenyan context (Madrid-Morales et al. 2021). In one case in the build-up to the election, a TikTok video alleging that William Ruto was guilty of homicide showed an edited photo of the future president holding a knife while covered in blood. The video was viewed over half a million times (Bhalla 2022). The perceived threat of similar rumors has been widely discussed locally, with organizations such as the ELOG and Ushahidi, in addition to the work of several media and

fact-checking outlets, having developed strategies for drawing on the credibility and perceived non-partisanship of civil society actors to promote a consistent picture of political events to the public.

Despite these notable efforts, which were overwhelmed by the speed and breadth of electoral rumors, the electoral conspiracy theories propagated on both in person and online were given further legs when outsider candidate William Ruto overperformed expectations to not only overtake Raila Odinga but win the election with more votes than the 50% plus one metric required to negate the need for a runoff (Houreld & Miriri 2022). Efforts to ensure the legitimacy of the outcome were damaged by the conduct of the Independent Electoral and Boundaries Commission (IEBC), which is charged with managing the conduct and certification of the nation's election results. Though the chairman of the IEBC upheld the results, four of members of the seven member commission abstained from certifying the results, citing the "opaque" nature in which it was said to have been conducted (Crawford 2022). Raila Odinga further exacerbated the role of misinformation by appealing the declaration of the IEBC on flimsy evidential foundations, resulting in a delay in Ruto's confirmation (Cheeseman 2022). Though William Ruto was eventually confirmed as President, suspicion of the election process and tally continue to be questioned, with Raila Odinga amplifying the skepticism of his supporters through continual attacks on the IEBC while refusing to accept William Ruto's victory (Otieno 2023).

IV. Categorizations of Electoral Misinformation

Starting in June 2022 and continuing through the post-election appeals in September, I collected a set of over two million Twitter posts relating to the election.[8]

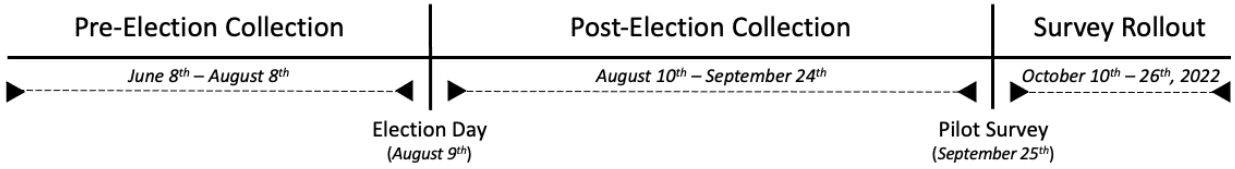

Figure 3.2: *Data Collection Timeline*

[8] *The corpus of terms used in the collection is contained in Appendix B.2.*

In order to assess the prevalence and composition of misinformation related to the election this set was randomized and a subset of 2,600 posts were coded by misinformation type between two trained coders.[9] Posts were first flagged if they had the potential to reduce reader trust in the integrity of the election's processes or outcome. Though the majority of these posts were easily identified, further discussion between coders was necessary to minimize disagreement in the final set. The primary points of contention related to posts that denigrated candidates or included rumors regarding policy decisions (both retrospective policies and projected enactments). To reduce uncertainty the study was limited to rumors specific to the integrity of the election itself rather than the character or motivations of the candidates. As an example, rumors that William Ruto or Raila Odinga would enact martial law once in office would not be included in the subset of integrity-related posts whereas posts containing a rumor that one of the two candidates had plans to alter votes to ensure themselves of victory would be.

Following this initial determination, each post designated as negatively influencing perceptions of election integrity was assessed to identify the type of misinformation it contained. Five initial categories were identified based on a preliminary sample of data and discussion with researchers working the developing country contexts. In subsequent rounds of coding these five categories were collapsed into three primary codes for clarity and replicability purposes. The first category included "*provable*" misinformation, which includes all posts that could plausibly be falsified and thus fact-checked using traditional fact-checking or social correction debunking methods (*Row 1* of *Table 3.1*). The second category included "*unspecified*" misinformation, which consists of posts that included vague references to fraud or violence but does not present a coherent theory, narrative, or evidence (*Row 2* of *Table 3.1*). The third and final category included misinformation that could not be proven or disproven with publicly available evidence ("*unprovable*"). Unlike provable misinformation, which could plausibly be fact-checked given time and investigative skills, misinformation in the no public evidence bin would have required either affidavits or intimate knowledge of the claimants personal lives (*Row 3* of *Table 3.1*). This determination was in part based

[9] *See Appendix B.3 for IRR details across categories. Disagreements were adjudicated by the author.*

on discussions with fact-checkers active in investigating political rumors present in developing countries.

Type of Misinformation	Definition	Example
Provable	A post that includes a direct reference to a specific narrative or piece of evidence that explicitly states or insinuates that the election was not free and fair and includes publicly verifiable information.	*"The results were hacked! Odinga was ahead in the valley until everything flipped. No doubt Chebukati is responsible."*
Unspecified	Any tweet that hints at issues of election integrity without making an explicit claim or narrative that includes falsifiable evidence. These statements often take the form of a question or the form of an indirect reference.	*"Rigged. Through and through."*
Unprovable	Any tweet that is not provable with public information, but which describes or mentions specific narratives or evidence related to plots or instances of damage to election integrity. Unprovable misinformation typically contains misinformation that includes both a subject and target.	*"Representative Gladys Shollei has been in the center stage helping DP Ruto to rig Raila Odinga out of the presidency."*

Table 3.1: *Example Codes by Type of Misinformation*[10]

By focusing on these three central codes, this coding process enabled the categorization of a wide range of electoral misinformation. While other coding schemes are better suited to identify and detail the specific aspects of misinformation narratives, this coding scheme is ideal for differentiating between misinformation posts based on their relationship to potential

[10] *Example Tweets included have been slightly edited from their original text to protect the anonymity of the original posters.*

interventions. In addition, the simplicity of the coding scheme should allow for simple replicability in the classification of misinformation in future elections.[11]

Alongside these categorizations, each of the 541 posts coded as containing misinformation were cross-referenced with formal fact-checks produced by the three largest Kenyan fact-checking organizations between July 1st and October 1st, 2022 (a total of 175 fact-checks).[12] The results of each of these efforts are presented separately in *Figure 3.3*.

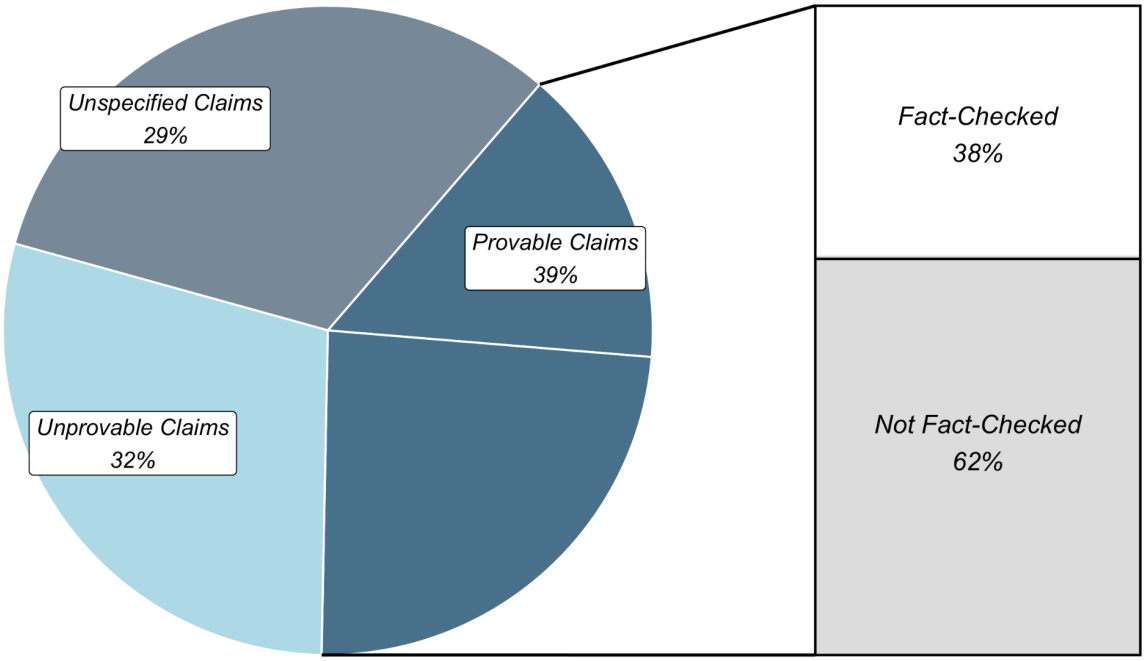

Figure 3.3: *Total Misinformation by Type & Fact-Checks*

I find that fact-checks were only applicable for 39% of the misinformation in the larger subset. Moreover, only 38% of the misinformation that could plausibly have been fact-checked could be linked to a fact-check that could have been used in a social correction (with this lowered to only 15% among all posts containing any type of identified misinformation).[13]

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[11] *Further examples are included in an excerpt from the extended coding scheme in Appendix B.4.*

[12] *These included fact-checks from several well-known non-partisan media outlets, including PesaCheck, AfricaCheck, and AP News. See Appendix B.5 for a list of all included fact-checks and more detail on the identification process.*

[13] *These percentages correspond to aggregate totals that include official sources ranging from fact-checking organizations to news sources and the official IEBC results. For more information on the breakdown of the identified fact-check links and the coding process see Appendix B.5.*

The limited reach of fact-checking efforts on Twitter in this election is partially by design. Given limits to funding and access to social media data, fact-checking organizations have to prioritize misinformation that in their view poses the greatest risk to the public (Graves & Cherubini 2016; Nakov et al. 2021). Yet while this is the most efficient use of resources, judgment of the most influential misinformation is often difficult to determine *a priori* (de Oliviera et al. 2021). Moreover, where the origins of misinformation are spread across local platforms damaging electoral misinformation may not reach fact-checkers in time for them to make prioritization decisions. In all, evidence from this audit reiterates the multifaceted challenges facing fact-checking organizations operating in developing countries. Given these limitations to existing methods, there remains an open question: What can be done to address the influence of electoral misinformation that is not fact-checked?

V. Beyond Fact-Checking: Social Truth Queries

As previously noted, strategies based on nudges hold certain advantages over fact-checking effort. Crucially, as lab studies have illustrated, they can be implemented quickly, are scalable, and do not require analysis of the quality of news (Jalbert et al. 2023). Unfortunately, these strategies are also limited by their disruptive qualities and the necessity of the user to maintain focus for long periods of time, which is unusual among the typical social media user (Bayer et al. 2022). Moreover, these strategies also require foresight and targeting by social media platform moderators, which saddles them with similar limitations to the fact-checking and social correction approaches.

In light of these limitations, organizations have started to develop their own community-driven strategies to combat the spread of harmful information online that take local conditions into account. One such organization is the Centre for Analytics and Behavioural Change (CABC), which has developed their own strategies for targeting election-related misinformation in South Africa. Among other programs, the CABC has attempted to counter misinformation by training volunteers to rely on posts with content that can reduce belief in the accompanying information. These replies are formed as questions and do not require an accompanying fact-check. For example, a user might reply "*where did you learn about this?*". Research on judgment suggests that

people utilize a limited set of truth criteria when deciding whether or not a claim is true, such as assessing the compatibility of the claim with adjacent beliefs or whether there is social consensus around the claim's accuracy. By allowing users to utilize an array of queries that appeal to different truth criteria, the CABC has attempted to create a flexible approach that does not require a user to post a specific response, but rather choose a response they prefer that matches the context of the correction. The Kenyan election presented an opportunity to test the potential of these "social truth queries", or STQs, as a novel strategy for minimizing the spread and influence of misinformation in developing countries.

STQs hold several advantages over existing methods. These include their flexibility in targeting specific posts, the speed with which they can be applied to potentially problematic content, their transferability to EMAs, and, perhaps most importantly, the ease with which individuals and organizations can deploy them. Moreover, as they are not linked to specific outlets or organizations they should not be as affected by deficiencies in social trust in local media. These differences could be particularly salient in developing countries, where a more diverse set of languages and local costs reduce the availability and generalizability of other forms of debunking content. These advantages prompted the author to conduct recent collaborative work testing the CABC's concepts with Dr. Madeline Jalbert. Laboratory studies illustrated the potential for STQs to limit not only accuracy perceptions but also the propensity of users to share posts containing misinformation (Jalbert et al. 2023). I hypothesize:

> ***Hypothesis 1 (H1):*** *Inclusion of social truth queries will reduce the perceived accuracy of the associated misinformation.*
>
> ***Hypothesis 2 (H2):*** *Inclusion of social truth queries will reduce the intention of users to share the associated misinformation.*
>
> ***Hypothesis 3 (H3):*** *Inclusion of social truth queries will reduce perceptions of the trustworthiness of the poster of the associated misinformation.*

Several chapters have illustrated the role of other forms of accuracy checks on perceived accuracy and sharing intentions (Pennycook et al. 2020; Banidathran & Chaurard 2023). Theoretically, I expect each of the STQs utilized in the treatment posts to minimize both judgements of accuracy and willingness to share by causing hesitation among the readers when interpreting social media posts. This is consistent with expectations from fact-checks and social corrections (Bode & Verba 2018). Given that these strategies rely on similar theoretical concepts, I expect aligned outcomes.

In addition to considerations of accuracy and sharing intentions, I have also introduced a third treatment focused on assessments of the trustworthiness of the poster. I envision the influence of STQs on trustworthiness perceptions to track those of *H1* and *H2* as, due to prolonged engagement with the post, the STQs could influence otherwise stable assessments of the poster's biases alongside reinterpretations of the posted information. If the results match this hypothesis, it could limit the spread not only of the identified misinformation but also the reliance of the reader on the poster for future information.

> ***Hypothesis 4 (H4):*** *Social truth queries will be more effective when misinformation is aligned with the partisanship of the reader.*

One concern with STQs and other strategies for combating misinformation reliant on comments is that they may only reduce perceptions related to misinformation that is already not easily believed. Fortunately, the theory underlying the operation of STQs suggests that comments which cause readers to consider information more intently are likely to be most effective when misinformation would otherwise be interpreted uncritically. The efficacy of STQs on political misinformation that is aligned with partisan beliefs is crucial if they are going to serve as a deterrent to potentially damaging electoral misinformation. The highly-politicized context of Kenya's 2022 presidential election should serve as a robust test of this hypothesis.

> ***Hypothesis 5 (H5):*** *Social truth queries will be more effective on unprovable misinformation than unspecified misinformation.*

Returning to the contribution this chapter makes regarding the various forms of political misinformation prevalent online during Kenya's election campaign, I hypothesize that STQs will be most beneficial in combating unprovable misinformation. Theoretically, unprovable and provable misinformation should respond similarly to the influence of STQs, with fact-checks and social corrections available to users attempting to address provable misinformation. I focus on the two remaining types of misinformation that are currently outside the bounds of user-based methods for combating online misinformation. Unprovable misinformation relies on specific narratives that are unable to be verified, which makes them potentially extremely pernicious in influencing perceptions and altering real world behavior. This is the type of misinformation STQs should be well-suited to address as they should get individuals to pause to interpret the evidence, bias, source, or legitimacy of the information and poster.

Alternatively, unspecified misinformation does not detail specific narratives and typically involves the reiteration of broad platitudes and conspiracy theories. This type of misinformation is less likely to have as detrimental an effect on the reader. Similarly, as there is no evidence or underlying theory to consider, I don't expect STQs to be as effective in minimizing their influence.

VI. Research Design

In addition to the collection of misinformation on Twitter, local volunteers were recruited to forward potential misinformation that appeared across private channels on both mainstream and alternative platforms, including WhatsApp, Telegram, and TikTok.

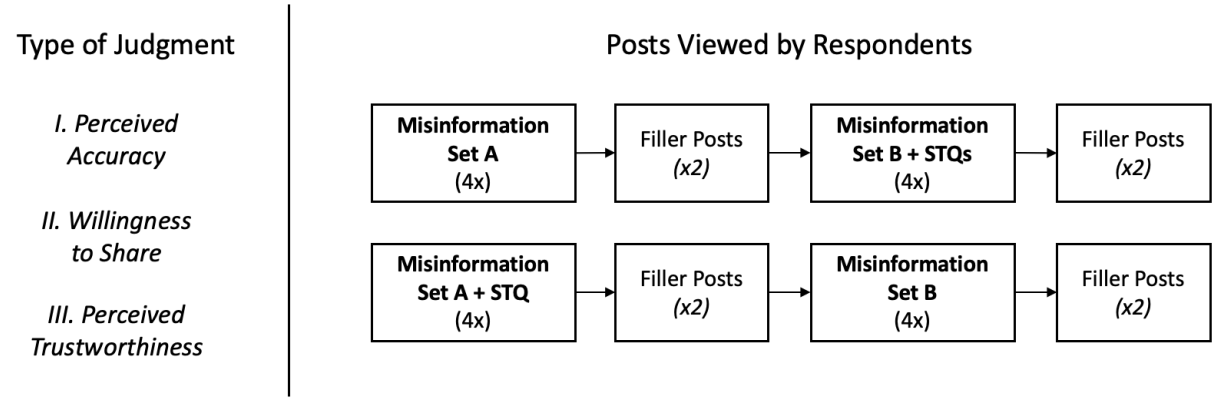

Figure 3.4: *Survey Randomization & Design*

From the 120 posts confirmed to contain political misinformation sourced from this collection, a selection of 40 of these stories were split into groups based on the partisan alignment of each post with the partisanship of the two candidates competing for Kenya's presidency. To ensure there was a balance across these categories in terms of baseline accuracy perceptions, I conducted a pre-survey (N=88) to norm the collected misinformation stories before selecting stories that led to an overall balance across both partisanship, misinformation type, and perceived accuracy. In addition, I included four filler posts containing both true (two) and false (two) misinformation unrelated to Kenyan politics to improve the accuracy of user perceptions and guesses. The final set of misinformation stories included two unprovable and two unspecified pro-Ruto stories as well as two unprovable and two unspecified pro-Odinga stories alongside the four filler posts.[14]

These posts were then randomized to include either no user comment or a user comment containing one of several STQs (see *Figure 3.5*). To ensure that the results weren't driven by specific misinformation posts or STQs, the set containing the misinformation and the STQs were randomized among all participants. Prior to the conduct of each survey, participants were split into one of three dependent variable conditions: *i*) perceptions of accuracy, *ii*) sharing propensity, and *iii*) perceptions of trustworthiness.

[14] *As the narrative selection in the norming pre-survey was based on balancing across outcomes of interest (specifically partisanship, misinformation type, and accuracy) rather than potential rumor virality, I expect the result to be more reliable, but most likely with smaller effect sizes. In combination with the focus on political misinformation, which is viewed as more difficult to alter than apolitical misinformation (Lazar et al. 2018), I view the analyses as producing evidence from a least likely case.*

Figure 3.5: *Example STQ Treatment Post (Left) & Control Post (Right)*[15]

For each group, respondents were asked to evaluate the randomized treatment condition for each post. For instance, respondents in the sharing condition were asked "How likely would you be to share the following post on social media?". In each condition, respondents were prompted to answer on a six-point Likert scale (in this case ranging from "*Extremely Likely*" to "*Extremely Unlikely*"). Results rely on OLS regressions comparing control and treatment responses.

VII. Survey Sample

In order to ensure the tests of my hypotheses were valid I recruited participants eligible to vote in Kenya's 2022 presidential election for a survey using online advertisements disseminated across Facebook, Instagram, and WhatsApp.[16] Recruitment advertisements were distributed from an account associated with the Center for an Informed Public (CIP), which is a publically funded center at the University of Washington focused on studying misinformation and promoting effective strategies for resisting its influence.[17] For an example of the materials used for the

[15] *Though the misinformation contained in each post was identified in the larger collection, it has been slightly reworded to protect the anonymity of the original poster. Additionally, to further ensure privacy and to limit potential bias based on the poster, images and names were replaced with a random assortment of photos split by gender and ethnicity. These image/name combinations were used for both the treatment and control posts for each condition to ensure results were not driven by external biases.*

[16] *OSF Pre-registration: https://osf.io/jznqt. Analyses follow the stated research design unless noted otherwise.*

[17] *https://www.cip.uw.edu/*

recruitment of participants see *Appendix B.6.* To limit potential partisan and other forms of bias in the slant of the collected misinformation I expanded the reach of my collection to include several additional encrypted platforms, including WhatsApp and Telegram. Using Facebook advertisements that have shown to be effective in broadening the reach of academic surveys in Kenya, recruitment was stratified by the country's former provinces, age, and gender by targeting ads to specific users based on information contained in their public profiles (Rosenzweig & Zhou 2021).

Participants were also recruited and given the option to take the survey in either English or Swahili. Though these are the two most widely spoken languages in the country, this selection still excludes a not-insignificant portion of the population. However, given the linguistic and ethnic diversity of the country these languages were chosen to maximize the reach and generalizability of the survey within financial and technical constraints. Given these limitations, as expected I find that our sample is younger, more male, and more educated than estimations of the wider Kenyan population.[18] While not representative of the county, I find that the sample is representative when compared to the subset of Kenyan social media users that are the target of the intervention and the most likely to encounter online misinformation due to their disproportionate online presence and engagement on social media platforms (Shrestha & Spezzano 2019). See *Appendix B.8* for a full set of descriptive statistics by treatment condition.

VIII. Aggregate Results

Can social truth queries limit the influence of electoral misinformation in developing countries? I first assess the consistency of the results with *Hypotheses 1-3*, which examine the effect of the inclusion of any one of the utilized STQs on the perceived accuracy (*H1*), sharing intentions (*H2*), and the perceived trustworthiness of the poster (*H3*). That is, this analysis looks at how much the inclusion of a question (or "STQ") in the comments under a post altered responses.

---

[18] *Appendix B.7 contains more information on the demographics of the sample compared to the 2019 Kenyan Census. The majority of the demographics match the census, though there is an overrepresentation of respondents of Kalenjin ethnicity. This disparity is accounted for by the randomized and pooled treatment design.*

To assess the effects of STQs on these outputs, I first ignore the partisan lean of the participant and of the misinformation by pooling all of responses to the treatment and control social media posts. For each of the outputs responses were recorded on a six-point scale, with higher values representing more skepticism among respondents. All subsequent tables utilize OLS regression models. Controls are excluded from the models due to the randomized design of the treatment to limit bias (Lin 2013).[19]

See *Table 3.2* for the aggregated results by treatment group.[20]

	Dependent Variable:		
	Accuracy	Sharing	Trust
	(1)	(2)	(3)
Social Truth Query	0.115***	0.067	0.051
	(0.037)	(0.043)	(0.041)
Constant	3.105***	2.453***	3.575***
	(0.295)	(0.432)	(0.250)
Observations	10,031	10,435	10,867
Adjusted R^2	0.024	0.026	0.026
Residual Std. Error	1.865 (df = 9984)	1.919 (df = 10388)	1.860 (df = 10820)
F Statistic	6.300*** (df = 46; 9984)	7.114*** (df = 46; 10388)	7.237*** (df = 46; 10820)
Note:			*p<0.1; **p<0.05; ***p<0.01

Table 3.2: *Aggregate Effect of STQs Across Accuracy, Sharing, & Trust Models (H1-H3)*

The results from this initial test suggest that STQs may be best suited for countering the perceived accuracy of political misinformation. Specifically, in assessing *H1*, I see that the addition of STQs to social media posts significantly reduces the likelihood that a respondent assesses rumors to be accurate relative to the control condition. In addition, the directionality of the results is consistent across both *H2*, the willingness of participants to share the misinformation, and *H3*, the perceived trustworthiness of the poster of the misinformation. However, the size of the effect is roughly half

[19] *As a robustness check, see Appendix B.9 for an alternative output matching the models contained in Table 3.2 that controls for gender, age, education level, ethnicity, employment status, urban residency, province of residence, and religion. Results are maintained.*

[20] *See Appendix B.10 for corresponding histograms.*

that of the accuracy condition in each case. Overall, taking into account low initial ratings and the highly politicized domestic electoral environment, STQs appear most helpful in reducing perceptions of rumor accuracy (*H1*) with more limited evidence for sharing intentions (*H2*) and perceptions of trustworthiness (*H3*).

Though not pre-registered, due to lower than expected rates of initial accuracy in the survey misinformation, I subset the data to focus on the most "susceptible" group of participants. To identify the group of participants most vulnerable to political misinformation I subset respondents by their mean scores across a set of control posts. As these posts are not included in the analyses they do not influence the scores directly, but serve as stand-ins for the mean responses of each respondent to misinformation. Specifically, to identify this group I take the respondents that score one standard deviation greater than average based on total group means based on either perceived accuracy, sharing propensity, and trustworthiness.[21]

Figure 3.6 details the coefficient results among this subset of susceptible individuals for each set of outcomes (*right*) next to the effects among the full sample (*left*).

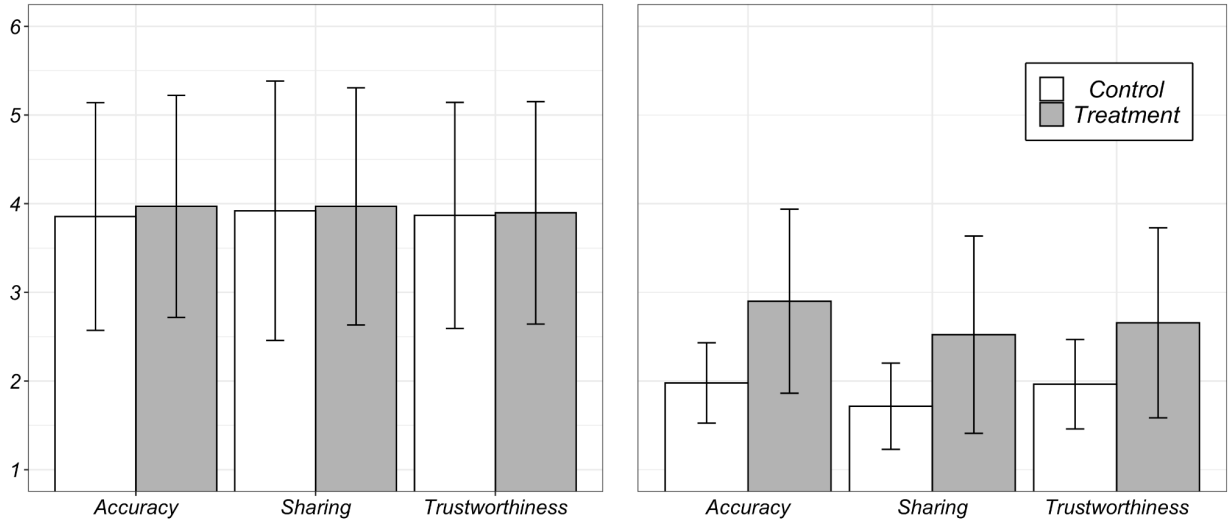

Figure 3.6: *Aggregate Effects Across All Participants (Left) & Susceptible Participants (Right)*

[21] *This group was drawn from a selection of individuals with rates of perceived accuracy (N=1,799), sharing (N=871), or trust (N=919) one standard deviation below the mean for each treatment. See Appendix B.11 for the corresponding regression table.*

As illustrated in *Figure 3.6*, the results of the STQs among this target group containing susceptible individuals are of greater magnitude across all three dependent variables (accuracy, sharing, and trustworthiness) than in the full set of participants. Substantively, these results represent a shift in all three outcomes an entire point on average across all three conditions. That is, these changes represent more than an eight-fold increase in the effect across each condition from the baseline effect.

To further illustrate this shift, *Figure 3.7* details the corresponding histograms among this cohort of susceptible respondents.

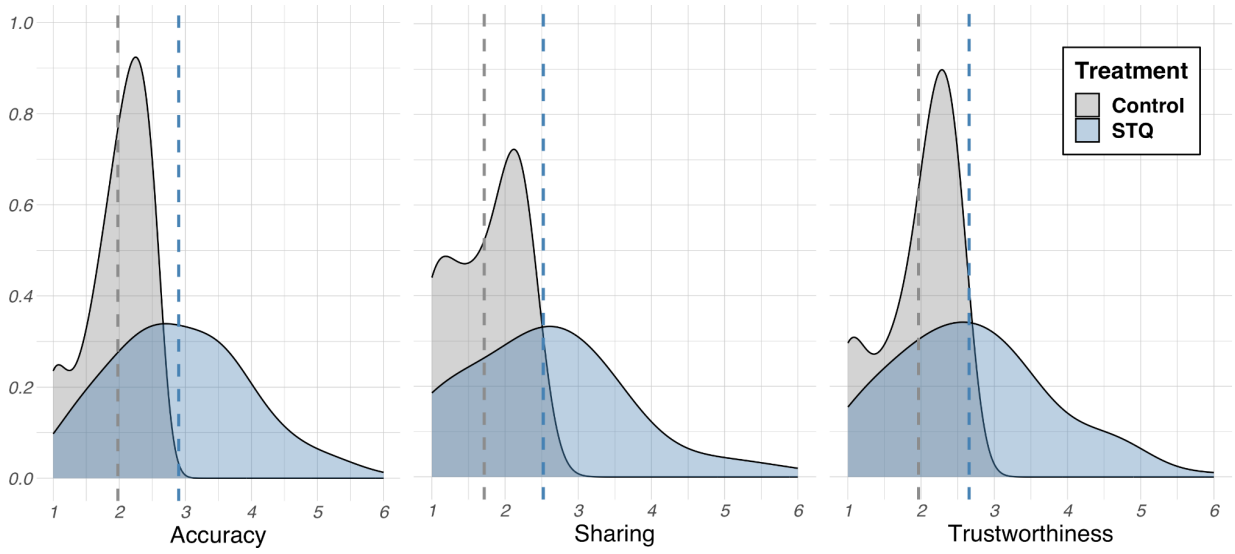

Figure 3.7: *Histogram Splits for Susceptible Participants (-1 SD)*

For each treatment group the inclusion of STQs substantially reduced negative outcomes related to the potential influence of political misinformation.

These results are highly encouraging given the real world influence of a small subset of "repeat spreaders" of misinformation, which have been shown to be responsible for an outsized share of the production and spread of online misinformation (Kennedy et al. 2022). Moreover, though the initial results were only significant for accuracy perceptions, among this subset all three outputs have large effect sizes that are also highly significant. Practically, these differential outcomes suggest that STQs may be most useful when directed at the users most likely to be influenced by political misinformation. To ensure that these results hold across conditions, which if not could

limit their real world applicability and potentially lead to negative outcomes, I conduct several additional analyses looking at the influence of STQs by the partisan alignment of the political misinformation as well as the content of the misinformation.

IX. Partisan Alignment

First I assess whether the efficacy of STQs is influenced by the partisan alignment of the respondent (*H4*). *Table 3.3* looks at the first aspect of *H4*, that is, whether corrections are less effective for ideologically aligned stories. I code rumors as aligned or misaligned based on their political subject and target, with discussions taking place between the researchers and local experts to adjudicate the partisan lean of narratives for which the alignment was uncertain. Alternatively, the partisanship of the respondent was taken from self-reported data on voting history in the 2022 election. For this analysis, I coded claims = 1 when they were political claims aligned to respondent ideology, and = 0 otherwise (misaligned).[22]

Table 3.3 details the effect of STQs on *misaligned* (vs. *aligned*) misinformation.

[22] *For example, if the respondent is a Ruto supporter and the claim is pro-Ruto, this would be coded as a '1', as would claims that are pro-Odinga if they are being rated by someone who supports Odinga.*

	Dependent Variable:		
	Accuracy	Misinformation Alignment Sharing	Trust
	(1)	(2)	(3)
Social Truth Query	0.121**	0.002	0.112*
	(0.057)	(0.066)	(0.061)
Misaligned (Aligned)	0.930***	0.701***	0.959***
	(0.055)	(0.079)	(0.073)
STQ*Misaligned (Aligned)	−0.003	0.079	−0.108
	(0.077)	(0.091)	(0.084)
Constant	3.392***	3.552***	3.384***
	(0.040)	(0.057)	(0.053)
Observations	9,087	9,411	10,116
Adjusted R^2	0.061	0.038	0.054
Residual Std. Error	1.833 (df = 9083)	1.914 (df = 9407)	1.842 (df = 10112)
F Statistic	197.231*** (df = 3; 9083)	123.996*** (df = 3; 9407)	192.877*** (df = 3; 10112)
Note:			*p<0.1; **p<0.05; ***p<0.01

Table 3.3: *Effect of STQs by Misinformation Alignment & Treatment Group*

The results of the interaction suggest that the alignment of the misinformation, or the congruence of the target of the post with the partisanship of the poster, makes little difference on the influence of the STQs. A detailed look at the results shows slight splits in the effect by treatment group, with STQs more effective in reducing sharing intentions when paired with *misaligned* misinformation and more likely to reduce trustworthiness perceptions when paired with *aligned* misinformation. Alternatively, the influence of narrative alignment on accuracy perceptions is negligible.

Collectively, the results of the political alignment analyses show that the efficacy of STQs is largely unaffected by the alignment of the political misinformation encountered by the respondents. This result is contrary to the expectations set forth in *H4* and goes against much of the literature on motivated reasoning, which both expect interventions to be more effective when politically aligned with respondents.[23] The primary explanation for this result relates to the nature of STQs, which unlike fact-checks do not confront readers with a particular partisan perspective. When readers cannot immediately dismiss contradictory evidence based on partisan cues it may enable users to consider the veracity of the underlying claim without first contextualizing the post as a partisan

[23] *Appendix B.12 contains specific inputs split by specific supporter groups.*

viewer. Further evidence is provided for this explanation in the breakdown of the effect size of specific STQs across treatment groups, which shows that the most adversarial question ("*Do other people actually believe this?*") was the least influential of the four included questions.[24]

X. Misinformation Type

In addition to the alignment of the post, I examine the comparative efficacy of STQs across the two prominent forms of misinformation classified by the included coding scheme: *unprovable* and *unspecified* misinformation (*H5*). Particularly, I separate unprovable and unspecified misinformation to determine whether the type of misinformation plays a role in persuasion. The included posts were selected based on their initial classification during the coding process.

