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# Is Latin America a Region for Green Parties? Factors Behind Their Presence and Performance

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## ABSTRACT

This research addresses the imbalance between the predominantly European-focused literature on Green Parties and the limited scholarly attention devoted to Latin America. It does so by mapping the current landscape of the Green party family in the region and the applicability of established theoretical frameworks. The study identifies the key factors influencing votes for Green Parties through Logistic Models on a dataset of 150 competitive elections across 15 Latin American countries (1985–2024). The findings reveal that the determinants of Green Party success in Latin America largely parallel those observed in Western contexts, with socioeconomic factors being associated with Green Parties' presence and decentralisation with electoral performances.

## 1 | Introduction

It is well-established that no green or environmental party has ever received a significant share of the vote in any Latin American national election. On the contrary, Green Parties have generally performed poorly, typically receiving less than 10% of the vote in general elections. Nonetheless, they have achieved comparably stronger results at the subnational level and have demonstrated their capacity as 'kingmaker parties'. Currently, the Colombian, Mexican, Brazilian, and Chilean main Green Parties have all formed alliances with governing parties, underscoring their strategic relevance.

Still, Green Parties in Latin America remain largely unknown and understudied actors, compared to the attention given to their European counterparts. European Green Parties have been more capable of winning seats in national Parliaments and entering ruling coalitions. But even accounting for this consideration, the literature gap remains striking, especially given the primacy of the environment in South American politics.

Among other reasons, natural resources are key for the region's domestic economies: during the period 2019–2021, the combined regional exports of these resources represented 50.7% of total exports and 10.1% of the region's Gross Domestic Product (GDP) (ECLAC, 2023). Even more striking, given the knowledge gap surrounding Green Parties, is the contrast with other environmental actors—such as non-governmental organisations (NGOs) and indigenous movements—which have been the focus of extensive scholarly attention (Arce et al. 2018; Bull and Aguilar-Stoen 2014).

This article seeks to address this gap by focusing on Latin American Green parties and their electoral performance. This situation raises an important question: what factors explain the consistently weak electoral outcomes of actors who, given their presumed expertise, should be able to capitalise on environmental issues? It is not that Latin American voters are not interested in these topics (see the EIB Climate Survey 2024); on the contrary, mobilisation for environmental causes has increased in recent years (Christel and Gutiérrez 2021). Distrust toward traditional

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and mainstream parties (Sánchez-Sibony 2024) is another factor that might have paved the way for Green Parties in the region, yet they have largely failed to benefit from it.

This paper has two main goals. The first is to provide a general overview of Green Parties' presence across the region. These parties display variations in their age and electoral performance, and differences also exist in their willingness and ability to build alliances with the party in government.

The second goal is to assess the impact of a set of variables to explain the varying success of Green Parties in the region. In Europe, socio-economic factors have been shown to shape voter demand—following Inglehart's post-materialist approach (2008)—and party competition dynamics (Meguid 2008) have also been found to play a role. In Latin America, these factors have yet to be systematically examined. However, as is the case with other political dynamics that are affected by socioeconomic variables, such as clientelism (Justesen and Manzetti 2023) and satisfaction with democracy (Carlin 2006), it is reasonable to expect that socioeconomic factors might also play a role in Latin American Green Parties' performance, as they do in Europe. Alongside these elements, institutional arrangements (Grant and Tilley 2018) and country-specific contexts, such as environmental conflicts (McNeish 2018), may also influence voter behaviour.

The paper is organised into four sections. Following an overview of Latin American Green Parties and the theoretical literature explaining their performance, the second section presents the working hypotheses. The next section outlines the data and methods employed, while the fourth section analyses and interprets the results. Finally, we conclude by summarising the main findings and discussing their broader implications.

## 2 | Green Parties in Latin America

Partido Verde Ecologista de México (PVEM) and Partido Verde (PV) from Brazil were established in the context of domestic democratisation processes in 1986. These two parties were pioneers of green politics within the region. The emergence of parties dedicated exclusively to environmental issues marked a novel development in Latin America's political landscape (Di Tella 2004). The other Green Parties in the region have more recent origins, with one of the youngest achieving a national presence, the Uruguayan Partido Constitucional Ambientalista, having only been established in 2023. The proliferation of these new parties is consistent with the idea that exogenous challenges generate opportunities for new parties to emerge (Cyr and Liendo 2020). In this context, environmental concerns, such as deforestation, would have helped Green Parties to carve out their place. Additionally, the weakening of traditional parties (Luna et al. 2021) has broadened this window of opportunity. The expansion of the party family in the region has also both resulted from and contributed to a process of transnational party formation, which has gradually strengthened members' organisational structures and culminated in the creation of the Federación de Partidos Verdes de América, a regional transnational network.<sup>1</sup>

Alongside the growing numbers of Green Parties, recent elections have seen exceptionally good performances at the national

level, relative to their historical record. For instance, in the Mexican 2024 and Colombian 2022 elections, the PVEM and Partido Alianza Verde received their largest share of the seats (15.4% and 8.02% respectively). Moreover, even their traditional lack of electoral strength has not precluded Green Parties from becoming key actors in coalitions, since left-leaning parties have been willing to establish pacts with them in recent years. Currently, Green Parties are part of left-leaning government coalitions in four Latin American countries: Mexico, Chile, Brazil, and Colombia. This has been in part made possible by the fact that progressive leaders, such as Petro (Colombia), Boric (Chile), and Lula (Brazil) (Bello 2022), have added a 'green twist' to their manifestos. Finally, at the local level, Green Parties have achieved comparatively greater success, with Colombia and Mexico being the most emblematic cases. The significance of this subnational performance lends support to Gahrton's (2015) thesis on the evolution of green politics—from local movements with green demands to the formation of green political parties.

Regarding their organisation, there is a sense that Green Parties have a 'double soul'. On the one hand, they could be said to operate as niche parties in Latin America (Kerneck and Wagner 2019). This means that they are far from a catch-all type and that they tend to emphasise a narrow set of issues that other parties tend to neglect. On the other hand, criticisms of Green Parties' priorities suggest that they develop clientelist strategies and display a pragmatic approach to politics where 'green' is primarily used as a marketing tool.<sup>2</sup> To some extent, this pragmatism aligns Green Parties with the political practices characteristic of other parties in the region (Barreda et al. 2024).

Another relevant organisational feature is that Green Parties have developed diverse ties with other actors. For instance, Partido Verde has historically had links with members of Partido de los Trabajadores, whereas the PVEM had relationships with Partido Revolucionario Institucional, as well as with civil society initiatives, such as Alianza Ecologista Nacional when it was first created.

