3.0 Who Influences Whom? Analyzing the Interplay of Mainstream and Outsider Parties in Social Media Campaigns

Despite extensive research showing that parties adjust their strategies in response to public opinion shifts (Abou-Chadi, Green-Pedersen, and Mortensen, 2020; Klüver and Sagarzazu, 2016; Adams et al., 2006), election outcomes (Somer-Topcu, 2009), and voter issue priorities (Klüver and Spoon, 2016), there has been less focus on how parties respond to the political behavior of their competitors. Where interdependence between party positions has been analyzed systematically, the focus has been on narrower, specific issues or longer-term evolutions over many years (Abou-Chadi and Krause, 2020; Gessler and Hunger, 2022; Hutter and Kriesi, 2022). Therefore, our understanding of the dynamics that drive political competition remains limited.; who leads whom with respect to both issue salience and ideology remains crucial for understanding the dynamics of electoral competition.

Political competition dynamics that drive position-taking and communication strategies by different parties, both within and outside the mainstream, over the long and short term are crucial for understanding democratic governance and the rise of new issues and ideologies, from climate change to populism. Previous works, such as those by Meguid (2005), address the strategic interaction between mainstream and niche parties, but focus on long-term responses within electoral cycles and overlook the short-term effects that are crucial during the final stages of campaigns.[1] What happens when we look at short-term dynamics? Applying Meguid's model to short-term dynamics helps us understand inter-party interactions during election campaigns. The advent of the internet and social media has enabled parties to compete for voters more dynamically within campaigns than with traditional party platforms. This raises the question of who influences whom in these digital environments beyond the long-term stability of party platforms.[2] This work aims to contribute to filling this gap by focusing on short-term responsiveness leading up to elections.

Moreover, most studies on party competition assume one-directional influence from out-

[1]Examples of works focusing on long-term relationships include Adams and Somer-Topcu (2009), Alonso and Fonseca (2012), Green-Pedersen and Otjes (2019), Ruedin and Morales (2019), Gruber (2014), van Heerden et al. (2014), Dalton and McAllister (2015), Meguid (2005), Abou-Chadi and Krause (2020), and Han (2015).

[2]For a reference on long-term stability, refer to Dalton and McAllister (2015).

siders to mainstream parties. We know less about what influences outsider parties, such as radical right and left parties, which have been active in the political arena for several years. For example, studies on the politicization of immigration often examine how the radical right's competitors address the issue based on the radical right's strategies (e.g., Gessler and Hunger, 2022; Hutter and Kriesi, 2022). Meanwhile, some scholars argue that the influence of the radical right on immigration has been overrated, while the role of mainstream parties in the politicization of the issue has been underestimated (Meyer and Rosenberger, 2015; Akkerman, 2015). This leads to the question of whether mainstream parties also influence outsider parties. In this study, I ask: do political parties shift their issue attentiveness or ideology in reaction to the behavior of rival parties during the electoral contest? Who influences whom? Specifically, how do mainstream and outsider parties respond to each other? Are parties more responsive to those ideologically closer to them, or do they react more to those further away? Are there specific issues that provoke greater responsiveness?

To address these questions, this study employs a novel empirical approach using the video-sharing platform YouTube to analyze the attention paid to different issues and ideological appeals across political parties. While it may not be as heavily researched as other social media platforms, YouTube is one of the world's largest and most engaging platforms for consuming online media with 4.95 billion monthly active users (Mohsin, 2020; Hosseinmardi et al., 2021). Research often targets Facebook and X (Twitter) for their polarizing effects (Conover et al., 2011; Del Vicario et al., 2016; Bossetta, 2018), but YouTube is an equally significant and growing news source for millions worldwide. More recently, scholars have started exploring YouTube's political effects, mainly focusing on viewership (Hosseinmardi et al., 2024, 2021; Haroon et al., 2023; Ibrahim et al., 2023; Mamié, Horta Ribeiro, and West, 2021).

