JOURNAL OF ELECTIONS, PUBLIC OPINION AND PARTIES
https://doi.org/10.1080/17457289.2021.1917584

Routledge
Taylor & Francis Group

NOTE

Do disasters affect policy priorities? Evidence from the 2010 Chilean Earthquake

Giancarlo Visconti

Department of Political Science, Purdue University, West Lafayette, IN, USA

ABSTRACT

Disasters can destroy and damage private property like houses and public property like roads, schools, and hospitals. Do people prioritize the distribution of both private and public goods after being exposed to these negative events? How long do these priorities last after disasters? Using ten surveys spanning four years — half conducted before and half after the 2010 Chilean earthquake — and a difference-in-differences design, I find that exposure to this disaster makes people care more only about housing but not about crucial public goods also affected by the earthquake such as infrastructure and transportation. Additionally, these effects on policy priorities vanished after two years. These findings further our understanding of citizens' policy priorities after shocks that severely deteriorate people's living conditions, such as disasters.

KEYWORDS Private goods; public goods; policy priorities; disasters

Introduction

Exposure to a disaster can substantially worsen victims' living conditions by destroying or damaging their homes and personal belongings, as well as by affecting crucial public infrastructure such as schools, hospitals, and roads. In this context, the distribution of both private and public goods by the state becomes urgently needed. This might include delivering private goods like food baskets, financial relief payments, and emergency housing to victims, or repairing and reconstructing key public infrastructure such as roads, schools, and hospitals. Do people prioritize the distribution of both private and public goods after being exposed to these negative events? How long do these new priorities last after disasters?[1]

CONTACT Giancarlo Visconti gviscont@purdue.edu

Supplemental data for this article can be accessed https://doi.org/10.1080/17457289.2021.1917584.

[1] Private goods refer to resources that are both excludable and rivalrous: recipients can exercise property rights on them, and receiving them affects their availability to someone else. Public goods refer to resources that are both non-excludable and non-rivalrous: that is, an individual cannot be excluded from using them and being used by one individual does not reduce their availability to others (Samuelson 1954).

Understanding people's policy priorities is particularly important in democratic countries where we expect governments to be responsive to individuals' concerns and citizens to hold governments accountable for addressing those needs. Additionally, democratic responsiveness and accountability become even more salient when it comes to large-scale policy problems such as climate change, pandemics, and disasters.

Most of the previous literature about disasters has studied how these events affect incumbent vote share, turnout, citizens' attitudes, and the blame attribution process (Maestas et al. 2008; Chen 2013; Fair et al. 2017; Visconti and Zubizarreta 2018). Therefore, we do not know much about which policy concerns become more or less urgent after disasters and for how long.

Previous studies find that disasters can change the policy issues on the agenda (Birkland 1998) and lead the media and the government to identify new or emphasize existing problems that were previously overlooked or perceived to be less relevant (Birkland 2013). As a consequence, there are reasons to believe that affected people might change their policy priorities about relevant post-disaster issues such as housing and public infrastructure.

Past research shows that hazards can increase community cooperation and cohesion. In particular, disaster victims might acknowledge "the importance of cooperating together to achieve mutually desired goals—that is, protecting community property and private assets concurrently" (Chang, 2010, 292). Following this line of reasoning, we could expect people to identify both housing and public infrastructure as key concerns after disasters. However, other studies have found that individuals sometimes make short-sighted political decisions (Achen and Bartels 2016) such as emphasizing short over long-term benefits after disasters (Healy and Malhotra 2009). As a consequence, we could also expect people to overlook the importance of crucial goods that do not immediately improve their lives, such as the slow process of reconstructing public infrastructure.

Regarding how long the political effects of disasters can last, there are few studies that use longitudinal data to evaluate political preferences and attitudes after disasters over an extended period of time. For example, there is evidence that major events such as the 2002 Elbe flooding affected the 2005 elections in Germany but that those consequences had faded by the 2009 election (Bechtel and Hainmueller 2011). However, there is also evidence of small or negligible effects of disasters on certain political attitudes, such as political trust and satisfaction with the government (Albrecht 2017), which could undermine the expectations of long-term consequences. Therefore, there are reasons to expect both long and short-term effects of disasters on people's policy concerns.

