After the Flood: Natural Disasters and Political Preferences in Chile*

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Abstract

Why do citizens change their political behavior after natural disasters? Can catastrophes make candidates with certain characteristics more attractive to voters? Climate change has increased concerns about the frequency and intensity of disasters. The extant literature tends to focus on how voters punish or reward the incumbent based on a model of (mis)attribution of responsibilities. This approach overlooks the forward-looking dimension of electoral decisions. I argue that disaster victims, in addition to evaluating incumbents, are also prospectively selecting political authorities based on how they can enhance their welfare and improve their living conditions. I use a natural experiment created by the flash floods that occurred in Chile in 2015 to take advantage of random variation in citizens' exposure to a natural disaster. I then measure voters' political preferences using a conjoint survey experiment. The findings show that material damage caused by the flood increased the probability of preferring left-wing candidates, who can be associated with welfare policies that could ameliorate the disaster's consequences, by 12 percentage points. Qualitative evidence from interviews helps illuminate the causal mechanisms underlying these results.

Keywords: Electoral behavior, Political preferences, Natural disasters, Natural experiments, Conjoint experiments.

1 Introduction

The question of how negative circumstances change citizens' political preferences is a central inquiry in any democratic country, especially in places that are frequently exposed to situations that can damage people's living conditions. Natural disasters are one of the most devastating of these negative events; they generate significant costs for the countries and citizens affected. This is evident in regions like Latin America, where between 1970 and 1999 the annual cost of natural catastrophes ranged between $700 million and $3.3 billion (Charvériat, 2000). Additionally, according to NASA, climate change will boost the likelihood of natural disasters in the future,[1] which could lead to an increasing risk of inland flooding and tropical cyclones (Van Aalst, 2006).

Disaster victims face a series of negative effects on their living conditions, such as income reduction, deterioration of public services, and post-traumatic stress disorder. Furthermore, natural catastrophes also have an impact on electoral outcomes (Healy and Malhotra, 2010; Ashworth, Bueno de Mesquita and Friedenberg, 2014; Achen and Bartels, 2016).

Why do citizens change their political behavior after natural disasters? Can catastrophes make candidates with certain characteristics more attractive to voters? We have learned from accountability models that retrospective and prospective voting are both present at the same time (Fearon, 1999; Besley, 2006; Ashworth, 2012). Therefore, when voters make electoral decisions, they judge incumbents based on the information they have about past events (Ferejohn, 1986), and also evaluate candidates based on their expectations about the future (MacKuen, Erikson and Stimson, 1992).

Nonetheless, the literature about the political consequences of natural disasters has mainly focused on the retrospective dimension of voting. Most of the findings showing a positive or negative effect on the incumbents' vote share have been attributed to voters' (mis)evaluations of previous events. Therefore, they overlook the forward-looking dimension of electoral decisions. For example, when the incumbent handled a negative event poorly, we can expect that voters will

[1] "The Impact of Climate Change on Natural Disasters", Earth Observatory, NASA, Retrieved May 30, 2017.

punish her or him and select another candidate from among the pool of challengers; but we do not know which of those alternatives will be more likely to be elected.

Additionally, there are methodological challenges when studying the political consequences of natural catastrophes. If we do not pay careful attention to the study design, disaster damage can be correlated with citizens' unobserved characteristics. Even though these events have an unpredictable nature, they are not randomized experiments.

In March 2015, unseasonal heavy rains in northern Chile triggered flash floods, which caused severe damage in different cities and towns. Copiapó, the capital city of the Atacama region, was severely affected by this natural disaster. I focus on a district called Paipote, the most affected area of the city of Copiapó. Some parts of Paipote, however, were not exposed to the flood. This provides an opportunity to compare voters indirectly affected by the flood (who experienced isolation and a scarcity of supplies for several days but no material damage) with those who were directly affected by the disaster (who experienced material damage in addition to the isolation and scarcity). Unexposed people did not sort or select their houses based on their expectations of being affected by a disaster: the magnitude and trajectory of the flood were unpredictable. Additionally, Paipote is a homogeneous low-middle income town, which increases the comparability between different voters.

I conducted an original survey with an embedded conjoint experiment in the more- and the less-affected areas of the town three months after the disaster. The main goal of the conjoint analysis was to determine how people value different attributes of candidates when making electoral decisions. The conjoint experiment randomized candidates' characteristics, which allows us to identify the effects of each of these attributes when voting for a mayor (Hainmueller, Hopkins and Yamamoto, 2014).

In this paper, I focus on how people select political authorities, and which candidate characteristics are more or less attractive to voters during hard times. This question requires a strategy for isolating forward-looking decisions from voters' evaluations of incumbents. The conjoint analysis (partially) removes the retrospective evaluation of the incumbent from voters' decision-making

process through asking them to state a mayoral preference by comparing a pair of hypothetical candidates with different attributes. Therefore, electoral choices should be mainly explained by prospective political preferences.[2] I also show that respondents' hypothetical choices strongly correlate with their actual preferences. In particular, I compare the results from the survey experiment with the 2016 local elections.[3] Additionally, I provide survey evidence from the 2010 earthquake in Chile, which affected a completely different part of the country, to increase the external validity of the main findings.

I argue that disaster victims focus on candidates who can improve their living conditions after a natural catastrophe. This represents a rational calculation about which candidate can maximize the amount of welfare provided. I expect that two kinds of candidates should be rewarded after natural disasters based on victims' attempts to improve their welfare: those who are associated with the provision of relief and/or social policies, and those who provide strong signals that they are competent to handle the consequences of the shock.

The incumbents' response to the shock can provide information about their willingness to deliver welfare and their competence at disaster management. However, citizens can also get information from other candidates characteristics, such as their ideological labels or personal background; these attributes can become even more relevant when voters are selecting a challenger after deciding to punish the incumbent.

The combination of the conjoint and natural experiment shows that victims reward the first type of candidate described. In particular, material damage due to the flood increases the likelihood of preferring left-wing candidates over those from the right and center by 12 percentage points. Citizens affected by natural disasters seek to improve their living conditions, which leads them to focus on welfare and social policies after the disaster, for example, new housing. As a consequence, they are more prone to vote for left-wing candidates, who would be associated with such measures.

[2] The conjoint experiment only partially rules out the role of retrospective accountability because the evaluation of the incumbent can also affect how voters perceive some of the hypothetical candidates' attributes. I discuss this issue in section 7.

[3] Hainmueller, Hangartner and Yamamoto (2015) provide a similar exercise to validate conjoint experiment results.

There is evidence from other contexts that voters shift their preferences leftwards after negative events such as unemployment, especially by supporting social policies (Margalit, 2013).

This paper provides three main contributions to the existing literature. First, the main finding complements what we already know about the consequences of disasters. Previous literature has shown that good incumbents are not always punished after disasters (Healy and Malhotra, 2010; Gasper and Reeves, 2011), and now it is possible to add that left-wing candidates have a natural advantage after these events. Second, this study investigates how voters select candidates based on their new needs after a natural catastrophe. The main argument stresses the role of welfare, and how victims select candidates who can improve it. This logic can be applied to other types of negative events. Third, affected citizens tend to reward political authorities with certain characteristics. The selection of a good type of political leader is a critical component of voters' electoral choices (Fearon, 1999). This article provides evidence about what kind of candidates – besides good incumbents – victims are looking for after a shock.

The empirical strategy is based on a design-based approach to causal inference (i.e., the combination of natural and conjoint experiments), qualitative interviews to illuminate the causal mechanisms at work, the implementation of a behavioral benchmark to compare results, and the use of survey data from another disaster to improve external validity. The study was registered at Evidence in Governance and Politics prior to any research activities (see Appendix A for details and amendments of the pre-analysis plan).

2 Theoretical Framework

2.1 Retrospective Evaluations

Research about how natural disasters affect voters' political preferences has increased in recent years.[4] Most of the literature focuses on retrospective voting and incumbents' evaluation (Healy and Malhotra, 2009, 2010; Gasper and Reeves, 2011; Bechtel and Hainmueller, 2011; Remmer,

[4] See Oliver and Reeves (2015) for an overview of the research on the politics of disaster relief.