YouTube data offers the advantage of being replicable across other social media platforms like X (Twitter), Instagram, and Facebook, thereby extending its reach beyond the platform itself. Moreover, unlike the formal and structured nature of press releases, YouTube videos offer greater flexibility, often including segments from speeches and interviews, providing a broader perspective on political communication. This fine-grained data enables the detection of party dynamics by analyzing daily changes in the issue salience and ideology of party messaging. With daily data we can more easily identify leaders and followers.

Although recent studies have used temporally-disaggregated data to evaluate party dy-

namics (e.g., Gessler and Hunger, 2022; Hutter and Kriesi, 2022), they have focused primarily on the salience of specific issues such as immigration. However, electoral campaigns encompass a broader range of issues. Responsiveness could also be ideological in nature: Are parties using more populist rhetoric in response to the populism of their rivals? Do parties adopt the overall tone or valence of their competitors? Do parties become more moderate or extreme in response to the messaging of their rivals? My empirical strategy allows for the examination of these broader ideological characteristics and issues.

I analyze YouTube videos posted by political parties in Spain and the UK for all elections between 2015 to 2023, covering the year preceding each event.[3] Using various natural language processing (NLP) tools, I examine the issue salience and ideological content of party communications through their official YouTube channels. My approach involves developing a novel supervised machine learning model with HuggingFace's PyTorch transformers to identify populist ideology. The models are trained at the token level using annotated data from Bang-Jensen, Colaresi, and Gonzalez-Rostani (2024). Additionally, I identify issues using dictionaries to pinpoint worker and cultural rhetoric and employ BERTopic,[4] a deep transfer learning technique, to uncover latent themes (e.g., EU integration). Furthermore, I use a pre-trained BERT-based algorithm to assess the sentiment of statements (negative or positive). Finally, I measure partisanship and extremism by building on a Wordscores supervised machine learning model, analyzing the distinctiveness of vocabulary by ideology.

I then employ a vector autoregression (VAR) approach to systematically infer party messaging dynamics, investigating the extent to which one party's attention influences another. This method allows for the analysis of multiple lags, helping to determine the leaders and followers. Moreover, unlike other models such as structural equations, VAR provides flexibility in the directions of interdependence and effectively documents reciprocity in interactions between parties.

My results illuminate the reciprocal dynamics of parties' attention to each other's rhetoric during electoral campaigns. In Spain, mainstream parties responded to outsider parties, supporting the "riding the wave" hypothesis, particularly with ideologically similar rivals. However, outsider parties reacted more strongly to mainstream parties, indicating that mainstream parties often lead the campaign debate. Outsider parties also competed with each

[3]For the UK, this also includes the Brexit referendum.

[4]Bidirectional Encoder Representations from Transformers (BERT) Topic model.

other despite their ideological differences. In the UK, the mainstream parties were responsive to each other, and the radical right (RR) was influenced by mainstream parties, but not the other way around. Additionally, my findings show limited evidence of ideological accommodation between these parties. While they respond to changes in issue salience, they do not change the ideological content of their political messages.

Overall my findings indicate that mainstream parties are the agenda setters during electoral campaigns, with outsiders following them. These short-term results in issue attention complement previous research on party competition and the politicization of issues or rhetoric (e.g., immigration), which often relies on long-term shifts typically derived from electoral manifestos (Adams and Somer-Topcu, 2009; Alonso and Fonseca, 2012; Green-Pedersen and Otjes, 2019; Ruedin and Morales, 2019; Gruber, 2014; van Heerden et al., 2014; Dalton and McAllister, 2015; Meguid, 2005; Abou-Chadi and Krause, 2020; Han, 2015). Existing measures that capture parties' positions or rhetoric often lack the frequency needed to provide day-to-day insights (e.g., Norris, 2020). Advances in computational science techniques can complement such sporadic data and create a dynamic picture of competition during elections.

