

# How Is Voter Movement Among Parties Structured? A Gravity Model of Voter Flow

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## **Abstract**

This paper proposes a general model of voter flow among political parties as a function of ideological distance, the social distinctiveness of party electorates, and the gravitational pull of party size. We evaluate the model in two studies. Study 1 uses Dutch and Swiss panel data alongside Comparative Study of Electoral Systems data for 26 countries from 2001 to 2021. The model is stable and explains 60 percent or more of the variation in dyadic voter flow across parties in a wide range of competitive party systems. Study 2 yields consistent results from a conjoint survey in which party attributes are varied experimentally. That a parsimonious model can explain this much variation suggests that the movement of voters among parties is more structured than previously apparent.

**Key Words:** Volatility; Voter Flows; Gravity Model; Cleavage Theory; Spatial Competition

Is there underlying structure in the movement of voters among parties? Vote choice is highly contingent on events and contexts, yet there are grounds for thinking that this complexity may conceal intelligible structure. Voter flow is movement within a system. Rather than asking why individual voters switch parties, we ask why the volume and direction of movement vary across party dyads. The premise of this paper is that a system-level approach can reveal regularities in voter movement arising from the relative positions of parties within the party system.

Gravity models are useful here because they take seriously the idea that the units form a system that is more than the sum of their isolated properties.<sup>1</sup> We adapt this logic to party competition by treating voter flow in a party dyad as a function of distance and size.<sup>2</sup>

Our conception of distance draws on two literatures that speak to this from different angles. Spatial theory conceives parties as more or less substitutable depending on their proximity in programmatic space: voters are more likely to move between parties that are ideologically close than between parties that are far apart (Adams, Merrill, and Grofman 2005; Adams and

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<sup>1</sup> Gravity models have been used across the social sciences to explain flows as a function of the properties of the units and their position within a wider system. In international trade, countries are linked through bilateral exchange (Tinbergen 1962); in migration research, places are linked through population movement (Borjas 1999); and in urban and regional studies, locations are linked through commuting, shopping, and intercity travel (Wilson 1971).

<sup>2</sup> In Newtonian mechanics, gravity is conceived as the force of attraction between bodies, jointly determined by their mass and their proximity (Newton 1687/1999).

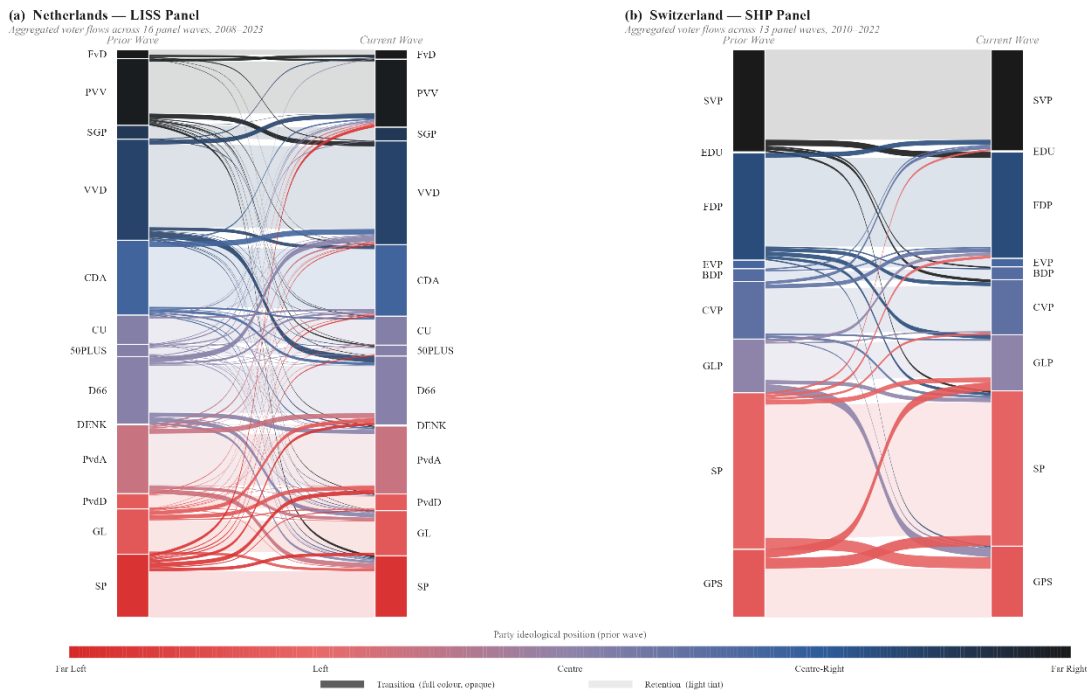
Somer-Topcu 2009; Downs 1957). We conceive this programmatic distance in a two-dimensional space defined by a party's economic left-right and socio-cultural position. Cleavage theory emphasizes that parties are rooted in socially distinctive constituencies and that these constituencies constrain the movement of voters among parties (Bornschieer 2010a; Ford and Jennings 2020; Lipset and Rokkan 1967; Westheuser and Zollinger 2025). We use class, religion, and education to measure differences in the social composition of party electorates, and we describe this as social distance because parties whose electorates differ more sharply in social composition can be considered to be farther apart in social space.

The third element is party size. A gravity model puts party size on the table as a source of voter flow. Party size reflects both the arithmetic fact that larger parties have more voters to lose and the substantive expectation that larger parties are more visible and consequential destinations. Prior work typically treats party vote share as an outcome, and has rarely treated it as an influence on voter movement. By incorporating party mass explicitly, the model allows party size to operate in two ways: as a systematic feature of voter flow and as a mechanical constraint on its volume

**Figure 1** displays the object of analysis: voter flows among parties from one wave to the next. Parties on the left represent vote choice in the prior wave, parties on the right represent vote choice in the current wave, and the bands between them show the volume of movement from one party to another. The overall pattern can vary widely. The Dutch party system on the left is fragmented and volatile, with many thin bands crossing in different directions. The Swiss party system on the right is more concentrated, with fewer parties and a smaller

number of thicker flows. The contrast illustrates the challenge facing a general model of voter flow: is it possible to discover an underlying logic that can account for such different patterns?

**Figure 1:** Alluvial plots of voter flows using the Longitudinal Internet Studies for the Social Sciences for the



Netherlands (LISS) and the Swiss Household Panel (SHP). In each plot, parties on the left represent vote choice in the prior wave  $t-1$ ; parties on the right represent vote choice in the current wave  $t$ . The flows between parties are proportional to the number of respondents moving from one party to another, with colors reflecting the party of prior vote choice. We refer to a flow from  $t-1$  to  $t$  to the same party as retention and a flow between different parties as transition. Parties are ordered from top to bottom based on their average general left-right position estimated using CHES data (Rovny et al. 2025).

Prior research has made major advances in explaining voter mobility. *Beyond Social Democracy* treats voter movement itself as the object of analysis to shed light on how overlaps between party electorates structure competition, and how ideological positioning constrains voter movement among left parties (Häusermann and Kitschelt 2024). Several chapters in the volume shift attention from the electoral fate of individual parties to the

broader field of proximate parties within which voter movement occurs (Häusermann 2024; Polk and Karreth 2024). Similarly, recent research shows that switching is conditioned by ideological incongruence: voters are more likely to defect when the party poorly matches their position in a multi-dimensional policy space (Bakker, Jolly, and Polk 2018; Dassonneville and Dejaeghere 2014). Transitions cluster among ideologically adjacent parties, while mainstream convergence redirects voters toward challengers by altering which parties voters perceive as plausible substitutes (Abou-Chadi and Stoetzer 2020; Hobolt and Tilley 2016; Spoon and Klüver 2019). This logic has been developed in recent work on social democratic decline, which shows that social democratic losses are often redistributed within the broader left field rather than to more distant right parties (Polacko 2023). Finally, and importantly, recent work has made analytical tools available for studying how much volatility occurs and where it goes. Cohen, Krause, and Abou-Chadi (2024) make comparative vote-switching analysis operational by providing a dyadic framework, a cross-national data infrastructure, and a statistical model for studying directional flows in multiparty systems. While this research has not yet produced a general account of voter flows, great strides have been made in showing that voter movement is ideologically structured, concentrated among proximate alternatives, and shaped by the competitive field in which parties are embedded.

Decades of research on vote choice, drawing on dozens of predictors across preferences, identities, and short-term considerations, have explained only a modest share of individual-level variance. The contrast between a systemic model and the much richer individual-level specifications that predominate in the literature rests on a claim about the structure of

electoral politics. Much of what looks like noise at the individual level may become signal at the system level because individual choice unfolds within ideological and social fields that shape which parties are plausible alternatives for which voters.

A series of empirical tests reveals that a sparse model of ideological distance, social distance, and party size can account for much of the variance in voter movement among political parties. Study 1 uses panel data from the Netherlands (2007–2024) and Switzerland (1999–2022) alongside recall data from the Comparative Study of Electoral Systems covering twenty-six countries from 2001 to 2021. With only three parameters, the gravity model explains 63 to 76 percent of the variance in the full matrix of dyadic voter flows across these datasets. Even when retentions are excluded, the model explains 35 to 54 percent of the variance in flows among voters who switch parties. This level of explanatory power is exceptional in the study of parties and voting. The stability of the coefficients across datasets and specifications suggests that ideological distance, social anchoring, and party mass capture fundamental features of democratic party competition.

We then examine whether the elements of the model operate as expected by disaggregating social distance across party families and decomposing party mass into sender and receiver size. Study 2 uses a pre-registered conjoint experiment fielded in Spain in which the three components of the model – ideological distance, social distance, and party size – are experimentally varied to assess their influence on individual-level party choice. Together, these studies suggest that a parsimonious model can travel across diverse party systems and reveal structure that becomes apparent only at the systemic level.

## **A GRAVITY MODEL OF VOTER FLOWS**

We outline the three elements of the gravity model in turn, explaining how each element constrains voter flow and how it relates to existing research. Our purpose is to assess how far a parsimonious specification can go in accounting for the structure of voter flows. We therefore employ widely used measures of ideological distance, social distance, and party mass. The three elements are treated in parallel, though they draw on distinct theoretical traditions. More elaborate operationalizations are possible, and we examine several in the appendix.