Given the high levels of volatility in Latin American party systems (Cohen et al. 2018), Green Parties face challenges in establishing themselves and surviving across electoral cycles. In those countries with a more stable party system, however, they have managed to leverage these inter-party linkages to affirm themselves on the national stage. For example, in Chile, they initially supported different and more established parties, such as Partido Humanista or Partido Por la Democracia, and struggled for some time before emerging as autonomous actors.

In this context, it might not be coincidental that the stronger Green Parties, PV, PVEM, and Alianza Verde have relied on their links with other parties as a key survival strategy.

At least three sets of explanations derived from the European experience can also be expected to influence Green Parties' performance in the region. The first deals with voters' demands. For instance, high levels of economic development are believed to have facilitated Green Parties' electoral success in Europe. It has been contended that economic security leads youth to prioritise post-materialist concerns over materialist ones (Inglehart 2008). Studies of citizens' values in the Global South suggest

that the relationship between socio-economic development and postmaterialist values is also present in Latin America (Yamin Vázquez 2020). Whether it influences voting behaviour along similar lines to those of the Global North, however, is unclear.

Socioeconomic factors may also play a role for reasons unrelated to the modernisation hypothesis. In the case of Latin America, these factors are likely to affect Green Parties' performance given the salience of economic matters in party competition, which is mainly organised around a single economic dimension. This contrasts with European party competition, which is structured around socioeconomic and cultural issues (Martínez-Gallardo et al. 2023). The impact of the socioeconomic context on voters' demands remains untested for Latin America. We know that positional issue voting has a limited say in voting behaviour, as illustrated below, but new evidence is needed (Baker and Greene 2015).

Leaving aside party competition for the moment, and continuing with the theme of voter demand, other contextual factors may also play a role. The existence of environmental catastrophes, such as that of the Amazon, might improve Green Parties' electoral prospects. Conflicts around state involvement in mining activities have also been prevalent (Bornschieer and Vogt 2024). As an example, the contract that the Panamanian government signed with a Canadian company for mining generated huge social protests, which forced the government to cancel the contract. Similarly, several presidents in the region have faced popular consultations challenging their decisions and corporate interests (Acosta García 2022). Additionally, many political phenomena are directly or indirectly related to the environment in Latin America. For instance, natural resources have affected the nature of Latin American states. Recently, following presidents Morales (in Bolivia) and Correa's (in Ecuador) 'left turn', states became heavily involved in extractive activities and created extensive infrastructures to accomplish their social agenda (Arsel et al. 2016).

Finally, another issue that affects voters' demand is polarisation. In Europe, increased spatial polarisation has been linked to the rise of Green Parties, as it created openings for niche actors (Ellger 2023). Similar to Europe, higher levels of party system polarisation in Latin America have been associated with greater programmatic structuring of the party system, which we expect to help issue-based parties (Béjar et al. 2020).

There is a second set of explanations regarding Green Parties' performance, which has to do with mainstream party strategies (Meguid 2008; Grant and Tilley 2018). If environmental issues are framed by well-established parties, then Green Parties lose their niche and their electoral chances decrease. To date, the literature on political cleavages highlights the point that environmental issues in the region have limited power in party-system structuring. Environmental issues, in fact, do not operate as an axis of competition of their own. On the contrary, environmental demands tend to be absorbed within existing socioeconomic cleavages (Martínez-Gallardo et al. 2023). Despite the magnitude of the challenges for the region, these issues have received very little attention in electoral politics. This does not necessarily mean that they have generated no societal confrontation, but they have not been a decisive topic in campaigns or in party

leaders' support. Therefore, Green Parties will face reduced opportunities if they do not widen their scope of interests, such as including new issues in their electoral platforms. Regarding party-level rivalry, alignment between Latin American left-of-center parties and environmentalism is not as clear-cut as in the global north (Ryan 2017). Nonetheless, both the recent emergence of eco-socialist parties and the incorporation of environmental issues into the agendas of progressive candidates, mentioned above, can be expected to have undermined Green Parties' prospects (Barros 2018; Maillet et al. 2023).

All of this is also expected to be affected by other party system dynamics that have proven to be relevant in the region, such as personalisation, clientelism, and their interrelation (Barreda et al. 2024). Green Parties, given their issue-driven nature (Kitschelt et al. 2010; Ruth 2016), are potentially negatively affected whenever programmatic links are overshadowed by clientelist and personal links, which often occur in the Latin American context (Singer and Ramalho Tafoya 2020). Overall, these contextual factors might limit the chances of positional issue voting, such as environmental awareness. Still, hope remains for Green Parties. Research from the region suggests that niche parties can strategically adapt by employing alternative linkages when programmatic appeals are ineffective (Kerneckner and Wagner 2019). This interpretation is consistent with the aforementioned "double soul" of the party family that commentators have observed.

However, maintaining the focus on issue-based mobilisation and on how regional rivals deal with environmental issues, there is evidence that environmentalism has been more effectively championed by NGOs and indigenous people than by Green Parties (Christel and Gutiérrez 2021).

Another set of factors, which concerns institutional arrangements, may also hold explanatory potential. Prior research has shown that proportional representation systems tend to favour parties with narrower issues compared to majoritarian, single-member district systems (Ezrow 2010; Bergman and Flatt 2020). Moreover, some evidence from Europe suggests that decentralised governments provide more favourable opportunity structures for green parties, as they can facilitate mobilisation around environmental issues, although their effects appear less clear than those of socio-economic indicators and patterns of party competition (Grant and Tilley 2018). Incorporating this institutional dimension into the study of Latin America is warranted, as prior research has shown how decentralisation has significantly influenced party institutionalisation in the region. For example, we know that decentralisation has challenged Latin American political parties, especially in contexts of poor economic conditions and scarce ideological differentiation (Harbers 2010; Morgan 2018). On the other hand, those policies that have hindered national established parties might have also created opportunities for Green Parties: the Chilean Green Party and Colombia's Green Alliance seem to have leveraged decentralisation to gain local footholds and build visibility (BCN 2020; Flint 2023).

Overall, Latin America is a perfect laboratory to test the generalisability of these sets of theoretical arguments. By focusing on this region, it is possible to observe cases with relatively low GDP

levels and wide cross-country variations, conditions rarely found in Western European countries. This can help us redefine the circumstances that determine the impact of Green Parties' economic development. Moreover, while systemic analyses of these factors have primarily guided region-wide European research, some of the literature presented above also highlighted their individual relevance for Latin American cases. Finally, the effects of other parties' strategies on Green Parties, such as the existence of established left-wing parties with the potential to capitalise on environmental issues, remain unexplored in Latin America and thus need to be researched.

To address this, in the next section, we outline the main aspects of our research design, including our main hypothesis and the data that will be used in order to provide an explanation about Green Parties' electoral performance in Latin America.