By leveraging these advancements, this study produces more temporally disaggregated measures of the issue salience and ideological content of political communication, building on cutting-edge NLP techniques that are just beginning to be utilized in political science (e.g., Bestvater and Monroe, 2023; Licht, 2023; Widmann and Wich, 2023; Burst et al., 2023; Laurer et al., 2024; González-Rostani, Incio, and Lezama, 2024*b*,*a*). This study serves as a template for examining parties' strategic responses in the short term and can be extended to explore additional research questions, leveraging the detailed data and tools used in this analysis. This work also provides a new efficient measure of responsiveness to populism, enabling us to identify instances at the sentence level where politicians respond to populist rhetoric. This includes usages such as pro-people, anti-elites, and claims of rights violations for the people. Unlike methods that rely solely on a rigid set of keywords, this measure has been trained with model-based transformers, allowing contextual information to inform the detection of populism. This approach enhances the accuracy and applicability of this tool across different contexts.

3.1 Hypotheses About Party Behavior

In this section, I draw on the existing literature to formulate hypotheses about the short-term responsiveness of political parties to the political messaging of their competitors. While other factors may explain parties' behavior, this discussion focuses exclusively on how political parties respond to their rivals' strategies.

3.1.1 Mainstream Parties' Responsiveness to Outsiders

Why would mainstream parties respond to outsiders? There are at least two alternative theories. On the one hand, there is the "riding the wave" theory, which suggests that parties respond to salient issues. On the other hand, the issue ownership theory argues that political parties are likely to emphasize policy issues they own (Budge and Farlie, 1983; Petrocik, 1996).

The spatial theory of party competition argues that parties seek to maximize their share of votes (e.g., Downs, 1957; Sartori, 1997; Meguid, 2005). Therefore, the rising electoral success of outsider parties poses a threat to established parties, prompting them to decide whether to accommodate, dismiss, or oppose these new competitors (Meguid, 2005). The key factor is not just the distribution of the electorate; established parties may also respond to policy shifts made by outsider parties. As Downs noted, "to get rid of this menace [outsider], party B [established] must adopt some of C's policies, thus moving back to the right and taking the wind out of C's sails" (p. 131). Similarly, Meguid (2005) argues that mainstream parties may accommodate by adopting issues from their niche counterparts. However, these dynamics during electoral campaigns are much more complex, as multiple issues are under debate.

Ansolabehere and Iyengar (1994) justify parties' attention to issues they do not own by arguing that candidates need "to be seen as concerned, responsive, and informed" about "the major issues of the day" (p. 337). This requirement may compel mainstream parties to adjust their strategies and messaging to address the issues that resonate with voters, potentially driving them towards populist positions when these are seen as electorally advantageous.

Empirically, several studies have documented how the success of populist radical-right parties has affected mainstream parties' policies. Nevertheless, we still have an incomplete

picture since most of these works have only focused on certain issues (e.g., Abou-Chadi and Krause, 2020; Bale et al., 2010; van Spanje, 2010). In particular, previous work has looked at anti-immigration mobilization. For instance, Gessler and Hunger (2022) shows that all parties were responsive to the refugee crisis, with radical right parties driving the attention of mainstream parties. However, given radical right parties' strong emphasis on anti-immigration politics, which has built certain "associative issue ownership" (e.g., Mudde, 2016; Udris, 2012), these results may be issue-specific. Hence, it is necessary to analyze this further.