### ***Ideological distance***

In the gravity model, distance between parties structures the field of voter movement. The greater the distance, the less likely that a voter will make a transition. Following spatial theory, voters have preferences along ideological dimensions, and parties that are programmatically proximate are more readily substituted for one another than parties that are far apart (Adams, Merrill, and Grofman 2005; Downs 1957). The gravity framework extends this individual-level theory to the system level. Rather than asking why a particular voter switches, it asks why flows between some party pairs are consistently larger than between others.

This expectation is well supported at both the individual and system level. Studies of individual vote switching show that voters are significantly more likely to move between

ideologically adjacent parties than between distant ones. At the system level, research on dyadic voter flows finds that ideological proximity consistently predicts the direction and magnitude of transitions between parties (Abou-Chadi and Stoetzer 2020; Krause, Cohen, and Abou-Chadi 2023; Spoon and Klüver 2019). Häusermann and Kitschelt (2024) show that voter movement is concentrated within ideological fields, with social democratic parties losing most to green and radical left competitors rather than to parties on the right (Polk and Karreth 2024). The gravity model builds on these findings by asking not just which dyads show larger flows, but why the full matrix of flows across all party pairs takes the form it does.

We conceive ideological distance as the Euclidean distance between parties on the economic left-right combined with a socio-cultural or GAL-TAN<sup>3</sup> dimension. This follows the standard proximity logic of spatial voting and mirrors recent applications (Ferland and Dassonneville 2021; Rosset and Kurella 2021; Schofield 1993). The measure is well suited for European multi-party systems because it conceptualizes party competition as multidimensional rather than reducible to a single left-right scale (Bakker, Jolly, and Polk 2012; Dalton 2018; Kriesi et al. 2012).<sup>4</sup>

**H1 (Ideological Distance)** Voter flow between two parties decreases with the ideological distance between them.

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<sup>3</sup> GAL stands for green, alternative, and libertarian. TAN stands for traditionalist, authoritarian, and nationalist (Hooghe, Marks, and Wilson 2002).

<sup>4</sup> We examine alternative specifications of ideological distance in Appendix C (Table C.3).

## ***Social distance***

In the gravity model of voter flow, distance between parties operates in social as well as programmatic space. Political parties can be understood as socially anchored groups with distinctive constituencies that attract or repel voters depending on a voter's willingness to associate with those constituencies. A voter moving to a party whose supporters differ in class, religion, or educational background crosses a social boundary, and that boundary involves a cost. We describe this as the social distance between party electorates, and operationalize it with the Party Cleavage Index (PCI) that measures the dissimilarity of two parties' electorates on a social characteristic (Hooghe and Marks 2026; Marks et al. 2023).

Voters often rely on social images of party supporters to navigate political choice. This happens when parties become associated with recognizable social groups: workers, churchgoers, or university graduates (Bornschieer et al. 2024). These social images reduce the cognitive burden of evaluating complex policy alternatives, particularly when voters have limited political information or weakly articulated preferences (van Oosten 2026; Popkin 1991; Sniderman, Brody, and Tetlock 1991; Zuber, Howe, and Szöcsik 2026). Hence, voters may judge a party by who belongs to it as well as its programmatic position. Research on party identification and partisan socialization shows that a party perceived as socially distant from a voter's own social image is less likely to be considered as a viable option (Ansolabehere and Puy 2016; Bornschieer et al. 2021; Lupu 2016). The implication is that even

ideologically adjacent parties may exchange few voters if they evoke contrasting social identities.

This line of thinking is developed in cleavage theory. In the classic formulation of Lipset and Rokkan (1967), political parties emerged from enduring social divisions that structured political conflict. In European multi-party systems, this generated party families rooted in particular social constituencies: chiefly, Christian democratic parties tied to religious communities (Guth and Nelsen 2021) and socialist and labor parties anchored in the working class. More recent scholarship extends this framework to green and radical right parties linked to an educational divide reflecting cultural predispositions and labor-market location (Attewell and Zollinger 2025; De Jong and Kamphorst 2025; Kriesi et al. 2012; Garritzmann 2026). While social distance constrains voter flows in general, cleavage theory suggests a more specific implication: voter flow is constrained by the extent to which a party is historically tied to a particular social group.

Hypothesis 2 stands as a central expectation in the gravity model: voter flow should decline to the extent that the social composition of party electorates is dissimilar. The subsequent hypotheses are more specific in that they map social distance onto the political cleavages that underpin party families. If social distance is capturing meaningful differences between party electorates, then the substantive consequence of social distance should vary systematically across party dyads.

**Hypothesis 2 (Social Distance)** Voter flow between two parties decreases with the difference in the social composition of their electorates.

**H2a (Christian Democratic)** Religious difference is the strongest social constraint on voter flow in dyads involving Christian democratic parties.

**H2b (Social Democratic/Radical Left)** Occupational difference is the strongest social constraint on voter flow in dyads involving social democratic and radical left parties.

**H2c (Green and Radical Right)** Educational difference is the strongest social constraint on voter flow in dyads involving green and radical right parties.

### ***Party Size***

A distinctive feature of the gravity model is that it introduces party size as a determinant of voter flows.<sup>5</sup> In a gravity model, the attraction between two objects is the product of their combined mass. We argue that a similar intuition applies to voter volatility for two reasons.

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<sup>5</sup> The literature that comes closest to theorizing party size emphasizes three mechanisms: viability, parliamentary representation, and coalition influence. Strategic-voting research argues that voters are less likely to support small parties when they believe those parties cannot win seats or affect the outcome (Blais et al. 2001; Cox 1997). Research on parliamentary thresholds shows that parties that enter parliament subsequently gain support because representation increases their visibility and credibility (Tavits 2006). Coalition theory suggests that larger parties are more attractive because they are more likely to enter government and shape policy (Gamson 1961; Herrmann 2014). What this literature does not do is theorize party size itself as a predictor of voter flow, nor does it distinguish between the arithmetic and substantive elements of party mass.

First, the incidence of voter movement across two parties is arithmetically bounded by the number of voters in each party. This arithmetic constraint mirrors gravity models in other domains, yet it has not been theorized as a factor in voter flows. All else equal, trade increases with the product of the GDP of the units; migratory flows increase with the population of the societies involved; commuting is busier between larger population centers (Beine, Docquier, and Özden 2011; Head and Mayer 2014). Similarly, a larger party will tend to shed more voters because it has a greater pool. Even if voters were randomly reallocating across parties, larger parties would generate larger observed flows.

Second, there are grounds for believing that party size has a substantive role in making a larger party a more likely destination for voters because it is more visible and easier to recognize in a crowded political space. Media attention reinforces this, providing voters who rely on heuristics to navigate complexity with salient cues about which parties matter (Schwarzbözl, Fatke, and Hutter 2020). Size also conveys potential influence: larger parties are more likely to enter government, hold cabinet seats, and have the leverage to implement a voter's preferred policy (Demyanenko and La Mura 2023; Gamson 1961). Hence our expectation is that dyads with larger parties will have larger flows both because larger parties *shed* more voters and because they *attract* more voters on account of their greater media visibility and potential power.

**Hypothesis 3 (Party Mass):** Voter flow increases with the product of the electoral support of parties in the dyad.

**Hypothesis 3a (Arithmetic Component):** Larger parties generate a greater volume of voter transitions because they have larger pools of potential movers.

**Hypothesis 3b (Substantive Component):** Larger parties attract a greater volume of voter transitions because their size enhances visibility and perceived political influence.

### Formalizing the Gravity Model

We now formalize the logic of the gravity-cleavage model in order to derive its empirical specification. Let  $V_{i,j,t}$  denote the number of voters moving from party  $i$  at time  $t - 1$  to party  $j$  at time  $t$ . These flows encompass retentions (where  $i = j$ ) and transitions (where  $i \neq j$ ). Consistent with classic gravity formulations, we model  $V_{i,j,t}$  as increasing with the product of party sizes and decreasing with both ideological distance and social distance. Unlike prior applications of the gravity model, party dyads span time as well as political space: they connect two parties at two time points. Accordingly, we use lagged party sizes and lagged social composition to avoid post-treatment bias. Equation 1 expresses the basic logic of the model: flows are proportional to the product of party size and inversely proportional to ideological distance ( $ID$ ) and social distance ( $SD$ ).

$$V_{i,j,t} \propto \frac{S_{i,t-1} \cdot S_{j,t-1}}{ID_{i,j,t} \cdot SD_{i,j,t-1}} \quad (1)$$

To operationalize ideological distance, we compute the Euclidean distance between parties  $i$  and  $j$  on two dimensions: economic left-right position ( $LR$ ) and socio-cultural position

(*GALTAN*), as shown in Equation 2. This specification follows current research on the dimensionality of European party systems (Bornschieer 2010b; Dassonneville, Hooghe, and Marks 2024; Kriesi and Hutter 2026).

$$ID_{i,j,t} = \sqrt{(LR_{i,t-1} - LR_{j,t})^2 + (GALTAN_{i,t-1} - GALTAN_{j,t})^2} \quad (2)$$

Going beyond the classic gravity model, our argument posits that voter flows are constrained by social differences between parties as well as by ideological distance. To bring this insight into play, we adapt the Party Cleavage Index (PCI) in Equation 3 (Hooghe and Marks 2026; Marks et al. 2023). The PCI for a party on a given attribute  $a$  is the difference between the proportion of party  $i$ 's supporters with attribute  $a$  ( $C_{i,a}$ ) and the proportion of people with attribute  $a$  in the sample ( $S_a$ ), multiplied by 100.

$$PCI_{i,a} = 100(C_{i,a} - S_a) \quad (3)$$

Ranging from  $-100$  to  $+100$ ,  $PCI_{i,a}$  corresponds to the extent of over-representation (positive values) or underrepresentation (negative values) of a group among a party's supporters relative to the society writ large.