To study changes in policy priorities among disaster victims, I use evidence from the 2010 earthquake in Chile, the sixth-largest earthquake ever documented. On February 27 of that year, Chile was shattered by a massive 8.8

(on the moment magnitude scale) earthquake affecting six out of the fifteen regions of the country, causing massive damage to not only houses but also bridges, roads, ports, and airports (American Red Cross Multi-Disciplinary Team 2011). The total cost of the disaster was estimated to be US $30 billion, or 18% of the Chilean Gross National Product (McClean 2012).

I use ten surveys implemented before and after the earthquake, comparing areas exposed and not exposed to the disaster, and implement a difference-in-differences design (DID) to learn whether affected citizens modify their policy priorities. Drawing from the official reconstruction plan, I identify the problems that the government most needed to address after the earthquake. Then, to gauge the outcome of interest, I used survey questions that asked respondents to select the country's three most significant problems that the government should address from a fixed pool of alternatives. I take advantage of the fact that the survey included options (before and after the disaster) that can be connected with the issues mentioned in the reconstruction plan. In particular, since the earthquake damaged and destroyed hundreds of thousands of houses and numerous bridges, roads, railroads, ports, airports, and bus stations, I use concerns about housing (i.e. private goods) and infrastructure and transportation (i.e. public goods) as the outcomes of interest. Because respondents can select three issues and not just one, people can prioritize both private and public goods simultaneously.

I find that exposure to the earthquake increased the likelihood of respondents reporting housing as one of the most critical problems to be addressed by the government but did not increase their concerns about infrastructure and transportation. The results also show that the effects on housing vanish after two years, illustrating how important policy priorities may be strongly tied to temporal material needs.

This research note provides two main contributions to the existing literature. First, it focuses on an under-explored political effect of disasters: their impact on the saliency of important policy issues such as the provision of private and public goods. The extant literature mostly studies victims' electoral choices, traditionally measured in terms of incumbent vote share. Second, rather than being purely driven by slow-moving or long-term variables such as ideology or partisanship, this article shows that policy priorities can also be explained by changes in people's living conditions. These changes, however, are not permanent, with citizens returning to their original priorities after two years. This shows how individuals can have flexible policy priorities that are shaped by personal and time-specific circumstances.

Research design

The 8.8 earthquake that shook the south-central regions of Chile in February 2010 was, according to the United States Geological Survey, the sixth largest

earthquake ever documented.[2] More than 12,000 people were injured and more than 500 were killed.[3] Across Chile, six out of fifteen regions were officially declared affected areas by the government. This disaster not only damaged and destroyed private and public infrastructure but it also affected people's psychological wellbeing (Zubizarreta, Cerdá, and Rosenbaum 2013), electoral preferences (Visconti and Zubizarreta 2018), and political attitudes (Carlin, Love, and Zechmeister 2014).

Chile provides an opportunity to test the political consequences of earthquakes because all of its regions have been affected by this type of disaster in the past (Bahamonde 2019). Therefore, all counties are eligible to be exposed to an earthquake, improving the comparability between these political divisions.

The disaster devastated exposed cities and localities and generated massive destruction to private and public property. To study disaster victims' policy priorities, I use ten nationally representative surveys, half conducted before and half after the earthquake, and spanning over four years (June 2008 to April 2012). These surveys were implemented by the Centro de Estudios Públicos (CEP) and followed a probabilistic sampling strategy.

To identify the issues that should be of greater concern to disaster victims, I use the official reconstruction plan generated by the government. Figure 1 provides an infographic from the English version of the document summarizing the areas that were most affected by the earthquake.[4] The first issue refers to the distribution of a critical private good (i.e. housing) and the others to public goods (e.g. the reconstruction of schools, hospitals, bridges, and roads).