### 3 | Research Design

#### 3.1 | Hypotheses

Among the most likely drivers of votes for green parties is the socio-economic development of a society. According to modernisation theory, higher levels of development are associated with greater interest in post-materialist concerns, among which environmental issues are typically included. It is therefore expected that:

**H1.** *Even in Latin America, higher levels of socio-economic development are positively correlated with both the presence and a stronger performance of green parties.*

The specific role that Latin American countries occupy within the global economy offers an alternative pathway for fostering support for environmental parties. In countries such as Bolivia, Peru, and Chile, social resistance to extractivist projects has often been spearheaded by Indigenous movements. How these mobilisations have, at times, led to the emergence of ethnic parties with a strong environmental orientation has been the focus of some research (Van Cott 2005; Ewig 2022; Giusti-Rodríguez 2024).

However, we argue that environmental conflicts, along with degradation stemming from the export-driven commodity dependence of many South American economies, can also create fertile ground for the formation and electoral success of Green Parties. For once, although Indigenous parties are effective at 'owning' environmental issues, they still rely on an ethnic component that is not present or effectively organised in all the region's countries, or they often lack a solid foothold in these countries' urban centres (Bretón et al. 2022). Images of the country's environmental degradation are then left open to be used as a mobilising factor by green parties, or to push environmental movements and NGOs to establish new electoral vehicles. Given this, our expectation is that:

**H2.** *Extractivism is positively correlated with both the presence and performance of green parties.*

Among the factors highlighted in the second and third sets of explanations from previous studies, we also posit that higher

levels of decentralisation positively influence Green Parties in Latin America, just as it does in Europe. Generally speaking, decentralisation has proved to be an incentive for the development of new parties, since new arenas of party competition are created (Cyr and Liendo 2020). Second-order elections are more accessible to niche parties (Grant and Tilley 2018), and we can speculate that the more resources and political prestige are attached to regional or provincial offices, the more these positions can serve as a springboard for accumulating the political capital necessary to compete effectively in first-order elections. Finally, Grant and Tilley (2018) note that the formation of certain Western Green Parties from local environmental groups suggests that regional autonomy can facilitate Green Party growth, with evidence of similar tendencies also observed in Latin America (BCN 2020).

Therefore, we hold that:

**H3.** *Decentralisation is positively correlated with both the presence and performance of Green Parties.*

The party competition literature suggests that established parties' capacity to absorb the environmental issue along the traditional left-right materialist divide may help explain variation in Green Parties' fortunes. However, the lack of systematic data on the environmental positioning of mainstream Latin American parties prevents its in-depth analysis. Similarly, the limited availability of longitudinal and cross-national data on NGOs and Indigenous' mobilisation makes it difficult to assess their role in mitigating green parties' success.

Nonetheless, taking into account the evidence illustrated above, we have grounds to hypothesise a potential effect of left-wing parties on the electoral performance of Green Parties:

**H4.** *Left-of-centre parties' performances are negatively correlated with both the presence and the performance of Green Parties.*

#### 3.2 | Dataset and Dependent Variables

Our dataset includes 18 Latin American countries, with a time frame spanning from 1985 to 2024. In those 40 years, there have been around 200 legislative elections in the region; however, we are only concerned with fair elections, as artificial engineering of the results by autocrats might obscure the effects of our independent variables. Therefore, the Regime of the World Database (Lührmann et al. 2018) was used to filter out elections occurring in 'non-electoral democracies'. This process left us with 152 observations, with 41 (27%) featuring a Green/Environmental party running and receiving more than 0.1% of the vote.

Green and Environmental parties were identified primarily by their official name or label, which included terms such as *Verde*, *Ecologista*, or *Ambientalista*. However, the party name can sometimes be misleading. One can think, for example, of the 'Good and Green Guyana' Party, where Green stands for the name of its leader (Commonwealth Observer Group 1998). Thus, once the party was identified, manifestos and secondary sources were consulted to confirm their commitment to ecological concerns. Ecosocialist parties were excluded to maintain a clearer

coherence within the party family.<sup>3</sup> Moreover, for the present dataset, parties have been automatically considered ‘Green Parties’ if they were members of *Federación de Partidos Verdes de América*.

As for our dependent variables, we used: (1) a dummy variable capturing whether or not a Green Party ran at a given country’s election, receiving more than 0.1% of the vote; and (2) a variable of the Green Parties’ electoral results in legislative elections.<sup>4</sup> Electoral results have been collected from several sources, among which are the countries’ National Electoral Commissions’ websites and Nohlen’s electoral data collections (Nohlen 2005).

### 3.3 | Independent Variables

Starting with our first hypothesis, the post-materialist dimension is captured by variables such as GDP Per Person and Urbanisation rates (Inglehart and Abramson 1994; Delhey 2010). To operationalise the dimension of environmental conflict, we relied instead on the contribution of commodity-export revenues to the countries’ GDP. The assumption is that the greater the reliance on commodity exports, the more accurately the country can be defined as an extractivist economy (Veltmeyer 2013). In turn, the more extractivist the country is, the greater the likelihood of environmental conflicts (Pérez-Rincón et al. 2019), around which the Green Party can successfully rally support. All three of these variables were collected from the World Bank Database.

Building on existing literature on fringe and Green Parties in Europe and Latin America, we hypothesised that decentralisation increases the likelihood of both the emergence and the electoral success of Green Parties (Willey 1998; Müller-Rommel 1998; Carter 2023). To operationalise this dimension, we rely on Hooghe et al.’s Regional Authority Index (RAI).

A second aspect of the ‘opportunity structure’ concerns electoral laws: as we saw, proportional representation (PR) and more permissive electoral systems are known to favour the entrance of niche Parties into parliament. Bormann and Golder’s measure of average district magnitude is employed to measure ‘electoral system permissiveness’ (Grant and Tilley 2018).

At the party system level, we were interested in capturing the influence of left-of-centre parties on the electoral performance of Latin American Green party family members. To identify these parties, we relied on the V-Dem Party Dataset (Lührmann et al. 2020). Parties were classified as centre-left (item value = 2–2.99), left (item value = 1–1.99), or radical-left (item value = 0–0.99) based on item ‘v2pariglef\_ord’, which codes party ideological placement on a scale from 0 (extreme left) to 6 (extreme right). In the previous section, it was mentioned how left-of-centre parties might be targeting a similar voter base to Green Parties, especially in recent years. Nonetheless, even within this framework, the economic radicalism typically associated with more extreme left-wing parties may not directly compete with the often more moderate platforms of Latin American Green Parties. To account for this possibility, we separately analyse the potential effects of centre-left, left, and radical-left parties.