2014; Lazarev et al., 2014; Achen and Bartels, 2016), or on factors that can blur the attribution of responsibility after disasters (Arceneaux and Stein, 2006; Malhotra and Kuo, 2008; Maestas et al., 2008; Gomez and Wilson, 2008). There is also a group of articles that study how natural disasters affect turnout (Gomez, Hansford and Krause, 2007; Sinclair, Hall and Alvarez, 2011; Chen, 2013; Lasala-Blanco, Shapiro and Rivera-Burgos, 2017), and political attitudes (Abney and Hill, 1966; Fair et al., 2013; Carlin, Love and Zechmeister, 2014; Kosec and Mo, 2015; Maldonado, Kronmüller and Gutierrez, 2016).

The literature about retrospective voting after natural disasters can be organized into two main arguments. The first holds that voters are myopic. Achen and Bartels (2016) argue that citizens will punish the government during hard times regardless of their ideological platforms or performance. The authors study the electoral consequences of floods, droughts, and shark attacks in the United States, and find that the electorate holds incumbents responsible even for calamities beyond their control. They hold "that voters simply punish incumbent leaders any time their own well-being falls below 'normal' levels, regardless of whether the incumbents have performed well or badly" (Achen and Bartels, 2016, p.138). The second argument posits that voters reward or punish incumbents depending on their performance handling the consequences of the disaster. Healy and Malhotra (2010) estimate the effects of exogenous economic losses on electoral outcomes. They find that after tornadoes, voters will punish the incumbent only when no disaster declaration takes place. Therefore, voting behavior in adverse conditions seems to reflect democratic competence rather than being a process of irrational blaming. As Healy and Malhotra (2010, p.195) hold, "observing that incumbents are adversely affected by natural disasters does not necessarily mean that voters are irrational. Even though government cannot be blamed for the adverse natural events themselves, they can be held responsible for mitigation, response, and recovery."

In contrast to this previous literature, I focus in this paper on the forward-looking dimension of electoral decisions by studying the candidate characteristics that become more attractive to voters in adverse conditions. Can retrospective evaluations help citizens select candidates? Absolutely, but these assessments are not enough to fully understand voter behavior. For instance, when the

incumbent has a poor performance handling the disaster, we might expect that voters will punish him or her and select another candidate from among the pool of challengers; but we do not know which candidate will be more likely to be elected. In other words, retrospective voting does not allow us to infer which challenger will be selected by the victims. Instrumental motivations can help us understand which kind of political authorities will be rewarded in adverse conditions. Retrospective voting is only one part of the story. Disaster victims will also select candidates based on their new priorities after the shock.

This logic can be applied to other negative events. For example, crime can undermine incumbents' vote share (Marshall, 2015). However, exposure to crime might also affect citizens' policy preferences (Visconti, 2017). Once again, retrospective and prospective voting can both be operating at the same time. Crime victims might punish the incumbent as well as prefer the challenger who is better suited to implement the policies they most care about (in this case, right-wing candidates can become more attractive because they are more likely to implement iron-fist measures to combat crime).

Voting during adverse conditions can be considered a four step process. First, voters develop new priorities after being exposed to a negative event. Second, they (mis)attribute responsibilities to political actors. Third, they observe the pool of candidates, looking for ones who can help them improve their living conditions. Fourth, they select candidates by combining the retrospective evaluation of step two and the forward-looking dimension of step three. This article, in contrast to extant research, focuses on the first and third step of this multistage process.

2.2 Prospective Evaluations

As mentioned above, electoral decisions are based on both retrospective and prospective considerations. Voters can punish or reward an incumbent, but also select a candidate based on their newly urgent needs. The forward-looking aspect of the vote can have multiple dimensions. What kind of authorities are citizens looking for after a natural disaster? I argue that affected citizens' prospective decisions are driven by instrumental motivations that are generated by the material

damage caused by the flood. In other words, citizens make rational decisions about which leader will provide them more welfare.

Victims' instrumental decisions are motivated by new concerns and preoccupations after a natural catastrophe. This reordering of personal priorities and goals implies a reassessment of the factors explaining voters' policy preferences. I hold that affected voters should be more likely to prefer candidates who can improve their living conditions and well-being after the catastrophe. Voters will make political decisions based on the expected benefits they can obtain. When facing adverse conditions, citizens will select candidates they perceive as more qualified to provide them what they need. That association can be done "without requiring the (probably heroic) assumption that voters actively seek out and process policy-relevant information" (Kim and Margalit, 2017, p.6), because citizens can rely on informational cues and heuristics to make simple connections between policy outcomes and candidate characteristics (Hamill, Lodge and Blake, 1985; Lau and Redlawsk, 2001).

Can voters make rational calculations in adverse conditions? There is evidence that citizens in times of anxiety try to collect information in order to decrease their own distress, and they can then exploit this new information to make decisions (Marcus, Neuman and MacKuen, 2000). These findings have also been used to understand how voters react to terrorist attacks (Merolla and Zechmeister, 2009). As a consequence, voters should be able to make rational decisions after a natural disaster. According to this argument, I expect that two different kinds of candidates would be rewarded after natural disasters based on victims' attempts to improve their welfare.[5]

The first profile is the "**Welfare Candidate**." This politician can focus on two dimensions of welfare that are important for disaster victims: she or he can provide financial relief and/or social policies. Regarding the first dimension, expectations about the distribution of benefits is a crucial element of any forward-looking decision after a natural disaster. Financial relief can help victims buy food and recover some of their essential belongings. Consequently, affected voters will prefer candidates who send strong signals about the distribution of aid. Regarding the second dimension,

[5] Besides a good incumbent, as mentioned before.

victims will be looking for welfare policies such as new housing. Left-wing parties have had an important role promoting welfare and social policies in Europe (Huber and Stephens, 2001) and Latin America (Pribble, 2013). Therefore, we can expect that voters will shift their policy preferences leftwards after a negative event that requires the implementation of social policies (Margalit, 2013). The role of the state in providing welfare becomes more salient in this context, and therefore left-wing candidates should have a natural advantage. It is important to stress that disaster aid (first dimension) is not the same as welfare policies (second dimension). Financial relief is commonly delivered after natural disasters by NGOs, private actors, and the government (regardless of its ideology). One example is the distribution of food baskets. Meanwhile, welfare policies are mainly distributed by the state, and they can be associated with particular parties or ideologies (usually, left-wing parties or candidates). One example is the provision of social housing.

How do victims connect expectations about the distribution of disaster relief and welfare policies with particular candidates? Expectations about future distribution of financial aid can be explained by credible promises made by candidates during the campaign or by previous interactions with the candidates. Meanwhile, ideological labels can be useful in linking candidates to welfare policies. However, this informational cue, which is important in countries like Chile, might be irrelevant in other contexts (Zeichmeister, 2015). In those cases, party labels can work as heuristics (Popkin, 1991).[6] In summary, I hypothesize that candidates who generate expectations about the distribution of financial relief (first dimension of welfare) and left-wing candidates[7] (second dimension of welfare) will be favored after natural disasters.

The second profile is the "**Managerial Candidate**." There are leaders who provide strong signals of competence while handling the negative consequences of a disaster. This strength of this type of candidate is based on the idea that a negative event might modify the salience of particular valence issues for affected citizens. A valence issue is one on which all voters hold the

[6] In places where ideological and party labels are meaningless, voters can exploit some candidates' characteristics to connect them with welfare policies or disaster relief, such as their socioeconomic background.

[7] When ideology is a meaningful heuristic.

same position (Stokes, 1963); for instance, everyone wants more security, growth, and jobs. In this case, everyone wants a leader who is competent enough to handle the consequences of the crisis. The ownership theory of voting assumes that voters make decisions on the basis of valence issues (Petrocik, 1996), and that these can become more or less salient over time (Bélanger and Meguid, 2008).