The PCI is a feature of individual parties, not dyads. To capture the social distinctiveness of the parties in a dyad relative to one another, we construct a dyadic measure that we refer to as social distance. For each dyad, we calculate the PCI for each party on a number of

relevant social characteristics and then take the largest absolute difference between the two parties' PCI values as our measure of social distance ( $SD_{i,j,t-1}$ ). This follows from the premise that voter movement is constrained by the largest observed difference in the social composition of two party electorates rather than the average difference across all social attributes. As with party size, we use PCI from  $t - 1$  rather than time  $t$  to avoid post-treatment bias. Using values from  $t$  would make the PCI endogenous to the resulting voter flows themselves; calculating  $SD_{i,j,t-1}$  eliminates this possibility.

$$SD_{i,j,t-1} = \max_a | PCI_{i,a,t-1} - PCI_{j,a,t-1} | \quad (3a)$$

Finally, we combine the cleavage element of our argument into a single, tractable statement in Equation 4. We take the natural log of normalized dyadic flow volume because the distribution of dyadic flows is highly skewed: most flows are small, with a long tail of high-volume flows. We divide the count of individuals in a voter flow by the total number of respondents in the relevant wave so that estimates are not driven by changing sample sizes across periods, and we add 1 prior to taking the natural log so that empty flows are not discarded from the model. We also log-transform the product of party sizes to stabilize variance.<sup>6</sup> The resulting model implies that voter flow increases with party size and decreases with ideological and social distance.

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<sup>6</sup> Appendix D presents Poisson and negative binomial models treating the dependent variable as the count of voters in a flow, rather than the log-transformed version presented in the paper. These alternative approaches yield results that do not meaningfully deviate from the results in Table 1.

$$\log \left( \frac{V_{i,j,t}}{N_t} + 1 \right) = \alpha + \beta_1 \log (S_{i,t-1} \cdot S_{j,t-1}) - \beta_2 ID_{i,j,t} - \beta_3 SD_{i,j,t-1} + \varepsilon_{i,j,t} \quad (4)$$

## STUDY 1: AN OBSERVATIONAL STUDY OF VOTER FLOWS

Study 1 tests the model in a wide range of party systems using three sources of observational data: the Comparative Study of Electoral Systems (CSES), the Longitudinal Internet Study for the Social Sciences (LISS) in the Netherlands, and the Swiss Household Panel (SHP). The CSES provides repeated cross-sectional evidence, while the Dutch and Swiss panels allow us to observe voter flows directly. Together, these data enable us to assess whether the gravity model travels across data forms and institutional contexts.

The CSES combines national election studies with a common post-election module that includes items on party preference and voter characteristics. We use Waves 2 through 5, covering 26 European countries<sup>7</sup> between 2001 and 2021. While absent from the first wave, later waves ask respondents which party they supported in the current election and in the preceding election. Following established practice, we use these responses to estimate the volume of inter-party voter flows (Cohen, Krause, and Abou-Chadi 2024).

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<sup>7</sup> Austria, Belgium (Flanders and Wallonia treated separately), Bulgaria, Czechia, Denmark, Estonia, Finland, France, Germany, Great Britain, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, and Switzerland.

A potential concern is that retrospective vote recall may contain random error or systematic bias, for example through overreporting support for winning parties (Belli, Traugott, and Beckmann 2001). However, research evaluating vote recall concludes that recall-based measures are appropriate for estimating aggregate voter flows (Dassonneville and Hooghe 2017). Recall data in repeated cross-sections are less precise than panel data, but they do not appear to be systematically distorted. Still, we analyze the CSES estimates alongside, rather than in place of, the Dutch and Swiss estimates. That the same three parameters perform well across the board reduces the likelihood that the results are an artifact of retrospective recall.

We use the recall vote question to allocate respondents to demographic categories for the calculation of the Party Cleavage Index (PCI). To avoid inflating PCI through post-election flows, we assign demographic attributes based on recalled vote from the prior election. For this broader cross-national sample, we calculate PCI and social distance using three attributes: occupation (production worker versus not), religiosity (weekly religious attendance versus less frequent), and education (college degree versus not).

To estimate ideological distance between parties, we use data from the Chapel Hill Expert Survey (CHES) on party positions on an economic left-right and a GAL-TAN dimension (Jolly et al. 2022; Rovny et al. 2025). We treat these dimensions symmetrically and combine them into a single measure of ideological proximity by calculating the Euclidean distance between each pair of parties. Since CHES is not conducted annually, we linearly interpolate between survey waves to obtain party positions for the relevant election years.

The Euclidean specification assumes that the economic and GAL-TAN dimensions are orthogonal and that each contributes equally to party substitutability. Because these assumptions may be restrictive, we also estimate models in which economic and GAL-TAN distances enter separately in Appendix Table C.3.

Party size is measured as the product of the parties' vote shares in the prior election. This operationalization captures both the arithmetic logic that larger parties have more potential movers and the substantive expectation that larger parties attract more voters because they are more visible and more likely to exercise political influence. To distinguish these mechanisms, we also estimate models that separate the size of the sending and receiving parties.

We supplement the cross-sectional CSES with panel data from the Netherlands and Switzerland. These political systems provide a demanding test of the gravity model because they differ sharply in voter switching. The Netherlands has a fragmented and dynamic party system with high levels of party switching, while the Swiss political landscape is characterized by long-standing parties with consistent voter bases and low levels of switching (Chiaramonte and Emanuele 2017, 2022; Dassonneville 2023, 5). If the gravity model accounts for voter flow in both settings, this suggests that it captures general features of party competition rather than characteristics of a particular type of party system.

The LISS panel survey covers the years 2007 to 2023 in 16 waves in the Netherlands ([www.lissdata.nl](http://www.lissdata.nl)). To measure vote intention, we use the item: "If parliamentary elections were held today, which party would you vote for?" The panel structure allows us to observe

the same individuals in consecutive waves and therefore to identify voter transitions directly rather than infer them from recall.

We calculate the PCI for the over-representation of respondents with a college degree or higher, employment as production workers, religious attendance, and religious affiliation (Catholic, Protestant, Muslim) to capture the constraining role of education, class, and religion on voter transitions. In the Dutch context, religious affiliation complements religiosity because the historical cleavage between Catholics and Protestants remains politically relevant (particularly for confessional parties like the SGP) and because the growth of the Muslim population is reflected in party competition following the emergence of DENK in 2015. Reliance on attendance alone could therefore obscure socially meaningful denominational distinctions among parties whose supporters are similarly religiously observant yet socially distinct. We then measure social distance between party dyads as the largest difference across these PCI values.

The Swiss Household Panel covers the years 1999 to 2022 across 24 annual waves (<https://forscenter.ch/projects/swiss-household-panel>). Respondents are asked: “If federal elections were held today, which party would you vote for?” As with the LISS, we use each respondent’s party preference in consecutive waves to calculate voter flow between party dyads and define party size using vote shares from the prior wave. In the Swiss case, we extend the PCI to include respondents’ primary language (German, French, or Italian), reflecting the importance of linguistic and cultural divisions in Swiss politics, alongside occupation, religiosity, and education. These components of PCI are calculated in the same

manner as in the LISS, and social distance is defined as the largest PCI difference across these dimensions.

For both the LISS and SHP datasets, we continue to use interpolated CHES measures of economic and GAL-TAN positions. As with the CSES, we estimate both Euclidean and disaggregated ideological specifications as robustness checks (Table C.3).

The dependent variable is the number of voters flowing from one party in the prior period to a party in the current period. Because the gravity model requires units with an ideological position, social constituency, and electoral mass, we exclude movement into and out of non-voting. In the two panel datasets (LISS and SHP), flows refer to vote preferences over successive waves. In the CSES data, they refer to respondents' self-reported vote choice in the previous election and their current vote choice.

As can be seen in Figure 1, retentions tend to be large in volume though relatively few in number, while transitions are smaller but far more numerous. The distribution of voter flows is therefore highly skewed: a small number of dyads account for large volumes, while most flows are small. In addition to retentions and transitions, we also estimate empty flows. These are dyads in which there could possibly be a flow from a party at time  $t-1$  to a party at time  $t$ , but no voter actually makes that transition in our data. Because a transition that could

occur but does not should be predicted within the gravity model, we include these cases in our analysis.<sup>8</sup>

The analysis focuses on dyadic flows without individual-level covariates. We examine voter movement at the level of party pairs, treating flows as a relational feature of the party system. Our purpose is to examine the power of a parsimonious systemic model in accounting for the flows of voters in a wide range of party systems.<sup>9</sup>

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<sup>8</sup> This choice is not consequential for our model results. Table B.1 in the Supplementary Material reproduces our preferred model specification for all three datasets excluding empty flows. The model results do not meaningfully differ from those including the empty dyads. We also estimate linear probability models predicting empty flows in Table B.2 and find, as expected within our gravity model framework, that empty dyads are more likely when parties are ideologically distal, socially different, and small. Table B.3 estimates hurdle models that incorporate both a logistic regression to predict empty flows and a Poisson model to predict the size of the flows. The results do not meaningfully deviate from those in the main text.

<sup>9</sup> Because the dependent variable is overwhelmingly cross-sectional rather than within-dyad, the main specifications do not use dyad fixed effects. Party ideology, social structure, and party size also change only gradually over time, so within-dyad estimators discard most of the relevant signal for the gravity model. Appendices F and G report alternative specifications with dyad random intercepts and period fixed effects following similar approaches in the voter flow literature (Krause, Cohen, and Abou-Chadi 2023; Lehmann 2026; Spoon and Klüver 2019), which leave the substantive conclusions unchanged.

## STUDY 1: CROSS-SECTIONAL AND PANEL DATA RESULTS

### *Baseline model*

We begin by testing the gravity specification combining ideological distance, social distance, and party size. There are three expectations: flow size is negatively related to the ideological distance between parties (H1), flow size is negatively related to the social distance between parties (H2), and flow size is positively related to party size (H3). We present the baseline model in the three datasets (CSES, LISS, and SHP). For each dataset we estimate the model for all dyads and for transition dyads only, that is, dyads conditional on exit from a prior party. The outcome variable in each of the six models in **Table 1** is the natural log of the dyadic flow expressed as a percentage of the total respondents in the relevant survey wave. Because the data include repeated observations of the same dyad, all standard errors are clustered by dyad. The CSES models also include country fixed effects (Appendix A). Despite its parsimony, the gravity model accounts for a substantial share of variation in voter flow. In the all-flows specification, the CSES model explains 63 percent of the variation, the Dutch (LISS) data 65 percent, and the Swiss (SHP) data 76 percent.<sup>10</sup>

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<sup>10</sup> See Appendix A for models with the predictors included separately. It also shows the country fixed effect values in Table A.2.