V-Dem also provides data on vote shares for parties that either surpassed 5% of the national vote or hold historical relevance in the country’s party system. However, these variables have limitations. In the case of Argentina, for example, the vote share variable conflates results for party alliances and individual parties, which led us to exclude observations for the country in models that include left-leaning parties’ results. Additionally, the V-Dem Party Dataset covers elections for Latin America only sporadically before 1990 and does not extend beyond 2017. For elections outside this range, we consulted secondary literature, and where party positions remained stable over time, we used the most recent available score to assign left–right ideological placement.<sup>5</sup>

Finally, two variables which are thought to affect voters’ demand were included as controls. These variables are: inflation and polarisation. While neither appeared in previous systematic studies of Green Parties’ success, we consider both relevant to understanding their performance. Inflation is expected to mitigate the influence of post-materialist values, as citizens confronted with a sudden rise in the cost of living may shift their electoral preferences toward parties perceived as capable of addressing economic concerns. Polarisation is thought to shape the competitive space available to emerging parties according to the expectations outlined above.

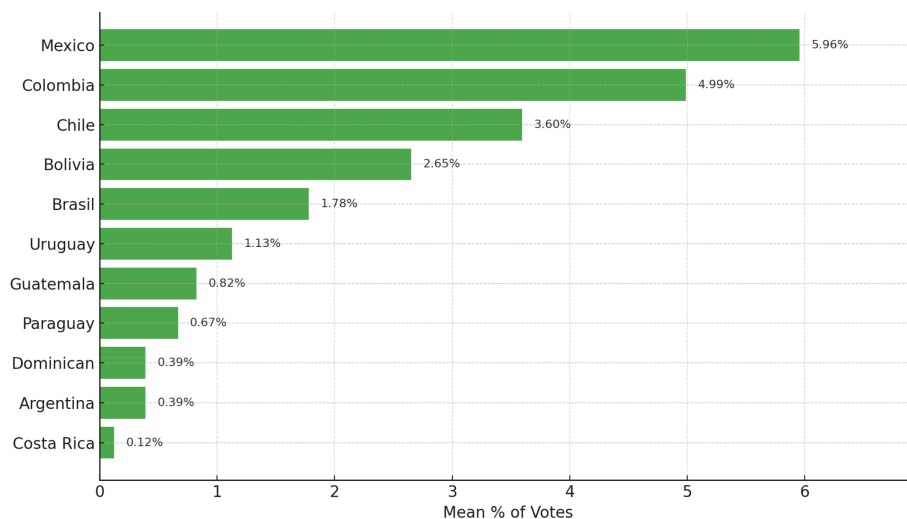
## 4 | Results

### 4.1 | Descriptive Statistics

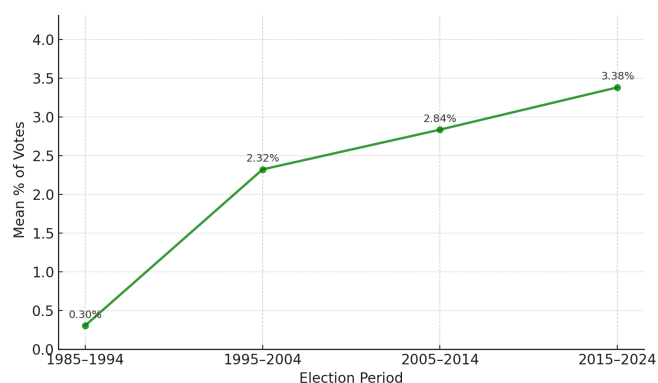
The average share of votes achieved by Green Parties in competitive elections is around 0.79%, with the maximum share of votes recorded in Mexico at the 2006 elections. However, if we consider only the elections in which Green Parties had run, their electoral figure improved, although they would still fall short of reaching the 3% threshold, halting at 2.8%.

Figure 1 plots the average results that green parties obtained in their respective countries’ electoral history. Older and more institutionalised green parties, such as those in Colombia and Mexico, fare better than those that are more ephemeral or more recent. However, this direct comparison overlooks the fact that—despite their limited number of electoral campaigns—the Green Parties in Bolivia and Chile have, on average, had stronger electoral performances than their Brazilian counterpart. This is notable given that Brazil’s Green Party is among the region’s oldest, suggesting that party age may matter, but is far from decisive. Moreover, the Brazilian case also highlights that electoral strength does not necessarily translate into influence, as the party has managed to participate in governing coalitions multiple times despite its modest vote share.

Even when only considering those few countries where Green Parties have obtained sufficient support to participate in national elections, these results confirm that these parties in the region remain unable to mobilise or attract a significant number of voters. Nevertheless, a longitudinal perspective on their electoral performance offers a somewhat more optimistic outlook for their future (Figure 2).



**FIGURE 1** | Percentage of average vote for Green Parties per country (Lower Chamber, 1985–2024).



**FIGURE 2** | Mean % of vote for Green Parties by decade.

**TABLE 1** | ANOVA.

Groups	Mean	SD
1985–1994	0.0682	0.27716
1995–2004	0.3695	1.11966
2005–2014	0.8883	1.97299
2015–2024	1.3688	2.43043

Latin American Green Parties, when running, have, in fact, progressively improved their electoral performances over the decades. In the midst of the third wave of democratisation (1985–1995), their average performance was below 0.5%, but with the consolidation of democracies in the region, this value has increased more than tenfold. The means of the Green Parties’ votes were also tested through ANOVA (Table 1) with results significant at the 0.99% level,  $F(3, 179) = 5497, p = 0.001$ . A post hoc Tukey Honestly Significant Difference (HSD) test indicated that the mean of Green Parties’ vote share during the last decade under observation was significantly higher than during the 80s and 90s ( $p = 0.001/0.027$ ).

To identify whether this electoral trend is likely to continue, more information should be gathered about the probable causes behind

its growth. This will be addressed in the following section, which deals with the interpretation of the outcome of a series of logistic models.

## 4.2 | Quantitative Analysis

The first dimension of Green Parties’ performance under examination is their ability to compete in national elections. Specifically, the analysis seeks to identify which factors influence the likelihood of a Green Party appearing on the ballot (and obtaining at least some support). The dependent variable is thus a binary indicator of the presence of Green Parties. Given the binary nature of the outcome, the most intuitive and appropriate approach was to conduct a series of binary logistic regression models. Table 2 presents the outcome of four such models. Model 1, the most conservative, excludes variables related to party competition. Model 2 introduces the second set of factors in the analysis. Finally, Models 3 and 4 employ Firth’s logistic regression rather than the traditional maximum likelihood approach, to address potential issues of complete separation due to the high number of factors per event observations.<sup>6</sup> This method is particularly well-suited to our data, which is characterised by a limited sample size. Firth’s correction effectively addresses this challenge, outperforming models that rely solely on maximum likelihood estimation (Suhas et al. 2023; Van Smeden et al. 2016).