Table 3.4 notes the effect of STQs on *unspecified* (vs. *unprovable*) misinformation.

	Dependent Variable:		
	Misinformation Type		
	Accuracy	Sharing	Trust
	(1)	(2)	(3)
Social Truth Query	0.156***	0.012	0.097
	(0.053)	(0.061)	(0.059)
Unspecified (Unproven)	−0.048	−0.190**	−0.038
	(0.054)	(0.076)	(0.072)
STQ*Unspecified (Unproven)	−0.082	0.086	−0.074
	(0.075)	(0.088)	(0.083)
Constant	3.880***	4.017***	3.888***
	(0.038)	(0.053)	(0.051)
Observations	10,031	10,435	10,867
Adjusted R^2	0.001	0.001	0.001
Residual Std. Error	1.886 (df = 10027)	1.944 (df = 10431)	1.884 (df = 10863)
F Statistic	5.372*** (df = 3; 10027)	4.489*** (df = 3; 10431)	3.190** (df = 3; 10863)
Note:			*p<0.1; **p<0.05; ***p<0.01

Table 3.4: *Effect of STQs by Misinformation Type & Treatment Group*

The results of the interaction suggest that the type of the misinformation, or in this case the specificity of the contained misinformation narrative, has a limited difference on the efficacy of

[24] *Appendix B.13 contains the results by specific social truth query.*

STQs. Though minimal, there are slight differences between treatment groups. Specifically, STQs were more influential in reducing sharing intentions when paired with *unprovable* misinformation. That is, when the misinformation targets a specific actor and details the intent of the conspiracy, respondents were less likely to signal their intention to share the post than when the misinformation was nonspecific. On the other hand, perceptions of accuracy and poster trustworthiness were influenced more greatly when associated with *unspecified* misinformation. Taken in full, counter to expectations, the split results suggest that STQs are not noticeably more effective when paired with *unprovable* misinformation.[25]

These results are encouraging as they suggest that STQs can serve as a complement to extant fact-checking efforts across a broad range of both specific and nonspecific misinformation narratives. This is particularly encouraging in reference to *unspecified* misinformation, which is viewed as more difficult to address due to its reliance on broad claims that are more difficult to disprove (Mousavi et al. 2022). The efficacy of STQs on these forms of unspecified misinformation are consistent with the theory that STQs work primarily by surfacing various truth criteria. As a result, they do appear to present a viable additional tool for addressing a broad range of posts containing political misinformation.

XI. Discussion & Conclusion

Fact-checking in developing countries can be seen as a necessary but insufficient solution to the threat of political misinformation. While official fact-checks hold several advantages over other debunking initiatives, including their links to legitimate organizations, their capacity for centralized distribution, and their investment in debunking highly disruptive narratives, among others, they are also limited on several fronts. As discussed, official fact-checks are often ill-suited to address misinformation quickly, across private platforms, and beyond relatively limited binary true-false claims. Given these limitations and finite investments in the extension of current

[25] *As noted, the results presented here for unprovable misinformation should match the result of provable misinformation, with the only difference being the availability of public information to fact-checkers.*

fact-checking efforts in developing countries alternative initiatives are needed to complement the important work of active global fact-checking organizations.

The first section of this chapter used online posts from the 2022 Kenyan election to illustrate the extent of these challenges. I found that of election-related discussion aimed at damaging perceptions of election integrity, fewer than half of the examined posts contained information that could be addressed by fact-checking methods. Moreover, in an analysis of the fact-checks released during the election period, fewer than 15% of the identified posts were addressed in official fact-checks. While these totals may undervalue the work done to target the narratives with the greatest potential to disrupt the election, they are suggestive of the need to provide organizations with additional tools to combat the spread of political misinformation. Evidence from this audit should be used to encourage greater investment in alternative tools and strategies.

Second, I contribute to a growing literature on the distinctive characteristics and effects of political misinformation in developing country contexts (Ceron et al. 2021; Porter & Wood 2021; Tully et al. 2020). Central to this contribution is the development of a new coding scheme tailored to differentiate between the types of electoral misinformation prevalent during electoral periods in similar environments. The final typology, which distinguishes between the fact-checkable misinformation typically targeted by media outlets and two adjacent forms (unspecified and unprovable misinformation), helps to clarify what types of misinformation are currently unaddressed during electoral periods. Further work utilizing this coding scheme should enable informed investment in alternatives capable of complementing the benefits of official fact-checking efforts. In addition, the benefits of this minimalist typology may inform future efforts to study the benefits and limitations of related interventions.

In light of the evidence enabled by the coding scheme and the social media audit, the final contribution of the chapter is to test the potential of "social truth queries" as a complementary strategy for managing belief in electoral misinformation. Having been originally designed by researchers based in the region, STQs sidestep some of the primary challenges facing official fact-checking efforts by harnessing the attention and reach of local users on both public and private

social media channels. Additional models suggest that under certain conditions STQs may also function regardless of differences in poster and reader partisanship. Finally, the results require caution in the broad application of STQs as well as the generalizability of the initial results as a lack of research in the study of electoral misinformation in developing countries makes it difficult to determine if the Kenyan case is exceptional or broadly representative of wider trends in content and prevalence of misinformation.

Chapter 4

Does Democracy Die in Darkness?
Electricity Outages & Electoral Accountability in South Africa

I. Introduction

In theory, elections provide citizens with an opportunity to reward or punish incumbents based on their performance in office. This check on incumbents is critical to the functioning of democracies as it ensures that politicians are incentivized to respond to the demands of the public (Linz & Stepan 1996; Rose-Ackerman & Palifka 2016). Yet in dominant party systems, in which a single party's governance is uninterrupted for several successive elections, less is known about whether these accountability mechanisms can still incentivize incumbents to improve their performance through voter defection at local levels of governance (Cox 1997). Given this puzzle I ask: Do voters use local elections to hold incumbents in dominant party systems accountable for failing to deliver essential services?

Despite the importance of this question for the function of democracy, recent evidence suggests from developing countries contending with dominant parties that the link between governance quality and voter support do not always match this theorized pattern of behavior.[26] When politicians are not held accountable for their performance, research has noted a range of deleterious consequences for voters, including a propensity toward unresponsive governance and rising rates of political corruption (Lederman, Loayza, & Soares 2005; Rose-Ackerman & Palifka 2016). Yet the majority of this work has been conducted in non-democratic settings (Linz 1990; Persson, Roland, & Tabellini 1997; Lijphart 1999; Samuels 2004), which are in part defined by the existence of legitimate institutional accountability mechanisms, including elections (Gilli & Li 2015; Hollyer & Wantchekon 2015).

Though the capacity of citizens to hold incumbents accountable is often assumed in democracies, there remain substantial challenges for establishing and maintaining accountability mechanisms. These include the difficulties facing voters attempting to obtain accurate information

[26] *Dominant party systems are also referred to as "predominant" party systems (Sartori 1976).*

about political performance (Manin, Przeworski, & Stokes 1999; Grossman, Michelitch, & Prato 2021) as well as shifting expectations among voters (de Kadt & Liebermann 2017). While recent work has attempted to assess the consequences of diminished accountability for incumbents, these works have largely tracked either long-run improvements (Moreno-Jaimes 2007; de Kadt & Lieberman 2017) or discrete governance crises, such as state abuses and violence (de Kadt, Johnson-Kanu, & Sands 2020; Hassell, Holbein, & Baldwin 2020).

In this article, I contribute new empirical evidence from South Africa to address this gap by asking whether citizens in dominant party democracies react to persistent governance failures as predicted by traditional theories of electoral accountability despite the absence of a direct channel to punish the national government. To test the relevance of theories of electoral accountability, I draw data from the recent high profile disruptions to South Africa's electoral grid, which I rely on as a critical public service failure. Using a variety of measures tied to these electricity blackouts, or instances of "load shedding", I test whether voters acknowledge and punish lower-level members of the ruling party at the ballot box as an effective substitute for national alternation.

The ANC's continued management of the country's public electricity utility, Eskom, and the persistence of its national governance provides a unique opportunity to track citizen responses to salient service failures while avoiding issues regarding the "clarity of responsibility" which have plagued both research into electoral effects and complicated voter assessments of political accountability (Powell & Whitten 1993: 397). Though the ANC has remained in power since the country's first historic 1994 election, South Africa's distinct federalized system presents voters with opportunities to react to the ANC's performance across various levels of local governance while making it easier for voters to link performance to a specific party (Hellwig & Samuels 2007). Moreover, though non-competitive at the national level, several distinct opposition parties have developed to counter the ANC's rule at various lower levels of governance, enabling a secondary assessment of the parties most likely to gain from public service failures linked to incumbents.

As it is not just important to understand *whether* voters respond to poor performance, but also *how* they respond due to the long-run implications of this behavior, the structure of South Africa's electoral system also allows me to determine whether defecting voters support populist or

reformist alternatives. Several country experts have worried aloud in recent years that the ANC's struggles may result not in a more competitive electoral environment, but in the empowerment of parties that favor a rollback of fundamental democratic rights (Cheeseman & Larmer 2015; Reddy 2022). As recent global trends tracking democratic backsliding have renewed interest in the role of populist political parties (Tilt & De Witte 2022), it is feared that voter apathy as well as sustained "expressive" voting patterns may threaten democracies when voters perceive extant alternatives to incumbents to be indistinguishable in terms of competence or corruption/legitimacy (Jennings 2011; Suiter 2016). Using data from South Africa, I am able to leverage the staggered occurrence load shedding to provide additional evidence with regards to which types of parties gain from salient governance failures in dominant party states.

In this setting, I present two primary sets of empirical tests of the accountability hypothesis. First, I exploit variation in the timing of load shedding prior to ward by-elections held between the 2016 and 2021 municipal elections using a novel dataset tracking by-election party performances. Second, to further examine these trends in the context of national party campaigns, I draw on new evidence reliant on variation in the staggered occurrence load shedding incidents across three prominent metropolitan municipalities in the week prior to the 2021 election. Collectively, these analyses help me determine whether the salience of these service failures results in a diminished vote share for the ANC. In addition, these related identification strategies allow me to examine whether the formidable challenge presented by load shedding failures results in increased support for populist or service-based opposition parties.

The results of both analyses show that increases in the salience of load shedding events, as measured in cumulative outage hours, leads to reduced support for the ANC consistent with the expectations of the accountability hypothesis. However, regarding concerns that the perceived extent of the challenge of reforming the country's atrophied public services may lead to voter apathy, load shedding failures appear to systematically reduce turnout in elections. Finally, the analyses provide evidence suggesting that populist parties are not favored over centrist opposition parties when the salience of service failures increases. To further examine the link between this highly visible failure in service provision and voter attitudes I draw from a representative survey

from the country's populous and political central Gauteng Province. The main findings from the electoral analyses replicate at individual level while controlling for a host of covariates and potential confounders. That is, failures in the provision of electricity predicts lower support for the ANC candidates regardless of their local status as incumbents or opposition. Collectively these results suggest that in dominant party states voters punish incumbent parties in local elections even when failures originate and are felt nationally.

The study has important implications for several literatures interested in democracy, representation, and development. Most importantly, I contribute novel evidence regarding the benefits of elections for the punishment of underperformance in dominant party systems. Where elected officials and parties reside over the visible decline of public services, voters do appear capable of assigning blame and holding parties accountable in competitive local elections even when failures cannot be linked to specific incumbents. Though consistent with theoretical expectations, recent work illustrating deviations from this direct form of accountability have necessitated the reparameterization of this essential tenet of democracy (Moreno-Jaimes 2007; de Kadt & Lieberman 2017; Hassell, Holbein, & Baldwin 2020). In addition, this study contributes to the literature on development in dominant party democracies by detailing the incentives local elections provide for investment in sustainable infrastructure and public services even when national elections and state control remain uncompetitive (Lake & Baum 2001; Deacon 2003; Keefer & Khemani 2005). Finally, this study provides additional context to studies of populist parties by noting the importance of institutional constraints in thwarting efforts to turn anti-democratic attitudes into electoral support as well as the importance of competent opposition parties in sustaining electoral incentives (Kriesi 2014; Mohrenberg, Huber, & Freyburg 2021; Tepe 2022).

The rest of the chapter proceeds as follows. First, I provide background regarding current evidence for the electoral accountability hypothesis, including recent exceptions that have brought its relevance into question in contemporary democracies. Next, I detail the context of the study and link recent electricity challenges to the management of Eskom by the ANC over the past two decades. Third, I outline the research design, data, and estimation strategy, which employs both electoral and survey outcomes. I then present my main results and summarize their robustness to

alternative specifications. Finally, I conclude by suggesting additional areas for research and detailing the policy implications of the study.

II. Electoral Accountability

Classic theories of electoral accountability are rooted in the principal-agent relationship at the heart of democracy (Przeworsk 1991; Fearon 2011). In theory, elections provide citizens the opportunity to hold their representatives accountable for their performance in office (Schmitter & Karl 1991; Przeworski 1999). This concept dictates that citizens are both able to both *identify* and *react* to the performance of representative politicians and parties. When organized and conducted correctly, elections present citizens with the opportunity to react, whether that be in the form of continued electoral support (rewarding) or vote switching/abstaining (punishing). Several scholars have emphasized this relationship as the central difference between democratic and non-democratic systems (Katz 1997; Lindberg 2006). Yet the availability of these options in practice do not necessarily result in them functioning as anticipated in practice. I am interested in determining whether this relationship holds in dominant party systems where incumbents face minimal pressure from voters to alter their behavior at the national level.

Given the importance of service provision in developing countries, it is expected that improvements in a government's ability to deliver essential goods will result in sustained voter support. Yet several developing countries are governed by dominant parties which maintain voter support at least in part due to attachments linked to the colonial and post-colonial legacies (LeBas 2011; Riedl 2014; Sanches 2018) resulting in 'de facto one-party regimes' (Bogaards 2004: 174). Though typologies differ, dominant parties largely follow Sartori's original definition that sees dominant parties as those which control "the system of interactions resulting from inter-party competition" (1976: 44). Regionally, several countries, including Namibia, Tanzania, Mozambique, Angola, Uganda, and South Africa, have been classified as dominant party regimes due to limited contestation between incumbent and opposition parties (Boucek & Bogaards 2010). Though the institutionalization of each of these dominant parties and the systems in which they govern are distinct (Mainwaring 2018), they have been able to sustain electoral dominance that has ensured

they maintain a disproportionate share of each state's political and economic resources (Levitsky & Way 2010b).

Cleavages rooted in racial and ethnic identities have remained a central focus of research on the persistence of dominant party regimes (Miguel & Gugerty 2005; Habyarimana et al. 2007; Miguel 2011; Long & Gibson 2015; Harding & Michelitch 2021). In nascent democracies ethnicity can serve as a powerful driver of electoral support due largely to its utility as a low-cost signal of loyalty (Bates 1973; Brass 1985; Ferree, Gibson, & Long 2021). Even when utilized solely to differentiate between new or unproven parties and candidates, voting based on ethnic cues can result in partisan stability that is unresponsive to party performance (Carlson 2015; Adida et al. 2017). In addition to ethnic identities, dominant parties also sustain support by reiterating their historical legacies as liberation parties. Though ethnicity and racial identity remain salient drivers of sustained support for many ANC voters (Ferree 2006), the party's success has also been tied to the maintenance of a multi-ethnic coalition grounded in the historical importance of the party (Giollabhuí 2011).

The persistence of these attachments for voters carry wide ranging implications for electoral accountability. Recent examinations of the ties between party identity and citizen preferences have noted persistent support across countries in Africa for parties that deliver on voter expectations (Lindberg & Morrison 2008; Bratton 2013). In their study on elections in Malawi, Ferree and Horowitz (2010) track the performance of President Bingu wa Mutharika, noting how his unexpected success across regional and ethnic boundaries could be largely explained by the electorate's response to his performance while in office. Alternatively, it is expected that the inability of governments to deliver services effectively to constituents would lead them to punish incumbents in subsequent elections. In Rosenzweig's (2015) study on electoral competition in Tanzania he details using a difference-in-difference design how the ruling party (Chama cha Mapinduzi) targeted public goods to competitive districts despite their control over national governance structures to maintain electoral majorities. These links is not limited to Africa, with data from public goods expenditure in Korea (Baek et al. 2017), Austria (Guger et al. 2015), and the

United States (Dafny 2010), provide additional evidence that under certain conditions voters are able to employ their votes to improve performance across elections.

Closer in theory to the current study, several important chapters have used data on corruption cases to detail how election incentives reduce engagement in corruption (Bardhan & Mookherjee 2006; Ferraz & Finan 2011; Bauhr & Charron 2017) and enable the punishment of corrupt politicians (Peter & Welch 1980; Chang & Golden 2004; Ferraz & Finan 2008). Though theoretically straightforward, the relationship between service provision and electoral support does not often reflect these expectations, even in cases of corruption (Banerjee et al. 2010; de Figueiredo et al. 2012; Klašnja & Tucker 2013). Pavão (2018) illustrates this using data from Brazil detailing how citizens that perceive all parties to be equally corrupt remove this component from their electoral calculus. This conception of corruption across incumbents and challengers reduces the influence of electoral accountability mechanisms and in other contexts has been shown to reduce engagement with representative governance institutions and processes more broadly (Moreno-Jaimes 2007).

Several other scholars have detailed additional factors that can determine whether incumbent performance is factored into voting decisions, specifically when performances are positive. The central explanations for underperformance at the ballot despite positive performance in office split between two primary explanations. The first explanation relates to adjusted expectations. While improvements in living standards are often expected to lead to incumbent gains, this does not hold where improved living standards cannot match gains in expected improvements, which are often non-linear. In their work tracking the provision of public goods across two elections in South Africa, de Kadt and Liebermann (2017) detail how voters update their expectations of the government as conditions improve. As a result, where gains are gradual, voters may actually be *more* likely to vote for opposition candidates than in areas where performance stagnates.

The second and more widely acknowledged source of deviation relates to the absence of accurate information. Essential to the accountability theory of democratic governance is the assumption that voters have access to information regarding the performance of their elected

officials (Manin, Przeworski, & Stokes 1999). Where voters have limited or biased information on incumbent performance it is neither expected nor evident in practice that voters are able to hold elected officials accountable (Gulzar, Hai, & Paudel 2020). Even when information is effectively provisioned, access can also fail to deliver voter sanctions by reducing turnout where the information provided exacerbates perceptions that politics are irreformable (Chong et al. 2011) or where attribution remains difficult (Jablonski et al. 2022).

Evidence of these failures has inspired several projects aimed at improving access to information on politicians and political parties. Relevant to regional politics, Grossman, Michelitch, and Prato (2021) conduct an extensive field experiment in Uganda detailing how the persistent distribution of information to voters in the form of politician "scorecards" can serve to inform citizens of their local politician's performance and kickstart the expected feedback loop between underperforming politicians and voter punishments. Similar transparency initiatives have shown mixed results where information is not consistently delivered to citizens (Gottlieb 2016; Ofosu 2019; Banerjee et al. 2020; Malik 2020). Further evidence from the collaborative Metaketa Initiative, which brought together several teams to investigate drivers of electoral accountability and competition, revealed how local conditions and attribution challenges can influence the efficacy of interventions aimed at improving information access and quality (Dunning et al. 2019).

Despite these challenges to the function of accountability mechanisms, public goods failures may still evoke a collective response from the public in dominant party regimes where failures are sufficiently salient and electoral institutions provide an opportunity for action. The provision of public goods, which are available to everyone (non-excludable) regardless of others' level of consumption (non-rival), is often viewed as the primary function of governments (Tilly 1975; Ostrom et al. 1994; Wimmer 2002). Public goods include essential services such as education, national defense, security, water, and sewage, in addition to electricity (Min 2015). As these services are typically centralized in their distribution and funded at least in part through public taxation, the development and distribution of public services are often included in election manifestos and campaign promises (Keefer & Vlaicu 2017). Though each service differs, the performance of politicians and parties in provisioning public services is expected to influence the behavior of

voters. This is especially true in developing countries where public goods and services are generally more central to government policy due to the direct role they play in the daily lives of their citizens (Booth 2011; Bardhan 2014).

In many ways, electricity is a quintessential public good. It is not only critical for the management of daily tasks related to employment and familial care , but similarly buttresses the growth of local businesses and the national economy (du Venage 2020). Due to the impact of electricity on individuals of all income levels, ages, genders, and racial groups, the production and management of electricity is often seen as a priority for governments in developing countries (Ahlborg et al. 2015; de Bercegol & Monstadt 2018). It is also a highly visible public good, which should make both government success and failures related to electricity more salient (Mani & Mukand 2007; Pereira & Melo 2015). Electricity has become in many developing countries a central topic of many political parties both during periods of governance as well as electoral campaigns (Min 2015). As stated by Brown and Mobarak "it is difficult to overstate the role of politics in the supply of electricity" (2009: 196).

Evidence from democracies has also illustrated how the salience of electricity as a strategic political tool (Bergara et al. 1997; Högselius & Kaijser 2010; Chatterjee 2018). Using panel data gathered from fifty-seven countries between 1973 and 1997, Brown and Mubarak (2009) detail how democratization correlates with a shift in the distribution of electricity away from industry toward voters in the residential sector. These efforts have been extended in developing country contexts to illustrate how coordination of electricity access has allowed governments such as India's to strategically distribute access to power (Min 2009) and minimize outages prior to elections to deter electoral consequences (Baskaran, Min, & Uppal 2015). Related work from Ghana has detailed how the state's rollout of electricity enabled the incumbent National Democratic Congress (NDC) to capitalize electorally on the importance of electricity (Briggs 2012). In each case it is expected that as a critical, and highly visible, public good, electricity has been used strategically to game the expected returns to service anticipated by the accountability hypothesis.

I contribute to both the public goods and dominant party literature. As the public goods literature has to date primarily emphasized the strategic use and expansion of electricity access, I

extend this work by examining the politics and consequences of an electricity provision collapse on voter responses in the context of dominant party regimes. In addition I provide evidence that local elections provide an opportunity for voters to hold incumbent parties accountable for their performance at the national level.

III. Study Context: Load Shedding & Governance in South Africa

South Africa has not been exempt from regional struggles to provide citizens with quality public goods and services. The country's rapid development since the transition to democracy in 1994 has, as elsewhere in the region, challenged an unprepared and underfunded government to manage difficulties related to deficient service provision (Farole 2020; Zimbalist 2021) as well as a recent expansion of domestic populist and anti-democratic parties (Mbete 2015; Hurt & Kuisma 2016; Fölscher, de Jager, & Nyenhuis 2021). At the same time, the African National Congress (ANC) has maintained its dominance over national politics in South Africa due in part to the persistence of racial voting patterns (Ferree 2006) and the reverence for the party's role in liberating the country from apartheid (Giollabhuí 2011). Despite this national dominance, South Africa's unique "quasi-federal" constitution, which was designed to limit overlap with extant ethnic and racial boundaries while ensuring regional autonomy, has limited the ability of the ANC to turn national dominance into local control (Richard 1998: 42).

The persistence of social and economic challenges despite a strong constitution is unsurprising given the exclusionary practices championed by the apartheid government. As with most essential goods, Black South Africans were systematically restricted from accessing the country's electric grid throughout the apartheid period, with fewer than 40% of South Africans having access to electricity as late as 1987 (CSRP 2022). In response to these deficiencies the ANC prioritized improvements in the provision of public services during and after the historic 1994 election, investing in an expansion of existing services to the previously marginalized majority (Zimbalist 2020). Though the maintenance and delivery of other public services are of similar concern to the South African public, the failure of load shedding has become a fixture of the South African consciousness. While failures in services such as education and healthcare can have

detrimental personal consequences, they are largely felt individually rather than the collective punishment of load shedding, which is announced nationally despite variation in local timing and management (Cowen 2022).

Due to these persistent challenges on February 9th, 2023 South African President Cyril Ramaphosa declared a State of National Emergency as a result of the accelerated collapse of the country's energy infrastructure (Roelf & du Plessis 2023). Though the declaration was a last resort to ensure the system would not collapse, contemporary challenges at Eskom are the culmination of decades of decay to the country's energy infrastructure. Though by the time of the announcement the extent and myriad causes of the crisis had been widely reported, South Africa's energy infrastructure had not always been on the verge of collapse.

Eskom, the state-owned electricity utility which generates over 95% of the country's power, was once seen as a tool for development among the post-apartheid government. Extensions of Eskom's electric generation capacity through investments in new coal power plants in the latter half of the 1990s and early 2000s played a role in driving integration and rural-urban migration as well as sustained economic growth (Styan 2015). Due to early investments, Eskom was able to produce electricity for the public at one of the lowest costs in the world (Baker 2015). As a result of this foresight and strategic public investment Eskom was voted the world's preeminent national power utility in 2001 (Cowen 2022). Though Eskom's struggles have only recently drawn international attention, they originate from the administration of former ANC leader Thabo Mbeki, who postponed investment in the electric grid due to misperceptions regarding the long-term sustainability of its power plants (AFP 2007). This initial mistake, which led to the first occurrence of "load shedding" in 2007.[27]

These challenges to Eskom services were exacerbated via the widely reported fraud and corruption perpetrated by cronies associated with Thabo Mbeki's successor as ANC Premier and

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[27] *Load shedding, also described as controlled rolling blackouts, takes place when Eskom is unable to generate adequate electricity to match demand. To resolve the discrepancy Eskom cuts off power to specific regions of the country on a rotational basis in a manner meant to equally distribute the burden of the blackouts. The desire to develop a system of shared burden is reminiscent of classic theories of desired even-handedness in the distribution of public goods (Wilson 1989).*

South African President, Jacob Zuma (Alence & Pitcher 2019). In recent investigations former Eskom chief executive Andre De Ruyer estimated that Eskom was losing upwards of $50 million USD to corruption each month (Magome 2023). By the time Jacob Zuma was replaced by current President Cyril Ramaphosa the combination of poor planning and state corruption had begun to exacerbate the reliance on load shedding as a routine requirement for maintaining the country's electricity demand. Though the failures of Eskom have long troubled citizens, both the underperformance of the public utility and public disillusionment with its service have only accelerated since 2018 (see *Figure 4.1*). Few hold anyone but the ANC accountable. In a national survey conducted near the beginning of upturn in loadshedding in April of 2019 over 75% of respondents blamed the ANC or an ANC-affiliated group for load shedding (Citizen Surveys 2019). These failures have contributed to widespread debates regarding the levels of ANC corruption and the party's complicity in the continuation of inadequate service provision (Martin & Solomon 2016; Alence & Pitcher 2019; Madonsela 2019).

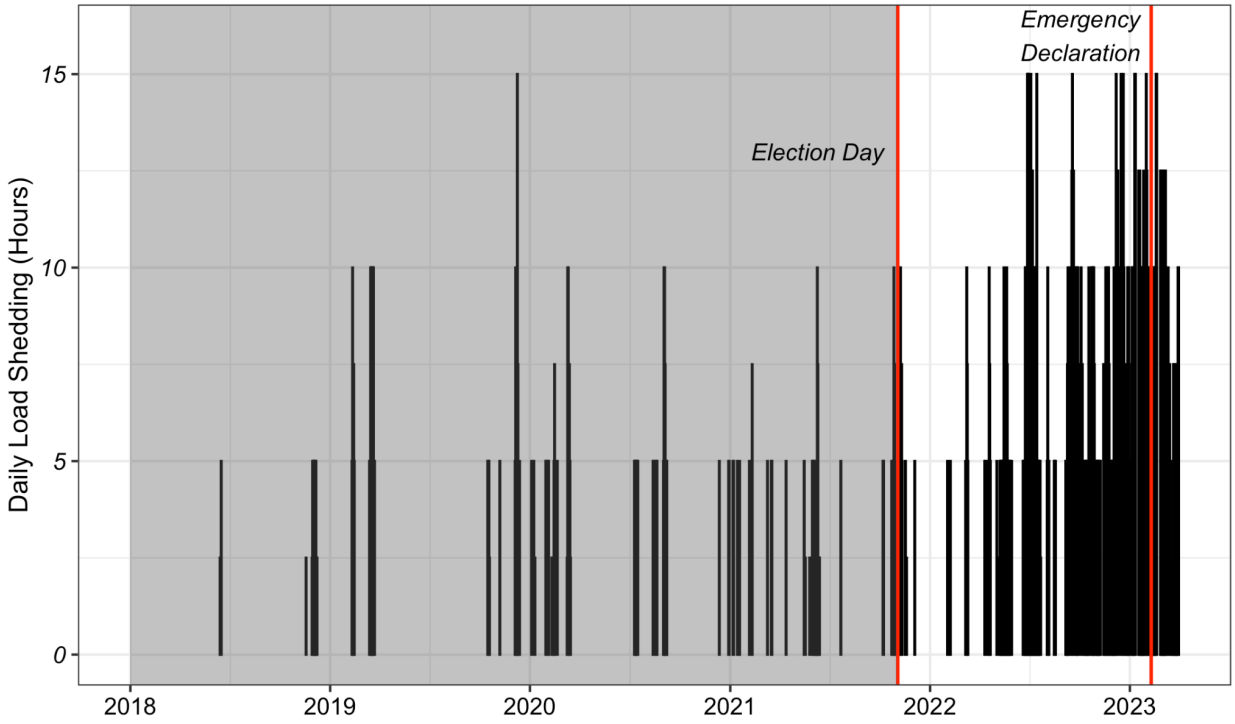

Figure 4.1: *South African Load Shedding Timeline*[28]

To reiterate the salience of load shedding in South Africa, while public demonstrations are a common occurrence and a favored pastime among politically active South Africans, demonstrations driven by concerns related to electricity access and blackouts have accelerated since the 2018 when the current phase of continued load shedding was enacted.[29] Amid this outcry, the utility has fought to protect its domestic monopoly, having gone so far as to pursue legal action against local municipalities that have entertained the purchase of renewable energy alternatives (Hancke & Gifford 2023).

The burden of this continued failure has not been felt solely by the public. In 2023, a year which is expected to see a record 250 days of blackouts, the Central Bank of South Africa has estimated that the country will lose just under one billion ZAR (49 million USD) to load shedding *each day* it is enacted (Burkhardt & Hill 2023). Due to the daily and long term damage caused by load shedding, several of the opposition parties in South Africa have seized on the failures of Eskom of visible, salient evidence of the ANC's failures as a ruling party. These efforts have been led by South Africa's largest opposition party: the Democratic Alliance (DA). Amid the failures of Eskom, the DA has readily relied on advertisements targeting the ANC's management of Eskom and the persistence of load shedding to target voters prior to the 2021 municipal election.[30]

Often considered the party of the country's white voters, the DA has seized on the issue of load shedding as well as service failures in other sectors as a strategy for extending support to voters outside of its racial and regional strongholds (Farole 2020). In the build-up to the 2021 Municipal Elections the party ran under a slogan "*The DA Gets Things Done*" to reiterate its commitment to improving failing services currently managed by the ANC (Gerber 2021). Due to the collective experience of load shedding and its national reach, challenging the ANC's management of Eskom specifically has become a central pillar of the DA's recent electoral strategy. Though the DA is the

[28] *Load shedding has increased since 2018 following a two year period of electric stability. The current study covers the period between 2018 and the 2021 municipal elections.*
[29] *Appendix C.1 contains an analysis detailing the relationship between load shedding and public demonstrations using ACLED data from 2010 through 2022..*
[30] *Appendix C.2 contains several examples.*

county's largest opposition party and the party that has done the most to emphasize the public services failures of the ANC, it is not the only opposition party that has attempted to exploit growing frustration among the public with the ANC's governance. As a result, the ANC has steadily lost supporters, dropping below the 50% majority threshold for the first time in the 2021 municipal election (IEC 2022).[31] While it is expected that the ANC will continue to shed support, sustained support for the ANC due to their liberation credentials has been aided by the complicated structure of the country's federated electoral system (Inman & Rubinfeld 2013). In the context of elections, it is unclear whether this system shields local party members and representatives from the failures of the party writ large due to complications with voter attribution (Powell & Whitten 1993). It is also unknown whether voters will react by shifting support to parties promising better service or parties focused on wider systemic change.

Amid rising unemployment, declining real wages, rising interpersonal insecurity, and a loss in South Africa's international standing, several populist parties offering voters anti-democratic alternatives have seen support surge in recent elections (Mbete 2015). The most well-known and widely supported of these parties are the Economic Freedom Fighters (EFF), whose personalistic leader Julius Malema champions a version of leftist pan-Africanism that wavers between traditional forms of opposition critique to calls for extensive economic transformation and a removal of barriers for executive rule (Mbete 2015; Fölscher, Jager, & Nyenhuis 2021). The success of the EFF in recent years has been widely reported as evidence of popular discontent with existing political, social, and economic systems in the country.

Though this chapter is focused on the influence of public service failures on changes in voting perceptions and behaviors toward these national parties, populist parties at the local and provincial levels continue to push both anti-state platforms that advocate the independence of regions perceived to be either ethnically or historically distinct. On the right end of the country's political and economic spectrum, Freedom Front Plus/Vryheidsfront Plus (VFP) have looked to fill the void left by the DA's attempted pivot to the middle by catering their policies to the identitarian

[31] *"The 'E' in South Africa stands for electricity": Amid the widely experienced failures of Eskom locals have attempted to make light of the situation by developing new taglines for the utility despite its severe consequences.*

concerns of the country's white minority. To do so, they have emphasized their commitment to the maintenance of Afrikaans culture over substantive national policy changes. Several other regional parties have seized on local issues and identities to push for greater sovereignty, including recent efforts from the "Cape Independence" movement as well as a resurgence among Zulu Nationalists, resulting in a competitive local environment distinct from the national dominance of both the ANC and its ill-defined political ideology. Most notably, a substantial number of active ANC members are associated with the "Radical Economic Transformation" (RET) faction of the party (Reddy 2022). Though not dominant, the RET's persistence is a reminder of the prominent positions held by actors opposed to central tenets of democratic governance.