The electorate might use candidate characteristics as a proxy for competence on particular issues and select the candidate who better fits with the newly salient problem. Some candidate characteristics can provide information about the capacities of the leader to mitigate the effects of a natural disaster. For example, age and education can be proxies for managerial competence. Thus, I hypothesize that candidates with more education and experience will be rewarded in adverse conditions. For example, voters should be more prone to vote for an old engineer than for a young gardener because the former can be associated with the skills necessary for handling a crisis.

The main findings provide evidence that victims support "welfare" candidates, but there is no evidence that "managerial" candidates are rewarded in these adverse contexts. This is novel evidence about how voters modify their preferences after natural catastrophes, and what kind of authorities they are looking for to handle the consequences associated with disasters.

2.3 Emphatic Feelings

Can unexposed citizens empathize with the conditions of the victims? It is possible to expect that unexposed citizens might also modify their political behavior as a response to the catastrophe. This spillover effect could be explained by the existence of empathic or altruistic feelings among the unexposed citizens, mainly motivated by witnessing their neighbors' suffering. For example, there is evidence of a correlation between altruism and support for international redistribution in Europe after the 2008 economic recession (Bechtel, Hainmueller and Margalit, 2014).

I find evidence that unexposed citizens display some empathic feelings. They are highly likely to vote for candidates who generate expectations about disaster relief; in fact, they are no different than disaster victims in regards to that particular preference. Qualitative evidence from interviews

confirms that unexposed citizens have empathic feelings. They support the distribution of financial aid (first dimension of a welfare candidate), but unlike disaster victims are not more likely to vote for left-wing politicians (second dimension of welfare candidates).

3 Research Design

3.1 The 2015 Atacama Floods

The Atacama Desert in northern Chile is one of the driest regions in the world. On March 25, 2015, thunderstorms brought the equivalent of 7 years of rain to the desert in only a few hours, which caused massive flooding in several cities in northern Chile. The terrain in this region is "hard and rocky because rainfall is not frequent or abundant enough for either weathering rocks into sand or supporting the kind of ecosystem that would help turn rocks and minerals into soil. Without soil and plant cover to help absorb rainfall, it just runs off instantly as torrents of water."[8] The floods and mudslides left two dozen people dead and more than a hundred missing, and the government estimated the damage as totaling at least $1.5 billion.[9] More than 30,000 people were affected by the floods, and 3,000 had to live in emergency shelters.[10] As the deputy interior minister declared, this was "the worst rain disaster to fall on the north in 80 years."[11] One of the most devastated areas was Copiapó, the capital city of the Atacama region. Within Copiapó, the most affected area was Paipote, where the mudslides from the mountains entered the city. Even though Paipote was the most damaged locality in Copiapó, some houses were not exposed to the flooding at all.

The floods came from the Andes, following a ravine that was connected downstream with the Copiapó River. However, a small bridge in Paipote stopped the water that was coming from the mountains. A mudslide brought debris, garbage, and sediment that blocked the circulation of water under the bridge. As a consequence, the ravine overflowed, generating damage in many (but not

[8] The Associated Press, "Thunderstorms Soak Chile Desert in Years of Rain and Kill at Least 9", The Weather Channel, March 27th, 2015.

[9] Taylor, Alan, "Devastating Floods Hit Northern Chile", The Atlantic, April 8th, 2015.

[10] Ford, Dana, "Chile floods: 25 dead, more than 100 missing", CNN, April 25th, 2015.

[11] Staff and agencies in Santiago,"Floods swamp Chile's Atacama region", The Guardian, March 26th, 2015.

all) areas of the city (see pictures of the bridge and the ravine in Appendix B).

The difference between the more and the less affected areas was that in the former the water flooded houses and generated massive material damage. People living in the most affected sectors lost their homes (and had to live in emergency housing) and their belongings. People living in the less affected areas were isolated for a number of days and suffered from a scarcity of food and supplies. In those areas, there was only a small amount of water in the streets, and it did not enter the houses.

Chile provides a meaningful opportunity to learn about the consequences of natural disasters, because these are common negative shocks (Hewitt, 2014). In addition, the country has stable patterns of programmatic political competition (Roberts, 2013).[12] Voters therefore should be able to connect candidate characteristics with simple policy outcomes.

3.2 Natural Experiment

A natural experiment is a real-world phenomenon that generates haphazard or as-if random assignment to treatment groups (Rosenbaum, 2010; Dunning, 2012). In other words, a particular and rare circumstance generates a situation where some people are exposed to the treatment but others are not, and none of these individuals can predict their future treatment status. The units cannot self-select themselves into the treatment or control groups; and pretreatment covariates should be, in expectation, similar across both groups (Keele and Titiunik, 2016).[13]

In the case of Paipote, the treatment corresponds to the existence of material damage to people's houses. I define as "more affected areas" the sectors where water entered the houses and people therefore suffered material damage due to the flood. I define as "less affected areas" the sectors where the flood did not enter houses and the citizens were only indirectly affected.[14]

[12] The center-left parties are liberal and more pro-state, while the center-right parties are more socially conservative and pro-market. However, the differences on the state-market divide have shrunk over time (Luna, 2014).

[13] The natural intervention should produce independence between treatment assignment and potential outcomes (Keele, 2015).

[14] I determined if an area was more or less affected using qualitative evidence from fieldwork. This decision is confirmed by official government images (figure 1), a map marked by the local fire department after the flood (figure 2), and satellite images (Appendix C).

The overflow of Paipote's ravine has two main elements that make it possible to define this situation as a natural experiment. First, the magnitude and trajectory of the flood were unpredictable; interviews show that people were not aware of the potential consequences of the rainfall the day before the disaster. Second, people were not aware of the possible negative externalities of the Paipote Bridge, because this was the largest flood in the region in 80 years and a situation like it had never happened before. Therefore, because the disaster and its consequences (due to the bridge) were not anticipated, one would not expect people to have selected their houses based on their expectations of a future natural disaster. This a critical issue because sorting is one of the main threats to any natural experiment.

The interviews help reconstruct the night of the floods, demonstrating that people living in Paipote were not able to predict which areas would be exposed. The story of Carmen, a 21-year-old mother, is a good example of the two points mentioned above.[15] Carmen lived in an unexposed area where the flood did not enter her house. On the night of the flood she heard firefighters in the streets saying that people needed to evacuate because that area would be affected by mudslides. She decided to go with her baby to her grandparents' house located near the bridge. After a few hours her new refuge was completely flooded, and they barely escaped. Her own house, however, was not affected at all since it was located in an area where water did not enter homes. The decision to move from an unexposed to an exposed area reflects the lack of information about the possible trajectory of the flood (I discuss concerns about spillovers in the next subsection).

The first map shows the more and the less affected areas, the bridge, and the floods coming from the Andes. The second map, created by the local fire department, highlights the flooded areas in red. As expected, the haphazard treatment assignment produced balance in the placebo covariates in the survey, as I show in the results section.

[15] The names of the interviewees have been changed according to the IRB consent form, but the age, gender, and occupation (when reported) have not been modified.