In Model 1 the direction of the coefficients aligns with the theoretical expectations outlined in the introduction. Notably, both GDP per capita, used to capture post-materialist conditions, and the variables measuring system openness are statistically significant. Their direction is also consistent with our expectations, lending support to Hypotheses H1 and H4. However, when electoral results of left-leaning parties are included in Model 2, the significance of regional autonomy and district magnitude disappears. In its place, the electoral strength of centre-left parties becomes a significant predictor, suggesting that party competition dynamics play a key role in determining Green Party presence. Model 2 would suggest that Green Parties are damaged by the performance of centre-left parties only, which might be explained by the ‘Green Party profile’ as mostly moderate actors.

**TABLE 2** | Factors for Green Parties' presence and persistence.

Variables	Model 1 (Conservative)	Model 2 (Extensive)	Model 3 (Firth Ext.)	Model 4 (Firth Log.)
GDP (per capita)	0.459*** (0.133)	0.492*** (0.157)	0.380*** 0.114	0.512*** 0.166
Urbanisation	0.024 (0.033)	0.128* (0.059)	0.088* 0.041	0.111 0.055
Extractivism	0.081 (0.094)	0.125 (0.098)	0.105 0.065	0.094 0.075
Regional autonomy	0.171* (0.067)	0.090 (0.080)	0.066 0.063	-0.104 0.107
District magnitude	0.208* (0.104)	0.299 (0.133)	0.158 0.087	0.183 0.132
Inflation	0.031 (0.037)	0.075 (0.051)	0.062 0.037	0.102 0.044
Polarisation	-0.140 (0.402)	0.213 (0.684)	0.237 0.495	0.523 0.614
Centre-Centre Left		-0.045 (0.038)	-0.031 0.027	-0.001 0.028
Centre-Left-Left		-0.120* (0.048)	-0.084* 0.033	-0.112* 0.052
Left-Radical Left		-0.042 (0.031)	-0.034 0.022	-0.024 0.025
Green Party Lag				4.372 1.345
N (1-0)	101 (72-29)	101 (72-29)	101 (72-29)	99 (72-27)

The fact that the results of Model 3 match those of the Binary Logistic Models further supports the conclusion that GDP per capita and Party Offer are the most likely contributors to Green Party presence. A conceptual caveat to consider is that the first series of models, from 1 to 3, conflates party emergence with persistence. While the models effectively capture the structural and contextual factors associated with a green party's presence, they do not distinguish between those facilitating initial entry and those that sustain long-term participation. This is particularly relevant since institutional inertia or access to public funding and media can significantly increase the likelihood of a Green Party running in subsequent elections, regardless of the original enabling factors. For this reason, Model 4 introduces a lagged measure of Green Party electoral performance as a predictor. The 'lagged Green Party variable' exhibits a large and highly significant coefficient, while previously significant predictors, such as the performance of left-leaning parties, lose significance. Notably, GDP per capita remains significant and positively correlated, reinforcing the first hypothesis regarding party presence. Socio-economic development, as a proxy for post-materialist values, appears to facilitate the emergence of parties prioritising environmental issues, which, after all, is typically associated with post-materialist agendas.

**TABLE 3** | Factors for Green Parties' first entry.

Variables	Model 5	Model 6
GDP (per capita)	0.3168*** 0.116	0.295*** 0.107
Urbanisation	0.0417 0.033	0.104 0.055
Decentralisation		-0.020 0.087
Centre-Left		-0.068 0.044
N	79 (72-7)	79 (72-7)

Table 3 presents the results of two additional Firth logistic regression models, which employ a slightly modified dependent variable relative to those in Table 1. The alteration was made to further investigate the difference between the emergence and persistence of Green Parties. Rather than examining Green Party presence, these models focus on their entry. 'Entry' is operationalised as the first instance in which a country's Green Party scored '1' on the Green Party Presence variable. If a Green Party skipped

one or more elections before running again, both occurrences are retained. This restriction slightly reduces our sample size and considerably reduces our sample of positive events (Green Presence = 1), further justifying the use of Firth's penalised likelihood method over standard maximum likelihood estimation.

To maximise robustness and account for the limited number of positive events, the models include only factors found significant in Table 2. Even in these conservative specifications, the ratio of predictors to positive events remains low, falling below recommended thresholds in the case of Model 6. Accordingly, these results should be interpreted cautiously and viewed as exploratory.

Overall, by exhibiting the same significant relationships, the findings in Table 3 support the idea that both the initial emergence and sustained presence of Green Parties are largely driven by the same underlying factor: socioeconomic development. As for the case of Green Party presence, the modernisation theory is seen as the most likely explanation for the significant relation between GDP per capita and Green Party entry.

Finally, before examining the impact of our variables on the actual number of votes received by Green Parties, we have to consider the zero-inflated situation we are facing. This is a challenge that has also affected other works dealing with niche party families. The quantitative literature investigating, for instance, radical-left parties' electoral performances has frequently relied on a Tobit regression to account for right-censored dependent variables (e.g., Meguid 2008; Grant and Tilley 2018). However, this approach is poorly suited to our case, as only 28% of our observations feature a Green Party running and receiving more than 0.1% of the vote. This would mean that over 70% of the data would be excluded. Thus, the Tobit model would discard too many observations, leaving the sample too small for reliable inference.

Traditional linear models were also abandoned due to the highly right-skewed distribution of our sample. Within these constraints, a fractional logistic model offered us an acceptable path forward. Since our dependent variable represents a proportion of the total votes cast, it is bounded between 0 and 1, making the model better suited for our goal (Villadsen and Wulff 2021). Moreover, this approach allowed us to estimate the fractional logistic model with cluster-robust (sandwich) standard errors (Model 7 and Model 8), which provide more reliable inference by accounting for potential within-country correlation of observations (Arundell et al. 2022; Young and Shah 2024). Because the number of country clusters is small (<40), we introduce in Model 9 the Satterthwaite correction to the cluster-robust variance estimator to reduce downward bias in the estimated standard errors (McCaffrey and Bell 2006; McNeish and Stapleton 2016).

Models 7 and 8 once again confirm the importance of GDP per capita and center-left vote shares for Green Parties (Table 4). The reasons why these factors impact Green Parties' performance are largely the same as those presented to explain Green Party presence and entry.