Collectively, South Africa's hierarchical governance structure and the persistence of both the ANC's national dominance and visible provision failures present an opportunity to examine whether voters utilize local elections to hold incumbents accountable for their performance at the national level. Moreover, given the trend of recent backsliding in the region (as elsewhere), the study of South African electoral patterns provides additional insight related to the specific actions taken by voters in reaction to governance failures by dominant parties.

IV. Hypotheses

The presence of a wide area of political parties and the persistence of load shedding throughout the country provides an opportunity for research into the undetermined influence of governance failures on voter behavior and attitudes. The first hypothesis addressed in this chapter relates to support for the ANC:

> **Hypothesis 1 (H1):** *Support for the African National Congress will decline as load shedding increases prior to elections.*

Based on the predictions of the democratic accountability theory, I expect ANC support to decline due to the links between the decline of Eskom and the governance of the ANC. If local elections serve as a channel for citizens to voice their dissatisfaction with the governing party, the ANC's inadequate management of the country's electricity infrastructure and capacity should result in a

decline in voter support. Though a large portion of the support for the ANC is rooted in immaterial concerns related to racial heuristics and the party's work liberating the country from apartheid, I expect a large segment of voters to remain responsive to the government's performance in delivering essential public goods.

> **Hypothesis 2 (H2):** *Support for opposition parties that are seen as capable providers of public goods will increase as load shedding increases prior to elections.*

Given the extent of the challenge posed by the failures of Eskom and the increasing severity of load shedding, I suspect that the parties most likely to gain from potential ANC losses are the parties that can credibly signal their willingness and capacity to address these challenges. While these signals are difficult to identify, I collected data from the Twitter accounts of the premiers and official accounts of the ANC, DA, and EFF in order to assess each party's public emphasis on the challenge of load shedding and public services more broadly. Though not a full collection of each party's statements or publications, I am able to rely on social media data as a proxy for each party's views as recent research has illustrated how parties utilize Twitter as a channel for communicating party values and campaign promises (Rauchfleisch & Metag 2016; Silva & Proksch 2022). An analysis of each account's Twitter posts in the three months prior to the election reiterates the salience of challenges with electricity among party officials during the study period (*Figure 4.2*). The data also shows that both electricity/load shedding and the other primary public services were emphasized in a greater share of official Tweets by the DA than any of the other parties.

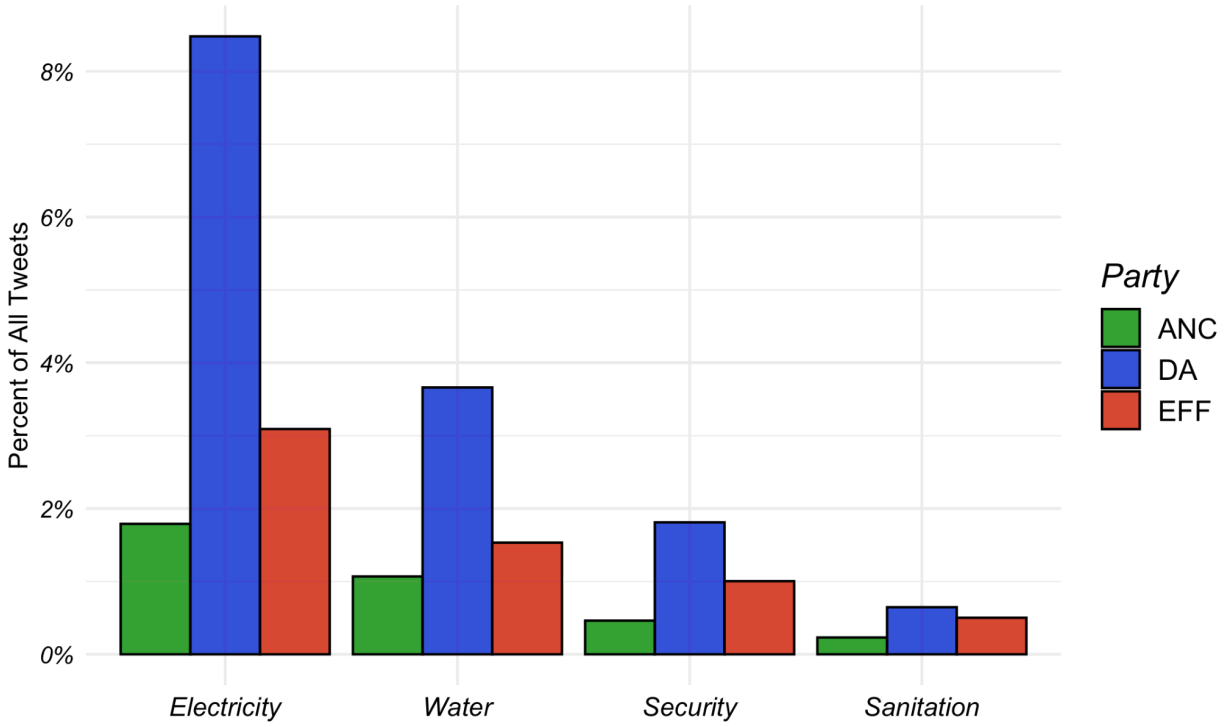

Figure 4.2: *Frequency of Public Services Mentioned during the 2021 Municipal Election Campaign*[32]

Both the EFF and ANC lag substantially behind the DA. Both the ANC's willingness to avoid these topics given the salience of their governance failures and the EFF's limited emphasis on public services confirm broader conceptions of each party. By focusing on issues related to identitarian concerns the EFF's inclusion in the study allows me to assess whether voters respond to service failures by rewarding parties dedicated to improving performance (the DA) or populist parties that call for a complete overhaul of extant systems (the EFF).[33]

> **Hypothesis 3 (H3):** *Support for opposition parties that emphasize populist rhetoric over rhetoric focused on improvements in service provision will not see their vote share affected by load shedding.*

Despite concerns regarding the willingness of citizens to vote for parties promising anti-democratic alternatives, I do not expect populist parties to benefit from failures in service provision. Though

[32] *More information on the Twitter data collection and coding process associated with this analysis, in addition to an overview of total Tweets by party, can be found in Appendix C.3.*

[33] *While this data is merely suggestive of the priorities of each party, it enables me to discuss shifts in support toward the DA as a potential response to their continued emphasis of the party's commitment to public service provision.*

populism has several definitions, I define populist parties as those which root their communications around distinctions between the "elite" and the "people" (Hameleers 2019; Brubaker 2020). In South Africa, as with other contexts, use of populist rhetoric like this is often paired with skepticism toward liberal democratic institutions as well as a focus on a subset of the "people" that emphasizes cleavages between racial groups as well as between foreigners and citizens (Fölscher, de Jager, & Nyenhuis 2021). As expected, an analysis of each party's Twitter communications throughout the campaign detail the EFF's comparatively frequent use of populist rhetoric (*Appendix C.3*). This expectation is based on a view that strategic voters will use their votes in local government elections to signal their support for service improvements by rewarding parties that promise solutions to immediate challenges. To instrumentalize this hypothesis, I expect based on their comparatively limited commitment to public services that parties such as the EFF will be unable to sway additional voters following salient public service failures.

Hypothesis 4 (H4): *Voter turnout will decrease as load shedding becomes more severe.*

For citizens living dominant party systems to hold underperforming politicians and parties to account, they need to turnout to voice their disillusionment with the government's performance. Traditional electoral accountability theory expects voters dissatisfied with their representatives to be *more likely* to participate in traditional forms of democratic politics (Bågenholm & Charron 2020). Yet evidence for this hypothesis from other contexts is mixed, with several studies suggesting that information on intractable challenges such as corruption can alternatively reduce turnout (Bauhr & Grimes 2014; Chong et al. 2015). In dominant party systems, where the public feels they lack a satisfactory alternative, there is less reason to believe that voters will resort to voting for opposition parties they rationally view as unable to enact fundamental change. Rather, I expect voters to punish the ANC by reducing turnout, though I am less confident in this prediction.

V. Research Design & Data

To contribute to these debates I rely on several related datasets with information on electoral behavior and public opinion focused on the period between the 2016 and 2021 South African

municipal elections. Previous efforts to assess the influence of governance provision failures have been hindered by the absence of quality data. To get around these challenges, researchers have developed clever designs that exploit either long-run changes in service quality (de Kadt & Liebermann 2017; Farole 2020) or discrete changes following one-off disasters (Gasper & Reeves 2011; Kindsmüller 2022). While these efforts have provided helpful information regarding the influence of specific forms of service provision, the salience of the structural governance failures common in many developing countries have remained difficult to track. Measurement of these critical outcomes has been complicated by the limited opportunities dominant party systems provide to observe competitive elections. In an attempt to fill this gap I draw on the integration of two randomized designs leveraging the sporadic occurrence of (*1*) elections and (*2*) load shedding.

VI. By-Elections and Load Shedding

South Africa's electoral system results in the direct election of over 4,468 ward councillors throughout its nine provinces, with the same number selected via proportional representation reliant on party lists. Whenever a councillor leaves office outside of an election a by-election is scheduled by the Independent Electoral Commission (IEC) to select a new ward representative.[34] Between the 2016 and 2021 Municipal Elections 547 by-elections were held throughout the country to fill councillor vacancies. In order to leverage the temporal stochasticity of these elections, I collected and developed a by-election database containing information on the contesting and winning candidates, location, date, and the reason for the vacancy for each of these elections. In their analysis of by-elections between 2007 and 2015, Berliner and Wehner (2021) acknowledge the randomness of South African by-elections as a tool for identifying changes in local voting behavior in response to regional audits. I similarly leverage the random occurrence of these elections and load shedding to enable an analysis focused on the electoral consequences of failures in service provision.

[34] *Ward by-elections can be called for several reasons. The primary causes include councillor resignations, instances when councillors are determined to no longer be qualified by their party or the IEC, when councillors are removed from office due to violations, when councillors change parties, or when councillors pass away (Berliner & Wehner 2021).*

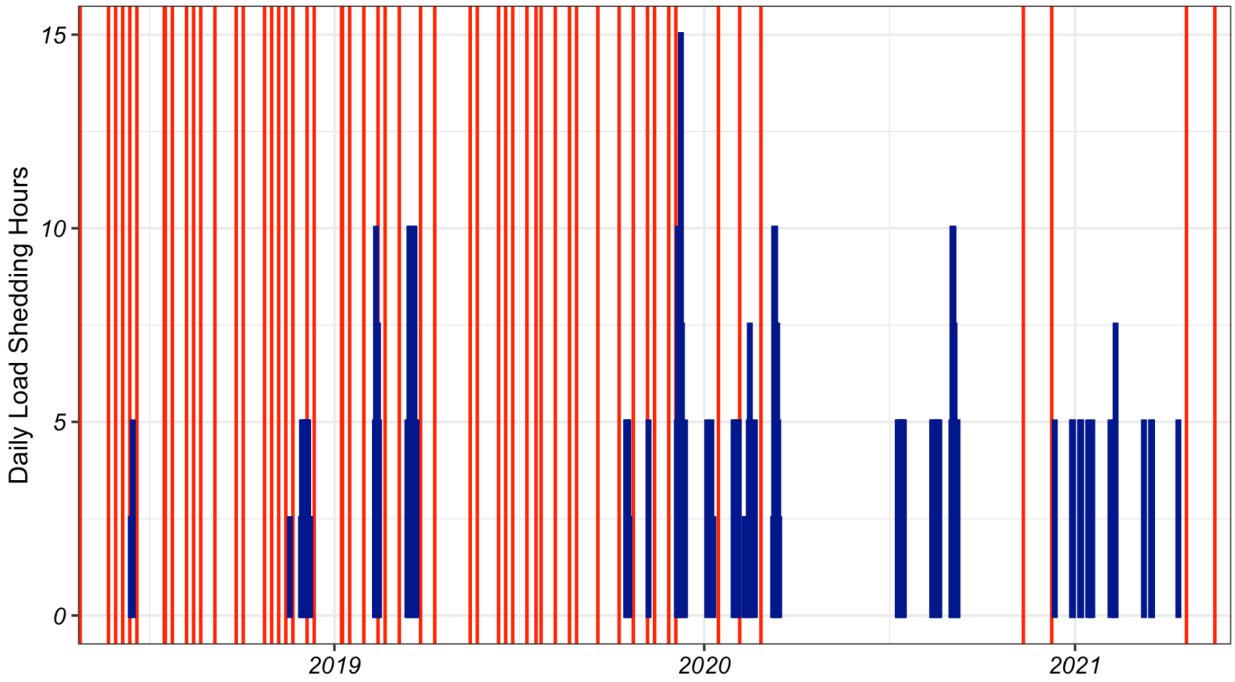

Figure 4.3: *Load Shedding (blue) and By-elections (red) between January 2018 & March 2020*[35]

While by-elections can occur at any point between elections, each individual by-election is required to be held within 90 days of a seat being vacated.[36] To provide a further check on the robustness of the analyses I conduct a narrower version reliant solely on the by-elections held following councillor deaths (see Jones & Olken 2005 and Berliner & Wehner 2021 for additional cases of politician deaths treated as random shocks). Though load shedding intensified following the 2021 elections, the period between 2016 and 2021 enabled variation in its distribution that was unavailable in later periods once load shedding became routine.

Contrary to the concerns of Berliner and Wehner (2021) regarding the potential for strategic scheduling of by-elections, whether or not load shedding is necessary on any particular day is rarely known days ahead of time, much less the month plus required for the registration of by-election voters. On the other hand, though municipalities governed by ward councillors are responsible for the effective provision of services, including electricity, load shedding occurs due to

[35] *Amid an uptick in load shedding (blue lines) 240 by-elections (red lines) were held between January 2018 and March 2020. The by-election dates noted in the graph often consist of multiple by-elections held throughout the country.*
[36] *Appendix C.4 contains a map displaying the wards that held by-elections during this period.*

the default of machinery that remains outside the control of individual politicians (Mbandlwa & Mishi 2020). Rather, it is coordination between the municipal council made up of several individually elected Ward members that is most able to affect change among public utilities. Moreover, as detailed later in relation to the second randomization strategy, if the ANC were able to limit the occurrence of load shedding by diverting energy, it is unclear why they would not have utilized this capability in the week prior to the 2021 Municipal Election which saw the deepening of load shedding amplify interest in this failure in the media and online.[37]

Alongside the complications with control on the side of the electric utility, the scheduling and management of by-elections is overseen not by the governing party but by the IEC. In order to strategically schedule elections coordination between several independent institutions would be required. Moreover, as by-elections called around the same time are typically scheduled on or around the same day despite occurring throughout the country by the IEC to simplify registration processes, coordination would likely be required between national, provincial, and local staff. This level of coordination is implausible and would likely be an inefficient use of resources given the minimal impact of any single ward vote, especially since the national scheduling of by-elections sees elections often held in both incumbent and opposition districts on the same day. To further assuage concerns I conduct additional analyses to address imbalances. There are no significant links between the ANC nor reasons for seat vacancies and the presence (or absence) of load shedding in the weeks prior to by-elections (see *Appendix C.6*). Given no evidence of bias, the treatment can be viewed to be distributed "as-if random".

VII. Municipalities & Load Shedding

Next to temporal variation, the occurrence of load shedding in urban centers is spatially segmented. Large municipalities, such as the City of Johannesburg, have attempted to distribute the burden of load shedding equally among residents while avoiding accusations of favoritism by publishing load shedding "schedules" that detail the geographic areas which will receive the daily load shedding.

[37] *Appendix C.5 contains more detail on this spike in media coverage and citizen interest in load shedding both online and in mainstream domestic publications.*

While providing transparency, these schedules also illustrate how seriously incumbents take the challenge of load shedding as well as perceptions of complicity. Each municipality is responsible for their own scheduling program, but they all share several features that enable me to leverage their publication as a random treatment. *Figure C.4* presents a portion of the schedule utilized by the City of eThekwini (in the KwaZulu-Natal Province) as of April 2023.

DAY	TIME	STAGE 1	STAGE 2
TUESDAY	00:00-02:00	9	9,5
	02:00-04:00	11	11,6
	04:00-06:00	3	3,16
	06:00-08:00	8	8,12
	08:00-10:00	13	13,2
	10:00-12:00	6	6,11
	12:00-14:00	16	16,3
	14:00-16:00	14	14,1
	16:00-18:00	5	5,9
	18:00-20:00	15	15,4
	20:00-22:00	7	7,10
	22:00-00:00	12	12,8

Figure 4.4: *Example Load Shedding Schedule from the eThekwini Metropolitan Municipality*[38]

Load shedding in eThekwini is distributed utilizing this schedule, which ensures that this "shock" of inadequate public goods is distributed randomly across urban blocks. Each "stage" in *Figure 4.4* represents the amount of electricity Eskom is restricting at any one point in time. Calls to move to a higher stage result in a greater number of blocks losing power (see how the quantity of blocks doubles between stage 1 and stage 2). Each denoted block represents a distinct area corresponding to the municipality's electric grid.[39] For further clarity, a red border has been affixed to illustrate the

[38] *Section of the schedule determining the times specific areas are subject to load shedding in South Africa's eThekwini metropolitan municipality. The peak daytime period is denoted by the colored rows (6:00 - 22:00).*

[39] *For an example of the map published by eThekwini officials in conjunction with this schedule see Appendix C.7.*

blocks that would lose power on Tuesdays under this schedule at the specified times. As an example, if it were 8:00 am on Tuesday, we would expect blocks 2 and 13 to be without power.

These schedules are widely utilized by South Africans due to the importance of electricity access for the conduct of both informal and formal businesses as well as daily household care. As a result, mobile applications informing locals of load shedding plans have become ubiquitous. Since the return of load shedding in 2018 *"EskomSePush"* has become one of most downloaded mobile applications in South Africa with over five million regular users (Nel 2022). Crucially, the areas collected in each block are based not on any existing or subsequent political boundary, but the underlying electricity grids that cross these areas. As a result, using the geographic areas contained in these blocks and the timing of load shedding in the build-up to the municipal election I can measure the influence of these outages on my dependent measures.

Critically, though the distribution of load shedding is equal *a priori,* the reliance on a pre-published schedule means that the actual occurrence of load shedding is random but not equal. For instance, if Eskom were to call for stage 2 load shedding under this schedule on Tuesday from 6:00 to 10:00, blocks 2, 8, 12, and 13 would experience power outages while the rest of the municipality would remain unaffected. I am able to exploit the random timing of load shedding by block by cross-referencing the municipal schedules during the month of the 2021 election to determine the amount of load shedding allocation by area.

Further variation between blocks is enabled by the timing of load shedding throughout the day. As acknowledged by both the government and Eskom, the timing of power outages throughout the day are not equally burdensome (eThekwini 2022). Specifically, as noted in surveys with citizens, daytime hours in which families utilize the majority of their household electricity are viewed as less favorable than load shedding that occurs during the night (CSRP 2022). Eskom is aware of this additional burden and attempts to conduct load shedding at night when possible. Yet as the night time hours are when electricity is used the least by the public, these are also the least efficient hours to conduct load shedding. As a result, daytime load shedding can be viewed as a particularly salient form of load shedding. Municipalities are aware of the disproportionate challenges of daytime load shedding and take this into account by randomizing throughout the

month the time of day each block is scheduled to during these "peak" daytime hours (see the blue rows in *Figure 4.4*).

Given these efforts to evenly distribute the electricity burden, load shedding can be seen as a randomized treatment even when segmented to a shorter time period. Though unlikely, to ensure that political actors are not strategically controlling the targets of load shedding I conduct additional robustness checks that show no correlation in the study period between the occurrence of any load shedding nor peak load shedding with a range of control variables, including average income and incumbency status (*Appendix C.8*). Moreover, if the ANC had the capability to control the occurrence of load shedding it is likely they would have suspended load shedding in the week prior to the election. Yet in reality, after two months without outages, in the ten days prior to the 2021 municipal election held in early November, load shedding at stages 2, 3, & 4 was intermittently evoked by Eskom, leaving millions of South Africans without power (*Figure 4.5*). The failure of the government to provision electricity in the build-up to the election was widely covered and discussed, as evidenced by a spike in local media coverage and internet searches on load shedding and blackouts in the weeks prior to the election.[40]

[40] *Appendix C.5 contains greater detail on this spike in media coverage and citizen interest in load shedding.*

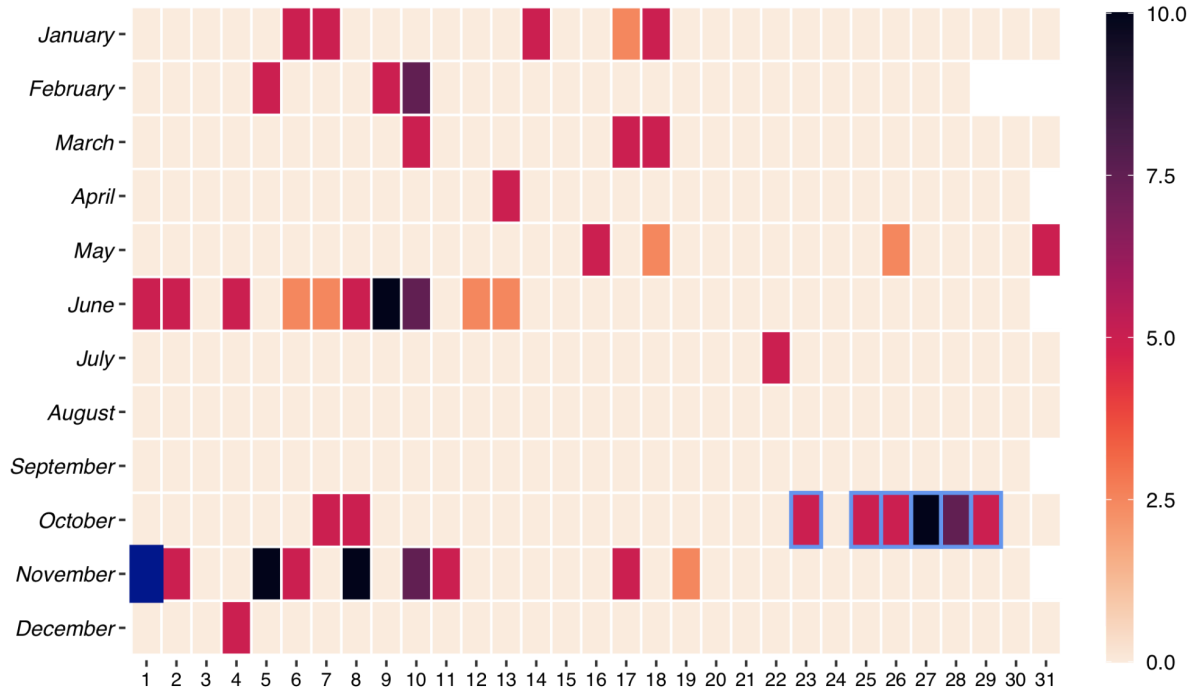

Figure 4.5: *Daily Hours of Load Shedding Scheduled by Eskom in 2021*[41]

Collectively, the purposeful randomization of South Africa's energy burden amongst its geographically varied population enables me to utilize these two related research designs to estimate the influence of load shedding in contexts that can also be considered "as-if" random.

VIII. Data & Estimation

A. By-Election Design & Data

Data for the by-election analyses are primarily sourced from the IEC as well as Statistics South Africa and official publications on seat vacancies published by the South African Government's official notifications page.[42] This by-election database was paired with data from the popular South African mobile application "*EskomSePush*", which draws from Eskom's load shedding schedule to

[41] *The days of load shedding prior to the election day (November 1st) that are included in the analysis are denoted by the colored borders.*

[42] *Data on councillor deaths was cross-referenced with data shared by researchers at the Global Initiative against Transnational Organized Crime (GI-TOG) on political homicides. This data enabled me to split the data among natural and unnatural deaths. The database containing all by-election results between the 2016 and 2021 Municipal Elections will be made available to researchers upon request. News on specific by-elections was sourced from the IEC's news bulletin at: https://www.elections.org.za/pw/News-And-Media/News-List/IECNews*

alert citizens of upcoming occurrences in order to help them plan to manage the blackouts.[43] The application's online repository contains information on load shedding data from 2014 to 2023, including the time of each instance of load shedding and the stage declared by Eskom. In order to account for variation in local conditions I pair this data with local area statistics from South Africa's 2011 National Census. The inclusion of census data enables me to pair local ward statistics with corresponding by-elections. The resultant dataset contains 2,341 observations related to party performance across 470 by-elections held across 83 dates between January 1st 2018 and the November 2021 municipal election.

The primary dependent variables for the by-election analyses are *vote share differential* and *voter turnout differential.* The vote share differential for each party measures the difference in share at the ward level for each party participating in the 2016 and 2021 municipal elections. This variable is meant to correspond to shifts in local voter support. The voter turnout variable is a similar measure noting the ward-specific turnout differential between the 2016 municipal election and each subsequent by-election. Data for both the party vote share and ward turnout are taken directly from the IEC's online databases for the 2016 municipal election and collected into a usable format in the aforementioned database for each of the by-elections held between the 2016 and 2021 municipal elections. The dependent variable for the by-election analyses is the cumulative hours of expected load shedding recorded via EskomSePush (and corroborated using data from Abisoft as well as Eskom's annual reports). As the question of the effect's longevity was difficult to hypothesize, I ensure these results are not contingent on this discrete period by conducting each analysis at several additional time points in the appendices to illustrate the (non)persistence of the effect over a longer period.

Despite these benefits there are limitations to this design. One limitation that remains in this design is the sporadic behavior of South Africa's electric grid. Though load shedding is implemented nationally, there is variation on its implementation at the municipal and ward levels of governance. Certain areas are at times able to limit the occurrence of load shedding by deploying

[43] *More information on EskomSePush can be found at: https://esp.info/*

alternatives sourced from private alternatives, which, though rare, are utilized by some municipalities. Though I am unable to account for this potentiality, the number of by-elections and their wide geographic distribution makes it unlikely that reliance on alternatives systematically influences results. In addition, power outages do occur outside of scheduled load shedding schedules. While I have no reason to suspect that they occur in certain areas more than others in advance of by-elections, the potential for outside influence due to unscheduled breakdowns in the electric grid remains a possibility.

In light of this design and these limitations, the primary model for the by-election analysis is sourced from the following linear equation:

$$\Delta Y_{iwt} = a + \beta_1(LoadShedding_t) + \delta_t + \varepsilon_{iwt}$$

where i indexes parties and w wards. ΔY is respondent party i's change in vote share for the specified party between the 2016 municipal election and each by-election of interest. *Load Shedding Hours* is a measure of the cumulative hours of power outages due to load shedding occurring in the week prior to the date of each by-election. δ is a vector of coefficients denoting the quarter in which each by-election took place and, lastly, ε contains the standard errors clustered by ward (w), party (i), and quarter (t).[44]

B. Municipal Election Design & Data

The accompanying spatial analysis relies on voting station-level data from the IEC drawn from polling-place election returns from the 2016 and 2021 municipal elections. This data is paired with individual spatial blocks corresponding to the load shedding plans of three prominent municipalities. As Eskom does not share data on the boundaries of its electric grids, I collected spatial data from three of South Africa's most politically and economically critical municipalities. Specifically, I utilized spatial boundaries shared by the three most populous metropolitan municipalities in South Africa: the City of Johannesburg (CoJ), the City of Cape Town (CoT), and the eThekwini Metropolitan Municipality (ETH).

[44] *Descriptive statistics for each of these variables and included controls can be found in Appendix C.8.*

Rooted at the center of the country's most populous city (Johannesburg), the CoJ is widely regarded as one of the country's most important political and economic metropolitan areas (Mokwena 2009). As the seat of South Africa's national political scene it is often heavily contested at the municipal level despite the ANC's national electoral dominance. Though control of the CoJ has shifted between the ANC and coalitions of minority parties led by the DA in recent elections, the ANC is the most widely supported party at the municipal and ward levels, having won 84 of the municipality's 135 wards in the 2016 municipal election (compared to 51 for the DA). The EFF received 11% of the vote and was awarded 30 seats through proportional representation, but did not win any of the municipality's wards directly. Load shedding schedules in the CoJ are monitored by City Power, the municipal electric utility that implements load shedding on behalf of Eskom.[45] The resultant grid is split between sixteen electric blocks that overlap the municipality ward boundaries.[46]

Unlike the CoJ, the CoT is located in the only province in South Africa not governed by the African National Congress. As the most prominent and wealthy municipality in the Western Cape the CoT is the primary hub of the Democratic Alliance. Though the DA is the largest party in the CoT at the municipal and ward levels, the ANC still won 35 wards out of 115 (compared to 81 for the DA) in the aftermath of the 2016 municipal election. The EFF received just over 3% of the vote and was awarded seven seats through proportional representation, but did not win any wards outright. Crucially, the Cape Town wards also intersect randomly with the electric grids in my sample. As with the City of Johannesburg, the City of Cape Town oversees wards that are representative of the country's extreme wealth disparities, including some of the country's richest areas as well as some of its most marginalized townships.

Lastly, ETH encompasses most of the city of Durban, which is the capital of South Africa's KwaZulu-Natal Province. Though the province is home to South Africa's third largest party, the Inkatha Freedom Party, eThekwini has been controlled by the ANC since the 1994 National Elections with the Democratic Alliance the second largest party in the municipality. In the 2016

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[45] *I would like to extend my sincere gratitude to City Power for agreeing to share their data.*

[46] *Appendix C.9 contains municipality grids illustrating the overlap of the ward boundaries and load shedding blocks.*

Municipal Elections the majority of the wards were split among the ANC (74), the DA (31), and IFP (2). The EFF was the third largest party with 3.4% of the vote, though they did not win any wards through direct elections. Once again, the load shedding blocks and the ward boundaries intersect at random. Collectively, these three municipalities govern one in every six South Africans (over six million total).

Data on the occurrence of load shedding in the build-up to the 2021 municipal elections were collected using the published schedules produced by each of these municipalities prior to the election.[47] In order to further the accuracy of the allotted hours of load shedding to each block in each municipality the schedules were cross-referenced with information reported by Eskom through its official Twitter handle, data from EskomSePush, and the individual Twitter accounts of each municipality, which all report in real time on the occurrence of load shedding in local blocks. The range of load shedding hours in the ten days prior to the 2021 municipal election extended from a low of four (CoJ) to a high of twenty (CoT). Collectively, this array of data allows me to assess hypotheses one, two, and three at a local level in three diverse, yet influential locales. In addition, given that this analysis contains data on individual voting stations I am able to provide complementary evidence regarding localized turnout related to public electricity failures in South Africa. In addition, unlike in by-elections, as municipal elections are coordinated by national parties they present an opportunity for campaigning related specific on service delivery issues, potentially making collectively experienced failures more salient than in by-elections.

As with the by-election model, there are limitations to the municipal election design. Mainly, there is evidence that power outages occurred in the select municipalities outside of the load shedding schedule. As an example, it is fairly common that the power does not return when scheduled due to complications resulting from the pressure the process places on the grid. As noted, I attempt to account for changes to the schedule during the allotted window by tracking changes noted by municipal accounts, but it is impossible to know whether all unscheduled outages were publicly commented on.

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[47] *Appendix C.10 details the collection and validation process for each municipality in more detail. It also presents examples of municipal load shed announcements.*

The primary model for the municipal election analysis is based on the following linear equation:

$$\Delta Y_{bsi} = a + \beta_1(PeakHours_b) + \varepsilon_{bsi}$$

where *i* indexes parties and *b* blocks. ΔY is respondent party *i*'s change in vote share for the specified party from the 2016 municipal election to the 2021 municipal election. *Peak Hours* is a measure of the cumulative hours of power outages due to load shedding occurring during peak daytime hours in the week prior to the election on November 1st, 2021. Finally, ε contains the standard errors clustered by block.[48]

IX. Results

The coefficients for the by-election models are depicted in *Figure 4.6*.[49] The results of the model provide support for each of *H1*, *H2*, *H3, and H4*. Specifically, the negative coefficient for the ANC suggests that for every additional hour of load shedding prior to a by-election the ANC loses about a quarter of a percent of its vote share (*H1*). The positive coefficient for the DA corresponds with a similarly sized increase in its proportion of the vote for every additional hour of load shedding (*H2*). Finally, the EFF's coefficient corresponds to a small, but significant decrease in support (*H3*). The coefficient corresponding to the final hypothesis (*H4*) is also visualized. The specifications for the voter turnout model match those of the vote share model, with ΔY replaced with change in turnout rather than vote share. The evidence presented goes against hypothesized expectation. The negative coefficient suggests that load shedding reduces turnout in by-elections.