To measure people's concerns about the issues identified in the plan, I use the following question from the CEP surveys: "Which are the three problems that the government should dedicate the greatest effort to solving?" Respondents then needed to identify three problems from a list of pre-defined issues that did not change across surveys. I took advantage of the fact that two of the issues included in the survey are closely tied to the consequences of the disaster: *housing* (reconstruction plan: 220,000 damaged or destroyed houses) and *infrastructure and public transportation* (reconstruction plan: damage schools, hospitals, roads, highways, bridges, ports, and airports).[5] I construct binary indicators showing whether those topics were mentioned by survey respondents as one of their three main priorities,[6] which is the outcome of interest. In appendix A, I use an ordinal instead of a binary

[2]United States Geological Surveys, "20 Largest Earthquakes in the World."
[3]Live Science, "Chile Quake & Tsunami Dramatically Altered Ecosystems."
[4]The original infographic also expanded on other infrastructure damage.
[5]The reconstruction plan explicitly mentions public transportation as a crucial problem to be addressed. The destruction of routes, highways, and bus stations substantially deteriorated the provision of this public service (Government of Chile 2010a).
[6]The same question was asked three times, prompting respondents to identify three problems.

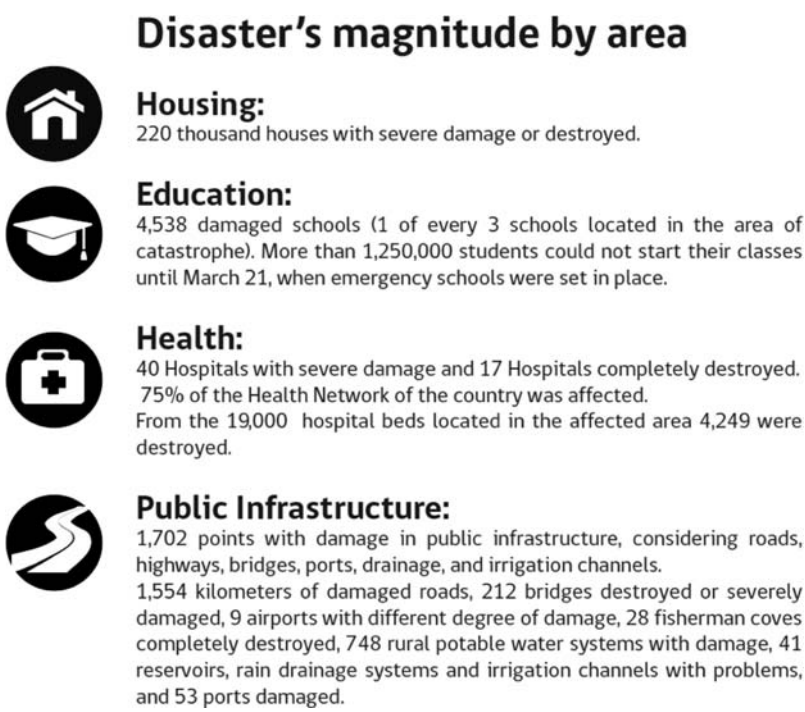

Figure 1. Infographic from the official reconstruction plan depicting the areas that were more affected by the disaster (Government of Chile 2010b).

outcome. In appendix B, I include an analysis using other survey items that might also be connected with public goods required after a disaster such as education (i.e. destruction of schools) and health (i.e. destruction of hospitals).

I use a difference-in-differences design (DID) with these ten surveys. The assumption underlying this empirical strategy is that in the absence of exposure, the outcome in the exposed and control groups would follow parallel trends. To implement the DID, we need a group of subjects living in counties that were exposed to the disaster (the exposed group) and subjects living in counties that were not exposed to the disaster (the control group). We also need data for both the exposed and control groups before and after the disaster.

To identify exposed units, I use the peak ground acceleration (PGA) at the county level. This indicator measures the strength or intensity of shaking produced by the earthquake in a given geographic area. Unlike the traditional Richter scale, this metric does not capture the energy released but "how hard the earth shakes in a given geographic area" (Bhushan 2011). The exposed counties are those with a PGA greater than 0.275 *g*, a traditional cutoff used for identifying localities severely affected by an earthquake

Figure 2. Map of Chile. Disaster declaration took place in the regions in red. This is a modified version of the official reconstruction map (Government of Chile 2010b, 6).

(Zubizarreta, Cerdá, and Rosenbaum 2013). The control group includes all counties in non-affected regions based on the government's official reconstruction plan (Government of Chile 2010b). In appendix C, I implement the main analysis using 30 different cutoffs for the peak ground acceleration.