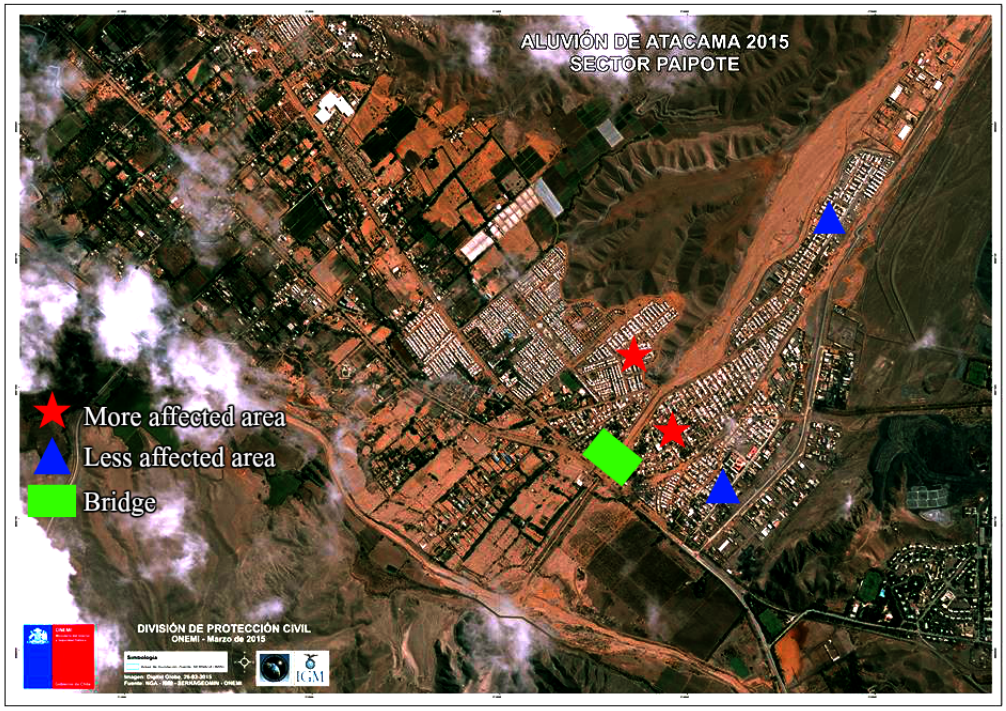

Figure 1: Map of Paipote

Figure 2: Map of the affected areas (in red) marked by the local fire department

3.3 Spillovers

In natural experiments, the identification of causal effects relies on two core (untestable) assumptions. The first is geographic treatment ignorability (Keele and Titiunik, 2016), which means that the distribution of potential outcomes should be the same for the control and exposed areas. The second is non-interference, or in other words, potential outcomes for any subject do not vary with the treatment assigned to other subjects.

However, as described in the theoretical background, unexposed citizens might present empathic feelings, which could be understood as a spillover effect. Non-victims observe how their neighbors were affected, and they might change their preferences based on that experience. Consequently, a finding of no difference between the groups could have two interpretations: there are no treatment effects or there are spillover effects. How can we differentiate between a null result and a spillover effect? It is impossible to fully distinguish one from the other, but there are some hints that can help us. For example, it is important to inspect the results within each subgroup and provide qualitative evidence to better understand how exposed and unexposed citizens are modifying their preferences.

On the contrary, if we do find a difference between the groups, that can also have two meanings: exposed citizens are changing their preferences more than unexposed people or the groups are altering preferences in opposite directions. Qualitative evidence helps us rule out the second alternative because non-victims have empathic feelings toward affected citizens (see section 6 for more details). As a consequence, the violation of non-interference assumption should tend to bias the effects towards zero; therefore, any effect can be seen as a conservative estimate (Keele, Titiunik and Zubizarreta, 2015). In other words, any significant result can be seen as strong evidence of a treatment effect because this is a hard case for finding any result at all.

3.4 Reducing Sensitivity to Hidden Biases

Comparing units from the same natural block, such as patients in the same hospital or students in the same school, is desirable in observational studies because unmeasured covariates may be more similar within the block (Pimentel, Kelz, Silber and Rosenbaum, 2015). Paipote is a homogeneous low-middle income town -for example, 90% of the survey respondents do not have any higher education- which makes the more and the less affected citizens comparable because they are drawn from the same "natural block." Any additional data that increases heterogeneity can also increase bias (Keele, 2015). Rosenbaum (2005) shows that reducing unit heterogeneity decreases sensitivity to unmeasured biases. In particular, when there is less unit heterogeneity, there needs to be larger unmeasured biases to explain away a given effect (Sekhon, 2009). This benefit cannot be achieved by merely increasing the sample size. Therefore, having a homogeneous sample will improve the comparability between groups of people, and also reduce the sensitivity to hidden biases. As Keele (2015, p.325) summarizes: "there are reasons for focusing on small samples where differences across treated and control units are reduced not by statistical means but by the design" (See Appendix D for an extra strategy to reduce sensitivity to hidden biases).

3.5 The Conjoint Experiment

Three months after the floods, I conducted a survey in Paipote with a conjoint experiment embedded in it. The sampling strategy was exactly the same across the more and less affected areas. On a given street, all households were invited to participate in the survey. The streets were selected following a random walk. By the end of the survey, almost all of the town was accounted for.[16] Nine months after the flood, I interviewed 30 citizens from the same area to illuminate the causal mechanisms behind the results (See Appendix E for more details about the survey implementation).[17]

[16] Only one neighborhood was not included in the design, since it was partially affected and it was a relatively new area, so it could bring unwanted heterogeneity.

[17] 17 exposed and 13 unexposed citizens.

I use a conjoint experiment that simultaneously tests the influence of multiple candidates' attributes on respondents' mayoral preferences. The survey experiment asked a sample of citizens living in Paipote to decide between two hypothetical candidates who would be running for mayor in the 2016 local elections. The respondents saw information about six attributes of these two candidates: ideological position, gender, previous political experience, profession, age, and proposals for affected citizens (e.g., expectations about financial relief). These characteristics randomly varied across pairings. The outcome was the answer to the following question: if you have to vote for one of these two candidates, whom do you prefer for mayor? Each of the respondents evaluated eight pairs of profiles. In the analysis I cluster the standard errors by respondent. I conducted 210 surveys, half in the more affected area of Paipote. This led to 3360 observations because each respondent rated eight pairs of candidates, and each pair provides two outcomes (a 1 for the preferred candidate and a 0 for the non-preferred candidate). Following Hainmueller and Hopkins (2015), I also randomly assign the order of the attributes to rule out primacy effects for each respondent. Based on the theoretical expectations, affected citizens should reward left-wing candidates and candidates who generate expectations about distribution of relief (welfare candidates). They should also be more likely to vote for older and more educated candidates (managerial candidates). The following tables summarize the attributes used to generate profiles, and provide an example of a possible pair of profiles to be evaluated by a respondent. Attributes in both bold and italic represent the candidate characteristics that should be rewarded in comparison to the benchmark category (the first value for each attribute). The rest of the attributes help depict a more realistic candidate.

Table 1: Profile of candidates

Attributes	**Values**
Ideology	Right
	Center
	Independent
	Left
Profession	Gardener
	Teacher
	Engineer
Gender	Male
	Female
Age	30
	40
	50
Previous Political Experience	No experience
	Council Member
	Mayor
Proposal for affected citizens	Will NOT distribute a financial relief
	Will distribute a financial relief

Table 2: Example of Experimental Design

Attributes	**Candidate 1**	**Candidate 2**
Ideology	Left	Right
Gender	Female	Male
Previous Political Experience	No experience	Council Member
Profession	Gardener	Engineer
Age	30	50
Proposal for affected citizens	Will NOT distribute a financial relief	Will distribute a financial relief

Given that the attribute values were randomized, the design allows us to identify the effect of each attribute on the probability of being preferred as mayor. I follow the approach developed by Hainmueller, Hopkins and Yamamoto (2014) to estimate the average marginal component effect (AMCE). This represents the average difference in the probability of being preferred as mayor when comparing two different attribute values: for example, a "female" candidate versus a "male" candidate.[18] The AMCE can be estimated by regressing the binary outcome (preferred or non-

[18] And due to the random assignment of attributes, the "female" and "male" profiles will have, on average, the same distribution for all the other attributes (Hainmueller and Hopkins, 2015).

preferred) on the set of attributes for each profile.[19]

In this paper, I mainly focus on the interactions between candidate attributes and treatment status to identify how the damage produced by the flood affected the way people make electoral decisions. I compare the political preferences of citizens who suffered material damage from the flood with those of citizens who did not. Equation 1 describes the main quantity of interest:

$$Y = \alpha + \beta_1 Ideology + \beta_2 Profession + \beta_3 Gender + \beta_4 Age + \beta_5 Experience + \beta_6 Expectations + \gamma Treatment + \delta_1 Ideology * Treatment + \delta_2 Profession * Treatment + \delta_3 Gender * Treatment + \delta_4 Age * Treatment + \delta_5 Experience * Treatment + \delta_6 Expectations * Treatment + \varepsilon \qquad (eq.1)$$

Y represents the candidate selected by the respondents. The coefficients β and δ are vectors, because each attribute contains different values. For example, ideology has four values, but the β vector provides only three coefficients because right-wing candidates are the reference category. The coefficient vectors β_1, β_2, β_3, β_4, β_5 and β_6 describe the effect of the candidates' attributes on the control group. Consequently, the vectors of interest are δ_1, δ_2, δ_3, δ_4, δ_5 and δ_6, because they describe the change in effect of the candidates' attributes between control and exposed conditions.