**Table 1. The Gravity Model of Voter Flows**

	CSES		LISS		SHP	
	<i>All flows</i>	<i>Transitions</i>	<i>All flows</i>	<i>Transitions</i>	<i>All flows</i>	<i>Transitions</i>
Ideological distance	-0.158*** (0.011)	-0.099*** (0.008)	-0.119*** (0.025)	-0.045*** (0.009)	-0.177*** (0.028)	-0.090*** (0.015)
Social distance	-0.415*** (0.018)	-0.063*** (0.008)	-0.357*** (0.040)	-0.063*** (0.012)	-0.423*** (0.061)	-0.140*** (0.024)
Party size	0.476*** (0.022)	0.350*** (0.015)	0.063* (0.021)	0.078*** (0.011)	0.169** (0.051)	0.080*** (0.020)
Constant	0.691*** (0.081)	0.478*** (0.068)	0.302*** (0.024)	0.159*** (0.010)	0.402*** (0.030)	0.212*** (0.017)
N	3,324	2,878	1,682	1,537	1,031	920
Clusters (dyads)	1,669	1,475	169	156	132	121
R <sup>2</sup>	0.634	0.378	0.648	0.350	0.754	0.538
Adjusted R <sup>2</sup>	0.630	0.371	0.647	0.349	0.754	0.537

*Note.* The dependent variable is the log of the flow volume as percentage of wave total + 1. Entries are OLS regression coefficients with standard errors clustered at the dyad level in parentheses. All predictors are scaled to mean = 0 and standard deviation = 1 within the estimation sample. Country fixed effects are included in the CSES models.

\*\*\* p < .0001; \*\* p < .001; \* p < .01.

The transitions-only specification poses a substantially tougher prediction challenge.

Transition dyads account for just 20 to 30 percent of all voters, and these voters are dispersed across roughly nine times as many dyads. Notwithstanding this, a gravity model with just three variables explains 37 percent of the variance in the CSES, 35 percent in the LISS, and 54 percent in the SHP.

Across all six models, the coefficient on ideological distance is negative and in the expected direction, indicating that parties that are farther apart programmatically exchange fewer voters. This supports Hypothesis 1: the coefficient is statistically significant at the 0.0001 level in every specification, and in the CSES all-flows model a one standard deviation

increase in ideological distance is associated with a 15.8 percent decrease in voter flow ( $\pm 1.1$  percentage points). This pattern holds for both the full flow matrix and transitions alone, suggesting that ideological distance constrains both voter retention and inter-party movement.<sup>11</sup>

Hypothesis 2 is also supported: social distance is negative and statistically significant at  $p < .0001$  in all six models. In the all-flows specification, a one standard deviation increase in social distance is associated with roughly a one-third reduction in voter flow across all three datasets. In the transitions-only specification, the corresponding reduction is smaller, ranging from 6 to 13 percent. The sharper attenuation in the transitions-only models is theoretically informative. In the full flow matrix, social distance helps distinguish large retention dyads from smaller inter-party flows; once retentions are removed, that source of contrast disappears. In addition, social distinctiveness is often most pronounced among smaller parties, so part of the remaining variation is absorbed by party size in the transitions-only specification.

This result is robust to alternative operationalizations of social distance. In Appendix E, we estimate models using each PCI element separately, all three elements jointly, and alternative summaries of party-level PCI differences. Across these specifications, social distance remains consistently negative. Further checks estimate the gravity model using random slopes by country (Figure I.2) and separately within each CSES party system with

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<sup>11</sup> Alternative specifications that disaggregate ideological distance into economic and socio-cultural components yield substantively similar conclusions and are reported in Table C.3.

sufficient data (Tables I.1, I.2, and I.3). Both approaches allow the predictors to vary by country. In the random slope specifications, all coefficients remain in the same direction and are statistically significant, with only some weakening of significance for ideological distance in cases where social distance has a larger association. In the country-specific all-flows specification, 24 of the 26 countries return all three coefficients in the predicted direction (17 of 26 for transitions only), indicating that the pooled CSES result is not an artifact of averaging across heterogeneous party systems.

Finally, we turn to party size. Hypothesis 3 posits that voter flow volume increases with the product of the sender and receiver parties' electoral support. Party size is positive and statistically significant in all six models, indicating that larger parties exchange more voters than smaller ones. This relationship is especially pronounced in the pooled CSES sample, where cross-national variation in party size is greatest. This holds in both the all-flows and transitions specifications, consistent with the claim that party size matters both through the arithmetic of large electorates and through the greater attraction of larger parties as visible and politically consequential actors.

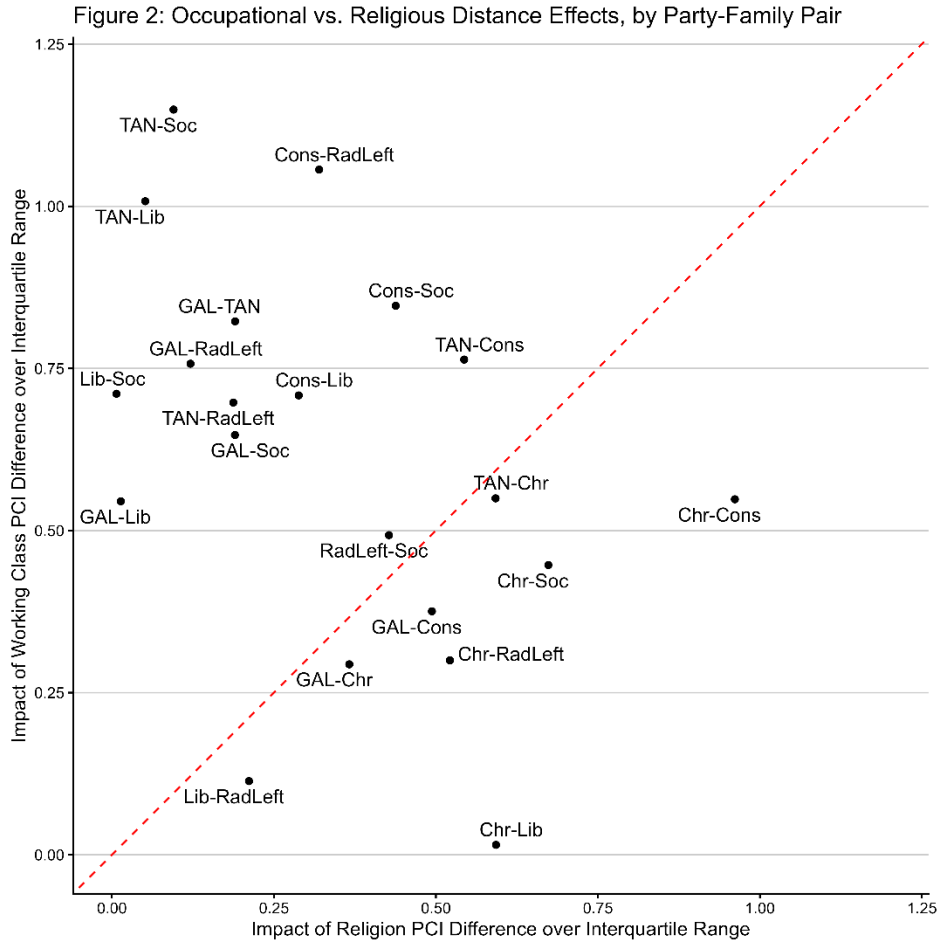
Taken together, these results indicate that the gravity model provides a parsimonious and powerful account of voter flow. Ideological distance, social distance, and party size each contribute independently to the structure of voter movement across both the full matrix of flows and transitions alone. We now turn to a more specific implication of the argument: whether the role of social distance varies across party families.

## ***Social Distance Across Party Families***

We now examine whether the dominant component of social distance varies systematically across party families. To do so, we compare the magnitudes of the absolute predicted change in voter flow associated with moving from the 25th to the 75th percentile in religious, occupational, and educational distance within the fully specified gravity framework. If the social-distance measure is capturing meaningful cleavage structure, the strongest component should reflect the historical social anchoring of the parties involved. The analysis is both a test of Hypotheses 2a–2c and a diagnostic check on the interpretation of the social-distance measure.

We frame the comparison around pairwise contrasts for the three components of social distance. As expected, occupational and educational distance are strongly correlated, since university graduates and non-graduates differ in labor-market location as well as cultural predispositions. Figure 2 plots the predicted difference in voter flow for religious and occupational distances across party-family dyads, while Figure 3 does the same for religious and educational distances. In both figures, the dashed 45-degree line indicates that the two components are associated with predicted differences of equal magnitude over their respective interquartile ranges. Each point summarizes a separate gravity regression for one of twenty-one family-pair subsamples, with religious distance and the focal social-distance component entered jointly alongside ideological distance, party size, and country fixed effects.