Figure 2 illustrates the geographic location of affected and non-affected regions.[7] Survey respondents who live in counties located in the gray

[7]The existence of spillovers could be a concern, where internal migration from exposed to unexposed counties could affect the results. However, the reconstruction plan attempted to avoid this situation.

regions are in the control group, and survey respondents living in counties located in the red regions and that had a PGA greater than 0.275 *g* are in the exposed group.[8]

This strategy allows me to exploit an extreme doses approach: by analyzing a subpopulation in which the exposure effect is larger, we can better identify the association between exposure and the outcome (Rosenbaum 2011). The use of extreme exposure conditions helps reduce sensitivity to hidden biases, which can be an issue with the inclusion of marginal exposures (Zubizarreta, Cerdá, and Rosenbaum 2013). Thus, based on the goal of comparing subpopulations experiencing very different levels of exposure, I focus on subjects living in counties severely affected by the earthquake and not affected at all, and exclude from the analysis people living in marginally exposed counties. The latter are places located in the affected regions but in counties that experienced a PGA lower than 0.275 *g*. In appendix D, I show that sample characteristics do not change meaningfully when excluding people living in marginally exposed counties. In appendix E, I conduct the main analysis using the partially exposed units instead of the exposed units. In appendix F, I use the peak ground acceleration as a continuous indicator of exposure and therefore do not remove partially exposed subjects.

I use equation (1) to estimate the effect of the 2010 earthquake on citizens' priorities. The units of observation are the survey respondents. I clustered standard errors at the exposure level (i.e. by county).

$$Y_{it} = \alpha + \beta_1 E_{it} + \beta_2 C_{it} + \beta_3 E_{it} * C_{it} + \beta_4 X_{it} + \varepsilon_{it} \quad (1)$$

Y is a binary indicator for the outcome of interest (housing and infrastructure and transportation). *E* is a binary indicator of exposure (living in a county affected by the 2010 earthquake), *C* is a factor variable representing the ten CEP surveys that goes from CEP June 2008 to CEP April 2012. The reference category is the CEP October 2009, since it is the survey conducted just before the earthquake (February 2010). *X* corresponds to the set of placebo covariates (i.e. individual characteristics not affected by exposure).[9] In this DID model, the key parameter of interest is β_3, which captures the effect of the earthquake after accounting for both within and between-group differences. Since I am interacting a binary with a factor variable, β_3 corresponds to a vector of nine coefficients. The first four allow us to check for the parallel trend assumption (comparing the CEP October 2009 with the CEP June 2008, November 2008, May 2009, and August 2009). The last five illustrate the

Its main goal was to "maintain neighborhood social networks, consolidate existing settlements, and avoid migration from rural areas" (Government of Chile 2010b). Another concern is that exposure to disasters is a compound treatment since being affected by an earthquake can mean different things to victims. Nevertheless, this is a common issue when using natural experiments to learn about the effects of negative events that cannot be randomized.

[8]Exposed participants come from 68 different counties and control participants from 76.

[9]I provide more details about the covariates in appendix D.

effects of the earthquake (comparing the CEP October 2009 with the CEP June 2010, November 2010, June 2011, November 2011, and April 2012). In appendix G, I include different specifications as robustness checks (e.g. no placebo covariates and using county fixed effects). In appendix H, I check whether placebo covariates in the exposed and control groups show a similar trend across time. In appendix I, I combine the DID with matching.

Results

Figure 3 displays the evolution of outcomes across time to empirically show citizens' priorities regarding the distribution of private and public goods before and after the February 2010 earthquake. This plot is particularly useful in 1) providing visual evidence for the parallel trend assumption and 2) demonstrating that the only preference that has changed after the earthquake is housing, and not infrastructure and transportation (both emphasized in the reconstruction plan). Indeed, affected respondents dramatically modify their concerns about housing after the earthquake. Three months before the disaster, 9% mentioned housing as one of the country's three top problems, and four months after the earthquake that number increased to 29%. Conversely, priorities for infrastructure and transportation are stable across time.

Figure 4 reports the β_3 coefficients (interaction term) and 95% confidence intervals when using equation (1). These coefficients represent the effects of the earthquake after accounting for differences over time and between groups (5,946 observations). As a reminder, I use the CEP survey implemented just before the earthquake as the reference category (CEP October 2009). The dots without confidence intervals represent this baseline survey.