3.6 Defining the Treatment

Half of the surveys and conjoint experiments were conducted in the more affected areas of Paipote. However, some flood victims moved to houses located in the less affected areas to live temporarily with relatives or friends. In particular, seven survey respondents in a less affected area were actually flood victims who lived in a more affected area the night of the disaster. Therefore, 112 respondents lived in the more affected area during the natural disaster, and 98 in the less affected one.

The haphazard nature of the flood generated two different sectors: one where people suffered extensive material damage due to the flood, and another where the mudslides did not enter homes.

[19] The estimator for the AMCE is nonparametric and does not require a functional form assumption (Hainmueller, Hopkins and Yamamoto, 2014).

The following table reports the number of people from these two areas that reported material damage after the flood.[20]

Table 3: Exposed and Unexposed Respondents

	More affected area	Less affected area	Total
Material damage reported	109	4	113
No material damage reported	3	94	97
Total	112	98	210

Material damage status is almost perfectly correlated with the area where the subjects were living. In the analysis the treatment status is equal to 1 if the respondent reported material damage, and 0 if he or she reported indirect or no damage.[21] The results are the same when using the area as the treatment (see Appendix H). The subjects who received the treatment will be referred to, from now on, as the "exposed group," and those that did not report material damage as the "unexposed or control group." Five percent of the survey respondents did not want to participate in the conjoint experiment or quit before finishing it: three in the less affected area and seven in the more affected area. I found no evidence to support the idea that the treatment affected the probability of completing the conjoint experiment (p-value: 0.30).[22] These 10 respondents are excluded from further analysis. Therefore, there are 106 individuals in the exposed group and 94 in the unexposed group, which leads to a total of 3200 observations (16 candidate-pairs evaluated by respondent.)

[20] The survey included the following question: How affected were you by the floods? The answers were categorized as follow: 1 when respondents said "nothing happened," 2 when they reported indirect consequences such as isolation, 3 when they reported partial material damage, and 4 when they reported complete material damage. The first and second categories generate the "no material damage" status, and the third and fourth the "material damage" status.

[21] It is possible to imagine that this natural experiment involves assignment to treatment into "hypothetical clusters." However, it is not clear what such a cluster would consist of with this design (a street, a group of streets, a block, a group of blocks, etc.). Additionally, because Paipote is not a heterogeneous town, I expect the citizens within each "hypothetical cluster" to be no more similar than citizens in other "hypothetical clusters."

[22] I tested this by regressing a binary indicator of a failed conjoint experiment on the treatment.

4 Results: Natural and Conjoint Experiment

4.1 Covariate Balance

The exposed and unexposed citizens should have similar distributions of observed and unobserved covariates. Although there are no pretreatment covariates available in this study, a number of the variables captured in the survey should not be affected by the treatment (placebo covariates), such as gender,[23] age, and education.[24] The next table reports the means and the standardized differences for the three placebo covariates.

Table 4: Balance of Placebo Covariates

Covariate	Mean exposed	Mean control	Standardized difference
Gender	1.72	1.77	0.11
Age	46.21	43.41	0.19
Education	3.20	3.01	0.14

Both groups are comparable because their standardized differences are below 0.2. One-fifth of a standard deviation is the usual rule of thumb for checking if covariate balance was achieved (Silber et al., 2013). It is also possible, however, to improve balance by constraining the standardized differences to be lower than 0.05 using optimal multivariate matching (see Appendix H). This statistical method helps reduce overt biases. Though hidden biases are still a threat in any observational study, the particularities of Paipote (specifically its being a homogeneous residential town) and the haphazard nature of the treatment assignment makes the comparison between these groups more credible.

[23] Male:1, Female:2.

[24] 1: Primary Education Incomplete, 2: Primary Education Complete, 3: Secondary Education Incomplete, 4: Secondary Education Complete, 5: College Education Incomplete, 6: College Education Complete, 7: Graduate Studies.

4.2 Voters' Ideological Preferences

Figure 3 provides a graphical comparison of the preferences of exposed and unexposed respondents. Based on the theoretical expectations, affected citizens should be more likely to vote for welfare and managerial candidates.

The plots on the left provide the β coefficient vectors for each subgroup of citizens. The plot on the right displays the interaction results from equation 1 or, in other words, the differences between the control and exposed groups (δ coefficient vectors). These results are interpreted as the effects of the flood on the attributes that explain the probability of being preferred as mayor. The dots indicate point estimates, and the lines indicate 95% confidence intervals. The reference categories are the dots without confidence intervals (the first category for each attribute).