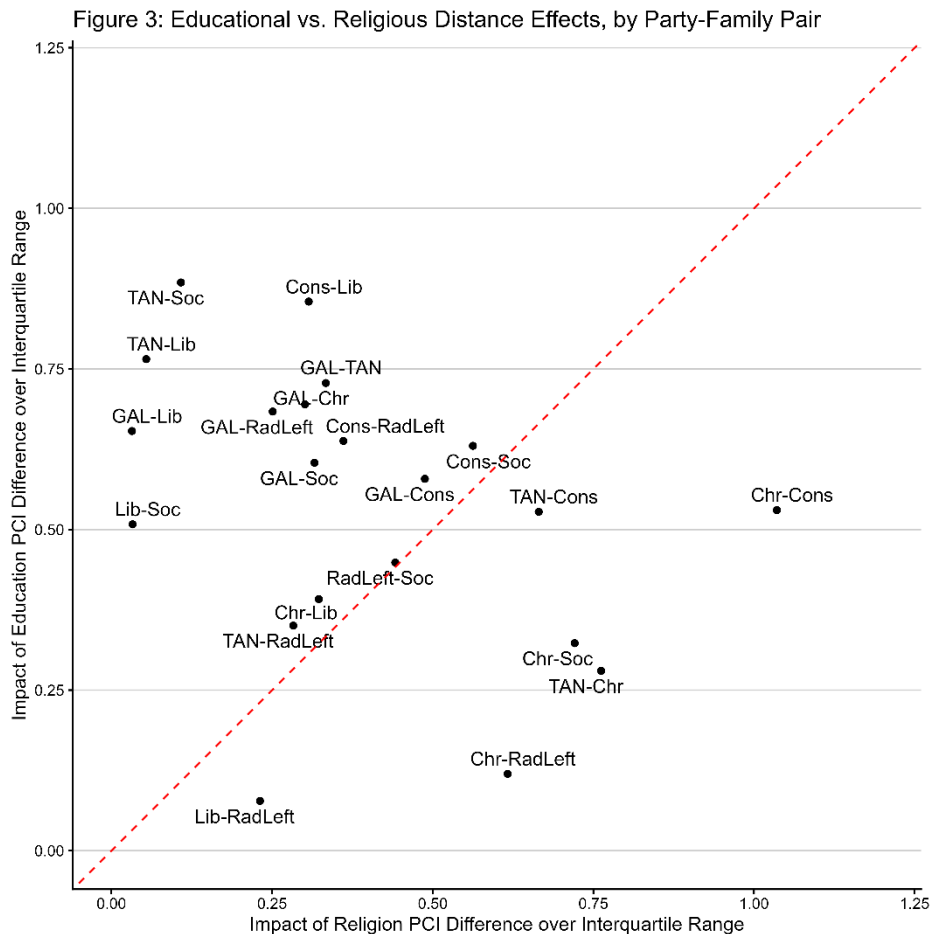
**Figure 2** shows that dyads involving Christian democratic parties cluster on the religion-dominant side of the diagonal. Across these dyads, the average difference due to religion is 0.62, compared to 0.36 for occupation. This is consistent with Hypothesis 2a and reflects the enduring religious anchoring of Christian democratic parties. Dyads involving social democratic and radical-left parties, by contrast, lie predominantly above the diagonal, with occupational distance more strongly associated with voter flow than religious distance. Across the eleven social democratic and radical-left dyads, the average predicted difference in voter flows due to occupation is 0.66, compared to 0.29 for religion, consistent with Hypothesis 2b. The remaining dyads mostly involve party families for which religion retains some residual organizational importance, particularly when Christian democratic or conservative parties are involved, while for one dyad (Liberal-Radical Left) neither component exerts much influence. Overall, the figure indicates that the dominant social constraint on voter movement varies systematically with the cleavage structure of the parties involved, supporting H2a and H2b.



Note: The scatterplot compares, for each party-family pair (e.g., TAN-Chr, or TAN-Soc), the absolute predicted change in voter flow associated with an interquartile-range (IQR) increase in religious distance (x-axis) versus an IQR increase in occupational distance (y-axis), based on the pair-specific regression (with controls for ideological distance, party size, and country fixed effects). Points below the 45° line indicate dyads where religious distance matters more than occupational distance.

**Figure 3** compares the estimated change in voter flows between educational distance and religious distance across the same twenty-one party-family dyads. Dyads involving green and radical-right parties tend to lie above the diagonal, indicating that educational distance is more strongly associated with voter flow than religious distance in this region of the party system. Across the eleven GAL or TAN dyads, the average predicted difference due to educational distance is 0.61, compared to 0.33 for religious distance. Most GAL or TAN dyads fall on the education-dominant side of the figure, while the few exceptions involve Christian democratic or conservative counterparts for which religion remains socially

salient. By contrast, dyads involving Christian democratic parties consistently lie below the diagonal, with religious distance exceeding educational distance in every case. These results support Hypothesis 2c and suggest that the social constraints on voter movement vary with the cleavage structure organizing party competition. Religion remains most consequential where party competition is rooted in the traditional religious cleavage, while educational difference is more strongly associated with voter exchange among parties structured by the contemporary GAL-TAN divide.



Note: The scatterplot compares, for each party-family pair (e.g., GAL-TAN, or TAN-Chr), the absolute predicted change in voter flow associated with an interquartile-range (IQR) increase in religious distance (x-axis) versus an IQR increase in educational distance (y-axis), based on the pair-specific regression (with controls for ideological distance, party size, and country fixed effects). Points above the 45° line indicate dyads where educational distance matters more than religious distance.

Disaggregating the social-distance measure reveals that the gravity model captures the contemporary reality, and the historical legacy, of cleavages in European party systems. Religion dominates for Christian democrats, occupation for socialist and social democratic parties, and education for parties on the contemporary GAL-TAN divide. In the full gravity model these distinct patterns are captured parsimoniously by a summary measure, namely the largest social difference between two party electorates. The predictive power of this measure suggests that voter flow responds above all to the most salient social difference between parties.

### ***Party Size: Arithmetic and Attraction***

The gravity model predicts that voter flow increases with the product of party sizes (H3). We distinguish between an arithmetic component (H3a) and a substantive attraction component (H3b). The arithmetic component reflects the fact that larger sender parties shed more voters because they begin with larger pools. The substantive component refers to the expectation that larger receiver parties attract more voters on account of their visibility, viability, and governing potential.

**Table 2** decomposes party mass by estimating sender party size and receiver party size as distinct terms. The results provide support for both components of the gravity hypothesis.

**Table 2. OLS Models Decomposing Sender and Receiver Party Size**

	CSES	LISS	SHP
Sender party size (arithmetic component)	0.198*** (0.013)	0.032 (0.020)	0.117*** (0.035)
Receiver party size (substantive component)	0.197*** (0.014)	0.068* (0.020)	0.110** (0.035)
Ideological distance	-0.149*** (0.011)	-0.117*** (0.025)	-0.195*** (0.033)
Social distance	-0.431*** (0.019)	-0.358*** (0.038)	-0.427*** (0.059)
Constant	0.935*** (0.084)	0.301*** (0.024)	0.403*** (0.030)
N	3,324	1,682	1,031
Clusters (dyads)	1,669	169	132
R <sup>2</sup>	0.606	0.655	0.757
Adjusted R <sup>2</sup>	0.603	0.654	0.756

Note. Standard errors clustered at the dyad level are shown in parentheses. All predictors are scaled to mean = 0 and standard deviation = 1 within the estimation sample. Sender and receiver party size are logged prior to standardization. Country fixed effects are included in the CSES model.

\*\*\* p < 0.0001; \*\* p < 0.001; \* p < 0.01.

The arithmetic component of party size is positive in all three datasets and statistically significant in the CSES and SHP models. This supports Hypothesis 3a: larger sender parties generate greater outgoing flow because they begin with larger voter pools. The estimate is weaker in the Dutch panel, where party-size variation is compressed.

The substantive component of party size is positive and statistically significant across all three datasets. This supports Hypothesis 3b: larger receiver parties attract greater inflows even when controlling for ideological and social distance. Party mass therefore operates not only as a mechanical constraint on outgoing volume but also as a cue of political viability.

Importantly, decomposing party size does not attenuate the coefficients for ideological or social distance. Both remain negative, large, and highly significant across all specifications. The stability of these coefficients indicates that party mass complements rather than substitutes for distance-based constraints in structuring voter flows.

These results support both components of the party-size argument. Larger parties generate greater outgoing flow because they have more voters to lose, and they attract greater incoming flow because size enhances visibility and political relevance. Party mass therefore enters the gravity model as both an arithmetic and a substantive force. We now turn to Study 2, which examines whether these same features shape individual-level party choice in a controlled experimental setting.

## **STUDY 2: AN EXPERIMENTAL DESIGN**

Study 2 provides an individual-level probe of the gravity model. To assess whether the three components identified in Study 1 also shape party choice when varied independently, we field a pre-registered conjoint survey experiment in Spain in December 2025 (1,605 respondents).<sup>12</sup> The purpose is not to reproduce the dyadic flow model at the individual level, but to examine whether ideological distance, social distance, and party size each affect the attractiveness of alternative parties when they are experimentally manipulated. Spain is a particularly appropriate case for this exercise. It combines intermediate levels of party

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<sup>12</sup> The study was pre-registered at <https://aspredicted.org/aa3gv6.pdf> and approved by the Institutional Review Board at [Anonymized].

fragmentation and voter switching with strong social cleavages in a multiparty system ranging from the far left (Sumar) to the far right (Vox), with robust center-left and center-right parties (PSOE and PP). This yields meaningful variation on the three dimensions central to the gravity model: party size, ideological position, and socially distinctive constituencies.

The experiment is designed to isolate and evaluate the three components of the gravity model in a controlled choice setting. The conjoint design allows us to independently vary ideological position, party core constituency, and party size across hypothetical party alternatives. Respondents are presented with paired party profiles and asked to choose between them, creating a direct test of relative attraction. By observing how respondents evaluate these profiles relative to their prior vote choice, we can assess whether the key elements in the gravity model are reflected in individual-level choice propensities (Hainmueller, Hopkins, and Yamamoto 2014). Because each attribute is randomly assigned across profiles, the marginal contribution of ideological distance, social distance, and party size can be estimated independently.

**Table 3** shows the potential attributes for each feature in the hypothetical party profiles. The electoral-support feature reflects the role of size in the gravity model with levels of 30, 20, 10, and 5 percent, to reflect party sizes that match the plausible support shares in the 2023 Spanish election and late-2025 polling. Because the Spanish party system has very low dimensionality (Koedam, Binding, and Steenbergen 2025, 11), we use a single left-right dimension to capture ideological positions. In line with Study 1, we use three primary demographic characteristics – workers, Catholics, and university graduates – to represent the main constituency of a political party. To capture the importance of regionalist parties in

Spain, we add regional minorities as a core demographic. We also include a “None in particular” category to represent parties without a clearly overrepresented social constituency.

**Table 3. Attributes and Levels in the Conjoint Experiment**

Attribute	Levels
Electoral Support	30 percent • 20 percent • 10 percent • 5 percent
Left–Right Ideological Position	Far Left ( <i>Extrema izquierda</i> ) • Left ( <i>Izquierda</i> ) • Center ( <i>Centro</i> ) • Right ( <i>Derecha</i> ) • Far Right ( <i>Extrema derecha</i> )
Core Demographic	None in particular ( <i>Ninguno en particular</i> ) • Workers ( <i>Trabajadores</i> ) • Catholics ( <i>Católicos</i> ) • College Graduates ( <i>Titulados universitarios</i> ) • Regional Minorities ( <i>Minorías regionales</i> )

*Note.* Each respondent evaluated 10 paired profiles, with attribute levels independently randomized. The experiment was fielded in Spain in December 2025 (N = 1,605; Bilendi). Spanish-language wording shown in italics. "Electoral Support" denotes the hypothetical party's vote share. "Core Demographic" denotes the social group most overrepresented in the party's electorate; "None in particular" indicates that no group is distinctively overrepresented.