[48] *Descriptive statistics for each of these variables and included controls can be found in Appendix C.8.*
[49] *The full table corresponding to the By-Election Vote Share and Turnout Models can be found in Appendix C.11.*

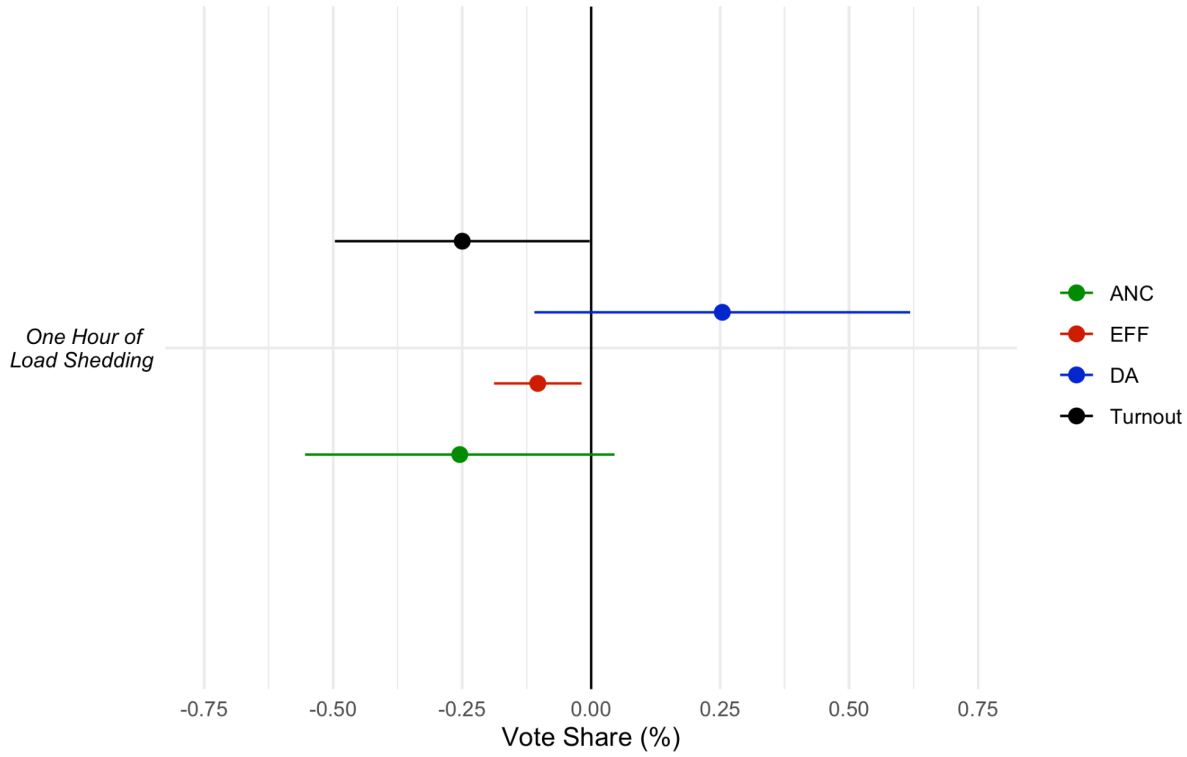

Figure 4.6: *Coefficients for the By-Election Models*[50]

To ensure that these results are not driven by the week cut-off point these results are replicated replacing the one week cumulative value with load shedding occurring within alternative two and three week windows (*Appendix C.12*). As an additional robustness check, the results of each model are also replicated on the subset of data corresponding to by-elections following natural deaths in *Appendix C.13*. The directionality of results is maintained across alternative models. As expected, the results fade as the time to the election is extended for each outcome suggesting that the timing of public service failures has an impact on voter responses at subsequent elections. Finally, *Appendix C.14* contains tables and plots illustrating how these results persist regardless of the partisanship of the prior incumbent.

X. Municipal Election Analysis

To ensure that these results are not driven by unacknowledged characteristics of by-elections or as the result of unobserved data artifacts, I present the results from the supplementary 2021 municipal

[50] *Confidence intervals denote significance at the 95% threshold (p<0.05).*

election analysis that takes advantage of the spatial randomization of load shedding enabled by municipal schedules.

As noted, the occurrence of load shedding across spatial blocks in the build-up to the 2021 municipal election first enables an additional check on the by-election results. Moreover, there are two primary reasons to believe that the effects may be more pronounced in municipal elections. First, as municipal elections are coordinated throughout the country they enable sustained campaign investments by national political parties targeting the failures of incumbents.[51] Second, as the composition of municipal councils is known prior to by-elections voters are typically aware that the election of a single ward councillor will not be enough to sustain changes in local governance priorities. Thus, it is expected that municipal election results would be more greatly affected by governance service failures.

The coefficients for the municipal election models are depicted in *Figure 4.7*.[52] The results of the model provide strong support for *H1*, *H2*, and *H3* as well as contradictory support for *H4*. Most critically, the negative coefficient for the ANC provides additional evidence that voters hold the ANC accountable as the salience of provision failures is made more salient (*H1*). Second, the DA's positive coefficient corresponds to a near 1% increase in support for every additional hour of peak load shedding prior to the election (*H2*). Third, the positive coefficient for the EFF corresponds with an *increase* in its proportion of the vote for every additional hour of load shedding, contrary to *H3*. Finally, Figure *4.7* also presents the coefficients corresponding to *H4* on voter turnout. The specifications for the models match those of the municipal election models, with ΔY replaced with change in turnout rather than vote share. The evidence presented again supports the hypothesized expectations and the turnout results contained in the by-election analysis. The positive coefficient reiterates that load shedding likely decreases turnout in elections.

[51] *Appendix C.2 contains advertisements focused on the DA's electoral promises related to service provision.*

[52] *The full table corresponding to the Municipal Election Vote Share and Turnout Models can be found in Appendix C.15.*

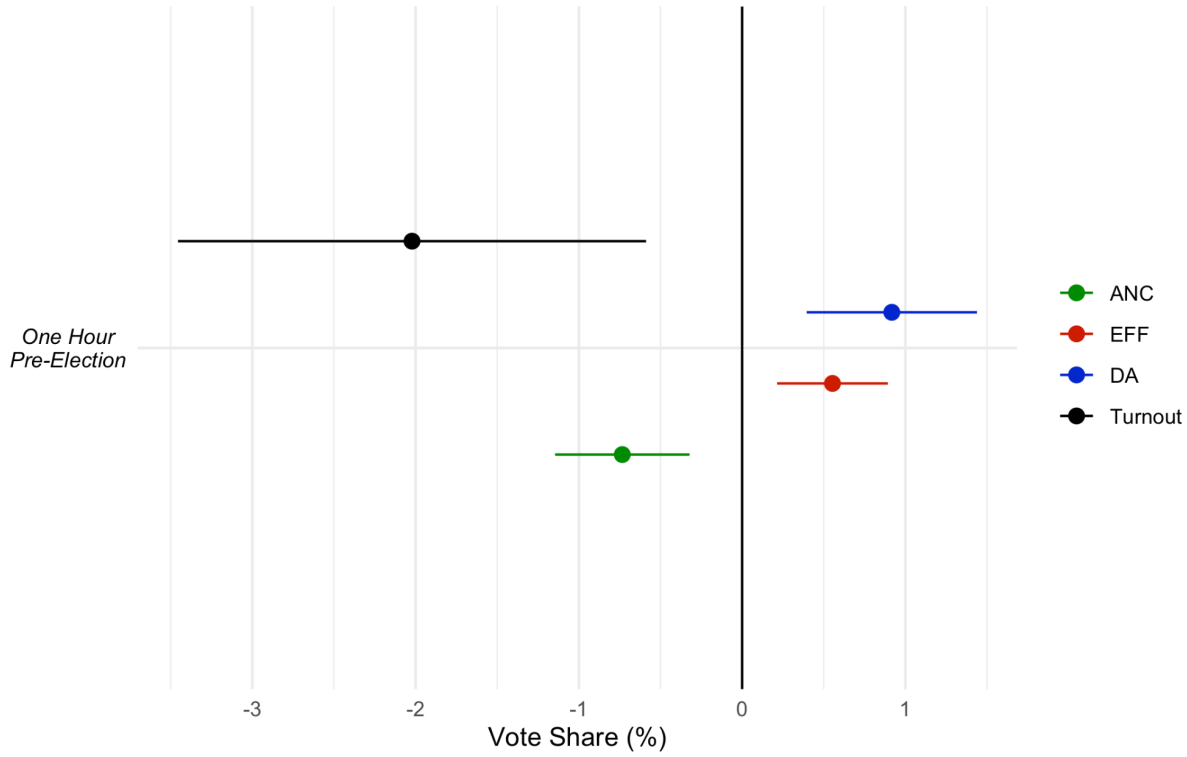

Figure 4.7: *Coefficients for the Municipal Election Models*[53]

To further interrogate the results to ensure they are not driven by coding decisions, these results are replicated replacing the *peak* load shedding variable with the value of *total* load shedding hours (see *Appendix C.16*). The directionality and significance of all results are maintained across these alternative model specifications.[54] Lastly, *Appendix C.18* contains tables and plots illustrating how the directionality of these results persists regardless of the partisanship of each ward's prior incumbent.

XI. Citizen Attitudes & Party Communications

In order to ensure that the mechanisms driving the primary results are reflected in voter attitudes, I utilize individual response data from the Gauteng City-Region Observatory's (GCRO) Quality of Life Survey. Conducted between 2020 and 2021 the survey's collection period spanned a total of seven months. As a result of this staggered rollout, several participants were interviewed just after instances of load shedding while others were interviewed during times of energy stability. In total,

[53] *Confidence intervals denote significance at the 95% threshold ($p<0.05$)*
[54] *Additional models with controls are contained in Appendix C.17.*

GCRO conducted 13,616 interviews with respondents from each of the province's 529 wards (de Kadt 2021). I pair this survey data with survey controls on respondent age, gender, race, language, education (as a proxy for income), and employment status.

With this data, I utilize the survey's interview schedule to conduct a model identical to the model utilized in the by-election analysis with the timing of the by-election replaced with the time of the interview.[55] Using this model and the survey data I first validate the measure by assessing how respondents answer the question: "*How satisfied are you with the energy sources you currently have access to?*". As expected, the cumulative hours of load shedding occurring in the week prior to the conduct of the interview sees a large and significant reduction in support for the government's electricity policies (*Appendix C.19.1*).

While this is encouraging, the survey also presents drawbacks. Specifically, the GCRO survey only asks questions as low as the ward level of aggregation As no party other than the ANC and DA won wards in Gauteng in 2016, I am unable to use this data to assess shifts in opinions related to the EFF. However, the available data makes it possible to assess attitudes at an individual level. I first look at responses to the survey question: "*How satisfied are you with your local ward councillor?*".[56]

[55] *As the survey was conducted by an independent organization and not focused on load shedding the survey's schedule rollout provides further confidence that the survey was not .*

[56] *This wording enables a look at the specific link between the individual and their councillor's performance in addition to the aggregate voting data to provide further evidence of the accuracy of each result.*

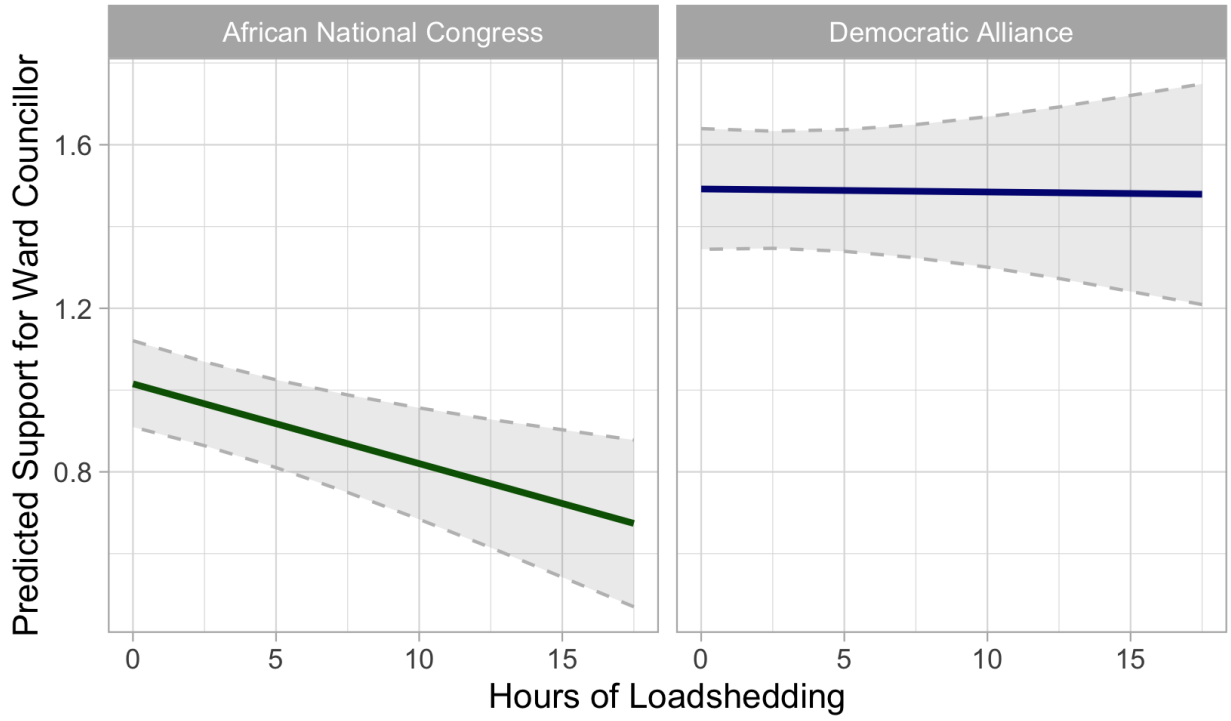

Figure 4.8: *Predicted Effect of Load Shedding on Support for Ward Councillor by Incumbent Party*[57]

Consistent with evidence from the election analyses, wards with ANC incumbents see individuals downweight their support for their ward councillor as load shedding intensifies. From opposition wards the survey results present no evidence that respondents attribute load shedding to incumbents who are not the ANC. These results are sustained when looking at the output across different time cut-offs (*Appendix C.20*).

XII. Discussion

Where prior research has relied on long-term changes in performance, the intermittent yet impactful occurance of load shedding enables me to detail the electoral threat public service failures pose to the continued electoral dominance of the ANC (in support of *H1*). Both the by-election and municipal election analyses provide robust evidence from recent results detailing how voters utilize local elections to voice their displeasure with the services provided by the ANC. To ensure that these results are not driven by artifacts related to electoral outcomes, this result is replicated in

[57] *The scale for the question ranges from 0 (very dissatisfied) to 4 (very satisfied).*

provincial survey analyses. These results further clarify that voters are not simply holding incumbents accountable for load shedding, but attributing load shedding to members of the ANC. Moreover, evidence from these analyses reveals why dominant parties in states with greater control over services have continuously minimized outages prior to elections (Min 2015).

In addition to these contributions to the literature on electoral accountability and dominant parties, I provide additional evidence regarding the ways in which voters behave in response to poor dominant party performance. Initial evidence from the electoral analyses is provided to support *H2*, which posits that the opposition parties that stand to gain most from public service failures are centrist parties that campaign on their commitment to addressing tangible governance challenges. To ensure that these results are not driven by artifacts related to electoral outcomes, these results are replicated in provincial survey analyses. While these results are encouraging in theory, the national appeal and performances of the DA are limited by a perception that the party will always prioritize the interests of white South Africans. As a result, the local achievements of the DA pose a more limited threat to the national dominance of the ANC and thus are likely to be less effective as a driver of incumbent reform.

Alternatively, as the country's largest populist party, the EFF's slight underperformance in the by-election model and slight overperformance in the municipal election model provides inconclusive evidence related to *H3*. That is, populist parties do not seem to gain or lose vote share disproportionately as a result of governance provision failures. Though these results suggest that the presence of a coordinated centrist opposition party may limit challenges made by populist parties campaigning primarily on populist rhetoric and policies, the evidence is not conclusive and is specific to South Africa's distinct electoral context and political institutions. An additional note of caution regarding *H3* relates to evidence from the corruption literature, which has noted shifts in voting behavior and voter attitudes when challenges appear intractable (Chong et al. 2011; Rose-Ackerman & Palifka 2016). This analysis was focused on the period of 2016 to 2021 as intermittent electricity provision failures enabled causal analysis of their influence, yet the electricity crisis in South Africa has become substantially worse in subsequent years. Though not conclusive, the comparative performance of the EFF in the Municipal Election model, which is

viewed as including a more salient treatment condition, suggests that the EFF (and other populist alternatives) could continue to gain if the crisis deepens.

Finally, in relation to the theory of electoral accountability's predictions on voter turnout, I find concerning evidence across both electoral analyses that support *H4*. Unlike work illustrating the potential mobilizing effects of governance failures, results from South Africa illustrate a pattern of voter apathy that should concern political analysts. As with studies on corruption, it could be that voters view Eskom's failures to be endemic. It may be that certain former ANC voters have lost faith in the ability of the system, and not just the ANC, to deliver improved results. Alternatively, given the absence of a national competitor to the ANC, it could also be that prior voters who have elected not to vote in subsequent elections do not feel there is currently an alternative to the ANC that is capable of both representing their interests and effectively managing South Africa's public services. Optimistically, if this were the case we may expect these non-voters to re-engage with politics if national elections were to become more competitive in the future.

XIII. Conclusion

This chapter examines the relevance of electoral accountability in dominant party systems. First, this chapter contributes to the literature on electoral accountability and governance in dominant party regimes by extending existing methods of causal identification while developing a novel additional design to reveal the substantive effects of public goods failures on the incumbent ANC's vote share.

Evidence from both electoral analyses and the survey data provide confirmatory evidence for several related hypotheses detailing how citizens utilize local elections to hold dominant parties accountable for poor performances. Where elected officials and parties reside over the visible decline of public services, voters do appear capable of assigning blame and holding parties accountable in competitive local elections even when failures cannot be linked to specific incumbents. On their face, these results are encouraging as they suggest that dominant parties are incentivized to improve their performance even when national elections remain uncompetitive. Evidence from both electoral analyses and survey results provide further optimism that the parties

that gain from incumbent underperformance are those that make public service improvements central to their campaign messaging and party identity.

Alongside these primary results, this study also contextualizes these shifts to note *how* voters respond to incumbent service failures. Contributions from this set of outcomes inform questions across the fields of public goods provisions, opposition politics, and populist governance. Takeaways suggest that opposition parties hoping to capitalize on dissatisfaction with government services need to serve not only as an outlet for outrage but as a potential solution to extant challenges. While evidence related to the performance of populist alternatives is more difficult to distinguish, the results emphasize the challenge posed by populist parties where issues appear endemic. Moreover, the influence of service failures on turnout in the South African context suggest that the failures of dominant parties may pose a long-term threat to political participation where opposition parties are not inclusive.

While contributing to the validation of these results, future research should use these splits to adjudicate between the potential factors driving differential turnout resulting from governance failures across election types. Similarly, research should aim to determine if the voters shifting to the DA and the EFF differ in their perceptions of democracy's efficacy as a political system as well as whether shifts in the perceived intractability of the challenge influences these shifts. Finally, greater investment should be made to illustrate the gains opposition parties can make in dominant party states by prioritizing improvements in the provision of essential public services.

Chapter 5

Conclusion

New technologies are rarely apolitical. As the quintessential democratic institution, it is unsurprising that elections have often become a stage for the use of new technologies by both pro- and anti-democratic actors. The pressures these technologies pose are often more acute in developing country contexts, which often possess lower governmental capacity to manage technological change. Thus despite the continued emphasis of political scientists on the role of elections across regime types, the rapid diffusion of new technologies has yet to be fully integrated into classic theories of democracy. My dissertation attempts to assess how new technologies have served to enable (and inhibit) pro-democratic behavior and attitudes depending on the context.

I argue that contemporary research into elections needs to be updated to account for the fundamental shifts in the forms of political engagement that have been enabled by the recent global dissemination of ICTs and the grids that sustain their function. In the case of both autocracies (Nicaragua) and nascent democracies (Kenya and South Africa), the adoption and maintenance of technologies that influence human communications pose a fundamental threat to state legitimacy. While the potential for these technologies to undermine governments has been widely discussed, I expend existing arguments by leveraging original surveys and identification strategies to bridge the divide between theory and evidence. The resulting analyses reiterate how new technologies can alter the benefits of elections to the state as well as the public.

Data for these analyses was drawn from a range of sources and methodologies, including online surveys with embedded experiments, social media data sourced from both APIs and crowdsourced collections, and spatial data on electrical grids from South African municipalities. Despite this diversity of sources I also note limitations in my findings across each chapter. While the data limitations are specific to each chapter, I want to reiterate challenges to the generalizability of these findings given the distinct media and political contexts of each study. Future research should examine the influence of ICTs and related grid technologies while taking from the project

broader trends related to the transformative potential of future technologies for democratic movements during electoral campaigns.

While limitations persist, the outputs of these chapters should inform both academic and policy debates related to elections and technology diffusion in developing countries. My findings on domestic technology adoption should inform policies aimed at incentivizing use of ICTs to ensure these technologies are positioned to enable access to verifiable information while minimizing the influence of misinformation over perceptions of election integrity. Moreover, my work on the potential deleterious consequences for South African citizens as well as the ANC should provide additional impetus to call for reform as well as investment in sustainable energy solutions. Each chapter provides additional details on policy relevant insights as well as future areas for research.

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Appendix A

Appendix A.1: *AmericasBarometer Survey Analysis*

	Facebook Use	Social Media Use (Any Platform)	Social Media Use (Political Content)
(Intercept)	2.000***	2.031***	2.027***
	(0.241)	(0.244)	(0.243)
Facebook Use	−0.059*		
	(0.032)		
Social Media Use		−0.033**	
		(0.016)	
Political Use			−0.038**
			(0.017)
Education	−0.013	−0.011	−0.012
	(0.013)	(0.013)	(0.012)
Income	−0.018	−0.013	−0.018
	(0.042)	(0.042)	(0.042)
Government Support	0.624***	0.624***	0.624***
	(0.019)	(0.019)	(0.019)
Female	0.155*	0.147	0.132
	(0.092)	(0.092)	(0.092)
Rural	−0.163	−0.159	−0.157
	(0.107)	(0.106)	(0.106)
Age	−0.005	−0.005	−0.004
	(0.003)	(0.003)	(0.003)
Num.Obs.	1372	1372	1376
R2	0.467	0.468	0.468
R2 Adj.	0.465	0.465	0.465
Std.Errors	HC1	HC1	HC1

* p < 0.1, ** p < 0.05, *** p < 0.01

Table A.1.1: *Predicted Effect of Facebook Use on Trust - OLS Regression Results*[58]

[58] *Reporting Coefficients and Robust Standard Errors (in parentheses)*

Appendix A.2: *Survey Recruitment & Selection*

Recruitment: To gather a representative sample of the adult population of Facebook users in Nicaragua we utilized Facebook advertisements (see examples below) that detailed entry in a raffle to win an iPhone. Based on evidence from the pilot period, which suggested that stratification would be too costly to implement for narrow gains in representativeness, we elected to collect data from any willing adult participants based in Nicaragua. Our sample should be seen as representative only of active Facebook users rather than of Nicaraguan society in full or of domestic internet-users.

Figure A.2.1: *Example Recruitment Advertisements*

Attention Checks: Low quality respondents were removed during the recruitment process using a question to test for participant attention. The question was designed to be easy to spot and respond to among active participants ("What day is it?"). We further restrict the sample to respondents who completed the survey between 1.5 and 10 minutes. This restriction was based on assessments of the survey and the time required to fully consider the included questions. Fortunately these restrictions excluded less than 10% of respondents from inclusion in the analyses.

Appendix A.3: *Regression Results for Main Models from Chapter 2*

	Meet with Opposition	Speak with Opposition	Incumbent Support
Post-Election	8.591**	9.181**	−7.321**
	(3.567)	(4.014)	(3.031)
Neighbors	8.552***	5.344***	−11.037***
	(1.229)	(1.569)	(1.189)
Education	0.098*	0.030	−0.050
	(0.055)	(0.060)	(0.047)
Income	2.982	2.647	−2.587
	(2.903)	(3.076)	(2.480)
(Intercept)	1.855	18.723**	89.217***
	(7.145)	(8.408)	(6.920)
Num.Obs.	288	288	288
R2	0.152	0.060	0.251
R2 Adj.	0.140	0.046	0.240
Std.Errors	HC1	HC1	HC1

* p < 0.1, ** p < 0.05, *** p < 0.01

Table A.3.1: *Estimated Opposition Engagement by Activity - OLS Regression Results*[59]

[59] *Reporting Coefficients and Robust Standard Errors (in parentheses)*

Appendix A.4: *Longitudinal Trends*

To ensure that these results were not driven by longitudinal trends, the figures below show the mean response to each of the three primary questions in the two weeks before and after the election on November 7th.

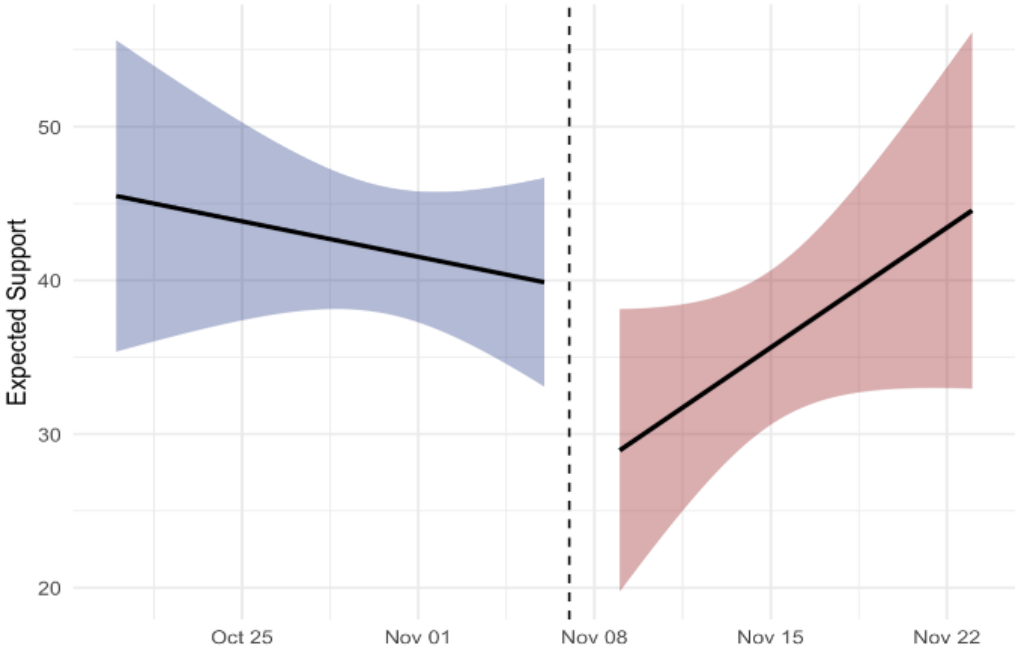

Figure A.4.1: *Predicted Public Support for the Incumbent Over Time*

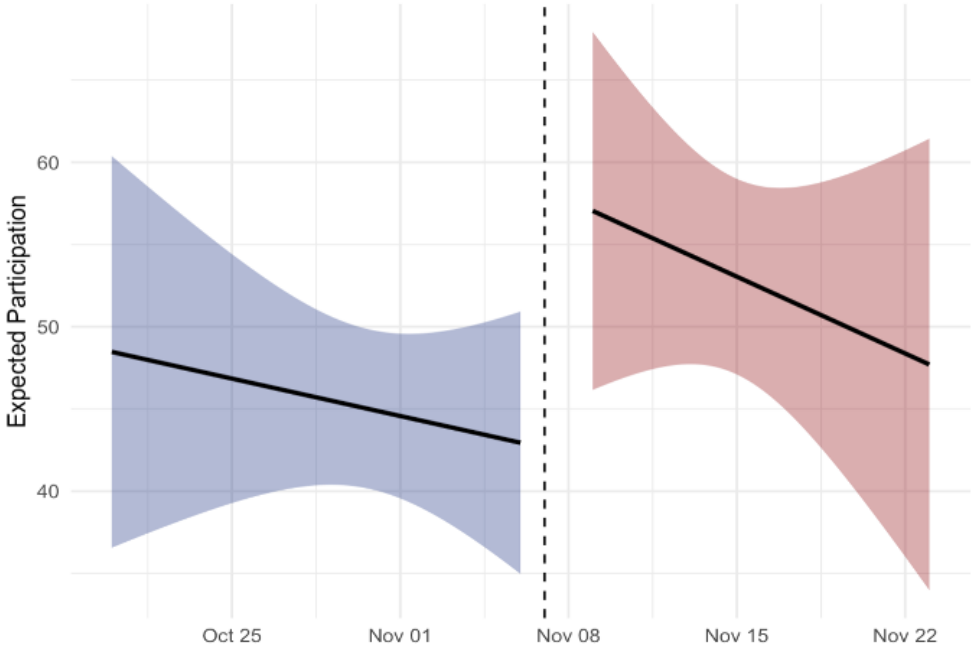

Figure A.4.2: *Predicted Public Willingness to Speak with the Opposition Over Time*

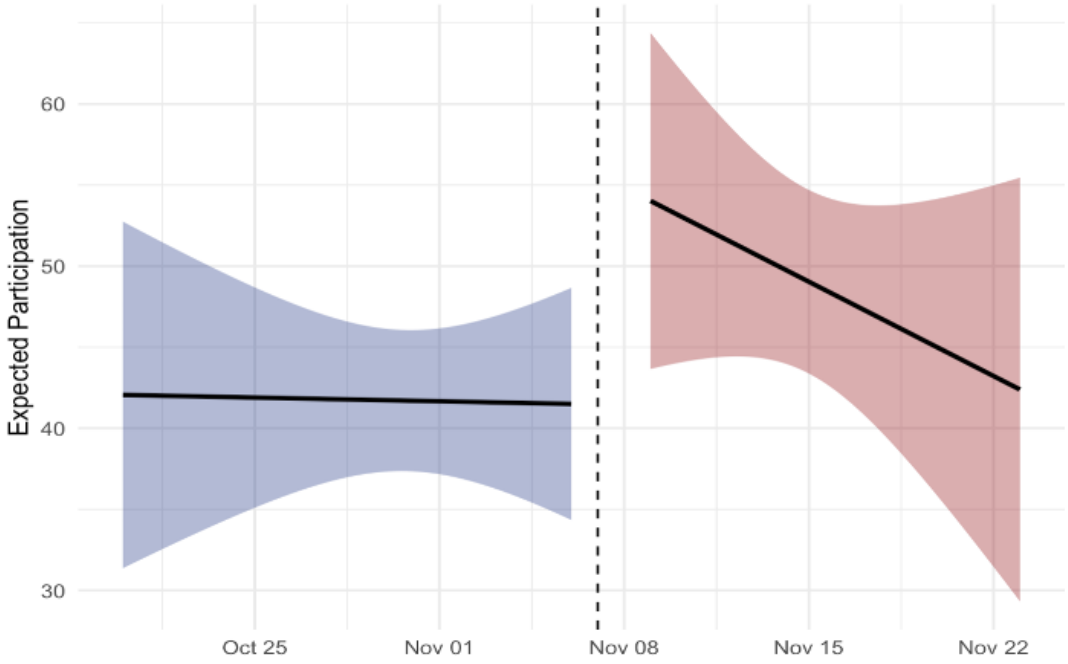

Figure A.4.3: *Predicted Public Willingness to Meet with the Opposition Over Time*

For each question there are definitive cut-offs between the pre- and post-election periods, which are clearly delineated by the election itself and not suggestive of longitudinal shifts in perceived support away from Ortega and the FSLN. These results present a consistent picture that the election served to accentuate downward perceptions of Ortega's support and bolster perceptions of oppositional participation.

Appendix B

Appendix B.1: *Additional Background on Global Fact-Checking*

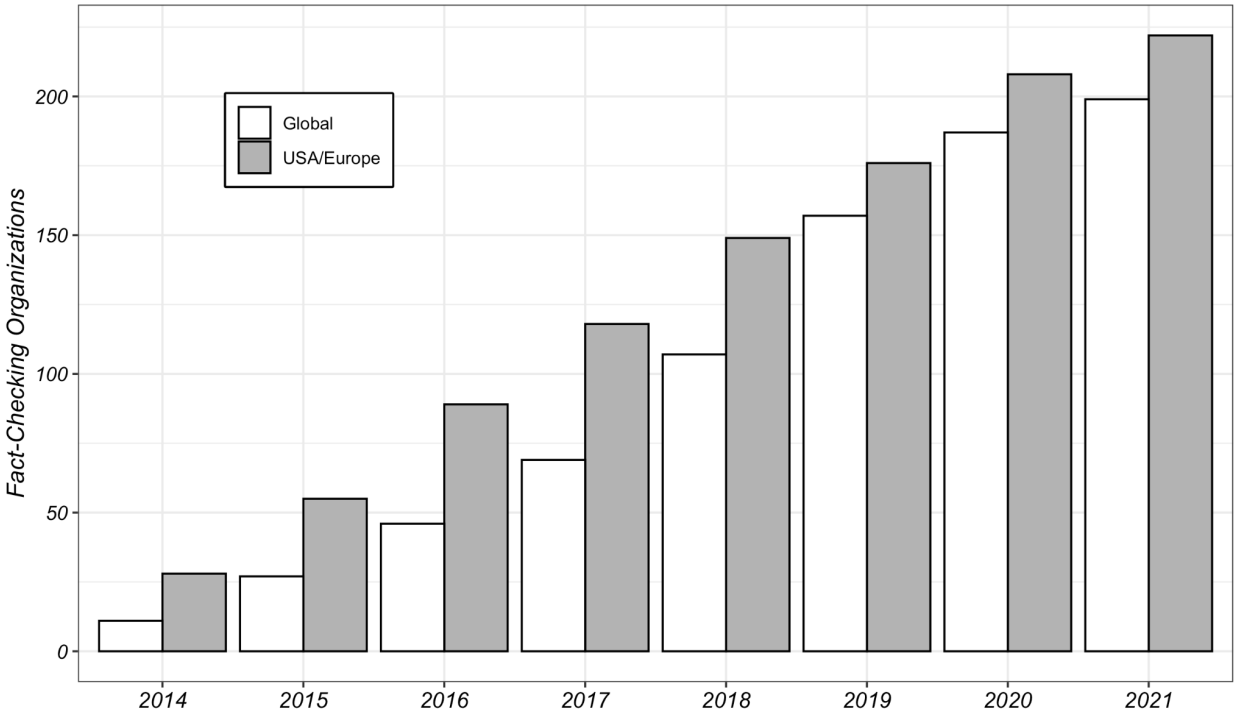

Figure B.1.1: *Cumulative Fact-Checking Organizations by Region (Duke Reporters' Lab 2023)*

Data from the Duke Reporters Lab illustrates the cumulative number of fact-checking organizations in Europe, the United States, and Australia compared to the rest of the World.