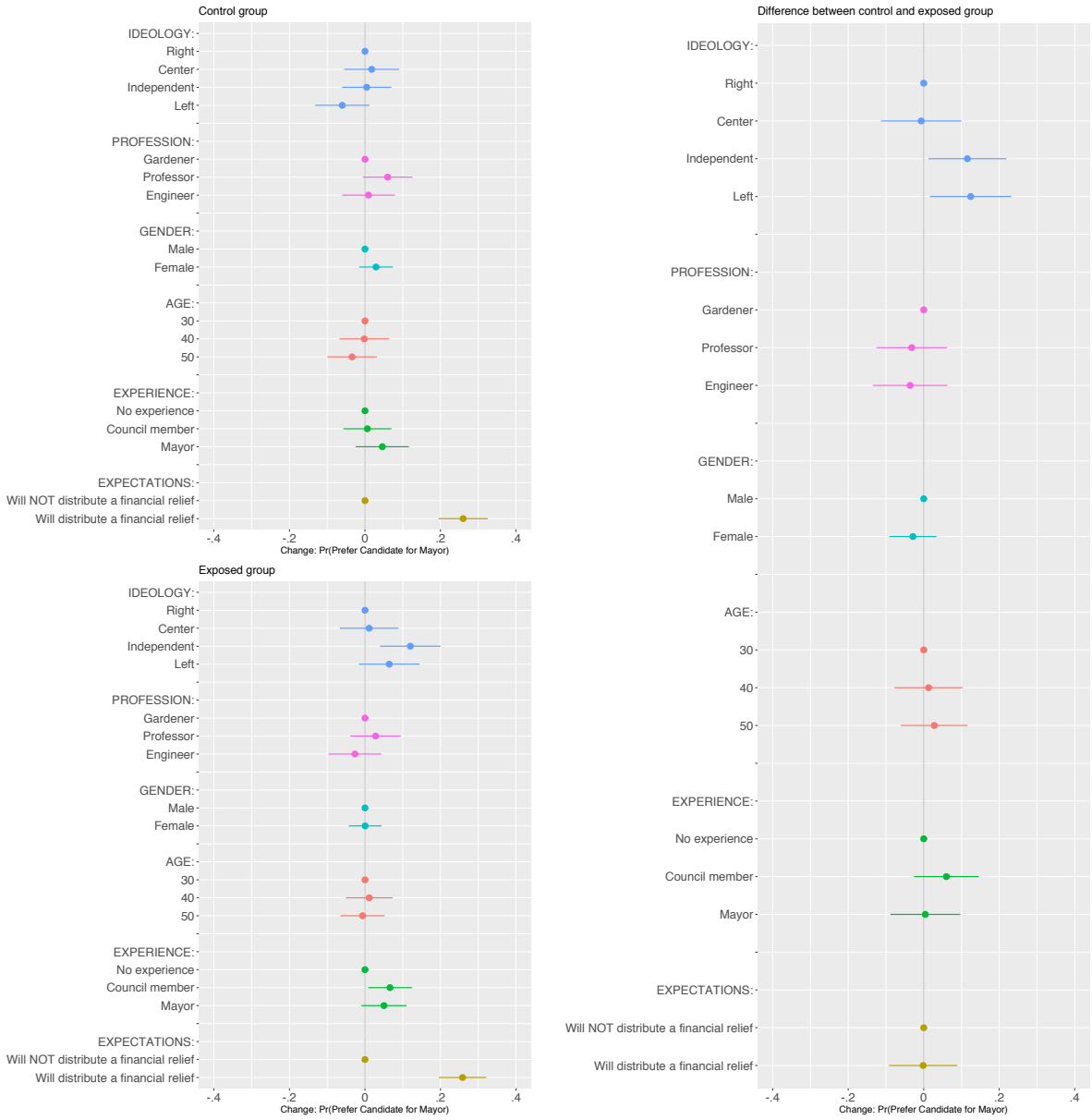

Figure 3: Effects of Candidates' Attributes on Probability of Being Voted for Mayor

Affected and unaffected citizens do have different ideological preferences. Independent and left-wing candidates become more attractive for disaster victims. The difference plot shows that flood exposure increases the chances of preferring a left-wing candidate over a right-wing candidate by 12 percentage points. Material damage due to the flood also increases the probability of preferring a left-wing over a centrist candidate by 12 percentage points (the full regression with the β coefficients is displayed in Appendix F).

Why are disaster victims more likely to vote for left-wing candidates? There are multiple answers to this question, and the conjoint experiment is not enough to understand the mechanisms involved. One response is that voters associate left-wing candidates with the mayor or the opposition and they are rewarding/punishing real politicians by using ideology as a proxy. A second option is that they prefer left-wing politicians for the policies they can implement. I conducted interviews and provide extra survey evidence to support the second alternative. I discuss the first option in section 7.

Independent candidates also have an electoral advantage in exposed areas, although not over left-wing candidates (see Appendix G). Natural disasters might also modify victims' political attitudes (Fair et al., 2013; Carlin, Love and Zechmeister, 2014). Consequently, the advantage of independent candidates versus right-wing or centrist ones can be an expression of voters' new attitudes toward the political system. There are similar findings in the economic voting literature in Latin America, where negative economic conditions have been associated with the deterioration of traditional parties' vote share (Carreras, 2012; Lupu, 2014; Murillo and Visconti, 2017). Therefore, natural disasters might have a similar effect on affected voters, making them more likely to support independent candidates.

However, there is also evidence of voters' empathic feelings in their electoral decisions. Both exposed and unexposed citizens are highly likely to prefer candidates who want to distribute financial relief to disaster victims, even though unexposed respondents were not affected.[25]

Why would victims and non-victims have similar preferences regarding the distribution of short-term benefits? This is not a pure null result because this characteristic is the most important factor explaining voters' decisions in each subgroup, but there is no difference between the exposed group and the control. This is congruent with a spillover hypothesis. Non-victims display empathic feelings towards their neighbors because they are seeing them suffer. Qualitative evidence supports this argument. There are no reasons to believe that the other attributes that report null results within

[25] An alternative option is that both groups had the same preference regarding the distribution of short-term benefits before the natural disaster, and material damage due to the flood did not change those preferences. That option seems very unlikely based on the magnitude of the catastrophe.

each subgroup and between the subgroups (e.g., gender) are evidence of spillover effects.

Finally, there is no evidence that managerial characteristics are important to voters. They are not more likely to vote for older or more educated candidates, and there are no differences between the groups. The interviews are a useful tool for understanding these null effects. Victims strongly focus on the distribution of welfare and relief, which overcomes the importance of other factors that might also be important for citizens, such as selecting politicians with more experience or expertise.

5 Behavioral Benchmark

The most relevant critique of conjoint experiments is that participants are evaluating hypothetical choices; in real life they might be making different decisions. Following Hainmueller, Hangartner and Yamamoto (2015) approach, one method of validating the conjoint analysis is to compare it with actual voting behavior: citizens' response to the 2015 flood in the 2016 local elections.

In this behavioral benchmark, the outcome is not the incumbent vote share, as it would be in the case of traditional research studying retrospective voting. First, I analyze the impact of the flood on voting for leftist, rightist, centrist, and independent candidates (welfare candidate hypothesis).[26] Second, I analyze the effect of the flood on voting for older and more educated candidates.[27]

How can I compare affected and unaffected areas? One option is to use the smallest level of electoral aggregation, which is the "*mesa*." However, there are no covariates available at that level, and they cannot be linked to particular neighborhoods. Consequently, I use counties as the unit of analysis.

The government declared a state of constitutional exception due to the catastrophe in 11 counties, therefore those municipalities are defined as the exposed units.

[26] It is not possible to test the role of the expectations about distribution of disaster relief in a behavioral benchmark.

[27] This empirical strategy cannot rule out the role of retrospective accountability. However, it is studying the political consequences of disasters by a different dimension since it focuses on the candidates' characteristics rather than the incumbent vote share.

One empirical strategy is to select 11 unaffected counties that are similar to the exposed municipalities. Ideally, the control group should be similar in terms of (i) unobserved and (ii) observed covariates.

Regarding point (i), I restrict the group of eligible control units to counties located north of Santiago, the capital city. The idea is to have a natural block of eligible counties from the center-north of Chile, and exclude all the municipalities located in the capital and the south of the country because they might have multiple unobserved characteristics if compared to places in northern Chile.

Regarding point (ii), I select from the sample of eligible units 11 control counties that are similar to the affected municipalities in terms of observed characteristics. I use the following pretreatment covariates to make more credible comparisons: the right, center, left, and independent candidates vote share in the 2012 local election, total population, percentage of rural population, human development index, and poverty levels. These covariates are included because they have been studied as factors explaining voters' behavior in Chile (González, 1999; Altman, 2004; López, 2004; Navia, Izquierdo and Morales, 2008; Luna, 2010; Calvo and Murillo, 2012).

The control units are obtained using recent advances in mathematical programming (Zubizarreta, Paredes and Rosenbaum, 2014; Zubizarreta and Kilcioglu, 2016).[28] I use integer programming to obtain 11 control units that are similar to the 11 exposed counties. In particular, the goal was to achieve the largest matched sample that reduces the standardized differences in means between the groups (see Appendix M for more details about the covariates and the selection of units).

The following table shows that covariate balance was achieved for all the pretreatment county characteristics. The algorithm kept the 11 affected counties, and optimally selected 11 other municipalities to reduce the standardized differences between both groups. The standardized differences are below the traditional requirements for illustrating balance, one-fifth of a standard deviation (Silber et al., 2013).

[28] See Murillo and Visconti (2017) and Visconti (Forthcoming) for applications in political science.

Table 5: Balance of Pretreatment Covariates

Covariate	Mean exposed	Mean control	Standardized difference
Left-wing candidates	0.60	0.59	0.05
Right-wing candidates	0.18	0.21	0.18
Centrist candidates	0.07	0.07	0.02
Independent candidates	0.15	0.13	0.11
Total population	53,808	47,016	0.08
Percentage of rural population	0.21	0.23	0.07
Human Development Index	0.72	0.72	0.03
Poverty	0.14	0.13	0.15

I use equation 2 to estimate the effect of the flood (disaster declaration) at the county level. The matched sample used for this estimation is not just balanced in terms of observed covariates, but was constructed while attempting to reduce sensitivity to hidden biases by focusing on a natural block to generate credible comparisons (cities to the north of Santiago).

$$Y_c = \alpha + \beta_1 T_c + \sigma_n + \varepsilon_c \qquad (eq.2)$$

Y represents the outcome of interest for the 2016 election (vote share of left, right, centrist, independent, more educated,[29] and older candidates.[30] T depicts the treatment (declaration of emergency). σ_n represents region fixed effects. I expect to find results that go in the same direction as the conjoint experiment, but because of power issues they might not be significant (n=22).