**TABLE 4** | Factors for Green Parties' performances.

Variables	Model 7	Model 8	Model 9
	(Sandwich)	(Sandwich)	(Satterthwaite)
GDP (per capita)	0.130*	0.156*	0.156
	0.063	0.071	0.071
Urbanisation	0.015	0.056	0.056
	0.046	0.038	0.038
Extractivism	0.045	0.046	0.046
	0.073	0.070	0.070
Decentralisation	0.198***	0.149***	0.149*
	0.058	0.054	0.054
District magnitude	-0.068*	-0.066*	0.066
	0.024	0.027	0.027
Inflation	-0.021	0.006	0.006
	0.040	0.044	0.044
Polarisation	-0.057	0.074	0.074
	0.261	0.468	0.468
Centre-Centre-Left		-0.019	-0.019
		0.0265	0.0265
Centre-Left-Left		-0.048*	-0.048
		0.021	0.021
Left-Radical-Left		-0.0210	-0.0210
		0.0176	0.0176
<i>N</i>	101	101	101

District magnitude is also significantly correlated, as it was for the models in Table 2.<sup>7</sup> Interestingly, the relationship between district magnitude and Green Party performance is negative, which is counter-intuitive given the expectation that niche parties should perform better under more permissive electoral systems. However, once additional controls are introduced, this association loses statistical significance, suggesting that the initial result may reflect statistical noise. Still, the Mexican Green Party's strong electoral performance despite operating within a semi-majoritarian system should remind us of the capacity for Green Parties to also thrive in these circumstances.

Perhaps the most original result that we have obtained from these models is the constant significance of decentralisation. This variable remains significant even in Model 9, where small-sample standard errors were obtained via the Satterthwaite adjustment, indicating the robustness of this finding. Notably, this variable was found to reach a *p* value <0.05 also in Grant and Tilley's (2018) in their study of Green Parties in the Western World, suggesting that this relationship may reflect a more universal feature of the Green party family. This finding aligns with their argument that decentralisation enhances opportunities for mobilisation, including around environmental issues, thereby benefiting Green Parties. An alternative explanation we propose is that Green Parties may be more likely to succeed nationally if they have previously won prestigious local elections, where they can gain experience and renown. The more autonomy and importance these sub-national polities have, the more visibility Green Party officials can gain when at their helm.

## 5 | Discussion and Conclusion

Aside from a few historical exceptions, most countries in the region still lack green or one-issue environmentalist parties capable of enduring across multiple electoral cycles. Nonetheless, in recent decades, their average vote share has shown a steady, albeit modest, upward trend, and they have generally managed to present themselves as attractive coalition partners. This led us to investigate the factors behind their presence and electoral success.

Among our set of variables, decentralisation plays an important role in the presence and performance of Green parties. While the number of observations comprising our dataset calls for caution when interpreting these results, this finding holds across all the different models and is consistent with the mainstream literature on Green Party politics. However, we proposed two possible explanations for this relationship. In-depth studies will have to be conducted to adjudicate between them and examine the specific ways through which Green Parties can leverage subnational victories to strengthen their prospects in first-order elections and how local mobilisation can contribute to their formation.

GDP per capita, used here as a proxy for the prevalence of post-materialist values, and centre-left parties' share of the vote also remain stable predictors for the presence of Green parties in Latin America. This would represent one of the first empirical pieces of evidence of center-left and Green Parties catering to a similar electorate. However, given the ambiguous role of left-right ideology in shaping Latin American party systems, future research should examine whether moderate, rather than specifically moderate left-wing, parties attract green voters.

In contrast, our expectation about economic dependence on extractivism, and its role in creating political opportunities for Green Parties, is not supported by the data. This further highlights the specificity of the dynamics that underpin environmental and indigenous mobilisation, from those related to more institutional forms of environmental politics.

Overall, therefore, the processes behind the success of European and Latin American Green Parties seem to resemble each other. However, this should not justify disinterest in understanding more about Latin America's green parties. Many aspects of their development remain insufficiently examined, including the social and attitudinal profiles of their voter base and the extent to which they successfully mobilise citizens with genuine environmentalist convictions. Future voter-centred analyses will be equally essential to confirm the connection between socio-economic conditions, post-materialist values, and electoral behaviour.

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### Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

### Endnotes

<sup>1</sup>Other green parties are: Partido Ecologista Verde (Chile), Federación Regionalista Verde Social (Chile), Partido Verde Dominicano (o Partido Socialista Verde) (Dominican Republic), Partido Ecologista Radical Intransigente (Uruguay), Partido Verde Paraguay, Partido Alianza Verde (Colombia), Partido Verde Oxígeno (Colombia), Movimiento Ecológico de Venezuela.

<sup>2</sup>In 2015, a Guardian newspaper article made claims about PVEM's corruption and selling of favours in exchange for power <https://www.theguardian.com/world/2015/apr/21/mexico-green-party-corruption-claims-environment>.

<sup>3</sup>All Radical Left-wing parties whose programs contain references to an environmentalist platform are considered as 'Socialist Green Parties'.

<sup>4</sup>For the first dependent variable, when Green Parties participate in a coalition during an election, we apply the method used by Grant and Tilley (2018) to estimate the portion of the total vote received by the coalition that is attributable to the Greens. This method involves reallocating the coalition's vote share by looking at the proportion of seats that each coalition member secured.

<sup>5</sup>The fact that all Indigenous parties achieving more than 5% of votes were also radical left-wing parties, and that Indigenous parties are present with a significant share of votes in only three countries led to the exclusion of this dimension from the study, which remains focused on the parties' purely economic-ideological dimension.

<sup>6</sup>Some works have argued that the '1 factor per 10 events' rule of thumb with positive observation should be relaxed even when dealing with Maximum Likelihood model (Vittinghoff and McCulloch 2007), however, given that in our models the ratio factors/observations is bordering on the acceptable threshold even for these less conservative interpretations, we still decided to corroborate our results with Firth's modelling (Van Smeden et al. 2016).

<sup>7</sup>We dropped those observations with Inflation values above 100%, as some countries, such as Bolivia and Peru, have experienced inflation levels even higher than 1000%.

### References

- Acosta García, N. 2022. "Can Direct Democracy Deliver an Alternative to Extractivism? An Essay on Popular Consultations." *Political Geography* 98: 102715. <https://doi.org/10.1016/j.polgeo.2022.102715>.
- Arce, M., R. E. Miller, C. F. Patane, and M. S. Polizzi. 2018. "Resource Wealth, Democracy and Mobilisation." *Journal of Development Studies* 54, no. 6: 949–967. <https://doi.org/10.1080/00220388.2017.1311408>.
- Arsel, M., B. Hogenboom, and L. Pellegrini. 2016. "The Extractive Imperative in Latin America." *Extractive Industries and Society* 3, no. 4: 880–887. <https://doi.org/10.1016/j.exis.2016.10.014>.
- Arundell, L., J. Salmon, A. Timperio, et al. 2022. "Physical Activity and Active Recreation Before and During COVID-19: The Our Life at Home Study." *Journal of Science and Medicine in Sport* 25, no. 3: 235–241. <https://doi.org/10.1016/j.jsams.2021.10.004>.
- Baker, A., and K. F. Greene. 2015. "Positional Issue Voting in Latin America." *Latin American Voter: Pursuing Representation and Accountability in Challenging Contexts* 7: 173–194.
- Barreda, M., P. Otero-Felipe, and L. M. Ruiz Rodríguez. 2024. "Clientelism and Ideological Competition: The Impact on Ideological Overlapping." *Journal of Elections, Public Opinion and Parties* 34, no. 3: 552–572. <https://doi.org/10.1080/17457289.2023.2190120>.
- Barros, A. T. D. 2018. "A Esquerda Verde: Partidos políticos e Ambientalismo Radical no Brasil." *Dados* 61, no. 2: 503–540.