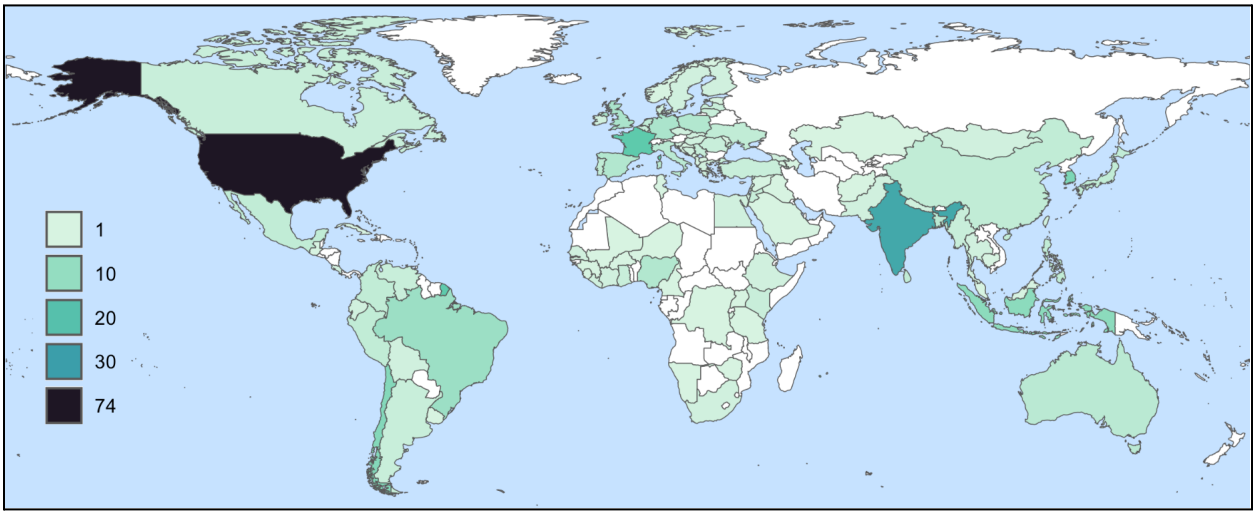

Figure B.1.2: *Total Fact-Checking Organizations by State (Duke Reporters' Lab 2023)*

Using this same data, *Figure B.1.2* illustrates the geographic distribution of official fact-checking organizations throughout the globe. Though there is an obvious concentration in the United States, there is also diverse representation across all six inhabited continents.

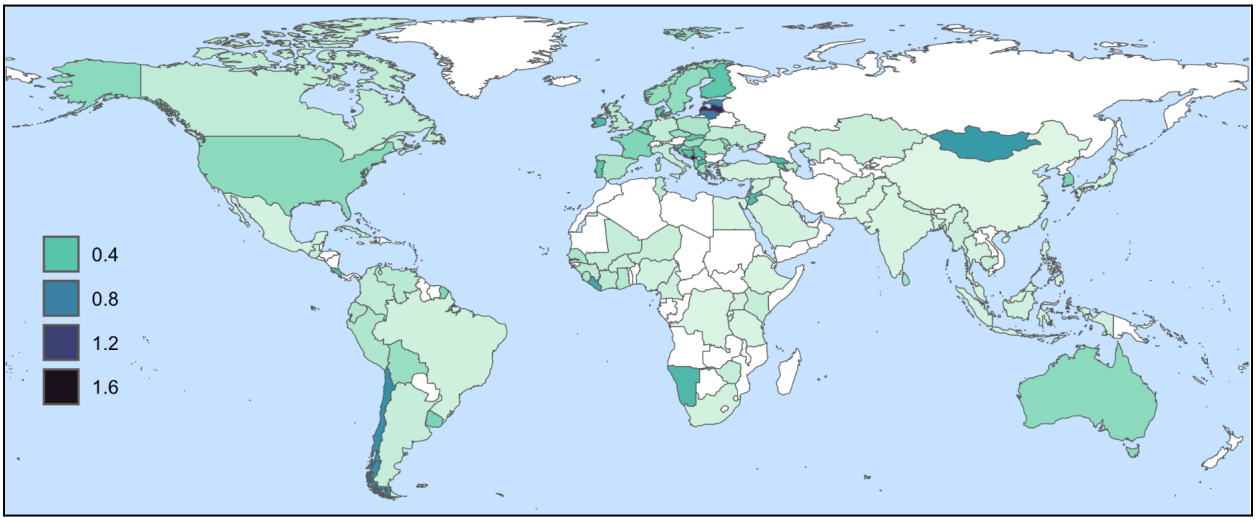

Figure B.1.3: *Fact-Checking Organizations Per 1,000,000 Residents (Duke Reporters' Lab 2023)*

Finally, if I look at the per capita representation (*Figure B.1.3*) I see that coverage is far more diffuse and the disparity is not as large as possibly suggested in *Figure B.1.2*.

Appendix B.2: *Terms in Twitter Collection*

Category	Terms
Kenyan Election Terms	Chebukati, Inawezekana, Kamba, Kikuyu, Kihihi, Kikuyu, Kimurkeldet, Kisii, Kwekwe, Luhya, Luo, Maasai, Madoadoa, Mende, Meru, Mijikenda, MorphoTablet, Mwiji, Ngetiik, Odinga, Ruto, Samburu, Siasaza, Siasazakenya, Tumejipanga, Turkana, Hatupangwingwi, Wakuja
Identified Hashtags	AzimioLaUmoja, Elections2022, ElectionsBilaNoma, ElectionsKE, ElectionsKE2022, FreedomIsComing, GE2022, KenyaDecides, KenyaElections2022, KenyaKwanza, KenyaMoja, MalizaUende, MalizaUfungwe, UhuruMalizaUende, VoteAzimio, VoteBlue, WabaraWaendeKwao, ChungaKura, Hatupangwingwi, KamaNoma, KatibaMbichi, Kihii, LindaKura, OtutuLabotonik, WatuWaKurushaMawe, WatajuaHawajui, UthamakiNiWitu
Phrases/Organizations	IEBC, Independent Electoral & Boundaries Commission, Independent Electoral and Boundaries Commission, Electoral Commission, uthamaki ni witu, operation linda kura, uthamaki ni witu, otutu labotonik, chunga kura, watu wa kurusha mawe, watajua hawajui, wabara waende kwao, chinja kafir, kama noma

Table B.2.1: *Corpus Utilized in Twitter Collection*

Included terms, hashtags, phrases, and organizations were selected based on pre-election expectations of the primary issues and targets of electoral discussion based on the author's prior knowledge of the political environment. In addition to this broad collection, which was meant to identify a representative sample of online election-related conversations, an additional subset of terms category was integrated to ensure that several of the terms included in the National Cohesion and Integration Commission of Kenya's collection of Kenyan hate were identified.[60] This collection of terms, hashtags, and phrases were distributed to several Kenyan citizens and activists familiar with local conditions to fine-tune the collection and to add additional terms of potential relevance. Discussion related to the IEBC was added in anticipation of potential post-election appeals.

[60] *https://cohesion.or.ke/images/docs/downloads/Hatelex_A_Lexicon_of_Hate_Speech_Terms_In_Kenya.pdf*

Appendix B.3: *Inter-Rater Reliability*

Coding Category	*Cohen's Kappa (IRR)*	*Percent Agreement*
General Election	0.87	95%
Election Integrity	0.62	88%
Provable Claim	0.73	97%
Unprovable Claim	0.63	97%
Unspecified Claim	0.52	96%

Table B.3.1: *Category Agreement Among Coders*

Appendix B.4: *Extended Coding Scheme*

Denominator Selection

(1) **"Election Adjacent"** (1,0): Any claim in the tweet references the 2022 Kenyan Presidential Election, including anything related to the campaign process, candidates, voting regulations, turnout, outcomes, appeal process etc.

Example 1: *"Odinga is going to win mt. kenya. The Kikuyu people love Martha."*
Example 2: *"The IEBC better shape up this time around. We can't afford a repeat of 2017."*

Inclusion Criteria

(2) **"Election Integrity"** (1,0): Any claim in the tweet **negatively** references the integrity of the 2022 Kenyan Presidential Election, including issues or improprieties with a potential impact on the equitable execution of its processes or the final results. This includes reference to corruption or fraud within the IEBC (or Chebukati), Supreme Court, or one of the two primary parties/candidates but only when related directly to the election. This also counts information claiming to be about failed attempts to rig the election.

Example 1: *"Chebukati gave this election to Ruto and we all just let it happen."*
Example 2: *"Rigathi "Riggy" Gachagua living up to his name with these games."*

Fact-checkable Claims

(3) **"Provable Claim"** (1,0): A tweet that includes a direct reference to a specific reason or piece of evidence that proves or hints that the election is not free and fair. If there are several claims related to election integrity, any ONE claim that is provable turns this to a '1'. Note which claim in the Notes column.

Example 1: *"The results were hacked! Odinga was ahead in the valley until everything flipped. No doubt Chebukati is responsible."*
Example 2: *"Smartmatic was bought fromVenezuela by Ruto to rig things behind the scenes."*

Non-Fact-checkable Claims

(4) **"Unspecified Claims"** (1,0): Any tweet that hints at issues of election integrity without making an explicit claim or narrative that includes falsifiable evidence. This can be in the form of a question or in the form of an indirect reference.

Example 1: *"The election was stolen from Odinga!"*
Example 2: *"Rigged. Through and through. And they think we'd just ignore the evidence?"*

(5) **"Unprovable Claims"** (1,0): Any tweet that is not provable with public information, but which describes or mentions specific narratives or evidence related to plots or instances of damage to election integrity. This includes tweets that reference events that may have occurred, but are impossible to prove without evidence either directly from the poster or the person accused in the post. Unprovable misinformation typically contains misinformation that includes both a subject and target.

Example 1: *"Woman Rep Gladys Shollei has been in the center stage on helping DP Ruto to rig Raila Odinga."*
Example 2: *"I voted three times yesterday for Odinga. And so did all my friends! #VoteBlue"*

Appendix B.5: *Fact-checking Analysis Details*

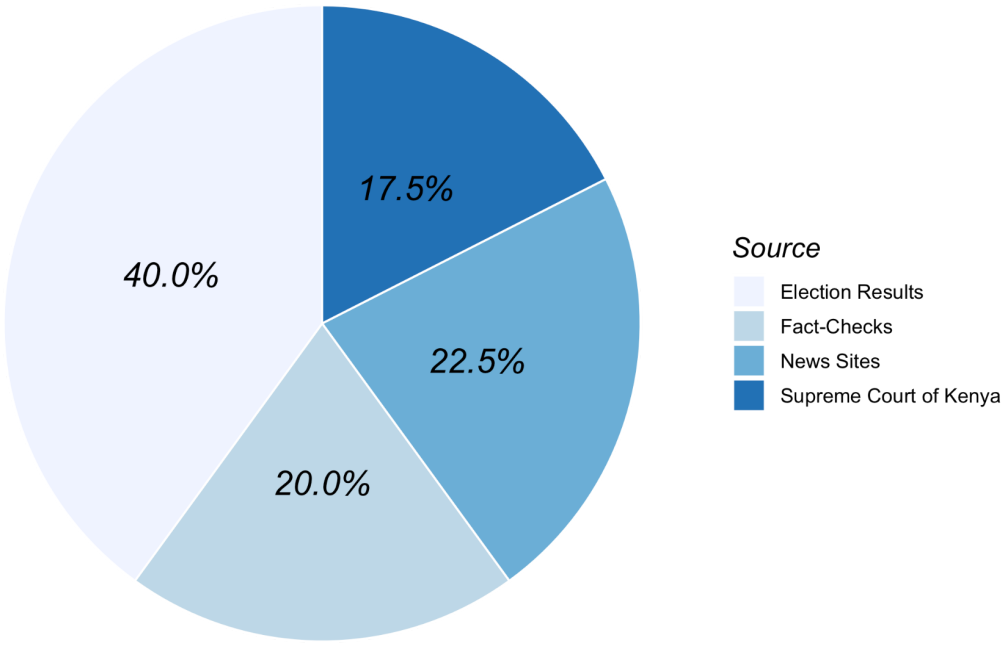

Figure B.5.1: *Source of Fact-Checks/Corrections in Coded Sample*

Organization	*Type*	*Total Links*	*Dataset Links*
PesaCheck	Fact-Checking Organization	95	4
AfricaCheck	Fact-Checking Organization	51	9
AFP	Fact-Checking Organization	27	1
FactCheck.org	Fact-Checking Organization	1	2
Standard Media	News Organization	5	11
BBC Africa	News Organization	1	4
Kenya Moja	News Organization	1	1
Capital FM	News Organization	1	1
IEBC Results	Official Results	1	32
Supreme Court of Kenya	Official Statement	1	14

Table B.5.1: *Links included in the Analysis (Total Links) & Coded Subset (Dataset Links)*

In order to assess the applicability and coverage of fact-checks produced in Kenya I drew from several related sources. Given the interest in official fact-checking organizations, I first identified official fact-checks produced by PesaCheck, AFP, and AfricaCheck, which are the three most prominent organizations that regularly produce fact-checks related to Kenyan politics.[61] For each organization I collected each fact-check produced by these organizations related to election integrity that was published between July 1st and October 1st, 2022. *Table B.5.1* shows the total links collected for each of these three organizations. I then went through each of the 541 misinformation posts identified through the coding process to find matches between these fact-checks and the misinformation contained in the included posts. From this, 16 posts could be debunked directly relying on the fact-checking information provided by one or more of these links. In order to extend this work to incorporate additional sources that could have been used to fact-check or counter online political misinformation, I took the subset of provable misinformation and conducted web searches to identify news articles that discussed the mentioned conspiracy theories or events. This process enabled me to link misinformation contained in the dataset to an additional 18 sources.

Finally, in order to address misinformation that may not have been fact-checked due to the availability of official results or the Supreme Court of Kenya's (SCOK) statement on Raila Odinga's appeal, I went through the data one final time to link posts discussing disparities in results and the appeal process. This resulted in the identification of a further 32 and 12 links, respectively, that could be paired with official sources. In all, 80 posts of the 541 posts could have been addressed during the extended electoral period with information contained in at least one of these primary sources. Put differently, these 80 links correspond to hypothetical connections that could have been made by individuals to pair official sources to online misinformation. While this could have hypothetically occurred, I identified no real world cases where these sources were used to actually counter online misinformation as encouraged by practices such as social correction.

[61] *As these are nonpartisan media outlets, I do not expect them to be biased against a particular candidate.*

Appendix B.6: *Example Recruitment Materials*

Figure B.6.1: *Example Advertisement (Left) & Recruitment Page Header (Right)*

Appendix B.7: *Survey Demographics*

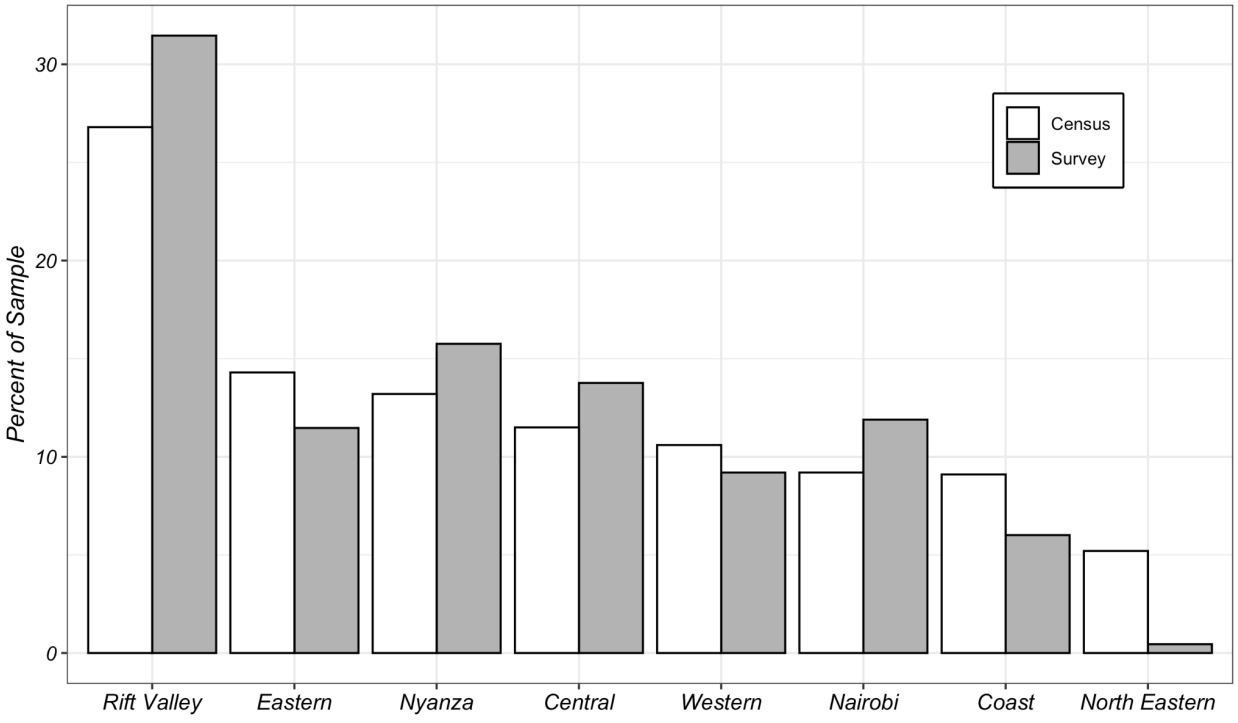

Figure B.7.1: *Distribution of Survey Respondents vs. National Census*

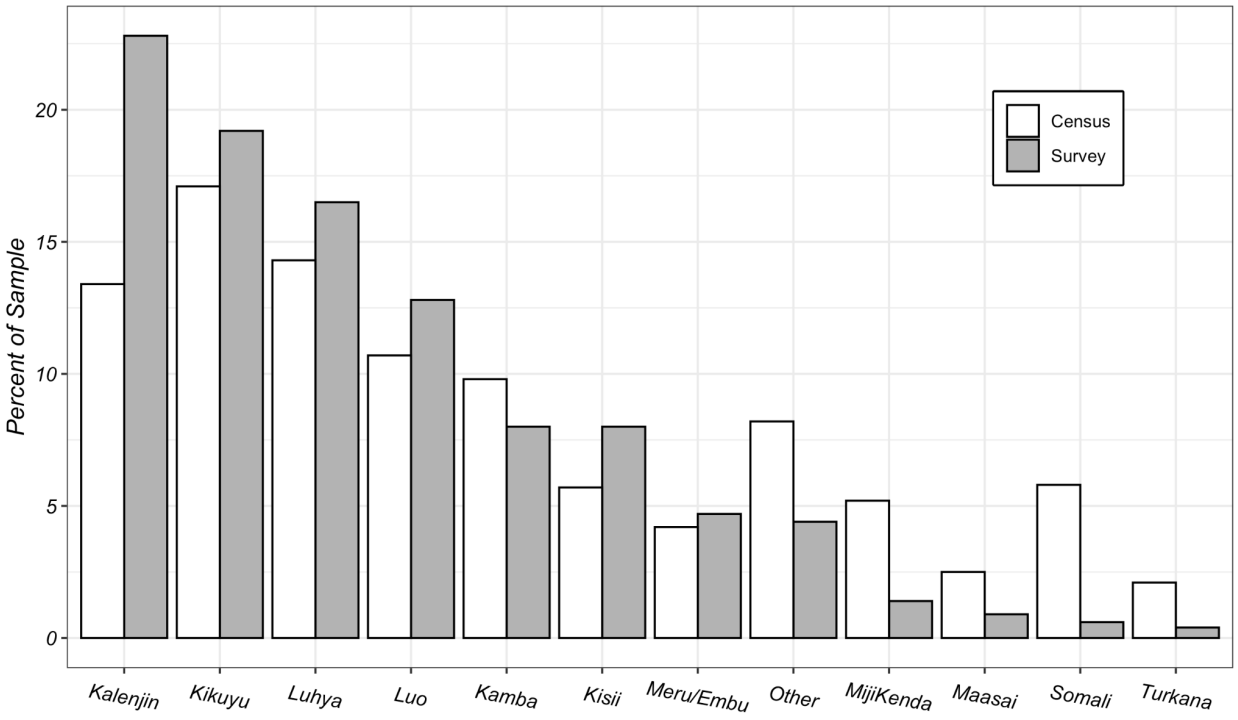

Figure B.7.2: *Ethnicity of Survey Respondents vs. National Census*

Appendix B.8: *Descriptive Statistics*

	Accuracy	Sharing	Trustworthiness	Total
Observations	N=1297	N=1338	N=1376	N=4011
Sex				
Male	885 (68%)	895 (67%)	953 (69%	2733 (68%)
Female	410 (32%)	417 (33%)	438 (30%)	1265 (32%)
Other	2 (0.2%)	5 (0.4%)	6 (0.4%)	13 (0.3%)
Age				
Mean (SD)	25.1 (6.07)	25.0 (6.06)	24.0 (6.07)	25.2 (6.36)
Median [Min:Max]	23 (18:64)	23 (18:70)	24 (18:78)	23 (18:78)
Education				
Primary or Less	20 (1.5%)	17 (1.3%)	23 (1.7%)	60 (1.4%)
Primary to Secondary	252 (19.4%)	318 (23.8%)	277 (20.1%)	860 (21.5%)
At Least University	1002 (77.2%)	989 (73.9%)	1066 (77.5%)	3057 (76.2%)
Employment				
No	887 (68.4%)	912 (68.1%)	940 (68.3%)	2739 (68.2%)
Yes	397 (30.7%)	407 (30.4%)	423 (30.8%)	1227 (13.2%)
Urbanization				
Rural	692 (53.4%)	751 (54.6%)	734 (54.9%)	2177 (54.3%)
Urban	603 (46.5%)	625 (45.4%)	602 (45.0%)	1830 (45.6%)

Table B.8.1: *Descriptive Statistics by Treatment Condition*

Appendix B.9: *OLS Regression Models With Controls*

	Dependent Variable:		
	Accuracy	Sharing	Trust
	(1)	(2)	(3)
Social Truth Query	0.115***	0.067	0.051
	(0.037)	(0.043)	(0.041)
Constant	3.105***	2.453***	3.575***
	(0.295)	(0.432)	(0.250)
Observations	10,031	10,435	10,867
Adjusted R^2	0.024	0.026	0.026
Residual Std. Error	1.865 (df = 9984)	1.919 (df = 10388)	1.860 (df = 10820)
F Statistic	6.300*** (df = 46; 9984)	7.114*** (df = 46; 10388)	7.237*** (df = 46; 10820)
Note:			*p<0.1; **p<0.05; ***p<0.01

Table B.9.1: *Effect of STQs by Treatment Group (Including Controls)*

As a robustness check, this reproduction of the main STQ models contained in *Table B.9.1* controls for gender, age, education level, ethnicity, employment status, urban residency, province of residence, and religion.

Appendix B.10: *Histograms - Aggregate Effect for H1-H3*

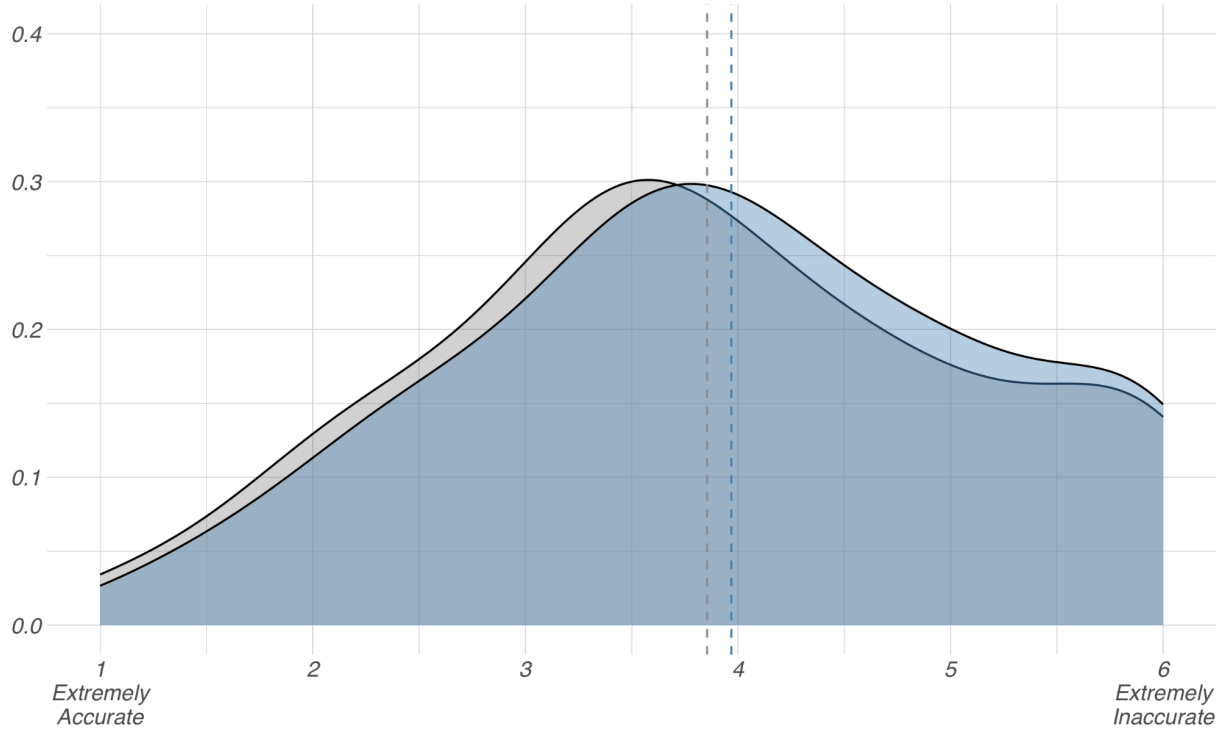

Figure B.10.1: *Histogram of Accuracy Perceptions*

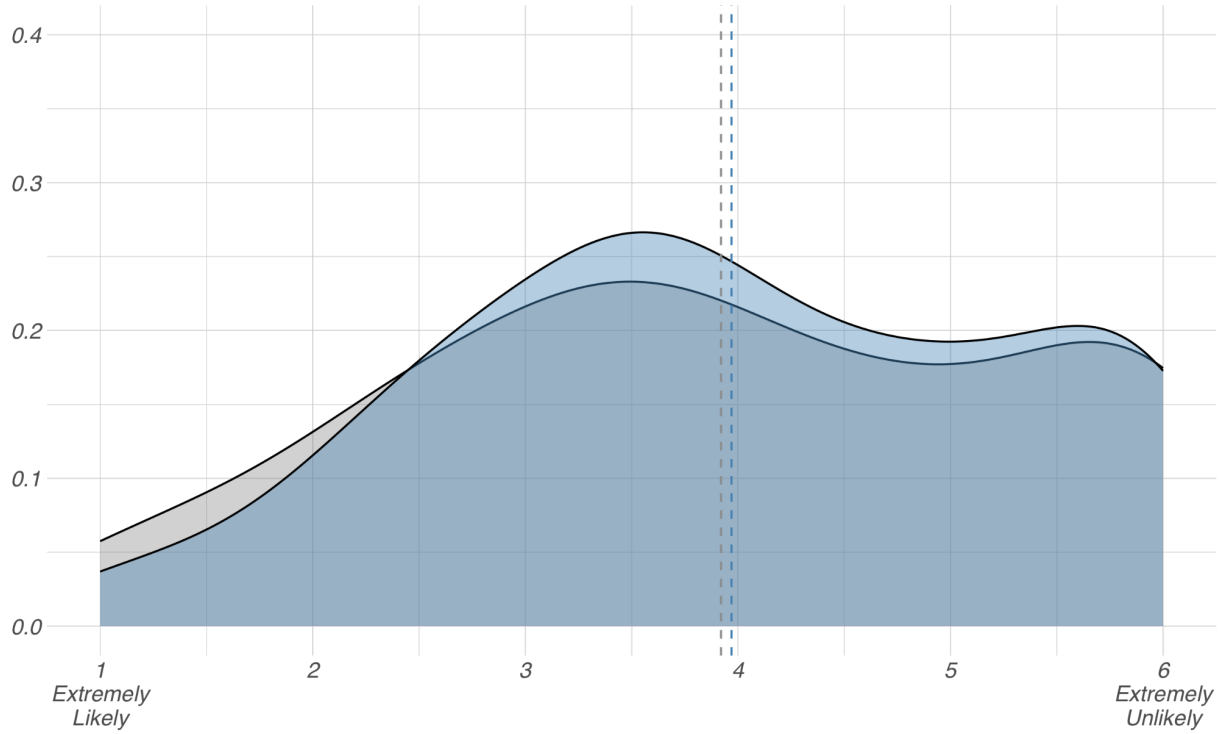

Figure B.10.2: *Histogram of Sharing Perceptions*

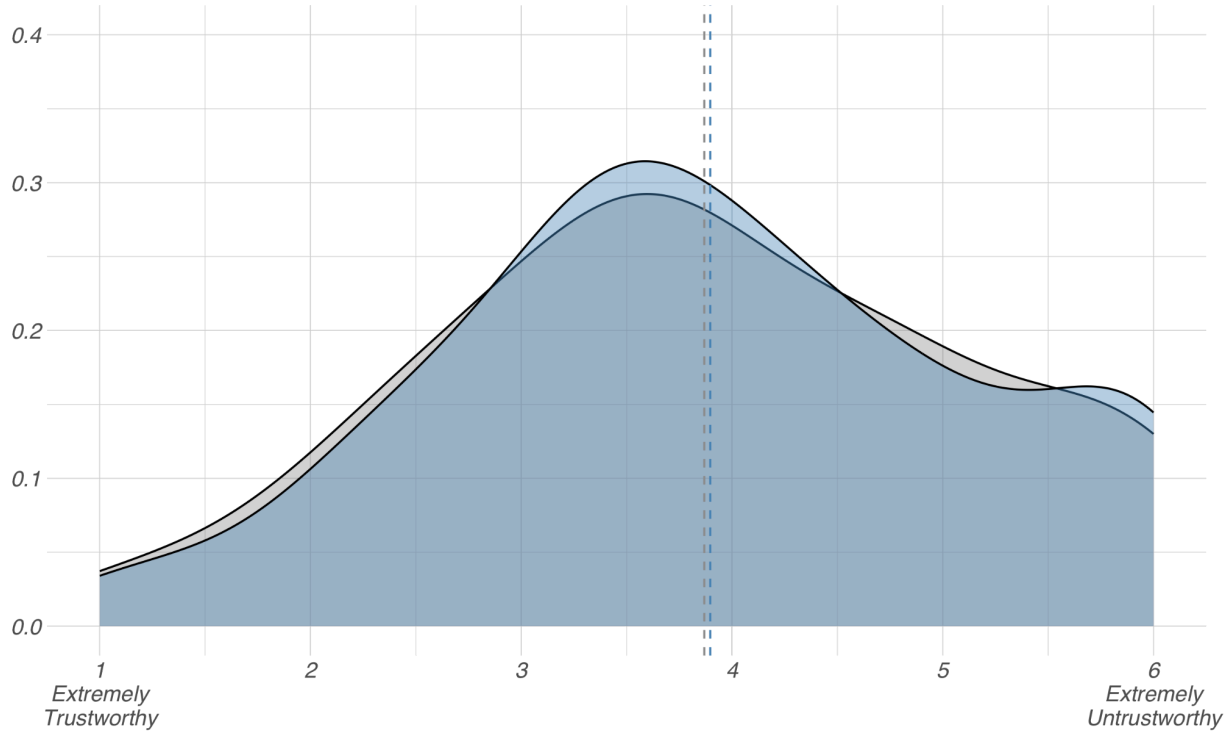

Figure B.10.3: *Histogram of Trustworthiness Perceptions*

Appendix B.11: *Effect of STQs on Susceptible Respondents*

	Dependent Variable:		
	Susceptible Respondent Responses		
	Accuracy	Sharing	Trust
	(1)	(2)	(3)
Social Truth Query	0.922***	0.805***	0.692***
	(0.072)	(0.101)	(0.098)
Constant	0.908*	0.734	0.425
	(0.485)	(0.593)	(0.907)
Observations	1,799	871	919
Adjusted R^2	0.099	0.116	0.067
Residual Std. Error	1.534 (df = 1756)	1.489 (df = 833)	1.490 (df = 878)
F Statistic	5.693*** (df = 42; 1756)	4.083*** (df = 37; 833)	2.659*** (df = 40; 878)
Note:			*p<0.1; **p<0.05; ***p<0.01

Table B.11.1: *Effect of STQs on Susceptible Respondents by Treatment Group*

Appendix B.12: *Effect of STQs by Voter Group*

	Dependent Variable:		
	Odinga Voter Responses		
	Accuracy	Sharing	Trust
	(1)	(2)	(3)
Social Truth Query	0.152**	−0.057	−0.106
	(0.062)	(0.074)	(0.068)
Constant	5.011***	2.224***	2.712***
	(0.531)	(0.575)	(0.382)
Observations	3,391	3,502	3,583
Adjusted R^2	0.078	0.042	0.061
Residual Std. Error	1.791 (df = 3346)	1.901 (df = 3457)	1.773 (df = 3537)
F Statistic	7.479*** (df = 44; 3346)	4.478*** (df = 44; 3457)	6.207*** (df = 45; 3537)
Note:			*p<0.1; **p<0.05; ***p<0.01

Table B.12.1: *Effect of STQs on Odinga Voters by Treatment Group*

	Dependent Variable:		
	Ruto Voter Responses		
	Accuracy	Sharing	Trust
	(1)	(2)	(3)
Social Truth Query	0.100**	0.104*	0.149***
	(0.050)	(0.059)	(0.055)
Constant	2.211***	2.708***	4.893***
	(0.362)	(0.550)	(0.308)
Observations	5,696	5,909	6,533
Adjusted R^2	0.019	0.026	0.026
Residual Std. Error	1.889 (df = 5651)	1.931 (df = 5862)	1.901 (df = 6488)
F Statistic	3.517*** (df = 44; 5651)	4.406*** (df = 46; 5862)	4.892*** (df = 44; 6488)
Note:			*p<0.1; **p<0.05; ***p<0.01

Table B.12.2: *Effect of STQs on Ruto Voters by Treatment Group*

Appendix B.13: *Effect of Specific STQs across Treatment Groups*

	Dependent variable:		
	Accuracy	Social Truth Queries Sharing	Trust
	(1)	(2)	(3)
What evidence is there for this?	0.146**	−0.001	−0.065
	(0.058)	(0.058)	(0.055)
Does this make sense given everything you know?	0.119**	0.101*	0.171***
	(0.059)	(0.058)	(0.055)
Do other people actually believe this?	0.059	−0.029	−0.094*
	(0.058)	(0.058)	(0.055)
Where did you hear this?	0.135**	0.197***	0.194***
	(0.059)	(0.058)	(0.055)
Constant	3.105***	2.461***	3.578***
	(0.294)	(0.435)	(0.248)
Observations	10,031	10,435	10,867
Adjusted R^2	0.024	0.028	0.029
Residual Std. Error	1.865 (df = 9981)	1.918 (df = 10385)	1.857 (df = 10817)
F Statistic	5.947*** (df = 49; 9981)	7.031*** (df = 49; 10385)	7.648*** (df = 49; 10817)
Note:			*p<0.1; **p<0.05; ***p<0.01

Table B.13.1: *Effect of Specific STQs by Treatment Group*

Appendix C

Appendix C.1: *ACLED Demonstration Data and Periods of Load Shedding*

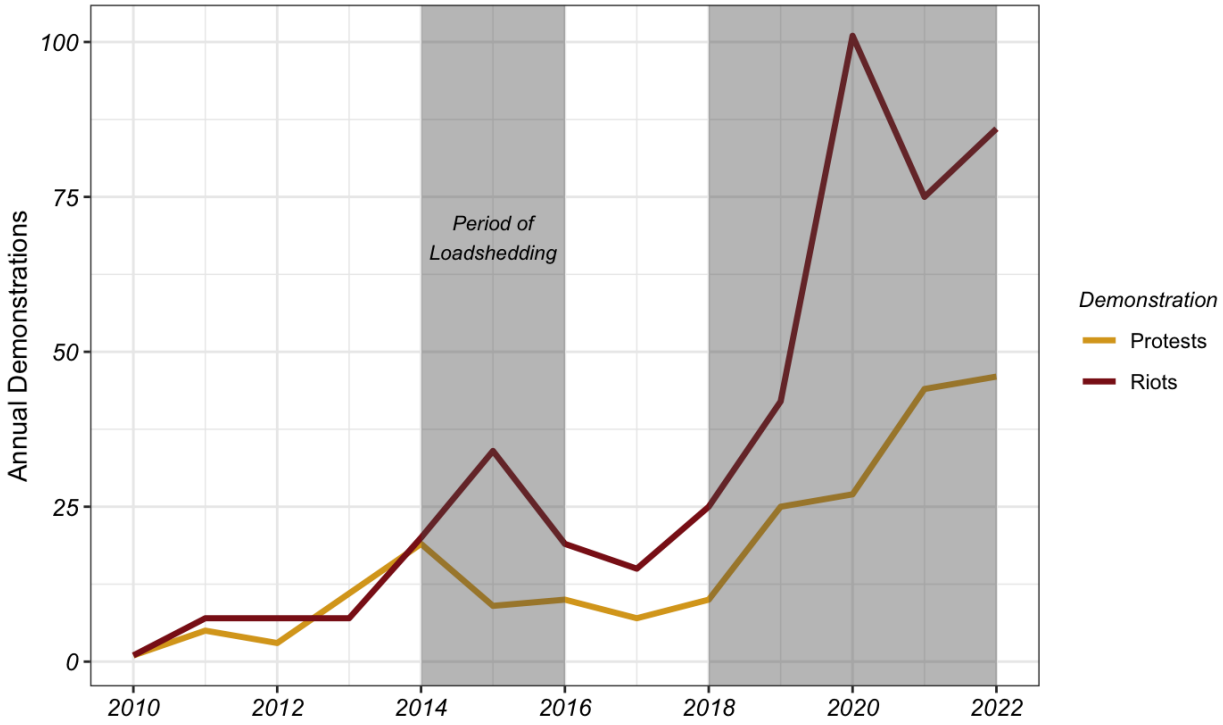

Figure C.1.1: *South African Load Shedding/Electricity Demonstrations*

Using data from ACLED enables me to plot the relationship between load shedding and public electricity demonstrations. During the two recent periods of load shedding (2014-2016 & 2018-onward) South Africans have seemingly reacted by taking to the streets to protest and riot against this salient provision failure. Data for the plot were collected by subsetting ACLED's collection of demonstrations originating in South Africa which included one or more of the following terms in the news source's description of the demonstration's purpose: *electricity, load shedding*, or *blackouts*.