[29] 0: High school or less, 1: More than high school. Source: public declaration of patrimony.
[30] 0: less than 50 years old, 1: more than 50 years old.

Table 6: Regression results

	Behavioral Benchmark: Welfare Candidates			
	Left	Right	Center	Independent
	(1)	(2)	(3)	(4)
Flood	0.097	−0.360*	−0.063*	0.327
	(0.203)	(0.175)	(0.036)	(0.286)
Region fixed effects	Yes	Yes	Yes	Yes
Observations	22	22	22	22
Note:				*p<0.1; **p<0.05; ***p<0.01

Table 7: Regression results

	Behavioral Benchmark: Managerial Candidates	
	Age	Education
	(1)	(2)
Flood	−0.035	0.086
	(0.279)	(0.323)
Region fixed effects	Yes	Yes
Observations	22	22
Note:		*p<0.1; **p<0.05; ***p<0.01

It is important to remember that we cannot directly compare the coefficients of the conjoint experiment with the behavioral benchmarks because the estimates of the former are obtained using a reference category. However, we should pay attention to the size and direction of the estimates. The results show that right-wing and centrist candidates were punished in the affected counties; meanwhile, the estimates for left-wing and independent candidates show a positive but non-significant effect. The large standard errors are probably explained by the small sample size. However, the direction of the coefficients for the welfare candidate perfectly matches the conjoint

experiment. There is a positive correlation between disasters and voting for left-wing and independent candidates, and a negative one between disasters and voting for right-wing and centrist ones. The findings are also congruent for the managerial candidates' characteristics. Citizens do not seem particularly focused on selecting more experienced and educated candidates.

All these results provide more robust evidence about how disaster victims evaluate candidates' ideological labels and increase the external validity of the conjoint analysis. Voters are more likely to vote for candidates associated with welfare policies (or punish candidates not associated with them), and these preferences seem to overcome any focus on managerial attributes.

6 Causal Mechanisms

I interviewed 30 affected and unaffected citizens from Paipote to understand the logic behind their electoral preferences after the flood (see Appendix N for interviews in Spanish). The combination of a conjoint and natural experiment is particularly useful for studying the effect of the natural disaster, but it does not help us understand the causal mechanisms at work. I use direct content analysis to interpret the interviews. This approach is based on the use of relevant research findings as guidelines when analyzing the data (Hsieh and Shannon, 2005). The main goal was to provide answers to two questions derived from the conjoint experiment. First, why do left-wing candidates become more attractive to victims? Second, why are both groups likely to vote for candidates who want to distribute financial benefits to the victims?

Regarding the first question, the flood inflicted a great deal of material damage on affected citizens. Most of them lost their houses or all their belongings. Daniela is a 31-year-old housewife who provides the following account of how the flood changed her life: "I had to change all the projects I had. I had to move backward. A lot of them got cut, and I had to change them for others. (For example) fixing my house, because we have not had any help (...). The priority right now is the house, the other things were pushed to the background." Rosa is a 44-year-old housewife who was emotionally and materially affected by the disaster: "After the floods everything changed (...).

I had aspirations, I had dreams, and they fell behind (...). For me it's been hard, my son had to drop out of college, and that has been tough for me too (...). On March 26th I saw my house full of mud, and I did not know where I would sleep that night. (I thought) Tomorrow I'll wake up and everything will be fine, because this was only a dream." These two testimonies illustrate how victims had to focus on new concerns, and how their most critical need was to improve their living conditions by fixing, cleaning, and repairing their houses. In this context, the role of the state is crucial, since it is the only actor that can shrink the gap between how victims are currently living and how they lived before the disaster.

Manuel is a 30-year-old miner. When he was asked about what kind of candidate he would prefer for the locality, he responded: "I think that when one chooses someone, it is not because of the distribution of short-term benefits, but because of a more general commitment to the community (...). Who benefited from a two or three *lucas*[31] bonus? No one in the long run. We need something concrete because if I give a short-term benefit, the people will remain the same. We need permanent, and not temporary, solutions." Claudia, a 23-year-old teacher, has a similar opinion about the ideal candidate for Copiapó: "I would like the next mayor to focus on people's quality of life (...),in every aspect, not just on that they give me a food basket, but on other things too." These two interviews show how victims also focus on multidimensional welfare policies (permanent solutions and improvement of the quality of life), [32] and not on just short-term relief.

Regarding the second question, the interviews show that there are some empathic feelings involved. Unexposed citizens constantly provide examples of their neighbors' suffering, which can be seen as evidence of their empathic feelings towards them. For example, Ana is a 33-year-old housewife who was not exposed to the flood. She mentions how difficult it was for her "to hear the testimony of the people, to hear how they saved their lives, that (some of them) had to tie up to a fence so the water did not take them (...) and how some kids lost everything." Tania is a 40-year-old housewife and also a non-victim. She provides the following anecdote: "I remember that

[31] Two *lucas* are two thousand pesos or three US dollars.

[32] Even though a mayor cannot directly provide new housing, they play a crucial role in asking the central government for more resources and coordinating their delivery.

when I was on the bus, I met a couple of grandparents who went to buy some things. I helped them to walk back to their house, and the grandmother told me she lost everything, and her daughter lives with them, but only the daughter got a benefit. What do you think about that, if they are two families, they should get two benefits, but they got only one?"

There is a third critical question for understanding the causal mechanisms involved. The conjoint experiment shows that affected citizens are more likely than non-affected voters to prefer left-wing candidates. However, can citizens connect ideological labels with policy ideas in Chile? Calvo and Murillo (2012) show that voters have the capacity to identify the position of the main two coalitions on the left-right ideological spectrum. Additionally, Zeichmeister (2015) shows that in Chile, and in 12 other Latin American countries, left-right self-placement is a significant predictor of the left-right vote. However, this argument can also be applied to countries where ideology is not as relevant as in the case of Chile. Voters would only need a very basic understanding of the political system to be able to link simple policy ideas (or outcomes) with party labels or candidate characteristics. The evidence from this paper shows that voters can rely on candidates' ideological labels when voting, which is not the same as traditional ideological voting. The latter assumes that voters are able to place themselves and candidates on an ideological scale. Then, they minimize the distance between their own position and the favored candidate's position on the spectrum. On the contrary, I only assume that voters can use information contained in candidates' ideological labels to make electoral decisions, not that they are minimizing distances.

7 Alternative Hypotheses

Can theories based on retrospective voting explain the previous findings? The blind retrospection theory argues that victims do not focus on candidates' ideology, but rather tend to punish incumbents as a way to channel their emotional distress. Consequently, candidates' ideological labels should not be relevant to voters when they make electoral decisions. However, the conjoint experiment shows exactly the opposite. Affected voters are more likely than non-affected voters to

choose candidates with a particular ideological label.

The research design attempts to rule out retrospective evaluations by focusing on hypothetical candidates who voters should not have a reason to punish or reward when making electoral choices. The conjoint experiment, however, can only partially discard the role of retrospective voting. For example, if affected citizens are rewarding the mayor and they associate him with the left, they would be more likely to vote for left-wing candidates.

Nevertheless, the evidence from the interviews does not support this alternative hypothesis. The mayor was the most blamed political actor: both affected and non-affected voters had a negative impression of his performance. The responses to the following survey question confirm the qualitative evidence: "Speaking about the floods, how would you rate the job performance of Mayor Maglio Cicardini in handling the disaster? (1) very good, (2) good, (3) neither good nor bad (fair), (4) bad, (5) very bad." The average response was 3.97. Moreover, the difference in the retrospective evaluation of authorities (mayor and president) by affected and unaffected people is statistically indistinguishable (see Appendix I).