- Béjar, S., J. A. Moraes, and S. López-Cariboni. 2020. "Elite Polarization and Voting Turnout in Latin America, 1993–2010." *Journal of Elections, Public Opinion and Parties* 30, no. 1: 1–21. <https://doi.org/10.1080/17457289.2018.1545775>.
- Bello, M. 2022. "¿Puede la nueva 'marea rosa' de América Latina volverse verde?" *Dialogue Earth*. <https://dialogue.earth/es/clima/52162-puede-la-nueva-marea-rosa-de-america-latina-volverse-verde/>.
- Bergman, M. E., and H. Flatt. 2020. "Issue Diversification: Which Niche Parties Can Succeed Electorally by Broadening Their Agenda?" *Political Studies* 68, no. 3: 710–730. <https://doi.org/10.1177/0032321719865538>.
- Biblioteca del Congreso Nacional de Chile (BCN). 2020. "Los Verdes." *Historia Política*. <https://www.bcn.cl/historiapolitica>.
- Bornschieer, S., and M. Vogt. 2024. "The Politics of Extractivism: Mining, Institutional Responsiveness, and Social Resistance." *World Development* 176: 106493.
- Bretón, V., M. González, B. Rubio, and L. Vergara-Camus. 2022. "Peasant and Indigenous Autonomy Before and After the Pink Tide in Latin America." *Journal of Agrarian Change* 22, no. 3: 547–575. <https://doi.org/10.1111/joac.12483>.
- Bull, B., and M. Aguilar-Stoen. 2014. *Environmental Politics in Latin America: Elite Dynamics, the Left Tide and Sustainable Development*. Routledge. <https://doi.org/10.4324/97801315764276>.
- Carlin, R. E. 2006. "The Socioeconomic Roots of Support for Democracy and the Quality in Latin America." *Revista de Ciencia Política (Santiago)* 26, no. 1: 48–66. <https://doi.org/10.4067/S0718-090X2006000100003>.
- Carter, N. 2023. "Green Parties." In *The Routledge Handbook of Political Parties*. Routledge.
- Christel, L. G., and R. A. Gutiérrez. 2021. "The Political Impact of Environmental Mobilization: A Theoretical Discussion in the Light of the Argentine Case." *Canadian Journal of Latin American and Caribbean Studies / Revue Canadienne Des Études Latino-Américaines et Caraïbes* 46, no. 1: 57–76. <https://doi.org/10.1080/08263663.2021.1855874>.
- Cohen, M. J., F. E. Salles Kobilanski, and E. J. Zechmeister. 2018. "Electoral Volatility in Latin America." *Journal of Politics* 80, no. 3: 1017–1022.
- Cyr, J., and N. Liendo. 2020. "Party Change and Adaptation in Latin America." *Oxford Research Encyclopedia of Politics*. <https://oxfordre.com/politics/view/10.1093/acrefore/9780190228637.001.0001/acrefore-9780190228637-e-1687>.
- Delhey, J. 2010. "From Materialist to Post-Materialist Happiness? National Affluence and Determinants of Life Satisfaction in Cross-National Perspective." *Social Indicators Research* 97, no. 1: 65–84. <https://doi.org/10.1007/s11205-009-9558-y>.
- Di Tella, T. S. 2004. *History of Political Parties in Twentieth-Century Latin America*. Transaction Publishers. <http://archive.org/details/historyofpolitic0000dite>.
- EIB Climate Surveys. 2024. "European Investment Bank."
- Ellger, F. 2023. "The Mobilizing Effect of Party System Polarization. Evidence From Europe." *Comparative Political Studies* 57, no. 8: 1310–1338. <https://doi.org/10.1177/00104140231194059>.
- Ewig, C. 2022. "Ethnic Parties and Indigenous Substantive Representation in Ecuador." *Representation* 58, no. 3: 391–409. <https://doi.org/10.1080/00344893.2020.1837212>.
- Ezrow, L., ed. 2010. "Linking Citizens and Parties: How Electoral Systems Matter for Political Representation." In *Linking Citizens and Parties: How Electoral Systems Matter for Political Representation*. Oxford University Press. <https://doi.org/10.1093/acprof:oso/9780199572526.002.0003>.
- Flint, A. 2023. "En Bogotá, nace una nueva era para la sostenibilidad." *Lincoln Institute of Land Policy*. <https://www.lincolninst.edu/es/publications/articles/2022-01-el-escritorio-del-alcalde-bogota-nace-nueva-era-para-sostenibilidad/>.
- Gahrton, P. 2015. *Green Parties, Green Future: From Local Groups to the International Stage*. 1st ed. Pluto Press. <https://doi.org/10.2307/j.ctt183p8rr>.
- Giusti-Rodríguez, M. 2024. "From Social Networks to Political Parties: Indigenous Party-Building in Bolivia." *American Political Science Review* 118, no. 4: 1803–1823. <https://doi.org/10.1017/S0003055423001272>.
- Grant, Z. P., and J. Tilley. 2018. "Fertile Soil: Explaining Variation in the Success of Green Parties." *West European Politics* 42, no. 3: 495–516. <https://doi.org/10.1080/01402382.2018.1521673>.
- Group Commonwealth Library. 1998. *The General and Regional Elections in Guyana, 15 December, 1997*. Commonwealth iLibrary. <https://doi.org/10.14217/9781848596313-en>.
- Harbers, I. 2010. "Decentralization and the Development of Nationalized Party Systems in New Democracies: Evidence From Latin America." *Comparative Political Studies* 43, no. 5: 606–627.
- Inglehart, R. F. 2008. "Changing Values Among Western Publics From 1970 to 2006." *West European Politics* 31, no. 1–2: 130–146. <https://doi.org/10.1080/01402380701834747>.
- Inglehart, R., and P. R. Abramson. 1994. "Economic Security and Value Change." *American Political Science Review* 88, no. 2: 336–354. <https://doi.org/10.2307/2944708>.
- Justesen, M. K., and L. Manzetti. 2023. "Poverty, Partisanship, and Vote Buying in Latin America." *Latin American Politics and Society* 65, no. 3: 1–19. <https://doi.org/10.1017/lap.2022.66>.
- Kerneck, T., and M. Wagner. 2019. "Niche Parties in Latin America." *Journal of Elections, Public Opinion and Parties* 29, no. 1: 102–124. <https://doi.org/10.1080/17457289.2018.1464014>.
- Kitschelt, H., K. Hawkins, J. P. Luna, G. Rosas, and E. J. Zechmeister. 2010. *Latin American Party Systems*. Cambridge University Press.
- Lührmann, A., N. Düpont, M. Higashijima, et al. 2020. "Varieties of Party Identity and Organization (V-Party) Dataset V1 [Data set]." Varieties of Democracy (V-Dem) Project. <https://doi.org/10.23696/vpartydsv1>.
- Lührmann, A., M. Tannenberg, and S. I. Lindberg. 2018. "Regimes of the World (RoW): Opening New Avenues for the Comparative Study of Political Regimes." *Politics and Governance* 6, no. 1: 60–77. <https://doi.org/10.17645/pag.v6i1.1214>.
- Luna, J. P., R. P. Rodríguez, F. Rosenblatt, and G. Vommaro. 2021. *Diminished Parties: Democratic Representation in Contemporary Latin America*. Cambridge University Press. <https://doi.org/10.1017/9781009072045>.
- Maillet, A., N. Muñoz, A. Maillet, and N. Muñoz. 2023. "Las expresiones del ambientalismo en la competencia electoral: El caso de Chile." *Revista Chilena de Derecho y Ciencia Política* 14: 1–28. <https://doi.org/10.7770/10.7770/rchdcp-v14n1-art62>.
- Martínez-Gallardo, C., N. de la Cerda, J. Hartlyn, L. Hooghe, G. Marks, and R. Bakker. 2023. "Revisiting Party System Structuration in Latin America and Europe: Economic and Socio-Cultural Dimensions." *Party Politics* 29, no. 4: 780–792. <https://doi.org/10.1177/13540688221090604>.
- McCaffrey, D. F., and R. M. Bell. 2006. "Improved Hypothesis Testing for Coefficients in Generalized Estimating Equations With Small Samples of Clusters." *Statistics in Medicine* 25, no. 23: 4081–4098. <https://doi.org/10.1002/sim.2502>.
- McNeish, D., and L. M. Stapleton. 2016. "Modeling Clustered Data With Very Few Clusters." *Multivariate Behavioral Research* 51, no. 4: 495–518. <https://doi.org/10.1080/00273171.2016.1167008>.
- McNeish, J. A. 2018. "Resource Extraction and Conflict in Latin America." *Colombia Internacional* 93: 3–16. <https://doi.org/10.7440/colombaint93.2018.01>.
- Meguid, B. M. 2008. *Party Competition Between Unequals: Strategies and Electoral Fortunes in Western Europe*. Cambridge University Press. <https://doi.org/10.1017/CBO9780511510298>.