Appendix C.2: *Democratic Alliance Campaign Advertisements*

Figure C.2.1: *DA Campaign Advertisements*

The advertisements above were utilized by the Democratic Alliance (DA) in campaigns for ward by-elections (top right) and the 2021 Municipal Elections (remaining three advertisements).

Appendix C.3: *Data Collection for Twitter Analyses*

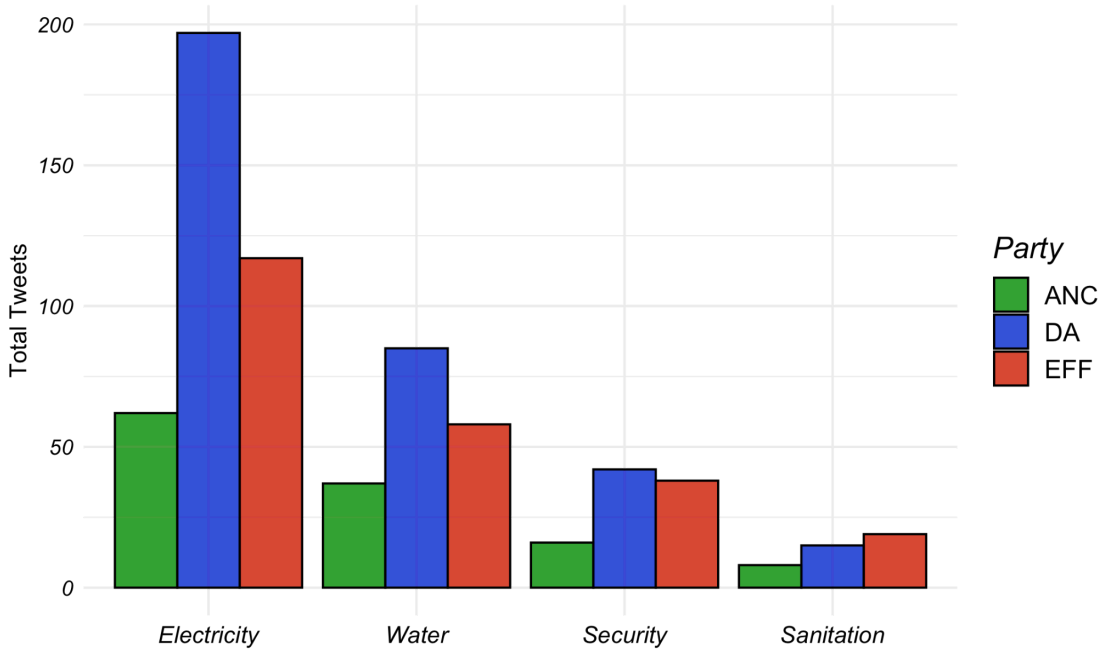

Figure C.3.1: *Total Public Service Tweets by Party*[62]

Political Party	Twitter Accounts	Total Campaign Tweets	Electricity Tweets	Public Services Tweets
African National Congress (ANC)	Leader: @CyrilRamaphosa Official: @MYANC	3461	62	123
Democratic Alliance (DA)	Leader: @jsteenhuisen Official: @Our_DA	2319	197	339
Economic Freedom Fighters (EFF)	Leader: @Julius_S_Malema Official: @EFFSouthAfrica	3784	117	232

Table C.3.1: *Details of Twitter Accounts by Category & Party*

[62] *Tweets were collected for the campaign period between September 1st & November 1st, 2021.*

Public Service	Terms Used for Twitter Collection
Water	water/water access
Sanitation	sanitation/sewage/trash
Security	police/security/safety
Electricity	load shedding/electricity/outage

Table C.3.2: *Terms Used in the Twitter Collection by Public Service*

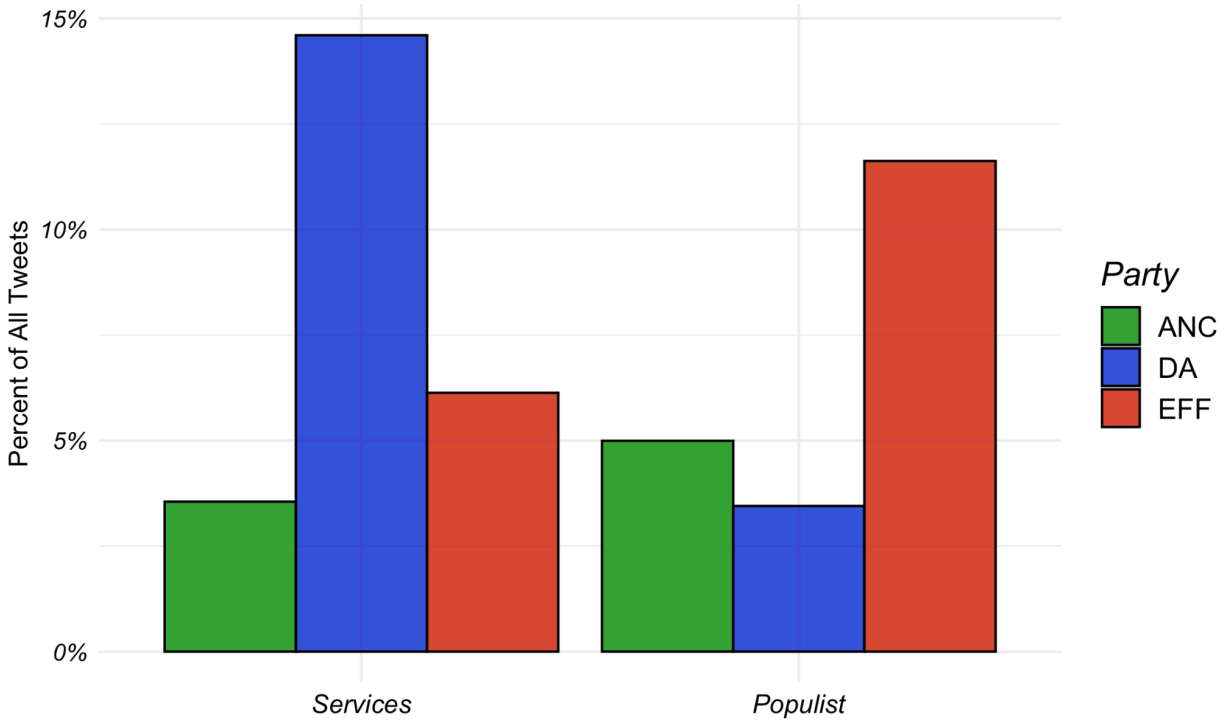

Figure C.3.2: *Total Public Service & Populist Tweets by Party*[63]

As an additional check to confirm the differences between parties the collective total "services" included in the first analysis are compared to use of "populist" rhetoric during the campaign by the three parties. As expected the EFF is the party that utilizes populist rhetoric most often. The terms in the populist category include "our people, the people, the elite, elites".

[63] *Tweets were collected for the campaign period between September 1st & November 1st, 2021.*

Appendix C.4: *By-Election Ward Locations*

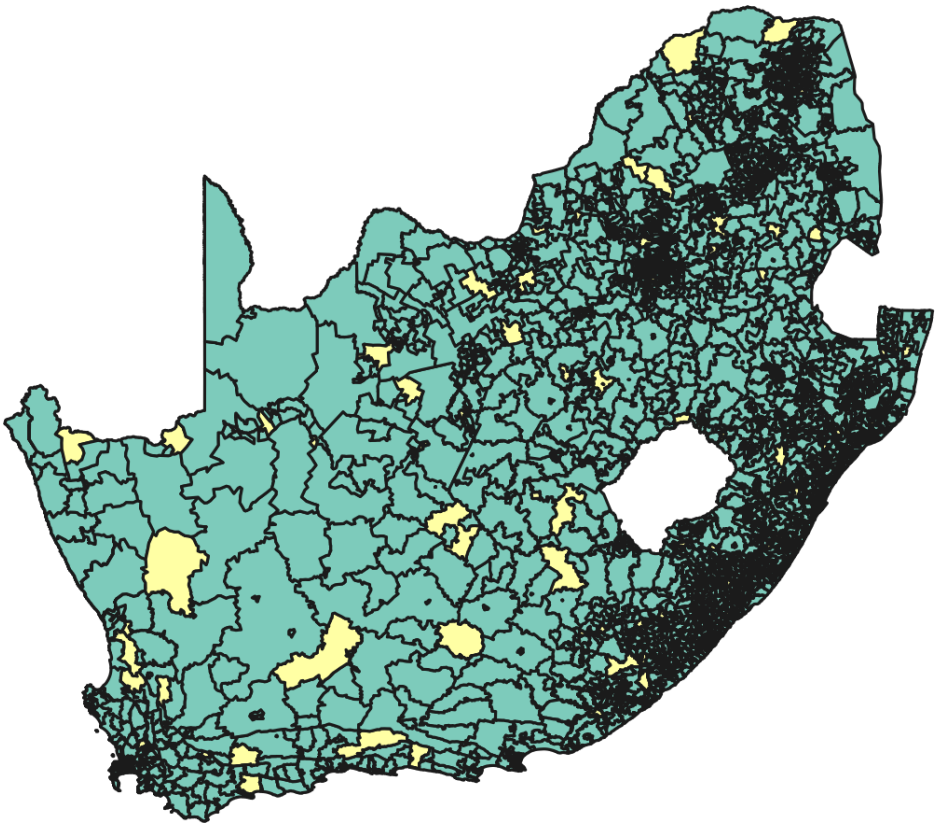

Figure C.4.1: *South African Election Wards*

Figure C.4.1 displays the South African wards hosting at least one of the 547 By-election held by the IEC between the 2016 and 2021 Municipal Elections (in yellow).

Appendix C.5: *Citizen & Media Interest in Load Shedding*

Figure C.5.1: *Load Shedding Depicted in Google Trends Data*

Figure C.5.1 displays Google Trends Data from the second half of the 2021 calendar year. The data shows that local user interest in "load shedding" peaked in South Africa in the weeks prior to the election held on November 1st.

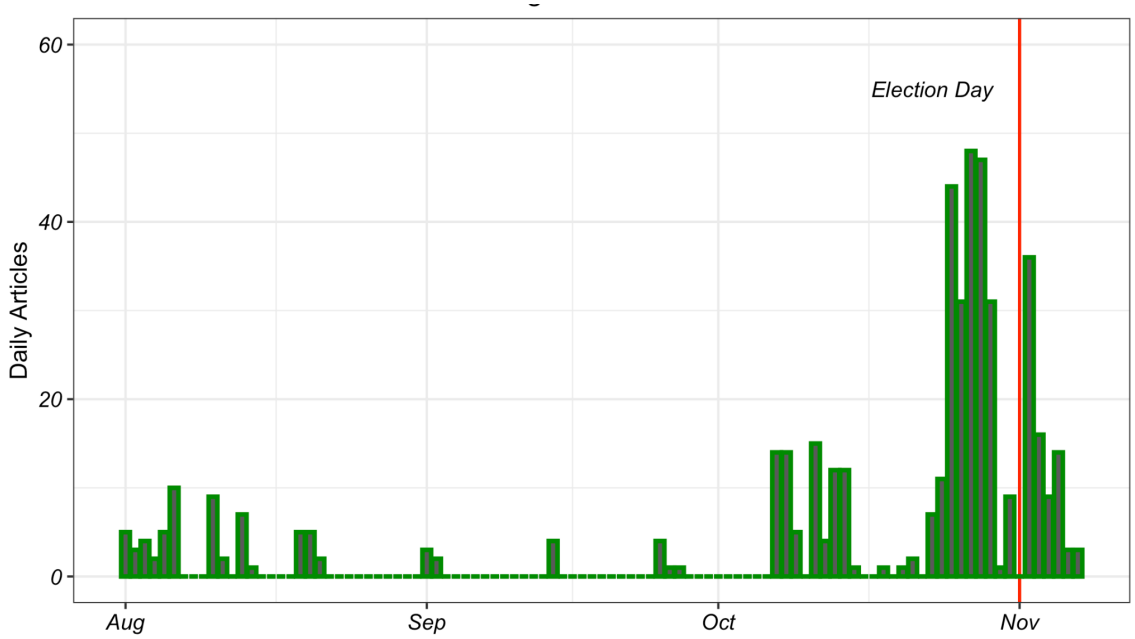

Figure C.5.2: *Load Shedding in Newsbank's News Data*

Data from *Newsbank's* global news repository shows that South African media interest in "load shedding" peaked in the month prior to November 1st.[64]

[64] *Both online and print articles were included in this collection. Data was subset to select articles that included "load shedding" in the title of the article. For more information on Newsbank's Data visit: https://infoweb.newsbank.com/apps/news/?p=AWNB.*

Appendix C.6: *By-Election Analysis Robustness Checks*

Incumbent Political Party	Total Elections as Incumbent	Mean Load Shedding Hours
African National Congress	800	3.06
Better Residents Association	9	1.67
Democratic Alliance	503	2.17
Independent Candidates	3	30.0
Inkatha Freedom Party	91	3.02
National Freedom Party	5	0.00
United Front of Civics	7	0.00

Table C.6.1: *Mean Load Shedding Hours by Incumbent Party*

A comparison of mean load shedding hours by party illustrates no relationship with ANC governance. As the party responsible for the management of Eskom this provides additional support for the randomness of the analyses.

2016 Winner	Death	Expulsion	Null	Prison	Removal	Resignation	Special Election	Termination
ANC	412	21	33	3	0	186	3	142
DA	103	6	5	0	0	325	0	64
Other	43	0	10	0	3	28	0	31
Total Elections	558	27	48	3	3	539	3	237
Total Hours	1225	30	0	0	90	1612.5	0	960
Mean Hours	2.19	1.11	0	0	30	2.99	0	4.05

Table C.6.2: *By-Election Totals by 2016 Ward Incumbent & Reason for the By-Election*

Appendix C.7: *eThekwini Municipality Map*

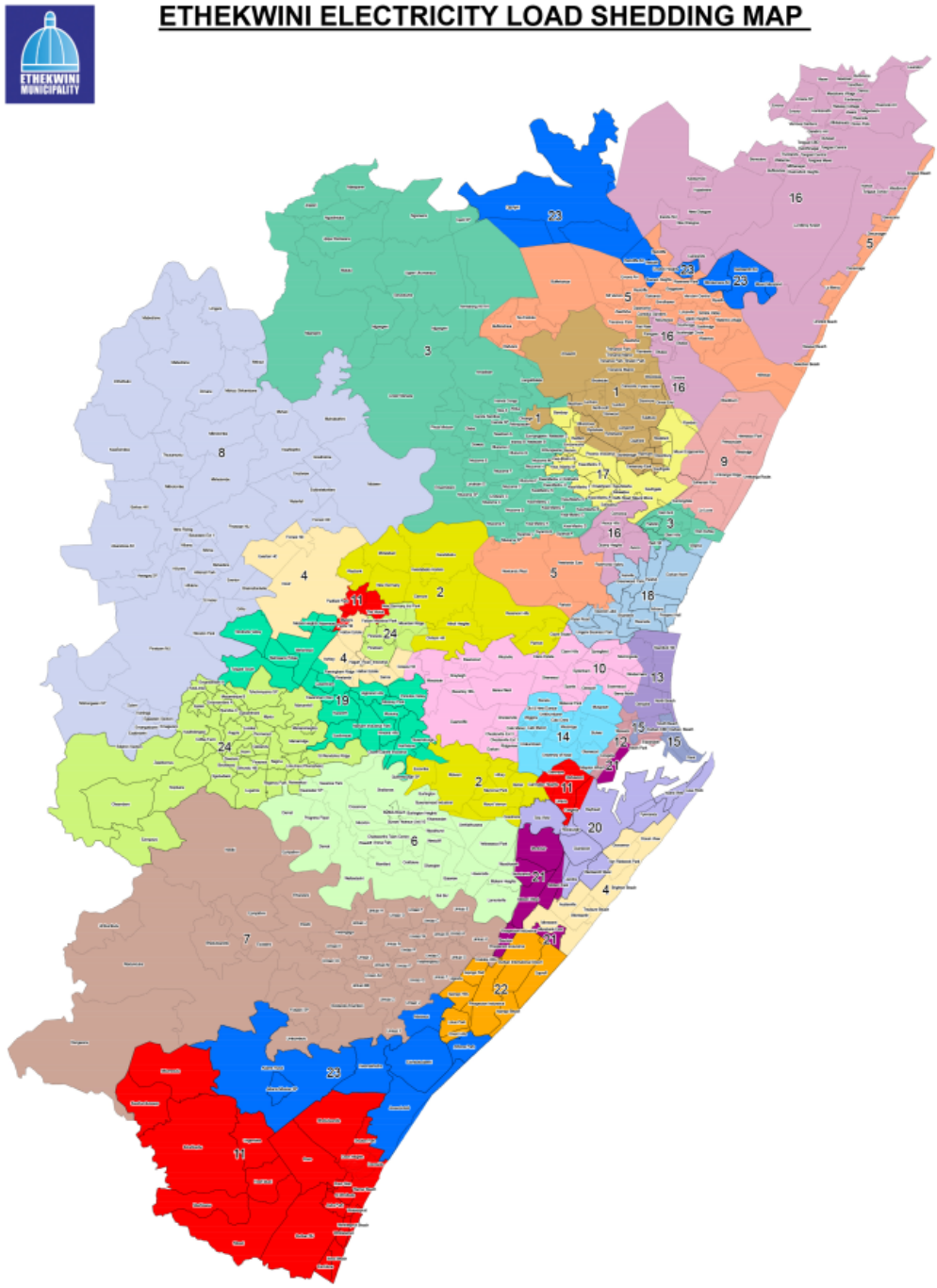

Figure C.7.1: *eThekwini's Load Shedding Map*

Appendix C.8: *Municipal Election Robustness Checks*

Given efforts to evenly distribute the electricity burden using load shedding, this form of power outage is widely seen and treated domestically as a random shock. However, to ensure that national incumbents (the ANC) are not able to strategically control the targets of load shedding, I conduct additional robustness checks looking at correlations with load shedding prior to the 2021 Municipal Election (*Table C.8.1*).

Variable	**Estimate** *(Peak)*	**Estimate** *(Total)*	**Std. Error** *(Peak)*	**Std. Error** *(Total)*	**t-value** *(Peak)*	**t-value** *(Total)*	**p-value** *(Peak)*	**p-value** *(Total)*
Female	-0.19	-0.43	0.24	0.35	-0.82	-1.21	0.41	0.23
Education	0.03	0.05	0.11	0.12	0.28	0.46	0.78	0.65
Age	0.08	0.08	0.05	0.05	1.51	1.44	0.14	0.16
Income	0.02	0.11	0.20	0.26	0.12	0.40	0.91	0.69
Black	3.62	3.95	1.55	1.63	2.33	2.43	0.02*	0.02*
White	0.64	-0.27	1.27	1.67	0.50	-0.16	0.62	0.87
Afrikaans	-2.83	-0.29	1.99	2.45	-1.42	-0.12	0.16	9.06
DA (2016)	-0.69	-1.24	0.64	0.99	-1.09	-1.25	0.28	2.15
IFP (2016)	0.18	1.46	1.44	2.64	0.12	0.55	0.90	5.83
Intercept	8.74	17.53	2.94	3.13	2.97	5.61	4e-3	6.79e-8

Note: + p<0.1; * p<0.05; ** p<0.01; *** p<0.001

Table C.8.1: *Covariate Balance by Load Shedding Hours*

Though we would expect 5% of the variables to be significant based on random chance, to ensure that the results are not driven by an unrelated correlation between outages and Black South African residents following the conclusion of the initial analyses I conduct additional analyses focused solely on blocks in the upper-half and upper-quartile of Black residency (*Appendix C.21*). Results hold.

Statistic	Vote Share	Voter Turnout	Peak Hours	Total Hours
Min	−100.0	−257.1	2.5	2.5
Max	95.6	244.4	19.0	30.0
Mean	0.1	−20.4	12.4	21.8
Pctl(75)	0.3	42.7	15.0	27.5
St. Dev.	5.7	74.5	4.2	5.3
N	46,253	46,253	46,253	46,253

Table C.8.2: *Municipal Model Summary Statistics*

Appendix C.9: *Maps of Municipal Load Shedding Blocks + Electoral Wards*

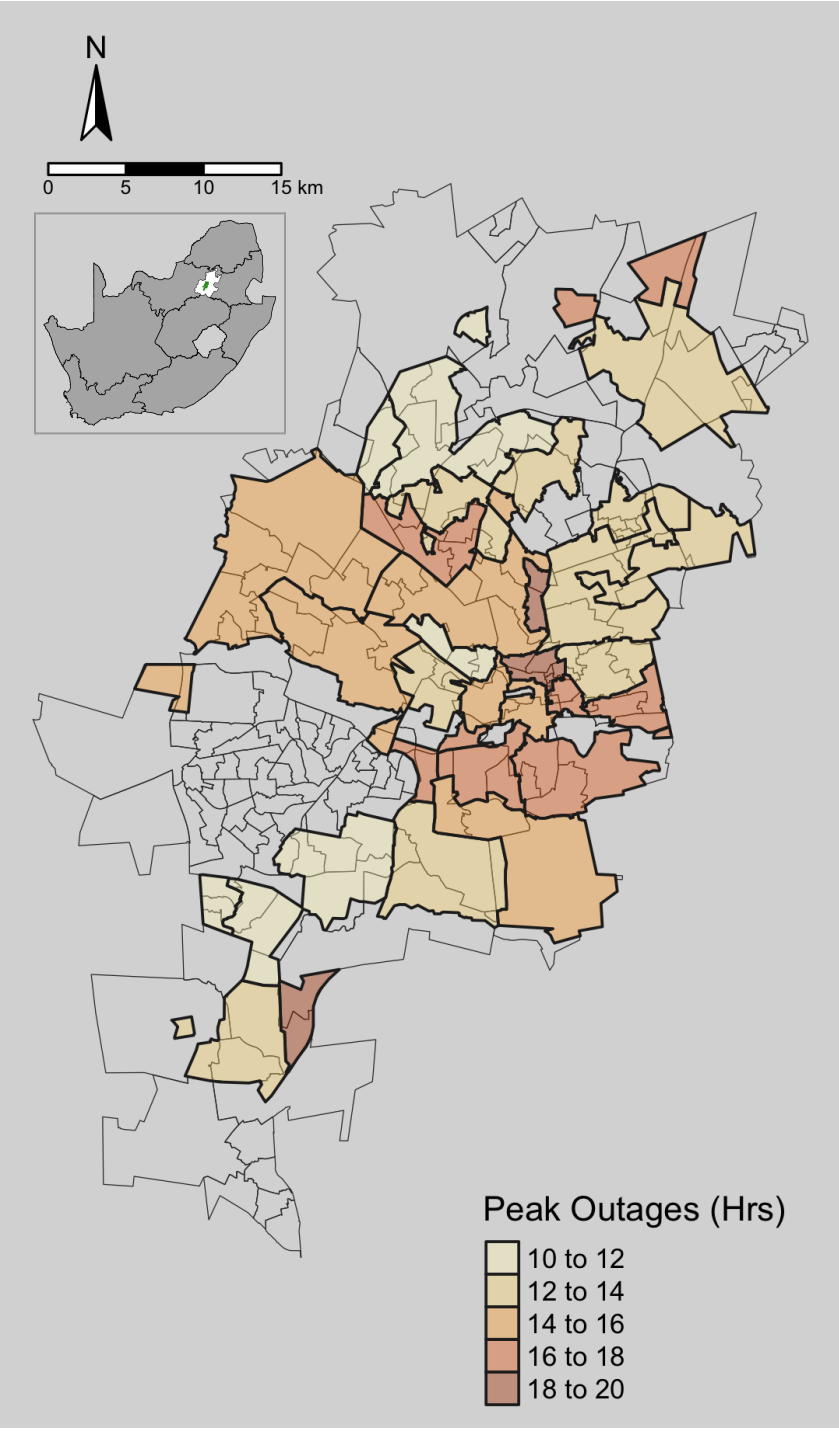

Figure C.9.1: *Distribution of load shedding blocks for the City of Johannesburg*

Each "Block" is shaded by the occurrence of peak outage hours in the week prior to the November 1st, 2021 Municipal Elections.

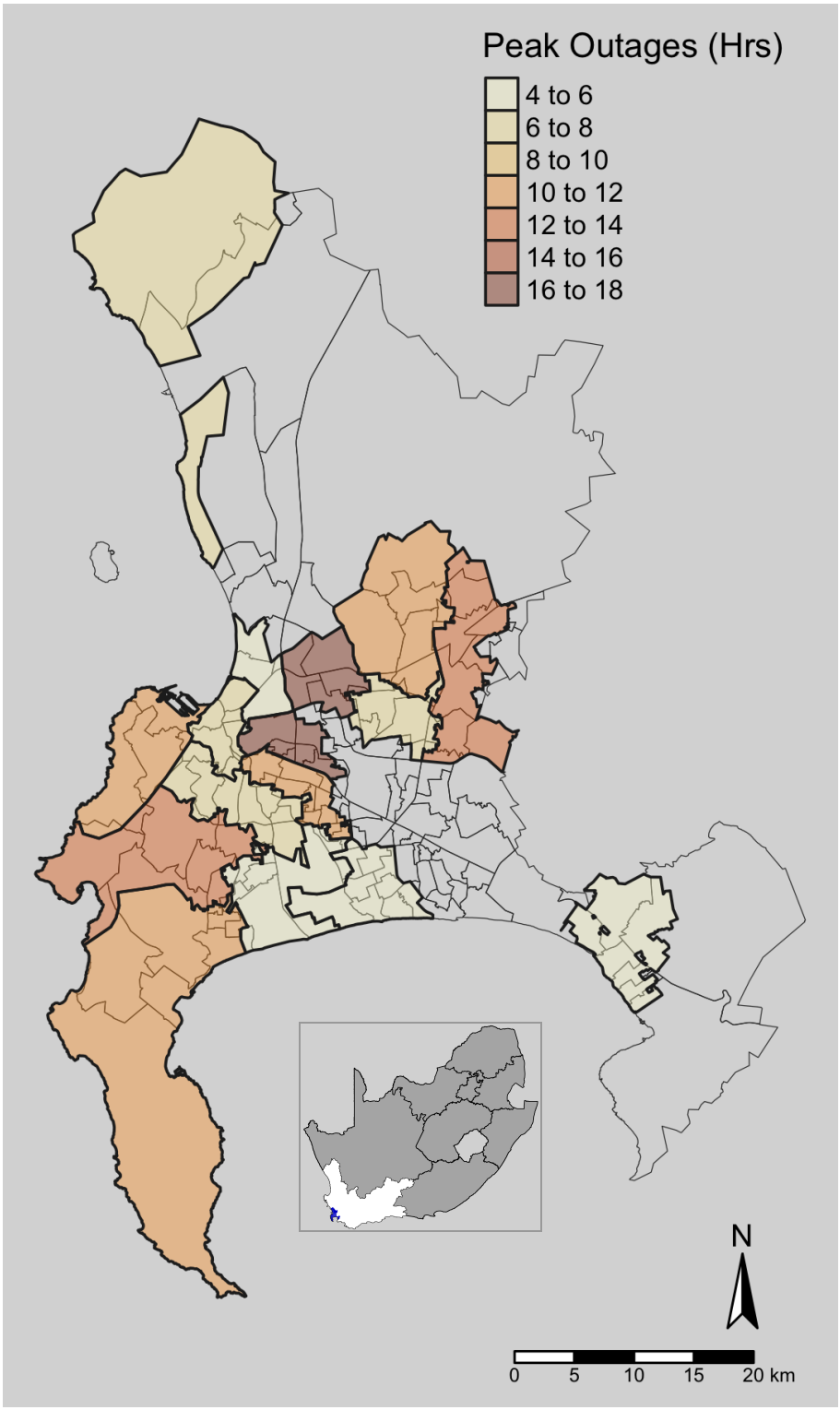

Figure C.9.2: *Distribution of load shedding blocks for the City of Cape Town*

Each "Block" is shaded by the occurrence of peak outage hours in the week prior to the November 1st, 2021 Municipal Elections.