Another option is that the mayor is associated with the right; therefore because he is being punished, victims are more likely to vote for the left. However, the mayor does not hold a clear ideological position. He was a member of the Socialist party (center-left) before running as mayor, but in 2008 he switched to the PRI (center) and in 2012 and 2016 ran as an independent (without party affiliation). Therefore, it does not seem that rewarding left-wing candidates is an alternative way to punish the incumbent mayor.

A different causal mechanism for explaining why affected and unaffected citizens have the same preference regarding distribution of financial relief is that the latter are expecting to also get a benefit even though they were not materially affected by the flood. The survey shows that only 5 % of non-affected respondents got aid from the state. Therefore, there should be no reason to think that non-victims can expect to get financial aid if they were not exposed to the disaster.

Finally, I include multiple robustness checks in the supplementary appendix. First, I conduct two different robustness checks to test the sensitivity of my results using a different treatment

and sample. When using the original treatment, 1 refers to reporting material damage, and 0 otherwise. In this check, I redefine the treatment to make 1 equal to living in the area affected by the flood and 0 to living in an unexposed area. The second robustness check tests the original specification in a matched sample (see Appendix H). Second, I conduct diagnostic checks for the conjoint analysis following the Hainmueller, Hopkins and Yamamoto (2014) recommendations. I check the randomization of attributes by regressing respondent characteristics on the candidates' attributes. Additionally, I check that the results are not conditional to candidate order, which can have two dimensions: the order within a pair and the order across the eight pairs. I regress the outcome on the attributes, indicators of the order (candidate or pair), and the interaction between them (see Appendix J, K, and L).

8 External Validity

The main evidence is coming from a particular natural disaster in the north of Chile. In this section I explore how a different disaster in a different region of the country can produce similar effects.

In 2010, the central-southern regions of Chile were shattered by an earthquake of magnitude 8.8. This was the 4th strongest earthquake the world had experienced during the previous 50 years. I exploit a national survey conducted four months after the flood to understand how this disaster might affect citizens' political preferences.[33] I follow Zubizarreta, Cerdá and Rosenbaum (2013) strategy to select affected counties by using the intensity of the earthquake at the county level. Counties with peak ground acceleration greater than 0.275g are identified as exposed. Respondents from those counties are assigned to the treatment group. Meanwhile, participants from municipalities that were not part of the reconstruction plan, and therefore were not affected by the earthquake, are categorized as controls (see Appendix O for more details). I find the largest matched sample that achieves covariate balance on three placebo covariates (i.e., gender, age, and education) by using integer programming as in section 5. The following table reports the standard-

[33] I use the national representative survey conducted by the Centro de Estudios Públicos (CEP) in June-July 2010.

ized differences between both groups, which are below 0.2 (Silber et al., 2013).

Table 8: Balance of Pretreatment Covariates

Covariate	Mean exposed	Mean control	Standardized difference
Gender	1.55	1.58	0.07
Age	45.63	45.94	0.02
Education	3.21	3.49	0.15

The survey did not ask about preferences for welfare and social policies. However, the survey included a group of questions that can help us test some implications of the main argument. If victims support the distribution of welfare policies, those measures must be funded from somewhere. As a consequence, it is possible to expect that victims might also be more likely to support a raise in taxes. The survey asked the following question: Do you agree or disagree with the following measures to fund the reconstruction efforts after the earthquake? (1) to raise taxes, and (2) to raise taxes on mining companies.[34] I use equation 2 to estimate the effect of the earthquake on victims' preferences regarding taxation. I cluster the standard errors at the municipality level.

$$Y_c = \alpha + \beta_1 T_c + \sigma_n + \varepsilon_c \qquad (eq.2)$$

Y represents the outcome of interest (support a raise on taxes for the reconstruction efforts). T depicts the treatment (respondent living in a county affected by the earthquake). σ_n represents region fixed effects. This natural disaster should increase support for these measures because these can be linked to the implementation of welfare policies to improve citizens' living conditions after the earthquake.

[34] There are other questions that are less relevant, such as to raise taxes on cigarettes.

Table 9: Regression results

	Policy Preferences	
	Mores taxes 1	More taxes 2
	(1)	(2)
Earthquake	0.437***	0.104***
	(0.000)	(0.000)
County fixed effects	Yes	Yes
Observations	478	478
Note:	*p<0.1; **p<0.05; ***p<0.01	

As expected, affected citizens are more likely to support a raise in taxes. The framing of the question directly links the taxes with the reconstruction efforts. Affected citizens have instrumental motivations, mainly based on improving their living conditions, and are more likely to support policies that reduce the gap between how they used to live before the earthquake and their living conditions after the earthquake. This particular post-disaster context provides a natural advantage to left-wing candidates.

9 Conclusions

Voters living in developing countries are frequently exposed to natural disasters and negative income shocks in general. Lack of preparedness and lower state capacity make these citizens very vulnerable to negative events. This paper provides evidence about the political preferences of natural disaster victims in a low-middle income locality. External validity could be a concern because the primary evidence is coming from one particular place. However, respondents' characteristics are a good representation of a median voter in a Latin American country (i.e. low-middle income and educational levels), and experimental results are paired with real electoral outcomes. In addition, I provide evidence from a different natural disaster in a different region of Chile, and those

findings point in the same direction.

Voters tend to select and sanction candidates at the same time, therefore any study that only focuses on the incumbents' share of votes cannot fully disentangle which causal mechanism is driving electoral outcomes. This paper, in contrast, attempts to partially rule out the role of retrospective voting by focusing on how people make electoral choices between a pair of hypothetical candidates. Consequently, the actual incumbents cannot be directly blamed or rewarded by the electorate. In other words, this article provides evidence about what kind of candidates victims are looking for, or which candidate characteristics are more attractive to affected voters.

An important challenge to address is that even though natural disasters might affect an area without deliberately targeting it, they are not randomized experiments. Nevertheless, natural experiments within natural blocks provide an opportunity to address this issue because treatment assignment can resemble a randomized experiment due to certain unusual circumstances (Zubizarreta, Small and Rosenbaum, 2014) and homogeneous units should have more similar unmeasured covariates (Pimentel, Kelz, Silber and Rosenbaum, 2015). I exploit the haphazard nature of the 2015 floods in Paipote, and the town's high levels of homogeneity, to understand how adverse conditions affect voters' ideological preferences.

The conjoint experiment shows that the treatment (material damage due to the flood) increases the probability of preferring left-wing candidates. Qualitative interviews help us understand that victims focus on multidimensional solutions to improve their living conditions; and welfare and social policies are the most important aspect of recovery from the negative consequences of a disaster. Therefore, left-wing candidates should have a natural advantage when compared with right-wing politicians because the former can be linked to the policies victims will like to see implemented. However, because prospective and retrospective voting are both present at the same time, right-wing incumbents can improve their vote share thanks to their performance handling the disaster, but they would remain at a disadvantage when compared to left-wing incumbents. In addition, unaffected voters have some empathic feelings while making electoral decisions. That finding should be taken into account when studying the consequences of natural disasters.

The argument of this paper can also be applied in countries where ideology is not a relevant explanation of voter behavior, such as Brazil. However, in that case I would expect that voters will link the distribution of welfare and social policies with the PT (party of workers). As a consequence, that party should have an advantage over other political parties after natural disasters.

The floods in northern Chile help us learn about how disaster victims tend to reward candidates with particular characteristics. This argument, however, could be extended beyond natural catastrophes to include other types of negative shocks. For example, crime victimization might make right-wing candidates more attractive to voters because they may be better suited to address victims' new policy concerns, such as the implementation of iron-fist policies to reduce crime. Disaster or crime victims will not only focus on the incumbents' performance or responsibility, but also select a political leader who can enhance their living conditions after the negative event.

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