The experiment departs from a standard conjoint design in one important respect. The gravity model is dyadic, whereas typical conjoint experiments are not. To bring the experiment into closer alignment with the model, respondents are shown factual information about the party they supported in the prior election alongside two hypothetical alternatives. These reference values are shown in **Table 4**. Party positions are based on the most recent Chapel Hill Expert Survey (Rovny et al. 2025). Party sizes approximate contemporaneous polling, and core constituencies are assigned on the basis of PCIs from the 2024 European Election Study and party family.

**Table 4. Reference Values: Empirical Profiles of Spanish Parties**

<b>Party</b>	<b>Ideological Position</b>	<b>Electoral Support</b>	<b>Core Demographic</b>
PP ( <i>Partido Popular</i> )	Right	30 percent	None in particular
PSOE ( <i>Partido Socialista Obrero Español</i> )	Left	30 percent	None in particular
Vox	Far Right	20 percent	Catholics
Sumar	Far Left	10 percent	Workers
Junts ( <i>Junts per Catalunya</i> )	Right	5 percent	Regional minorities
ERC ( <i>Esquerra Republicana de Catalunya</i> )	Left	5 percent	Regional minorities
BNG ( <i>Bloque Nacionalista Galego</i> )	Left	5 percent	Regional minorities
EH Bildu ( <i>Euskal Herria Bildu</i> )	Far Left	5 percent	Regional minorities
EAJ-PNV ( <i>Eusko Alderdi Jeltzalea – Partido Nacionalista Vasco</i> )	Center	5 percent	Regional minorities

*Note.* Reference profiles for the Spanish parties used to calibrate the conjoint design described in Table 3. Ideological positions are based on the CHES expert codings for the most recent available wave. Electoral support is based on the 2023 general election and contemporaneous polling before the survey was fielded. The core demographic is the social group most overrepresented in the party's electorate, based on the Spanish component of the 2024 European Election Survey; "none in particular" indicates that no group is distinctively overrepresented. Italicized text gives the full party name in Spanish (or, where applicable, in the relevant regional language).

For mainstream catch-all parties such as PSOE and PP, no single PCI dimension stands out sufficiently to designate a core demographic, and they are coded as having no particular core constituency. The remaining parties align more clearly with specific social profiles. Vox is explicitly linked to Catholicism (Rama et al. 2021), Sumar has an overrepresentation of workers, and the remaining parties are regionalist.

Respondents see the profile for the party they supported in the prior election alongside the hypothetical parties. This allows us to estimate the positional difference by coding the left-right scale from 1 to 5 and taking the absolute difference between the prior party and each

hypothetical alternative. We operationalize social distance as a binary indicator for whether the core demographic of the prior party matches that of the hypothetical party. These operationalizations bring the typical conjoint into alignment with the dyadic logic of Study 1. We use only the receiver party size to isolate the attraction component of party mass.

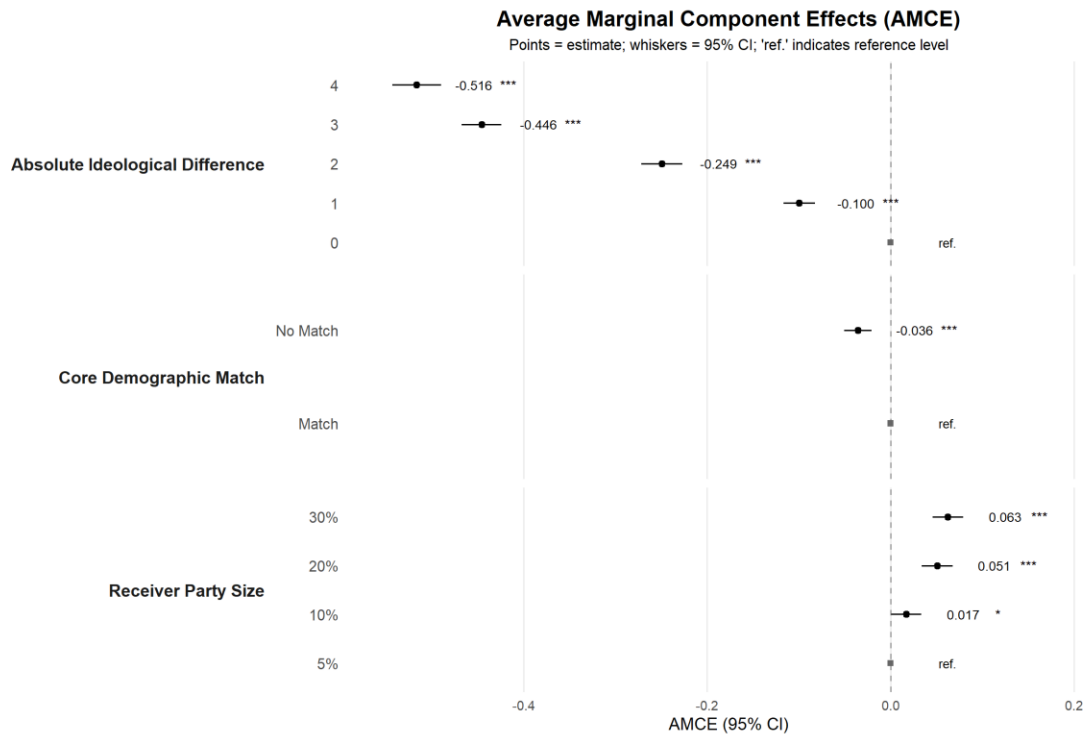
We estimate average marginal component effects (AMCEs) with standard errors clustered by respondent to account for repeated choice tasks (10 decisions each) (Bansak et al. 2018). Consistent with our preregistration, we also conduct subgroup analyses to assess if there are any meaningful deviations in results by respondents' prior vote choices (see Figure J.4 in the appendix) (Leeper, Hobolt, and Tilley 2020).

## **STUDY 2 RESULTS**

We estimate average marginal component effects (AMCEs) from the conjoint experiment, with standard errors clustered by respondent. **Figure 4** displays how ideological distance, core demographic congruence, and party size are associated with the probability that a respondent selects a hypothetical party relative to their prior vote choice.<sup>13</sup>

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<sup>13</sup> See Figure J.3 in the Supplementary Information for corresponding marginal means.



**Figure 4:** Average marginal component effects (AMCEs) from a conjoint experiment reflecting dyadic vote choice with 1,605 respondents, each of whom completed 10 choice tasks. Ideological distance is the absolute difference between the prior party choice position and the profile's position. Core demographic is operationalized as a match between the prior vote choice's core demographic and the profile's core demographic. Receiver size is the size of the profile's support, which isolates the attractive effect of receiver party size.

All three components of the gravity model are statistically significant and substantively meaningful. Ideological distance strongly reduces the probability of selecting a party as the absolute distance from the respondent's prior party increases (e.g.,  $-0.100$  for a one-unit difference;  $-0.249$  for a two-unit difference;  $p < .001$ ). Social distance also independently shapes choice: when the hypothetical party's core demographic does not match that of the respondent's prior party, the probability of selection declines ( $-0.036$ ,  $p < .001$ ). Party size is positively related to selection: relative to a 5 percent party, larger parties are more likely to be selected ( $+0.017$  at 10%;  $+0.051$  at 20%;  $+0.063$  at 30%; all statistically significant). The

significant results for social distance and party size are noteworthy because our operationalization is conservative: the core demographic is operationalized here as a binary match (congruent/incongruent), and party size is operationalized as receiver size only and not sender size.

When ideological position, social constituency, and party size are varied simultaneously, the experiment reveals that each contributes independently to choice. The experiment therefore provides individual-level support for Hypotheses 1, 2, and 3 in a single integrated design. The large coefficient for ideological proximity is plausible in this setting since ideological distance is presented explicitly and is directly compared to respondents' prior party in a forced-choice task. Though they are less influential, party size and social congruence are each independently and significantly associated with party choice.

Corresponding analyses by prior party show that the aggregate results are broadly consistent across prior vote choice. Figure J.4 in the Supplementary Information reveals little evidence of substantial heterogeneity. The association with ideological distance is similar across prior-party groups, and the association with party size is likewise positive throughout, though the point at which larger size becomes more attractive varies somewhat. The demographic results are also aligned with the expectations of the gravity model: Catholic profiles are not disadvantaged among prior Vox and PP voters (though they are for other social groups), workers are relatively attractive among prior PSOE and Sumar voters, and regional minority profiles are least penalized among respondents whose prior vote was for a regionalist party.

## **DISCUSSION AND IMPLICATIONS**

This paper proposes and tests a general model of voter flow. We begin with the intuition drawn from gravity theory that the attraction between units in a dyad is greater where the distance is smaller and the mass larger. We adapt this to party competition by treating voter movement as a function of ideological distance, social anchoring, and party mass. Parties that are farther apart in programmatic space are less substitutable, parties with more socially distinct electorates constrain movement among them, and larger parties both shed and attract more voters.

This sparse model accounts for a large share of voter retention and transition in competitive party systems. Across panel data from the Netherlands and Switzerland and recall data from twenty-six CSES countries, the gravity model explains 63 to 76 percent of the variance in the full matrix of dyadic voter flows and 35 to 54 percent of the variance in transitions alone. The component terms are consistently aligned with theoretical expectations, in line with the claim that ideological distance, social anchoring, and party mass capture fundamental features of democratic party competition.

Unpacking social distance and party mass strengthens this interpretation. When social distance is disaggregated, the dominant component aligns with what we know about historically formed cleavages and the prominent role of religion in dyads with Christian democrats, occupation in dyads with social democratic and radical-left parties, and education in dyads with green and radical-right parties. When party mass is decomposed

into sender size and receiver size, both components operate as expected. Larger parties generate greater outgoing flow because they begin with larger voter pools, and they attract greater incoming flow because size enhances visibility and political relevance. These results suggest that the constituent terms of the gravity model substantively clarify the underlying structure of voter flows.