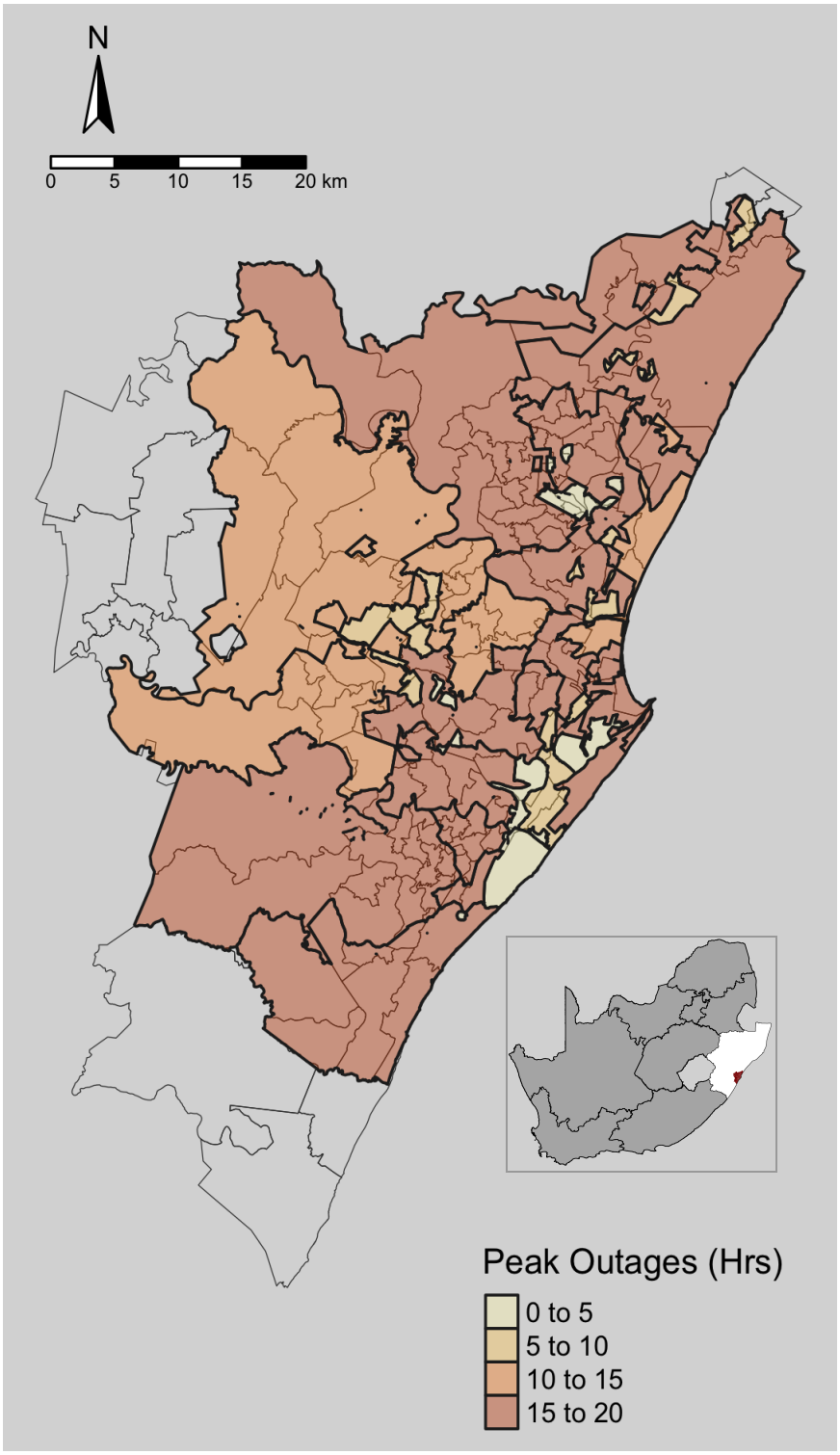

Figure C.9.3: *Distribution of load shedding blocks for the eThekwini Metropolitan Municipality*

Each "Block" is shaded by the occurrence of peak outage hours in the week prior to the November 1st, 2021 Municipal Elections.

Appendix C.10: *Load Shedding Data Collect & Validation*

To ensure that the correct number of both peak and full outage hours were assigned to each block for the municipal analysis I relied primarily on data from EskomSePush, which records each declaration of load shedding made by Eskom. To validate this data I used data from Abisoft, which also collects data on load shedding declarations.[65] Finally, historical data from Eskom's official Twitter handle (@Eskom_SA) confirmed the data from EskomSePush and Abisoft, giving me a complete understanding of the national load shedding schedule from October 1st to November 1st, 2021.

While the majority of South Africa's municipalities follow the Eskom schedule throughout the year, both municipalities and wards are able to procure electricity from other sources where opportunities are available. When this occurs, these contracts primarily include connections to electricity sourced from hydroelectric dams, solar power, and private coal power plants (Baker 2015). In order to account for potential deviations from the national schedule, data was collected from the official municipal Twitter accounts from throughout October 2021. These accounts included the CoT (@CityofCT), the CoJ (@CityofJoburgZA), and ETH (@eThekwiniM). For an example of a post on load shedding from the CoJ see *Figure C.10.1*:

[65] *A special thank you to the Abisoft Team for their willingness to share this data as well as information on historical changes to municipal load shedding schedules.*

Figure C.10.1: *Example Post from the Official CoJ Account on Load Shedding*

This final form of validation enabled me to account for any unrecorded deviations from the official national load shedding schedule.

Appendix C.11: *By-Election Results (Main Specifications)*

	Dependent variable:			
	'Vote Share'			'Voter Turnout'
	ANC	EFF	DA	
	(1)	(2)	(3)	(4)
Load Shedding	−0.249*	−0.081*	0.272	−0.212
	(0.146)	(0.043)	(0.177)	(0.173)
Quarter	0.404	1.192***	−1.540	−2.562**
	(0.781)	(0.358)	(1.306)	(1.195)
Constant	−810.510	−2,406.277***	3,112.761	5,171.953**
	(1,576.709)	(723.860)	(2,637.921)	(2,413.465)
Observations	341	337	177	1,418
Adjusted R^2	0.009	0.029	0.020	0.020
F Statistic	2.565* (df = 2; 338)	6.018*** (df = 2; 334)	2.802* (df = 2; 174)	15.195*** (df = 2; 1415)
Note:				*p<0.1; **p<0.05; ***p<0.01

Table C.11.1: *OLS Regression Results - By-Election Analyses*

Appendix C.12: *By-Election Results at Alternative Time Windows*

	Dependent variable:		
	'Voter Turnout'		
	(1)	(2)	(3)
One Week	−0.212		
	(0.173)		
Two Weeks		−0.107	
		(0.135)	
Three Weeks			−0.036
			(0.117)
Time	−2.562**	−2.645**	−2.604**
	(1.195)	(1.197)	(1.201)
Constant	5,171.953**	5,338.545**	5,255.426**
	(2,413.465)	(2,418.249)	(2,425.053)
Observations	1,418	1,418	1,418
Adjusted R^2	0.020	0.019	0.015
F Statistic (df = 2; 1415)	15.195***	14.451***	11.717***
Note:			*p<0.1; **p<0.05; ***p<0.01

Table C.12.1: *Voter Turnout Results at One, Two, & Three Weeks*

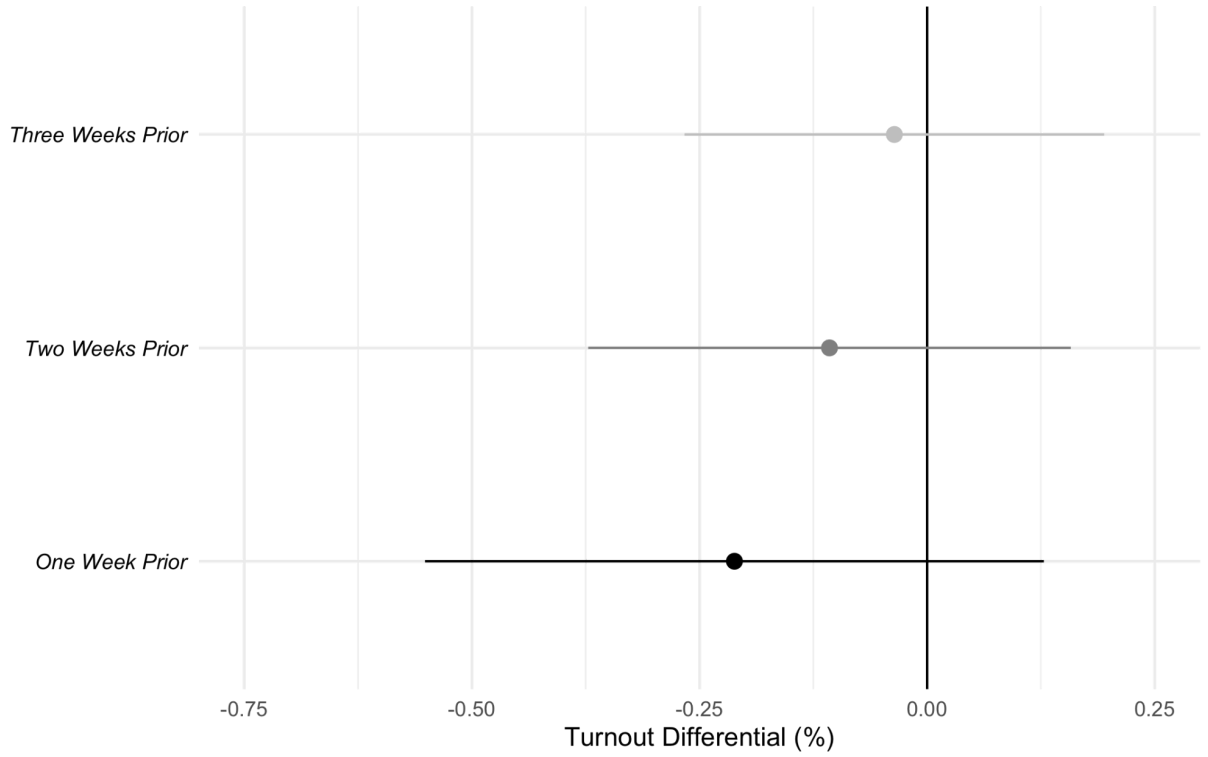

Figure C.12.1: *Coefficients Plot for Voter Turnout at the One, Two, & Three Weeks*

Economic Freedom Fighters (EFF): *By-Election Analyses at Alternative Time Windows*

	Dependent variable:		
	'Vote Share'		
	(1)	(2)	(3)
One Week	−0.081*		
	(0.043)		
Two Weeks		−0.015	
		(0.024)	
Three Weeks			−0.029
			(0.023)
Time	1.192***	1.175***	1.147***
	(0.358)	(0.361)	(0.362)
Constant	−2,406.277***	−2,371.959***	−2,315.277***
	(723.860)	(728.517)	(731.928)
Observations	337	337	337
Adjusted R^2	0.029	0.024	0.026
F Statistic (df = 2; 334)	6.018***	5.081***	5.453***
Note:			*p<0.1; **p<0.05; ***p<0.01

Table C.12.2: *EFF Vote Share Results at One, Two, & Three Weeks*

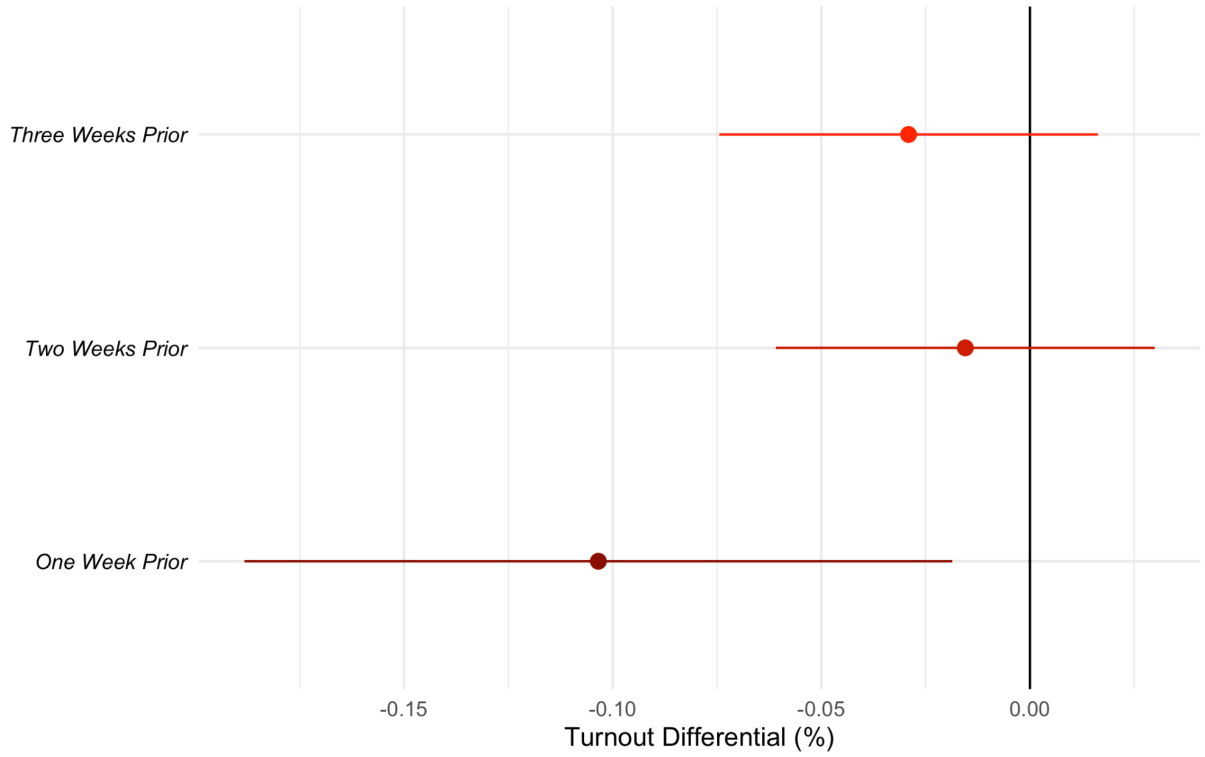

Figure C.12.2: *Coefficients Plot for EFF Vote Share at the One, Two, & Three Weeks*

Democratic Alliance (DA): *By-Election Analyses at Alternative Time Windows*

	Dependent variable:		
	‘Vote Share‘		
	(1)	(2)	(3)
One Week	0.272		
	(0.177)		
Two Weeks		0.118	
		(0.093)	
Three Weeks			0.057
			(0.078)
Time	−1.540	−1.501	−1.562
	(1.306)	(1.331)	(1.327)
Constant	3,112.761	3,034.119	3,156.445
	(2,637.921)	(2,687.846)	(2,680.105)
Observations	177	177	177
Adjusted R^2	0.020	0.009	0.002
F Statistic (df = 2; 174)	2.802*	1.800	1.140
Note:			*p<0.1; **p<0.05; ***p<0.01

Table C.12.3: *DA Vote Share Results at One, Two, & Three Weeks*

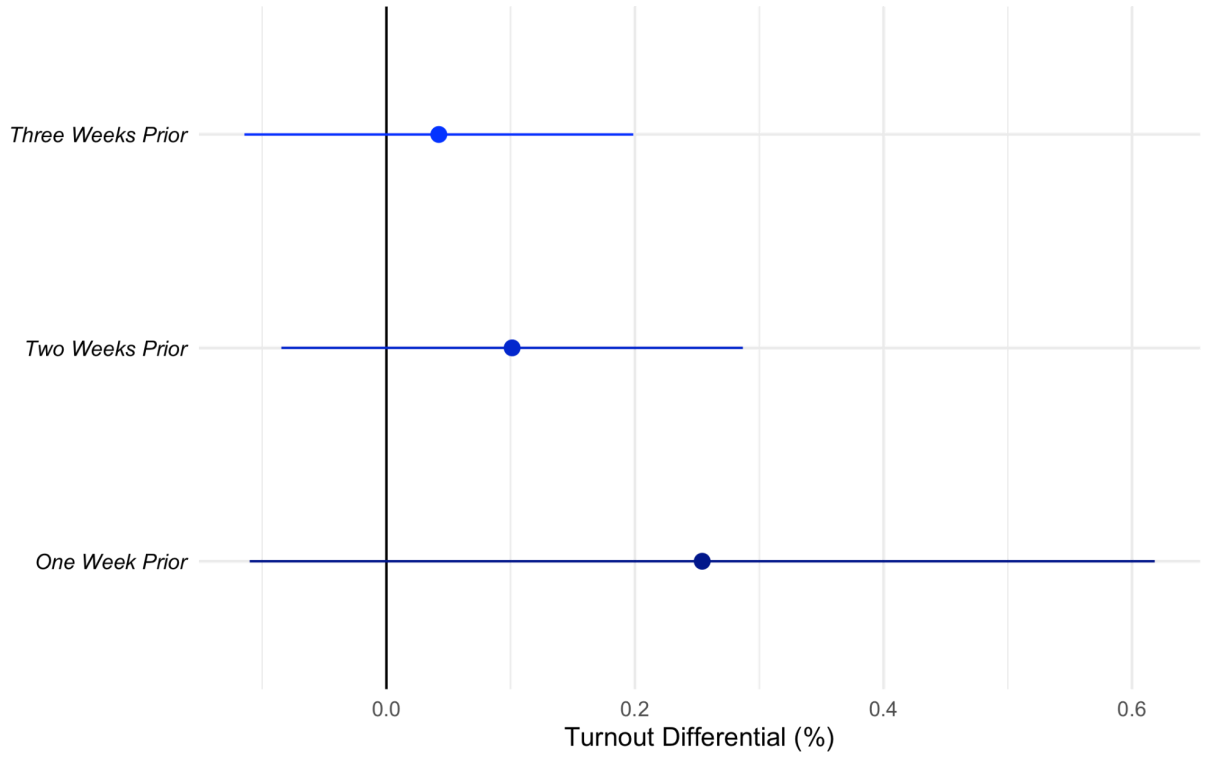

Figure C.12.3: *Coefficients Plot for DA Vote Share at the One, Two, & Three Weeks*

African National Congress (ANC): *By-Election Analyses at Alternative Time Windows*

	Dependent variable:		
	'Vote Share'		
	(1)	(2)	(3)
One Week	−0.249*		
	(0.146)		
Two Weeks		−0.079	
		(0.059)	
Three Weeks			−0.057
			(0.054)
Time	0.404	0.330	0.305
	(0.781)	(0.783)	(0.791)
Constant	−810.510	−660.893	−610.842
	(1,576.709)	(1,581.686)	(1,598.004)
Observations	341	341	341
Adjusted R^2	0.009	−0.001	−0.002
F Statistic (df = 2; 338)	2.565*	0.892	0.602
Note:			*p<0.1; **p<0.05; ***p<0.01

Table C.12.4: *ANC Vote Share Results at One, Two, & Three Weeks*

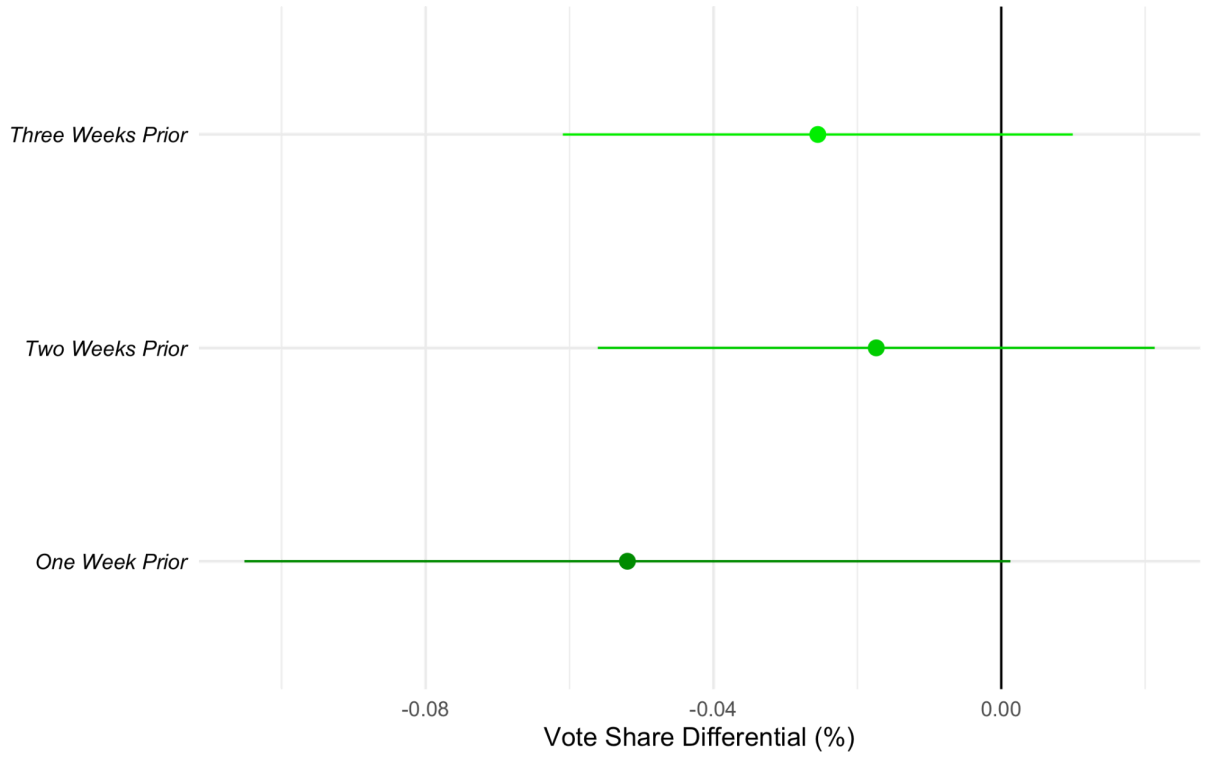

Figure C.12.4: *Coefficients Plot for ANC Vote Share at the One, Two, & Three Weeks*

Appendix C.13: *By-Analysis OLS Results (Natural Deaths Subset)*

The natural death by-election dataset contains 1,086 observations related to party performance across 274 by-elections held across 59 dates between January 1st 2018 and the November 2021 Municipal Election. Data from the IEC and Statistics South Africa was cross-referenced with information on political homicides provided by the Global Initiative (GI-TOC 2022).

	Dependent variable:			
	'Vote Share'			'Voter Turnout'
	ANC	EFF	DA	
	(1)	(2)	(3)	(4)
Load Shedding	−0.292	−0.202	0.260	−0.180
	(0.190)	(0.135)	(0.474)	(0.160)
Quarter	2.498**	0.941	−3.266	−4.055***
	(1.231)	(0.803)	(2.523)	(1.391)
Constant	−5,038.431**	−1,899.020	6,598.316	8,183.723***
	(2,487.441)	(1,622.431)	(5,097.106)	(2,809.610)
Observations	116	117	42	421
Adjusted R^2	0.027	0.003	0.010	0.077
F Statistic	2.601* (df = 2; 113)	1.149 (df = 2; 114)	1.212 (df = 2; 39)	18.588*** (df = 2; 418)
Note:				*p<0.1; **p<0.05; ***p<0.01

Table C.13.1: *Effect of Load Shedding on Party Vote Share & Voter Turnout Following Councillor Deaths*

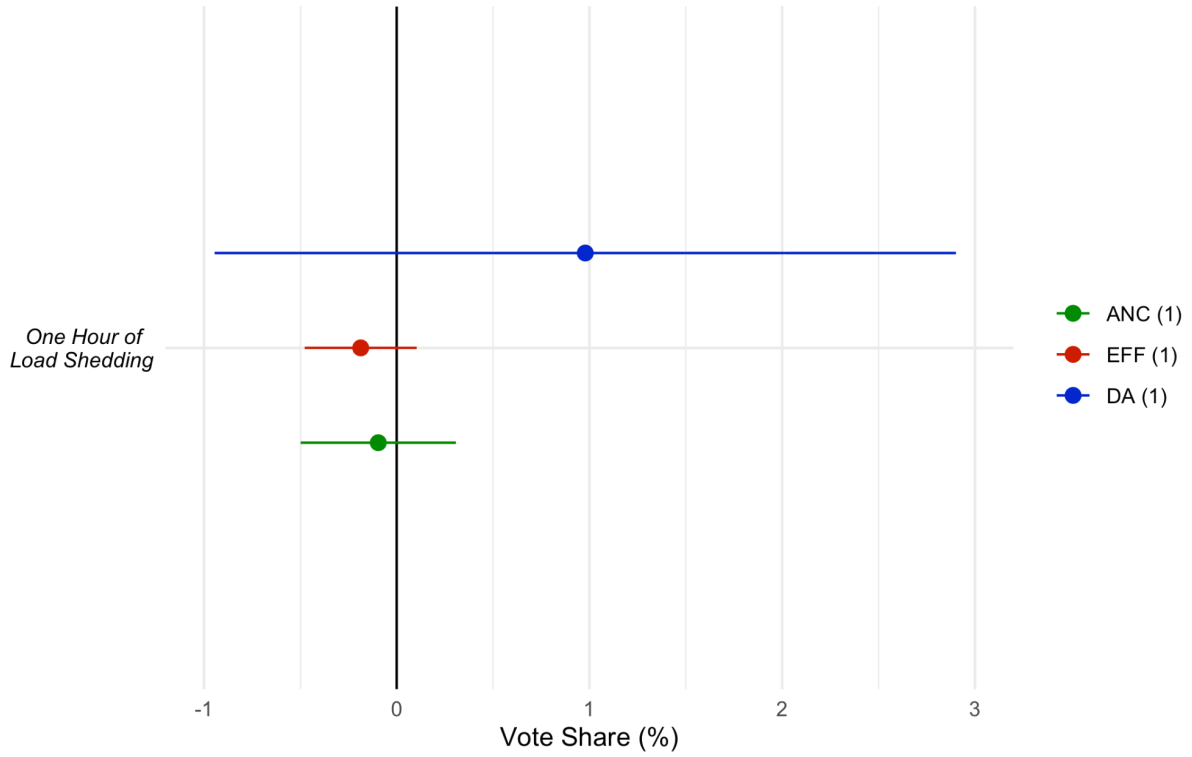

Figure C.13.1: *Coefficients for the By-Election Model When Subset by Councillor Deaths*

The coefficients for the one-week interval are presented in *Figure C.13.1* for the subset focused on by-elections following councillor deaths. Though the directionality of the results is maintained the results are less certain and cannot be confidently distinguished from the null.

Appendix C.14: *ANC Incumbency & Opposition By-Election Plots*

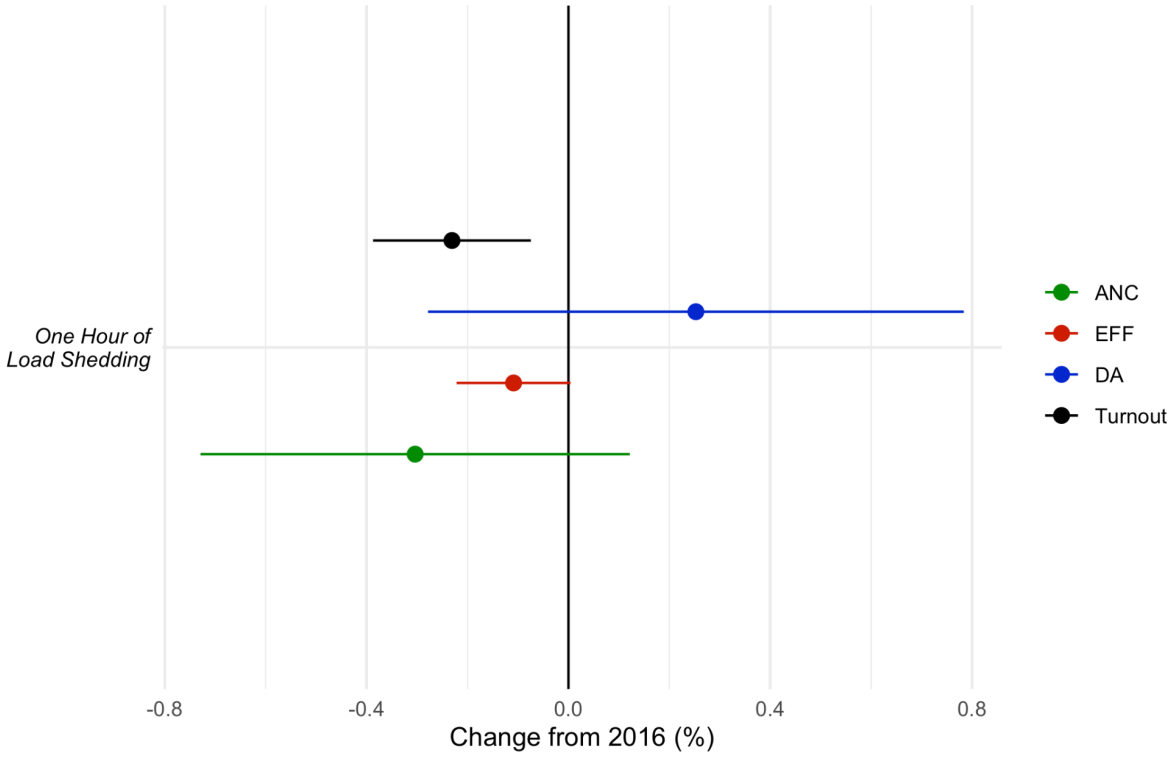

Figure C.14.1: *Coefficients for each outcome among wards with ANC incumbents*

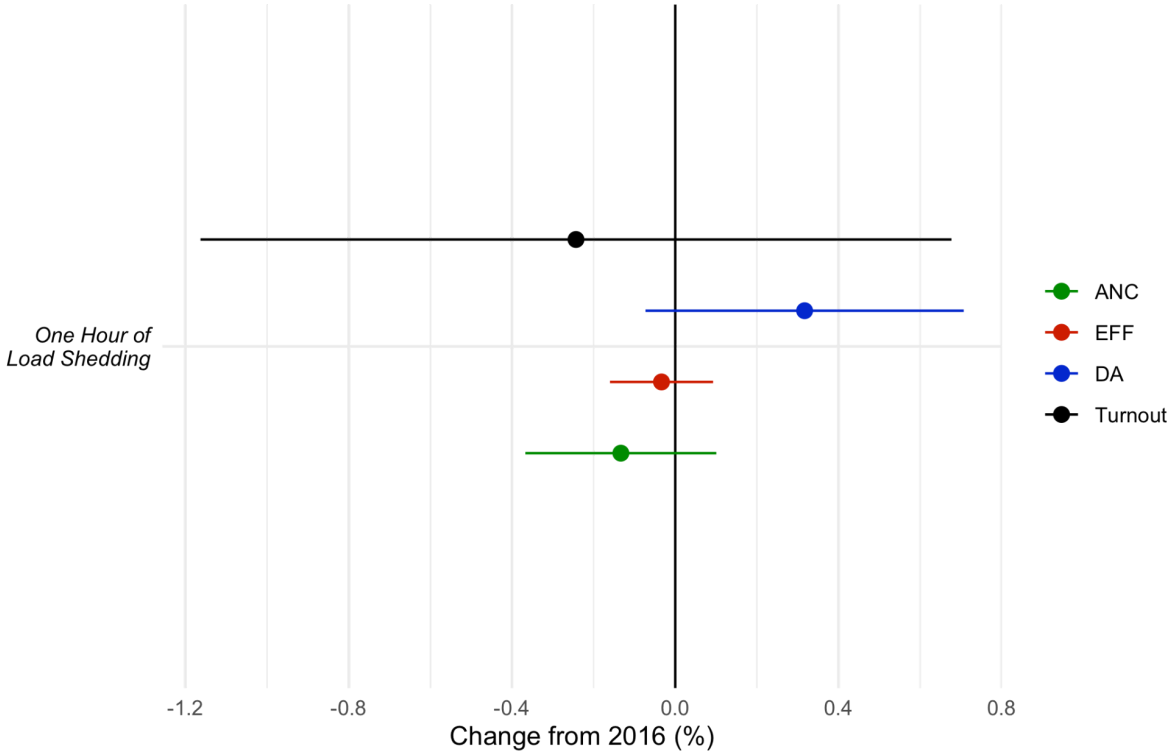

Figure C.14.2: *Coefficients for each outcome among wards with an ANC opposition*

Appendix C.15: *Municipal Block Analysis Tables - Peak Hours*

	Dependent variable:			
	'Vote Share'			'Voter Turnout'
	ANC	EFF	DA	
	(1)	(2)	(3)	(4)
Peak Hours	−0.734***	0.553***	0.917***	−2.022***
	(0.206)	(0.169)	(0.260)	(0.715)
Observations	1,676	1,675	1,674	46,253
Adjusted R^2	0.043	0.080	0.077	0.013
F Statistic	75.352*** (df = 1; 1674)	147.504*** (df = 1; 1673)	140.293*** (df = 1; 1672)	597.275*** (df = 1; 46251)
Note:				*p<0.1; **p<0.05; ***p<0.01

Table C.15.1: *Municipal Election Results for Vote Share & Turnout by Peak Load Shedding Hours*

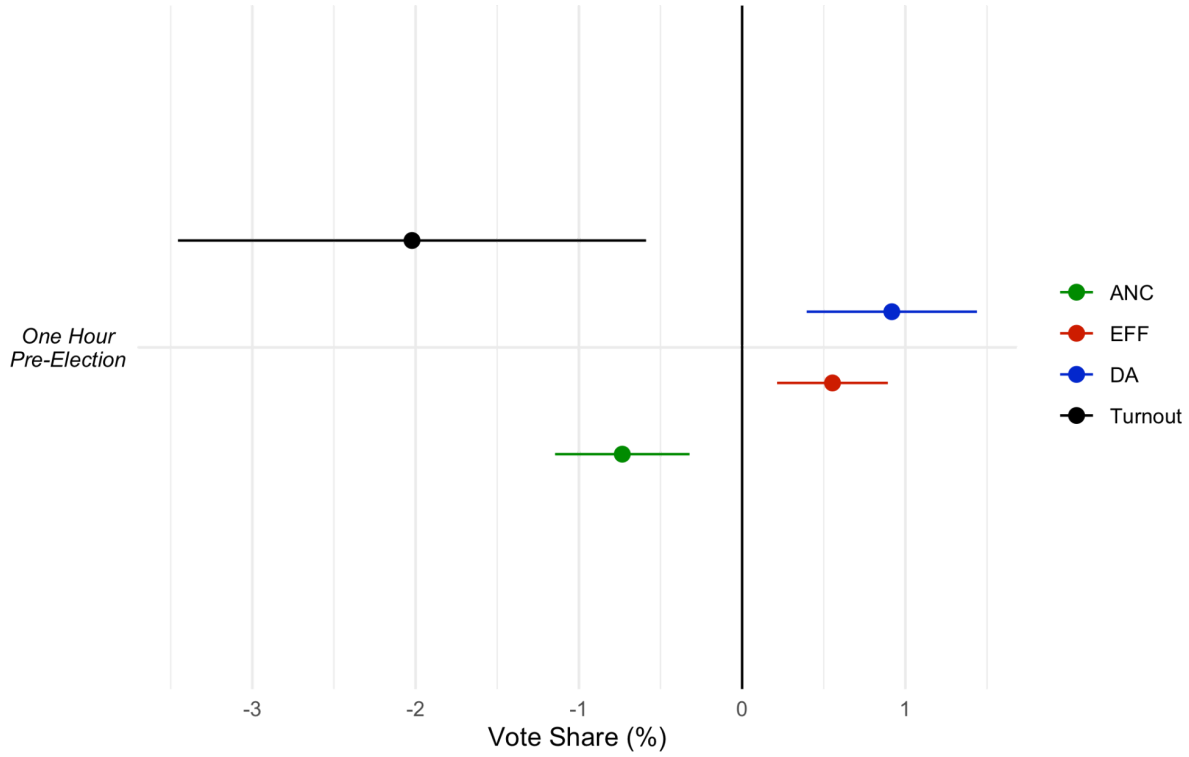

Figure C.15.1: *Coefficients for the Municipal Election Model by Peak Load Shedding Hours*

Figure C.15.1 displays the coefficients for party vote differentials for the subset of peak load shedding hours in the ten days prior to the 2021 Municipal Elections

Appendix C.16: *Municipal Block Analysis Tables - Total Hours*

	Dependent variable:			
	'Vote Share'			'Voter Turnout'
	ANC	EFF	DA	
	(1)	(2)	(3)	(4)
Total Hours	−0.515**	0.411**	0.646**	−1.365*
	(0.206)	(0.169)	(0.260)	(0.715)
Observations	1,676	1,675	1,674	46,253
Adjusted R^2	0.036	0.077	0.066	0.009
F Statistic	63.833*** (df = 1; 1674)	140.412*** (df = 1; 1673)	119.234*** (df = 1; 1672)	437.902*** (df = 1; 46251)
Note:				*p<0.1; **p<0.05; ***p<0.01

Table C.16.1: *Municipal Election Results for Vote Share & Turnout by Total Load Shedding Hours*

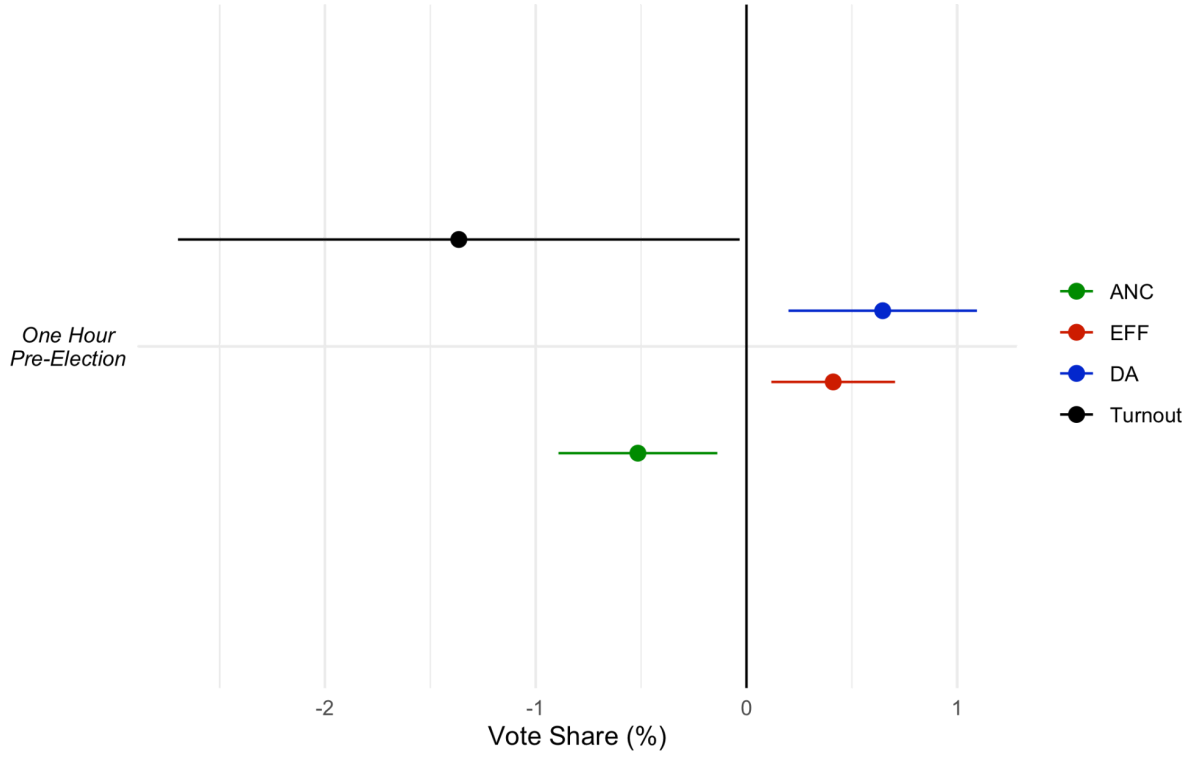

Figure C.16.1: *Coefficients for the Municipal Election Model by Total Load Shedding Hours*

Figure C.16.1 displays the coefficients for party vote differentials for the subset of total recorded load shedding hours in the ten days prior to the 2021 Municipal Elections.