Results for the CEP June 2008, November 2008, May 2009, and August 2009 (before the earthquake) provide evidence of the parallel trend assumption. Both exposed and control groups follow a common trend since the interaction terms are not significant. Results for the CEP June 2010, November

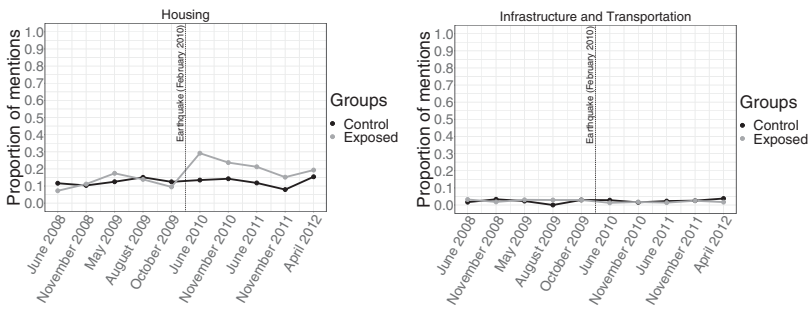

Figure 3. Priorities about housing and infrastructure and transportation across time.

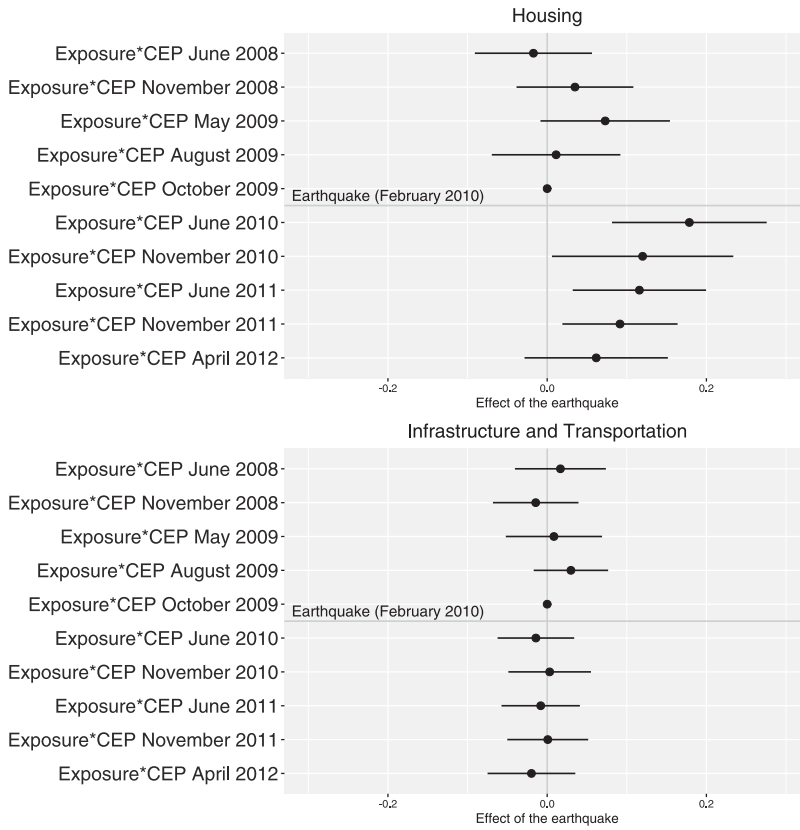

Figure 4. Difference-in-differences estimates. CEP October 2009 is the reference category. Horizontal line represents the earthquake (February 2010). Only the coefficients from the interaction term are reported. Observations: 5,946.

2010, June 2011, November 2011, and April 2012 (after the earthquake) show how the disaster only changed priorities about housing but not about infrastructure and transportation.

When comparing the CEP October 2009 and June 2010, the February 2010 earthquake increased by 18 percentage points the likelihood of mentioning housing as one of the key problems the government needs to address. For CEP November 2010 the effect decreased to 12 percentage points, continuing to decrease until CEP April 2012, when it is no longer significant. Therefore, two years after the disaster the priorities of the exposed and control groups become indistinguishable. Why people stopped worrying about housing two years after the disaster? A possible explanation might rely on victims' being able to find a permanent solution to their housing issues thanks to state support (i.e. through the provision of new houses) or private help (i.e. the use of savings, loans, or family networks).