- Morgan, J. 2018. "Political Decentralization and Party Decay in Latin America." *Latin American Research Review* 53, no. 1: 1–18. <https://www.jstor.org/stable/26744286>.
- Müller-Rommel, F. 1998. "Explaining the Electoral Success of Green Parties: A Cross-National Analysis." *Environmental Politics* 7, no. 4: 145–154. <https://doi.org/10.1080/09644019808414428>.
- Nohlen, D., ed. 2005. *Elections in the Americas: A Data Handbook 2-Volume Set*. Oxford University Press.
- Pérez-Rincón, M., J. Vargas-Morales, and J. Martínez-Alier. 2019. "Mapping and Analyzing Ecological Distribution Conflicts in Andean Countries." *Ecological Economics* 157: 80–91. <https://doi.org/10.1016/j.ecolecon.2018.11.004>.
- Ruth, S. P. 2016. "Clientelism and the Utility of the Left-Right Dimension in Latin America." *Latin American Politics and Society* 58, no. 1: 72–97.
- Ryan, D. 2017. "Politics and Climate Change: Exploring the Relationship Between Political Parties and Climate Issues in Latin America." *Ambiente & Sociedade* 20: 271–286. <https://doi.org/10.1590/1809-4422ASOCEx0007V2032017>.
- Sánchez-Sibony, O. 2024. "Why Latin American Parties Are Not Coming Back." *Latin American Politics and Society* 66, no. 3: 164–193. <https://doi.org/10.1017/lap.2023.40>.
- Singer, M., and G. Ramalho Tafoya. 2020. "Voter Behavior in Latin America." Oxford Research Encyclopedia of Politics.
- Suhas, S., N. Manjunatha, C. N. Kumar, et al. 2023. "Firth's Penalized Logistic Regression: A Superior Approach for Analysis of Data From India's National Mental Health Survey, 2016." *Indian Journal of Psychiatry* 65, no. 12: 1208–1213.
- Van Cott, D. L. 2005. *From Movements to Parties in Latin America: The Evolution of Ethnic Politics*. Cambridge University Press. <https://doi.org/10.1017/CBO9780511756115>.
- Van Smeden, M., J. A. H. De Groot, K. G. M. Moons, et al. 2016. "No Rationale for 1 Variable Per 10 Events Criterion for Binary Logistic Regression Analysis." *BMC Medical Research Methodology* 16, no. 1: 163. <https://doi.org/10.1186/s12874-016-0267-3>.
- Veltmeyer, H. 2013. "The Political Economy of Natural Resource Extraction: A New Model or Extractive Imperialism?" *Canadian Journal of Development Studies / Revue Canadienne d'études Du Développement* 34, no. 1: 79–95. <https://doi.org/10.1080/02255189.2013.764850>.
- Villadsen, A. R., and J. N. Wulff. 2021. "Are You 110% Sure? Modeling of Fractions and Proportions in Strategy and Management Research." *Strategic Organization* 19, no. 2: 312–337. <https://doi.org/10.1177/1476127019854966>.
- Vittinghoff, E., and C. E. McCulloch. 2007. "Relaxing the Rule of Ten Events Per Variable in Logistic and Cox Regression." *American Journal of Epidemiology* 165, no. 6: 710–718. <https://doi.org/10.1093/aje/kwk052>.
- Wiley, J. 1998. "Institutional Arrangements and the Success of New Parties in Old Democracies." *Political Studies* 46, no. 3: 651–668. <https://doi.org/10.1111/1467-9248.00159>.
- Yamin Vázquez, P. 2020. "Environmental Concern in the Global South: Tackling the Post-Materialist Thesis and the Impact of Ideology." In *Latin America in Times of Global Environmental Change*, edited by C. Lorenzo, 75–91. Springer International Publishing. [https://doi.org/10.1007/978-3-030-24254-1\\_6](https://doi.org/10.1007/978-3-030-24254-1_6).
- Young, E. H., and R. D. Shah. 2024. "Sandwich Regression for Accurate and Robust Estimation in Generalized Linear Multilevel and Longitudinal Models (No. arXiv:2412.06119)." arXiv. <https://doi.org/10.48550/arXiv.2412.06119>.