Appendix C.17: *ANC Peak & Total Hours Tables with Controls*

(1) Peak Hours and Controls

	Dependent variable:			
	'Vote Share'			'Voter Turnout'
	ANC	EFF	DA	
	(1)	(2)	(3)	(4)
Peak Hours	−0.225*	0.153*	0.087	−0.605
	(0.136)	(0.079)	(0.167)	(0.444)
Women	−0.143	−0.221	−0.100	1.101**
	(0.322)	(0.208)	(0.086)	(0.520)
Education	−0.409**	0.227*	−0.096	−0.191
	(0.191)	(0.137)	(0.226)	(0.479)
Age	0.011	−0.108*	0.142	0.151
	(0.071)	(0.058)	(0.107)	(0.204)
Income	−0.890*	0.344	−0.862**	0.568
	(0.472)	(0.347)	(0.399)	(0.935)
Employed	10.591***	−8.264***	1.275	32.727***
	(3.357)	(2.635)	(3.545)	(7.927)
RaceWhite	4.450**	0.428	13.505***	6.484
	(1.771)	(0.970)	(2.965)	(5.224)
LanguageAfrikaans	0.957	−0.374	−11.266***	30.638***
	(1.863)	(0.917)	(4.304)	(6.112)
IncumbentDA	1.813**	−2.932***	−4.943***	12.955***
	(0.903)	(0.694)	(1.449)	(3.603)
IncumbentIFP	4.412	−1.281	1.589	−9.452
	(9.888)	(2.013)	(1.498)	(10.527)
Water	−4.437	2.284*	−0.887	−8.586**
	(3.540)	(1.269)	(1.298)	(4.272)
Sewage	1.068	−1.970	−1.530	22.044***
	(2.608)	(1.411)	(1.064)	(5.488)
Lighting	−2.931	−2.581	−0.251	−15.532*
	(7.388)	(3.703)	(1.401)	(8.031)
Observations	1,669	1,668	1,667	46,063
Adjusted R^2	0.146	0.312	0.362	0.051
F Statistic	21.376*** (df = 14; 1654)	55.043*** (df = 14; 1653)	68.536*** (df = 14; 1652)	177.411*** (df = 14; 46048)
Note:				*p<0.1; **p<0.05; ***p<0.01

Table C.17.1: *Peak Hour OLS Analyses with Controls*

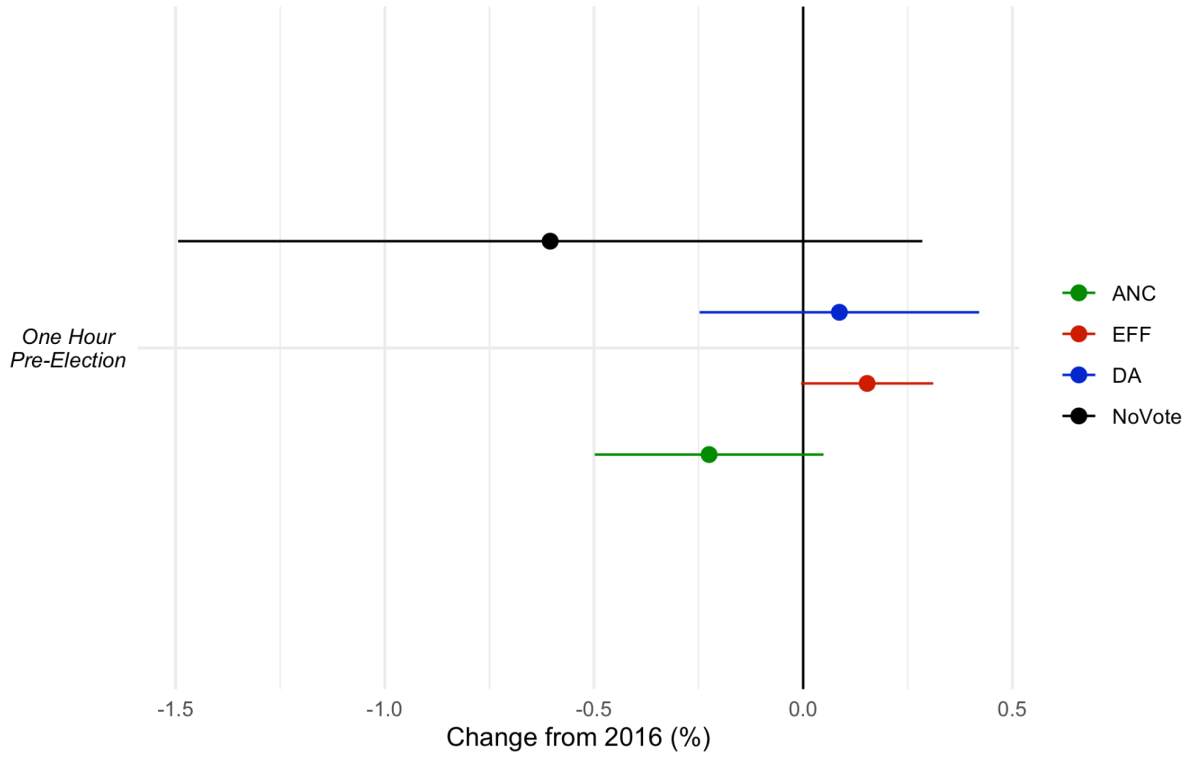

Figure C.17.1: *Coefficients for the Municipal Election Model by Peak Hours of Load Shedding with Controls*

(2) Total Hours and Controls

	Dependent variable:			
	'Vote Share'			'Voter Turnout'
	ANC	EFF	DA	
	(1)	(2)	(3)	(4)
Total Hours	−0.188*	0.144**	0.202*	−0.459
	(0.104)	(0.067)	(0.121)	(0.369)
Women	−0.172	−0.198	−0.059	1.033*
	(0.329)	(0.204)	(0.093)	(0.530)
Education	−0.389**	0.209	−0.142	−0.161
	(0.193)	(0.135)	(0.228)	(0.490)
Age	0.008	−0.107*	0.137	0.138
	(0.070)	(0.058)	(0.104)	(0.205)
Income	−0.869*	0.322	−0.928**	0.639
	(0.472)	(0.355)	(0.402)	(0.938)
Employed	10.127***	−7.873***	2.155	32.099***
	(3.235)	(2.642)	(3.721)	(7.763)
RaceWhite	4.267**	0.576	13.738***	5.938
	(1.730)	(0.929)	(2.941)	(5.233)
LanguageAfrikaans	1.523	−0.756	−11.443***	32.259***
	(2.015)	(0.874)	(4.194)	(6.274)
IncumbentDA	1.726*	−2.862***	−4.788***	12.831***
	(0.882)	(0.693)	(1.422)	(3.595)
IncumbentIFP	4.670	−1.487	1.231	−8.927
	(9.925)	(2.082)	(1.467)	(10.471)
Water	−4.605	2.411*	−0.741	−9.017**
	(3.546)	(1.269)	(1.292)	(4.242)
Sewage	1.056	−1.938	−1.327	22.097***
	(2.630)	(1.414)	(1.005)	(5.507)
Lighting	−2.782	−2.696	−0.392	−15.466**
	(7.374)	(3.685)	(1.388)	(7.878)
Observations	1,669	1,668	1,667	46,063
Adjusted R^2	0.147	0.315	0.367	0.051
F Statistic	21.545*** (df = 14; 1654)	55.878*** (df = 14; 1653)	70.039*** (df = 14; 1652)	177.576*** (df = 14; 46048)
Note:				*p<0.1; **p<0.05; ***p<0.01

Table C.17.2: *Total Hour OLS Analyses with Controls*

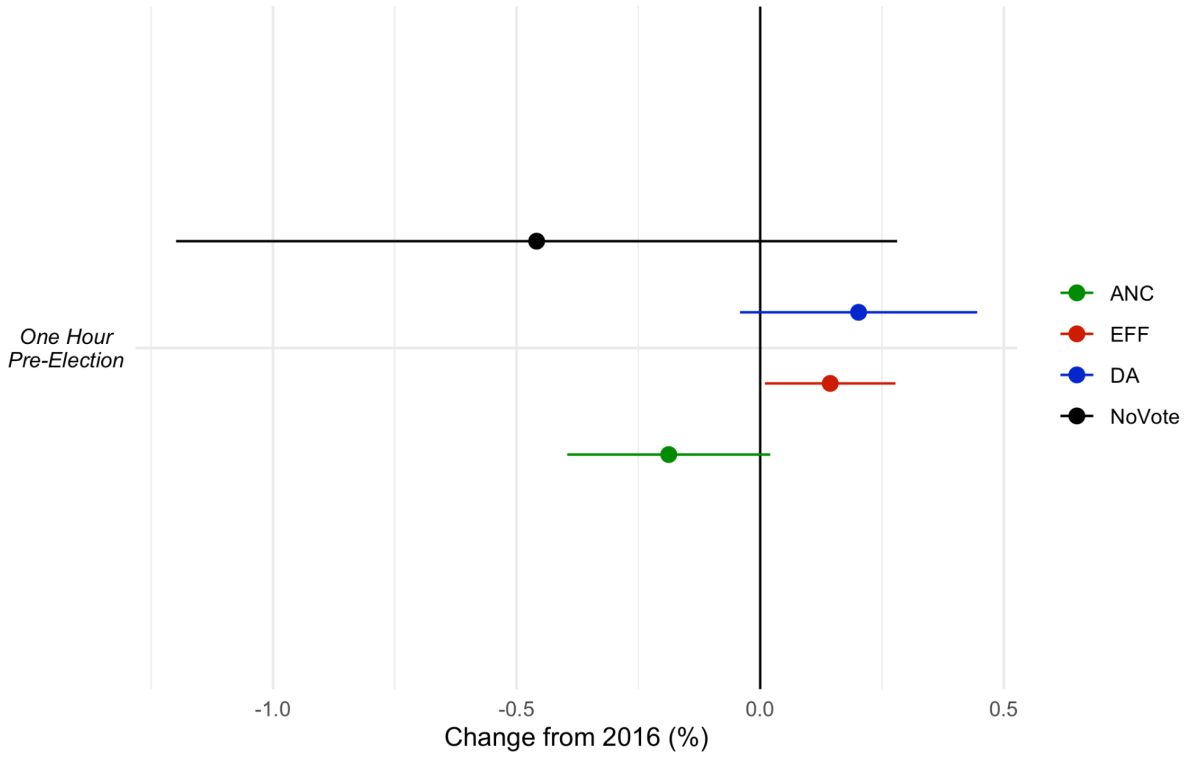

Figure C.17.2: *Coefficients for the Municipal Election Model by Total Hours of Load Shedding with Controls*

Appendix C.18: *ANC Incumbency & Opposition - Municipal Plots*

	Dependent variable:			
	'Vote Share'			'Voter Turnout'
	ANC	EFF	DA	
	(1)	(2)	(3)	(4)
Peak Hours	−0.746***	0.586***	0.263	−1.342
	(0.267)	(0.190)	(0.210)	(0.860)
Observations	766	766	764	19,443
Adjusted R^2	0.022	0.054	0.015	0.006
F Statistic	18.265*** (df = 1; 764)	44.610*** (df = 1; 764)	12.766*** (df = 1; 762)	125.956*** (df = 1; 19441)
Note:				*p<0.1; **p<0.05; ***p<0.01

Table C.18.1: *Coefficients in Wards with ANC Incumbents*

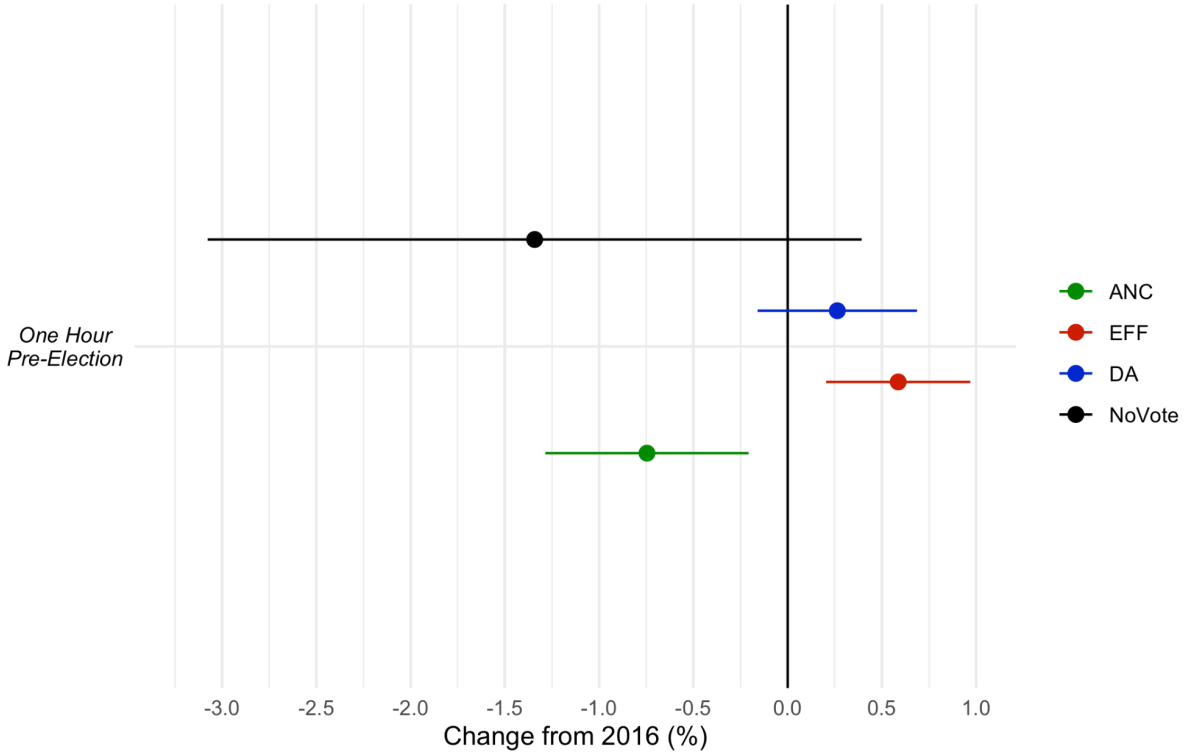

Figure C.18.1: *Coefficients for each outcome among wards with ANC incumbents*

ANC Opposition:

	Dependent variable:			
	'Vote Share'			'Voter Turnout'
	ANC	EFF	DA	
	(1)	(2)	(3)	(4)
Peak Hours	−0.159	0.030	0.634***	−0.857
	(0.125)	(0.049)	(0.242)	(0.673)
Observations	910	909	910	26,810
Adjusted R^2	0.005	−0.0001	0.028	0.002
F Statistic	5.600** (df = 1; 908)	0.886 (df = 1; 907)	27.368*** (df = 1; 908)	48.590*** (df = 1; 26808)
Note:				*p<0.1; **p<0.05; ***p<0.01

Table C.18.2: *Coefficients in Wards with ANC Opposition*

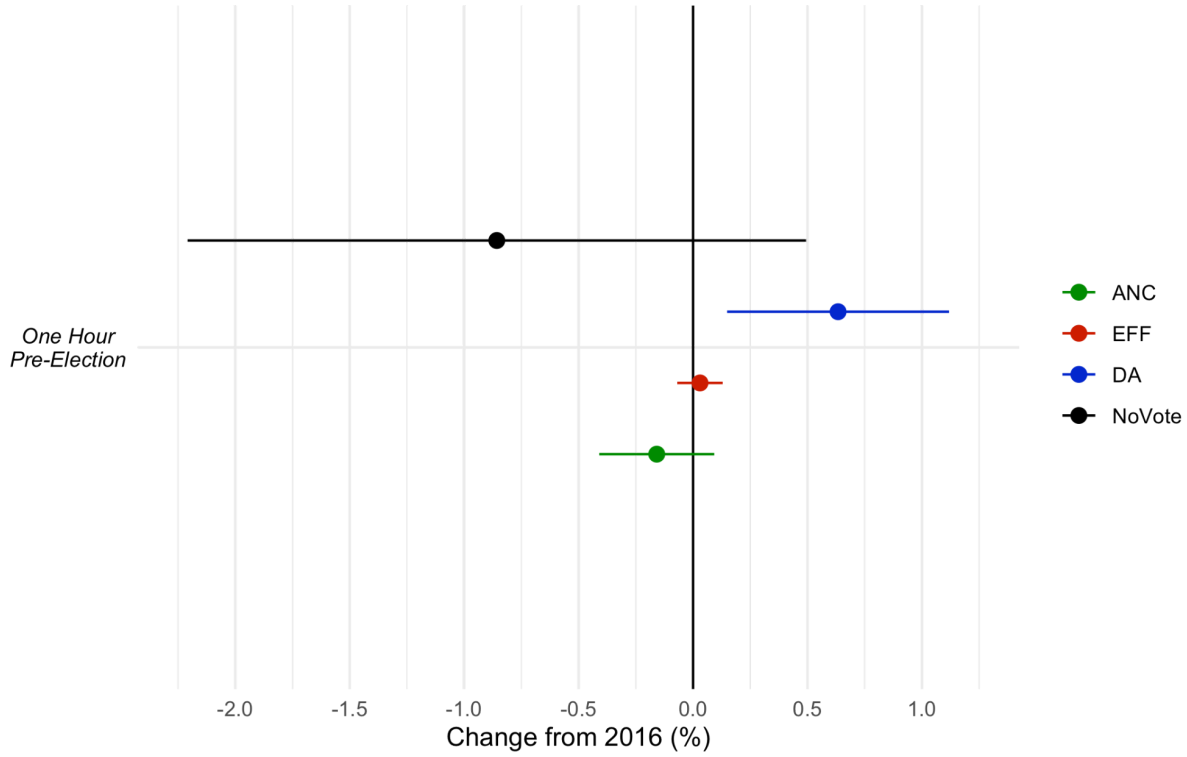

Figure C.18.2: *Coefficients for each outcome among wards with an ANC opposition*

Appendix C.19: *Predicted Satisfaction with Government Energy Provision*

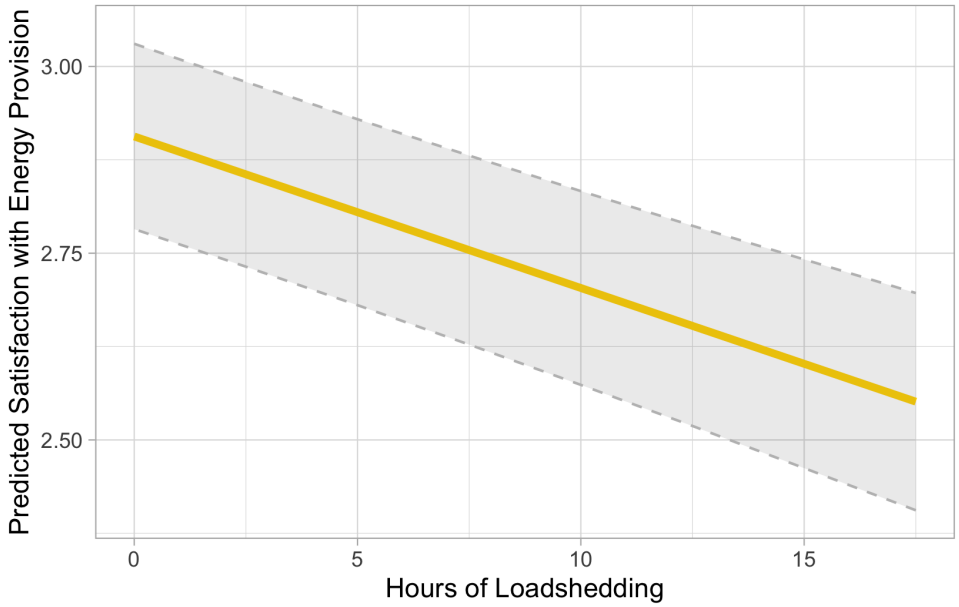

Figure C.19.1: *Load Shedding & Energy Satisfaction*

Figure C.19.1 illustrates the predicted effect of load shedding outages on satisfaction with ward councillors split by the partisanship of the ward incumbent. The scale for the question ranges from 0 (very dissatisfied) to 4 (very satisfied).

Appendix C.20: *GCRO Survey Results at Alternative Time Periods*

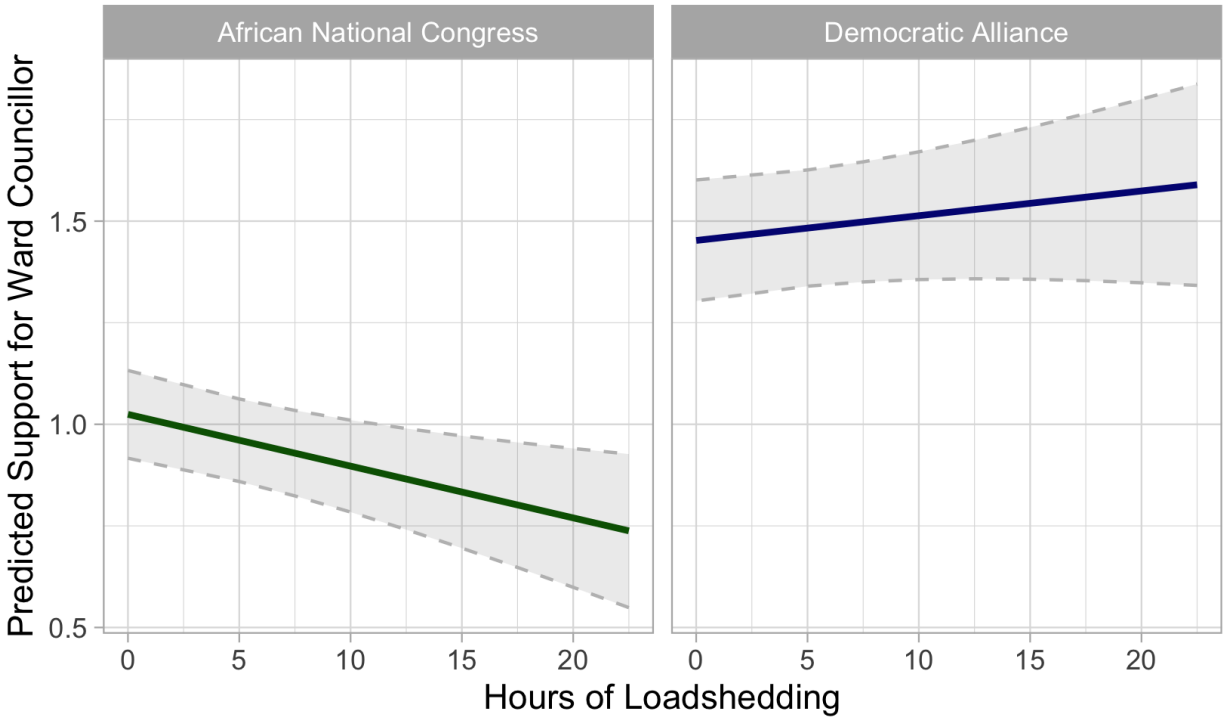

Figure C.20.1: *Predicted Support for Ward Councillor with a Two-week Cut-off*

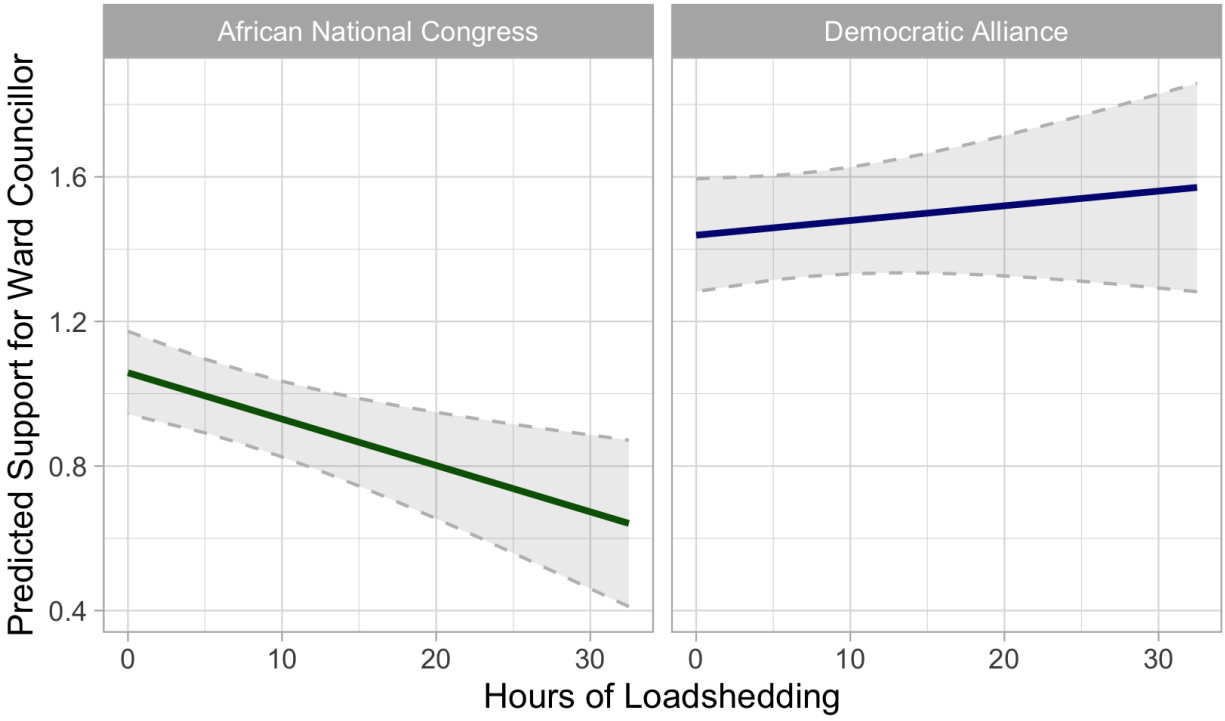

Figure C.20.2: *Predicted Support for Ward Councillor with a Three-week Cut-off*

Appendix C.21: *Regression Subset by Black South African Representation*

	Dependent variable:			
	'Vote Share'			'Voter Turnout'
	ANC	EFF	DA	
	(1)	(2)	(3)	(4)
Peak Hours	−0.502***	0.404**	0.105	−1.365**
	(0.192)	(0.162)	(0.100)	(0.665)
Constant	−0.787	−2.076	−5.445**	9.327
	(4.205)	(4.043)	(2.358)	(13.855)
Observations	818	817	816	46,253
Adjusted R^2	0.021	0.051	0.005	0.009
F Statistic	18.809*** (df = 1; 816)	44.447*** (df = 1; 815)	4.723** (df = 1; 814)	437.902*** (df = 1; 46251)
Note:				*p<0.1; **p<0.05; ***p<0.01

Table C.21.1: *Stations with greater than the mean (47%) Black South African residents - Peak Hours*

	Dependent variable:			
	'Vote Share'			'Voter Turnout'
	ANC	EFF	DA	
	(1)	(2)	(3)	(4)
Total Hours	−0.502***	0.404**	0.105	−1.365**
	(0.192)	(0.162)	(0.100)	(0.665)
Constant	−0.787	−2.076	−5.445**	9.327
	(4.205)	(4.043)	(2.358)	(13.855)
Observations	818	817	816	46,253
Adjusted R^2	0.021	0.051	0.005	0.009
F Statistic	18.809*** (df = 1; 816)	44.447*** (df = 1; 815)	4.723** (df = 1; 814)	437.902*** (df = 1; 46251)
Note:				*p<0.1; **p<0.05; ***p<0.01

Table C.21.2: *Stations with greater than the mean (47%) Black South African residents - Total Hours*

	Dependent variable:			
	'Vote Share'			'Voter Turnout'
	ANC	EFF	DA	
	(1)	(2)	(3)	(4)
Peak Hours	−0.782**	0.506*	0.076	−1.174
	(0.389)	(0.306)	(0.127)	(1.114)
Constant	−2.388	1.686	−2.555	−23.837
	(5.489)	(5.152)	(1.862)	(18.195)
Observations	459	459	457	11,689
Adjusted R^2	0.016	0.029	0.002	0.004
F Statistic	8.304*** (df = 1; 457)	14.465*** (df = 1; 457)	1.955 (df = 1; 455)	45.222*** (df = 1; 11687)
Note:				*p<0.1; **p<0.05; ***p<0.01

Table C.21.3: *Stations with upper-quartile (99%) Black South African residents - Peak Hours*

	Dependent variable:			
	'Vote Share'			'Voter Turnout'
	ANC	EFF	DA	
	(1)	(2)	(3)	(4)
Total Hours	−0.594**	0.366	0.047	−0.679
	(0.288)	(0.247)	(0.070)	(0.742)
Constant	0.586	0.211	−2.572	−24.603
	(6.793)	(6.523)	(1.714)	(19.726)
Observations	459	459	457	11,689
Adjusted R^2	0.022	0.035	0.002	0.003
F Statistic	11.097*** (df = 1; 457)	17.546*** (df = 1; 457)	1.694 (df = 1; 455)	35.068*** (df = 1; 11687)
Note:				*p<0.1; **p<0.05; ***p<0.01

Table C.21.4: *Stations with upper-quartile (99%) Black South African residents - Total Hours*