Study 2 provides pre-registered individual-level evidence consistent with the gravity model in a controlled choice setting. The systemic elements that organize dyadic voter flows also influence individual party choice. When voters choose among hypothetical parties, they favor alternative parties that are ideologically close, socially congruent, and have a large electoral footprint.

Gravity models are often a point of departure for scientific inquiry rather than the endpoint. Like gravity models in other domains, the model proposed here specifies how movement among units varies with their size and distance. It leaves open why the system contains the particular units it does, why those units occupy particular locations, and why they have the social constituencies they have. In party competition, this means that the model takes as given the number of parties in a system, the ideological content of their programs, and the social bases of their support. Moreover, the model does not specify the characteristics of individual voters and how these influence their decisions.

In each of these respects, the model invites extension. On the party-system side, broader social, economic, and political developments can help explain why parties enter or exit the system, shift their ideological positions, change in size, or gain distinctive social

constituencies (Emanuele 2024; Mierke-Zatwarnicki, Borbáth, and Hutter 2026; Zuber, Howe, and Szöcsik 2026). On the individual side, voter characteristics, preferences, identities, and campaign responses can be introduced to refine the analysis of party choice (Dennison and Kriesi 2023; Westheuser and Zollinger 2025; Zollinger 2024). The contribution of the model set out here is to reveal the underlying structure by which these factors shape the movement of voters among parties.

## References

- Abou-Chadi, Tarik, and Lukas F. Stoetzer. 2020. "How Parties React to Voter Transitions." *American Political Science Review* 114(3): 940–45.
- Adams, James, Samuel Merrill, and Bernard Grofman. 2005. *A Unified Theory of Party Competition: A Cross-National Analysis Integrating Spatial and Behavioral Factors*. Cambridge University Press.  
[https://books.google.com/books?hl=en&lr=&id=AHw6vYDv69cC&oi=fnd&pg=PR10&dq=info:RUknopUj7D8J:scholar.google.com&ots=s\\_tOTfgeiO&sig=Tq10ljlo5YJE0e7cGkuT7-pEG8k](https://books.google.com/books?hl=en&lr=&id=AHw6vYDv69cC&oi=fnd&pg=PR10&dq=info:RUknopUj7D8J:scholar.google.com&ots=s_tOTfgeiO&sig=Tq10ljlo5YJE0e7cGkuT7-pEG8k) (July 28, 2025).
- Adams, James, and Zeynep Somer-Topcu. 2009. "Policy Adjustment by Parties in Response to Rival Parties' Policy Shifts: Spatial Theory and the Dynamics of Party Competition in Twenty-Five Post-War Democracies." *British Journal of Political Science* 39(4): 825–46.  
doi:10.1017/S0007123409000635.
- Ansolabehere, Stephen, and M. Socorro Puy. 2016. "Identity Voting." *Public Choice* 169(1/2): 77–95.
- Attewell, David, and Delia Zollinger. 2025. "Educational Networks, Social Closure, and Cleavage Stabilization." *British Journal of Political Science* 55: 1–28.
- Bakker, Ryan, Seth Jolly, and Jonathan Polk. 2012. "Complexity in the European Party Space: Exploring Dimensionality with Experts." *European Union Politics* 13(2): 219–45.  
doi:10.1177/1465116512436995.
- Bakker, Ryan, Seth Jolly, and Jonathan Polk. 2018. "Multidimensional Incongruence and Vote Switching in Europe." *Public Choice* 176(1–2): 267–96. doi:10.1007/s11127-018-0555-z.
- Bansak, Kirk, Jens Hainmueller, Daniel J. Hopkins, and Teppei Yamamoto. 2018. "The Number of Choice Tasks and Survey Satisficing in Conjoint Experiments." *Political Analysis* 26(1): 112–19. doi:10.1017/pan.2017.40.
- Beine, Michel, Frédéric Docquier, and Çağlar Özden. 2011. "Diasporas." *Journal of Development Economics* 95(1): 30–41. doi:10.1016/j.jdeveco.2009.11.004.
- Belli, Robert F., Michael W. Traugott, and Matthew N. Beckmann. 2001. "What Leads to Voting Overreports? Contrasts of Overreporters to Validated Voters and Admitted Nonvoters in the American National Election Studies." *Journal of Official Statistics* 17(4): 479.
- Blais, André, Richard Nadeau, Elisabeth Gidengil, and Neil Nevitte. 2001. "Measuring Strategic Voting in Multiparty Plurality Elections." *Electoral Studies* 20(3): 343–52.
- Borjas, George J. 1999. "The Economic Analysis of Immigration." *Handbook of labor economics* 3: 1697–1760.
- Bornschieer, Simon. 2010a. *Cleavage Politics and the Populist Right: The New Cultural Conflict in Western Europe*. Temple University Press. <https://muse.jhu.edu/book/9498/> (May 25, 2026).

- Bornschieer, Simon. 2010b. "The New Cultural Divide and the Two-Dimensional Political Space in Western Europe." *West European Politics* 33(3): 419–44. doi:10.1080/01402381003654387.
- Bornschieer, Simon, Lukas Haffert, Silja Häusermann, Marco Steenbergen, and Delia Zollinger. 2024. *Cleavage Formation in the 21st Century: How Social Identities Shape Voting Behavior in Contexts of Electoral Realignment*. 1st ed. Cambridge University Press. doi:10.1017/9781009393508.
- Bornschieer, Simon, Silja Häusermann, Delia Zollinger, and Céline Colombo. 2021. "How 'Us' and 'Them' Relates to Voting Behavior—Social Structure, Social Identities, and Electoral Choice." *Comparative Political Studies* 54(12): 2087–2122. doi:10.1177/0010414021997504.
- Chiaramonte, Alessandro, and Vincenzo Emanuele. 2017. "Party System Volatility, Regeneration and de-Institutionalization in Western Europe (1945–2015)." *Party Politics* 23(4): 376–88. doi:10.1177/1354068815601330.
- Chiaramonte, Alessandro, and Vincenzo Emanuele. 2022. *The Deinstitutionalization of Western European Party Systems*. Cham, Switzerland: Springer International Publishing. doi:10.1007/978-3-030-97978-2.
- Cohen, Denis, Werner Krause, and Tarik Abou-Chadi. 2024. "Comparative Vote Switching: A New Framework for Studying Dynamic Multiparty Competition." *The Journal of Politics* 86(2): 597–607. doi:10.1086/726952.
- Cox, Gary W. 1997. *Making Votes Count: Strategic Coordination in the World's Electoral Systems*. Cambridge University Press. <https://www.cambridge.org/hn/universitypress/subjects/politics-international-relations/comparative-politics/making-votes-count-strategic-coordination-worlds-electoral-systems?format=PB> (May 15, 2026).
- Dalton, Russell J. 2018. *Political Realignment: Economics, Culture, and Electoral Change*. Oxford: Oxford University Press.
- Dassonneville, Ruth. 2023. *Voters Under Pressure: Group-Based Cross-Pressure and Electoral Volatility*. Oxford: Oxford University Press.
- Dassonneville, Ruth, and Yves Dejaeghere. 2014. "Bridging the Ideological Space: A Cross-National Analysis of the Distance of Party Switching." *European Journal of Political Research* 53(3): 580–99. doi:10.1111/1475-6765.12049.
- Dassonneville, Ruth, Liesbet Hooghe, and Gary Marks. 2024. "Transformation of the Political Space: A Citizens' Perspective." *European Journal of Political Research* 63(1): 45–65.
- Dassonneville, Ruth, and Marc Hooghe. 2017. "The Noise of the Vote Recall Question: The Validity of the Vote Recall Question in Panel Studies in Belgium, Germany, and the Netherlands." *International Journal of Public Opinion Research* 29(2): 316–38. doi:10.1093/ijpor/edv051.

- De Jong, Jona, and Jonne Kamphorst. 2025. "Separated by Degrees: Social Closure by Education Levels Strengthens Contemporary Political Divides." *Comparative Political Studies* 58(7): 1533–68. doi:10.1177/00104140241271104.
- Demyanenko, Nataliya, and Pierfrancesco La Mura. 2023. "Gamson–Shapley Laws: A Formal Approach to Parliamentary Coalition Formation." *Humanities and Social Sciences Communications* 10(1): 710.
- Dennison, James, and Hanspeter Kriesi. 2023. "Explaining Europe's Transformed Electoral Landscape: Structure, Saliency, and Agendas." *European Political Science Review* 15: 483–501. doi:10.1017/S1755773923000085.
- Downs, Anthony. 1957. *An Economic Theory of Democracy*. New York: Harper & Row.
- Emanuele, Vincenzo. 2024. "Class Cleavage Electoral Structuring in Western Europe (1871–2020)." *European Journal of Political Research* 63(2): 556–78.
- Ferland, Benjamin, and Ruth Dassonneville. 2021. "Shifting Parties, Rational Switchers: Are Voters Responding to Ideological Shifts by Political Parties?" *Party Politics* 27(1): 114–24. doi:10.1177/1354068819829207.
- Ford, Robert, and Will Jennings. 2020. "The Changing Cleavage Politics of Western Europe." *Annual Review of Political Science* 23(1): 295–314. doi:10.1146/annurev-polisci-052217-104957.
- Gamson, William A. 1961. "A Theory of Coalition Formation." *American sociological review*: 373–82.
- Garrizmann, Julian. 2026. "From Educational Conflicts to an Educational Cleavage? The Multiple Transformations of Educational Conflicts from Medieval to Post-Industrial Times." *West European Politics* 49(3): 617–35. doi:10.1080/01402382.2025.2512295.
- Guth, James L, and Brent F Nelsen. 2021. "Party Choice in Europe: Social Cleavages and the Rise of Populist Parties." *Party Politics* 27(3): 453–64. doi:10.1177/1354068819853965.
- Hainmueller, Jens, Daniel J. Hopkins, and Teppei Yamamoto. 2014. "Causal Inference in Conjoint Analysis: Understanding Multidimensional Choices via Stated Preference Experiments." *Political Analysis* 22(1): 1–30. doi:10.1093/pan/mpt024.
- Häusermann, Silja. 2024. "Social Democracy in Competition: Voting Propensities, Electoral Potentials and Overlaps." In *Beyond Social Democracy: The Transformation of the Left in Emerging Knowledge Societies*, eds. Herbert Kitschelt and Silja Häusermann. Cambridge: Cambridge University Press, 163–90. doi:10.1017/9781009496810.007.
- Häusermann, Silja, and Herbert Kitschelt, eds. 2024. *Beyond Social Democracy: The Transformation of the Left in Emerging Knowledge Societies*. Cambridge: Cambridge University Press.
- Head, Keith, and Thierry Mayer. 2014. "Gravity Equations: Workhorse, Toolkit, and Cookbook." In *Handbook of International Economics*, Elsevier, 131–95.