Discussion

There are two main plausible explanations for why victims' concerns after the earthquake have changed only about housing. First, there is abundant evidence documenting citizens' short-sightedness when making political decisions (Achen and Bartels 2016). In the case of disasters, previous research has shown that victims tend to prefer policies that benefit them in the short-term over those that benefit them in the long-run: for instance, by rewarding the government for distributing disaster relief but not for investing in preparedness (Healy and Malhotra 2009). This lack of foresight could explain why exposed respondents fail to identify a need for infrastructure and transportation. Even when the destruction of schools, hospitals, and bus stations had a direct impact on people's quality of life.

Second, it is possible that respondents might assume that public goods like airports, roads, and ports will have to be reconstructed regardless, as the government cannot avoid the repair of crucial public infrastructure. Indeed, the literature about post-disaster recovery emphasizes the importance of restoring of normal community activities (Lindell 2013) and adopting swift reconstruction measures to sustain economic growth (Deraniyagala 2016). These efforts might be especially crucial in developing countries whose economies can severely suffer from damage to roads and ports. If people share this expectation, then they will pay greater attention to issues that are not guaranteed, such as housing. In other words, because the provision of private goods will always be less certain than that of public goods that are critical for the well-functioning of the country, people will prioritize accordingly.[10] Finally, I discuss possible alternative explanations in appendix J.

Conclusions

The 2010 earthquake in Chile, which caused massive damage to both public and private goods, provides an opportunity to study citizens' priorities about the distribution of goods. The findings show that disaster victims are 18 percentage points more likely to identify housing as a crucial concern just after the earthquake, and that effect vanishes after two years. On the contrary, people are not more likely to mention crucial public goods such as infrastructure and transportation.

These findings have two main political implications regarding how people make electoral choices and how they evaluate politicians. First, if citizens reorganize their policy priorities, that process might also imply a

[10]A third explanation could rely on the role of social dilemma principles. In particular, on how people can change their focus from collective to individual goals (Chang, 2010).

reassessment of their electoral choices. We expect disaster victims to select (in addition to sanction) candidates (Fearon 1999), therefore, people might make political decisions based on the expected benefits they will receive (i.e. housing). Identifying appropriate candidates can be done through the use of simple heuristics such as ideology, partisanship, or campaign promises.

Second, citizens' priorities about the provision of private and public goods are central to the study of democratic responsiveness and accountability. Studying the value that disaster victims place on the distribution of each type of goods can help us understand how people prioritize certain issues when their living conditions suddenly deteriorate and what individuals request from politicians. We know that citizens evaluate the performance of their political leaders (Ferejohn 1986), and therefore, during elections voters might check whether incumbents addressed these new priorities or not.

Large-policy problems such as climate variability generated by unmitigated climate change, global pandemics, and large disasters are events that can have medium- or long-term effects on individuals' political priorities. In these emergency contexts, people urgently need help from the state to improve their welfare and living conditions. As a result, it becomes crucial to improve our understanding of how citizens modify their policy concerns after a negative shock and how long these new priorities last.

Acknowledgements

I thank Kathleen Griesbach, Shigeo Hirano, Owura Kuffuor, Greg Love, Luis Maldonado, Isabela Mares, John Marshall, Jay McCann, M. Victoria Murillo, Kayla Young, and José Zubizarreta for their valuable comments and suggestions. I am grateful to Ricardo González, Bernardo Mackenna, and the Centro de Estudios Públicos for sharing the survey data. This project was supported by FONDECYT grant number 1191522 (Economía Moral de los Desastres Socionaturales y el Estado). All errors are my own.

Disclosure statement

No potential conflict of interest was reported by the author(s).

References

Achen, C. H., and L. M. Bartels. 2016. *Democracy for Realists: Why Elections Do Not Produce Responsive Government*. Princeton University Press.

Albrecht, F. 2017. "Government Accountability and Natural Disasters: The Impact of Natural Hazard Events on Political Trust and Satisfaction with Governments in Europe." *Risk, Hazards & Crisis in Public Policy* 8 (4): 381–410.

American Red Cross Multi-Disciplinary Team. 2011. "Report on the 2010 Chilean Earthquake and Tsunami Response." U.S. Geological Survey Open-File Report 2011–1053, v. 1.1, 68 p.

Bahamonde, H. 2019. "Income Taxation and State Capacity in Chile: Measuring Institutional Development using Historical Earthquake Data." Working paper.
Bechtel, M. M., and J. Hainmueller. 2011. "How Lasting is Voter Gratitude? an Analysis of the Short-and Long-Term Electoral Returns to Beneficial Policy." *American Journal of Political Science* 55 (4): 852–868.
Bhushan, P. B. 2011. *Advanced Soil Dynamics and Earthquake Engineering*. New Delhi: PHI Learning.
Birkland, T. A. 1998. "Focusing Events, Mobilization, and Agenda Setting." *Journal of Public Policy*, 18 (1): 53–74.
Birkland, T. 2013. "Disasters, Focusing Events, and Sociolegal Studies." *Oñati Socio-Legal Series* 3 (2): 363–377.
Carlin, R. E., G. J. Love, and E. J. Zechmeister. 2014. "Natural Disaster and Democratic Legitimacy the Public Opinion Consequences of Chile's 2010 Earthquake and Tsunami." *Political Research Quarterly* 67 (1): 3–15.
Chang, K. 2010. "Community Cohesion After a Natural Disaster: Insights from a Carlisle Flood." *Disasters* 34 (2): 289–302.
Chen, J. 2013. "Voter Partisanship and the Effect of Distributive Spending on Political Participation." *American Journal of Political Science* 57 (1): 200–217.
Deraniyagala, S. 2016. "Economic Recovery After Natural Disasters." *UN Chronicle* 53 (1): 31–34.
Fair, C. C., P. Kuhn, N. A. Malhotra, and J. Shapiro. 2017. "Natural Disasters and Political Engagement: Evidence from the 2010–11 Pakistani Floods." *Quarterly Journal of Political Science* 12 (1): 99–141.
Fearon, J. D. 1999. "Electoral Accountability and the Control of Politicians: Selecting Good Types Versus Sanctioning Poor Performance." *Democracy, Accountability, and Representation* 55: 61.
Ferejohn, J. 1986. "Incumbent Performance and Electoral Control." *Public Choice* 50 (1): 5–25.
Government of Chile. 2010a. Plan de reconstruccion terremoto y maremoto del 27 de febrero de 2010.
Government of Chile. 2010b. "Reconstruction plan (English version)." Ministry of Housing and Urban Development.
Healy, A., and N. Malhotra. 2009. "Myopic Voters and Natural Disaster Policy." *American Political Science Review* 103 (03): 387–406.
Lindell, M. K. 2013. "Recovery and Reconstruction After Disaster." *Encyclopedia of Natural Hazards* 8: 12–824.
Maestas, C. D., L. R. Atkeson, T. Croom, and L. A. Bryant. 2008. "Shifting the Blame: Federalism, Media, and Public Assignment of Blame Following Hurricane Katrina." *Publius: The Journal of Federalism* 38 (4): 609–632.
McClean, D. 2012. *Chile Still Living with Quake Effects*. Geneva: UNISDR.
Rosenbaum, P. R. 2011. "What Aspects of the Design of an Observational Study Affect its Sensitivity to Bias from Covariates That Were not Observed?" In *Looking Back*, edited by Neil J. Dorans and Sandip Sinharay 87–114. New York: Springer.
Samuelson, P. A. 1954. "The Pure Theory of Public Expenditure." *The Review of Economics and Statistics*, 36 (4): 387–389.
Visconti, G., and J. Zubizarreta. 2018. "Handling Limited Overlap in Observational Studies with Cardinality Matching." *Observational Studies* 4: 217–249.
Zubizarreta, J. R., M. Cerdá, and P. R. Rosenbaum. 2013. "Effect of the 2010 Chilean Earthquake on Posttraumatic Stress Reducing Sensitivity to Unmeasured Bias Through Study Design." *Epidemiology* 24 (1): 79–87.