- <https://www.sciencedirect.com/science/article/pii/B9780444543141000033> (March 31, 2026).
- Herrmann, Michael. 2014. "Polls, Coalitions and Strategic Voting under Proportional Representation." *Journal of Theoretical Politics* 26(3): 442–67. doi:10.1177/0951629813505722.
- Hobolt, Sara B., and James Tilley. 2016. "Fleeing the Centre: The Rise of Challenger Parties in the Aftermath of the Euro Crisis." *West European Politics* 39(5): 971–91. doi:10.1080/01402382.2016.1181871.
- Hooghe, Liesbet, and Gary Marks. 2026. "How Does the Education Cleavage Stack up against the Classic Cleavages of the Past?" *West European Politics* 49(3): 636–68. doi:10.1080/01402382.2025.2452789.
- Hooghe, Liesbet, Gary Marks, and Carole J. Wilson. 2002. "Does Left/Right Structure Party Positions on European Integration?" *Comparative Political Studies* 35(8): 965–89. doi:10.1177/001041402236310.
- Jolly, Seth, Ryan Bakker, Liesbet Hooghe, Gary Marks, Jonathan Polk, Jan Rovny, Marco Steenbergen, and Milada Anna Vachudova. 2022. "Chapel Hill Expert Survey Trend File, 1999–2019." *Electoral Studies* 75: 1–8. doi:10.1016/j.electstud.2021.102420.
- Koedam, Jelle, Garret Binding, and Marco R. Steenbergen. 2025. "Multidimensional Party Polarization in Europe: Cross-Cutting Divides and Effective Dimensionality." *British Journal of Political Science* 55: 1–18. doi:10.1017/S0007123424000474.
- Krause, Werner, Denis Cohen, and Tarik Abou-Chadi. 2023. "Does Accommodation Work? Mainstream Party Strategies and the Success of Radical Right Parties." *Political Science Research and Methods* 11(1): 172–79. doi:10.1017/psrm.2022.8.
- Kriesi, Hanspeter, Edgar Grande, Martin Dolezal, Marc Helbling, Dominic Höglinger, Swen Hutter, and Bruno Wüest. 2012. *Political Conflict in Western Europe*. Cambridge University Press. [https://books.google.com/books?hl=en&lr=&id=6\\_zivrfDd3AC&oi=fnd&pg=PR10&dq=Kriesi+et+al.+2012%3B+&ots=hjnuecOmhd&sig=RfPCdpDLSAdrEh2bbV\\_AVaujE](https://books.google.com/books?hl=en&lr=&id=6_zivrfDd3AC&oi=fnd&pg=PR10&dq=Kriesi+et+al.+2012%3B+&ots=hjnuecOmhd&sig=RfPCdpDLSAdrEh2bbV_AVaujE) (March 31, 2026).
- Kriesi, Hanspeter, and Swen Hutter. 2026. "Restructuring Party Systems in Northwestern Europe: A Comparative Analysis of Six Countries." *Party Politics*: 13540688261415751. doi:10.1177/13540688261415751.
- Leeper, Thomas J., Sara B. Hobolt, and James Tilley. 2020. "Measuring Subgroup Preferences in Conjoint Experiments." *Political Analysis* 28(2): 207–21. doi:10.1017/pan.2019.30.
- Lehmann, Felix. 2026. "When Does Accommodation Fail? The Electoral Consequences of Intra-Party Divisions and Mainstream Party Strategies." *West European Politics*: 1–28. doi:10.1080/01402382.2026.2625601.

- Lipset, Seymour Martin, and Stein Rokkan. 1967. "Cleavage Structures, Party Systems, and Voter Alignments." In *Party Systems and Voter Alignments: Cross-National Perspectives*, New York: Free Press, 3–64.
- Lupu, Noam. 2016. *Party Brands in Crisis: Partisanship, Brand Dilution, and the Breakdown of Political Parties in Latin America*. Cambridge University Press.
- Marks, Gary, David Attewell, Liesbet Hooghe, Jan Rovny, and Marco Steenbergen. 2023. "The Social Bases of Political Parties: A New Measure and Survey." *British Journal of Political Science* 53(1): 249–60. doi:10.1017/S0007123421000740.
- Mierke-Zatwarnicki, Alex, Endre Borbáth, and Swen Hutter. 2026. "Cleavage Theory Meets Civil Society: A Framework and Research Agenda." *West European Politics* 49(3): 726–55. doi:10.1080/01402382.2025.2543136.
- Newton, Isaac. 1999. *The Principia: Mathematical Principles of Natural Philosophy*. Translated by I. Bernard Cohen and Anne Whitman. Berkeley: University of California Press.  
<https://books.google.com/books?hl=en&lr=&id=eEhkAAAAMAAJ&oi=fnd&pg=PA1&dq=info:HbaWUwc3BckJ:scholar.google.com&ots=GfgeKLvpEE&sig=DYDpRzQqwoDuGjboBjcl7hSp tTk> (March 31, 2026).
- van Oosten, Sanne. 2026. "Affinity Voting in Europe: The Impact of Religion, Migration Background and Gender on Preferences for in-Group Politicians." *European Political Science Review*: 1–21. doi:10.1017/S1755773926100393.
- Polacko, Matthew. 2023. "Who Benefits from the Social Democratic March to the Middle?" *European Political Science Review*: 1–21. doi:10.1017/S1755773923000115.
- Polk, Jonathan, and Johannes Karreth. 2024. "Voter Responses to Social Democratic Ideological Moderation after the Third Way." In *Beyond Social Democracy: The Transformation of the Left in Emerging Knowledge Societies*, eds. Silja Häusermann and Herbert Kitschelt. Cambridge: Cambridge University Press, 279–313.
- Popkin, Samuel L. 1991. *The Reasoning Voter: Communication and Persuasion in Presidential Campaigns*. University of Chicago Press.  
<https://books.google.com/books?hl=en&lr=&id=fAT-IREgyQ8C&oi=fnd&pg=PP13&dq=The+Reasoning+Voter:+Communication+and+Persuasion+in+Presidential+Campaigns&ots=6ei9DULg6d&sig=gPkuwimTQeajrOPvC4q1LBV6h1c> (May 15, 2026).
- Rama, José, Lisa Zanotti, Stuart J. Turnbull-Dugarte, and Andrés Santana. 2021. *VOX: The Rise of the Spanish Populist Radical Right*. Routledge.  
<https://api.taylorfrancis.com/content/books/mono/download?identifierName=doi&identifierValue=10.4324/9781003049227&type=googlepdf> (February 22, 2026).
- Rosset, Jan, and Anna-Sophie Kurella. 2021. "The Electoral Roots of Unequal Representation. A Spatial Modelling Approach to Party Systems and Voting in Western Europe." *European Journal of Political Research* 60(4): 785–806.

- Rovny, Jan, Jonathan Polk, Ryan Bakker, Liesbet Hooghe, Seth Jolly, Gary Marks, Marco Steenbergen, and Milada Anna Vachudova. 2025. "The 2024 Chapel Hill Expert Survey on Political Party Positioning in Europe: Twenty-Five Years of Party Positional Data." *Electoral Studies* 97: 102981. doi:10.1016/j.electstud.2025.102981.
- Schofield, Norman. 1993. "Political Competition and Multiparty Coalition Governments." *European Journal of Political Research* 23(1): 1–33.
- Schwarzbözl, Tobias, Matthias Fatke, and Swen Hutter. 2020. "How Party–issue Linkages Vary between Election Manifestos and Media Debates." *West European Politics* 43(4): 795–818. doi:10.1080/01402382.2019.1609292.
- Sniderman, Paul M., Richard A. Brody, and Philip E. Tetlock. 1991. *Reasoning and Choice: Explorations in Political Psychology*. Cambridge University Press. <https://books.google.com/books?hl=en&lr=&id=7mJw5IHl0LYC&oi=fnd&pg=PR8&dq=Reasoning+and+Choice:+Explorations+in+Political+Psychology&ots=Ye7F6ALZjt&sig=Q075WYM0z-3h9AAa3lQbcMYbUH8> (May 15, 2026).
- Spoon, Jae-Jae, and Heike Klüver. 2019. "Party Convergence and Vote Switching: Explaining Mainstream Party Decline across Europe." *European Journal of Political Research* 58(4): 1021–42. doi:10.1111/1475-6765.12331.
- Tavits, Margit. 2006. "Party System Change: Testing a Model of New Party Entry." *Party Politics* 12(1): 99–119. doi:10.1177/1354068806059346.
- Tinbergen, Jan. 1962. "Shaping the World Economy; Suggestions for an International Economic Policy." <https://repub.eur.nl/pub/16826/Appendices.pdf> (March 31, 2026).
- Westheuser, Linus, and Delia Zollinger. 2025. "Cleavage Theory Meets Bourdieu: Studying the Role of Group Identities in Cleavage Formation." *European Political Science Review* 17(1): 110–27.
- Wilson, A G. 1971. "A Family of Spatial Interaction Models, and Associated Developments." *Environment and Planning A: Economy and Space* 3(1): 1–32. doi:10.1068/a030001.
- Zollinger, Delia. 2024. "Cleavage Identities in Voters' Own Words: Harnessing Open-Ended Survey Responses." *American Journal of Political Science* 68(1): 139–59. doi:10.1111/ajps.12743.
- Zuber, Christina Isabel, Philip J. Howe, and Edina Szöcsik. 2026. "Group Identities and Party Competition." *European Journal of Political Research*: 1–21. doi:10.1017/S1475676526100723.