Thus, a hypothesis to be tested about the strategic interaction among parties is as follows:

Hypothesis 1. *Mainstream parties will be responsive to the issue and ideological attention paid by outsider parties*

An alternative perspective, the theory of issue ownership, suggests that political parties strategically highlight issues they are perceived to manage better than their opponents. Originating from Budge and Farlie's "selective emphasis" thesis and developed further by Petrocik (1996) and Simon (2002), it seems rational for parties to focus their campaigns on these advantageous issues while downplaying those more strongly associated with their competitors. This strategy means that while mainstream parties could respond to outsiders, they are likely to be less responsive to issues outside their ownership. They may craft their campaign messages selectively to highlight themes that bolster their electoral chances. For instance, based on this theory, we should not expect mainstream parties to accommodate as much on issues related to immigration compared to other issues they may own, such as labor issues for a labor party. Therefore, we should expect that:

Hypothesis 2. *Mainstream parties will be less likely to be responsive to the issue and ideological attention paid by outsider parties on issues that outsider parties own, relative to those that mainstream parties own.*

A third hypothesis incorporates the mediating role of the rival party's ideology. As Adams and Somer-Topcu (2009) argue, left-wing parties are more likely to respond to those closer to them on the ideological spectrum, while right-wing parties will disproportionately respond to those on the right. From a spatial modeling perspective, vote-seeking parties should adjust to the changes of their proximate parties. Even in contexts without full information, mainstream parties may have an incentive to become "aggregating" parties, as described

by Laver (2005), aiming to represent the views of their supporters and thus becoming more responsive to adjacent parties in the policy space.

Hypothesis 3. *Mainstream parties will be more likely to be responsive to the issue and ideological attention paid by outsider parties closest to them in the ideological spectrum.*

Previous hypotheses about mainstream parties responding to outsiders may only be relevant in multi-party systems. In contexts with only two major parties, such as the US or UK, responsiveness is not expected if the other parties are too small. In these contexts, one or both major parties are likely to become anti-establishment by selecting party leaders who are outsiders.[5] Examples include Boris Johnson, former leader of the Conservative Party, and Donald Trump, former president and member of the Republican Party. Here, mainstream parties are more likely to be responsive to their mainstream counterparts. Meanwhile, in proportional systems with coalition building, mainstream parties have more to lose from the success of outsiders, especially when it affects both sides of the political spectrum, as in Spain. Therefore, it is reasonable to expect they will prefer to "take the wind out of outsiders' sails" by becoming more responsive to such rhetoric. Another reason for mainstream parties to be responsive, especially to ideologically adjacent outsiders, is to signal coalition formation compatibility.

Hypothesis 4. *Mainstream parties are more likely to be responsive to the issue and ideological attention paid by outsiders in multi-party systems with coalition governments and representation from both sides of the ideological spectrum.*

3.1.2 Outsider Responsiveness: To Whom?

Aside from determining whether mainstream parties respond to outsiders or their mainstream rivals, another important question for understanding election responsiveness is: to which parties, if any, are outsider parties likely to react? Previous work has often assumed a one-directional relationship, frequently asking, "How do mainstream parties respond to outsiders?"[6] However, after years of these parties being active in the electoral arena, there

[5]For a discussion of outsider leaders entering through established parties in a majoritarian system with intense interparty polarization, see Buisseret and Van Weelden (2020).

[6]Whether mainstream parties adapt to the issues of populist parties has received some attention, with some works supporting this relationship (van Spanje, 2010; Gessler and Hunger, 2022; Abou-Chadi and Krause, 2020; Schumacher and van Kersbergen, 2016), others questioning it (Rooduijn, de Lange, and van der Brug, 2014; Akkerman, 2015), and some presenting ambiguous findings (Bale et al., 2010).

are good reasons to believe that outsiders also have incentives to respond to their rivals.

Based on spatial theory, it is reasonable to expect competition between outsider left and right parties despite their ideological differences. While these parties are positioned at opposite ends of the ideological spectrum, they share several key characteristics. Both are anti-system and anti-elite, often adopting similar issues and rhetorical strategies of political communication. For instance, De Vries and Edwards (2009) argue that Euroskeptic leaders can be found both on the radical right and the radical left. Furthermore, Rooduijn and Akkerman (2017) demonstrate that outsider parties from both the left and the right are inclined to employ a populist discourse. Although there are significant differences in their sociocultural positions, such as their stances on immigration, the increasing strength of one outsider party can present a substantial challenge for its counterpart. For example, while the radical right may pose a threat to the mainstream right, it could also represent a threat to the left. It is well known that the outsider right has significant appeal among working-class voters (Bale et al., 2010). Therefore, the outsider left, aiming to compete for these voters, may become responsive to the issues raised by the radical right, and vice versa. This dynamic highlights the complex and reciprocal nature of competition among outsider parties. Thus, I hypothesize:

Hypothesis 5. *Outsider parties are likely to be responsive to the issue and ideological attention paid by other outsider parties' appeals.*

Another relationship to explore is whether outsider parties respond to mainstream parties. Given that some outsiders have been in the political arena for several years, it is plausible that they react to mainstream strategies and issues. Engaging with mainstream-led issues can also be strategic as they seek broader appeal and legitimacy. Consequently, they may adjust their rhetoric in response to mainstream discourse.[7]

Hypothesis 6. *Outsider parties are likely to be responsive to the issue and ideological attention paid by mainstream parties.*

[7]Note that this response does not necessarily mean mainstreamization in the sense of Akkerman, Lange, and Rooduijn (2016), as they may still hold different positions.

3.2 Modeling Responsiveness

The previously discussed hypotheses suggest that interactions between parties are dynamic and endogenous. For instance, these interactions indicate that while mainstream parties may be influenced by outsiders, they also influence them, creating a reciprocal relationship. Furthermore, past changes in attention to specific appeals are likely to impact current levels of attention. Coping with these challenges requires a framework that can account for multiple variables influencing each other.

To evaluate these hypotheses, I employ vector autoregression (VAR) models with fixed effects by electoral campaigns.[8] These models allow us to analyze the evolution of multiple variables based on their own lagged values and those of other variables that may strategically affect them (Freeman, Williams, and Lin, 1989). This method enables us to analyze their interconnections. VAR models have been previously used to analyze the interactions among endogenous variables, as studied by Barberá et al. (2019), Gilardi et al. (2021), Brandt, Colaresi, and Freeman (2008), Brandt and Freeman (2009), Edwards and Wood (1999), and Enders and Sandler (1993). Unlike other methods, such as structural equation models, VAR provides a solution to the issue of 'model choice' since it does not require the imposition of a theoretical structure about the direction of the influence of each variable (Qin, 2011). Instead, this method allows the inclusion of all variables that might influence each other over time and establishes their relationships.

Specifically, I employ a VAR model to analyze a set of stationary time series Y_i, which capture the daily focus each party i dedicates to various topics or the ideology of political communication j over days (t). The model includes indicators of electoral campaigns as exogenous fixed effects, indicated by α_e. Since Y_i variables are counts and their distributions are skewed—with some days showing high levels of attention and most days much lower—I apply a logarithmic transformation to account for this skewness. Therefore, I model the logged counts Z_i of the series Y_i rather than the raw counts. In this approach, $Z_{i,j,t}$ is influenced by its own past values (autoregressive terms) and the interdependencies with other variables and their past values. A four-day lag structure is implemented to consider potential

[8]The fixed effects account for the unique characteristics of each period. In doing so, we assume that only the equilibrium of attention changes election by election, not the dynamics of how this attention shifts within each election cycle.

longer-term effects, selected based on the lowest Akaike Information Criterion (AIC) scores.[9] The model specification is as follows:

$$Z_{i,j,t} = \log\left(Y_{i,j,t} + 1\right)$$

$$Z_{i,j,t} = \alpha_e + \sum_i \sum_{p=1}^{4} \beta_{i,p} Z_{i,j,t-p} + \varepsilon_{i,j,t}$$

3.3 Data and Measurement

3.3.1 The Cases: Spain and the United Kingdom

I analyze the interactions between parties in Spain and the UK as test cases, as they offer variations in institutional contexts while both featuring successful outsider parties that pose a threat to mainstream parties (UKIP in the UK, and Vox and Podemos in Spain). The British case exemplifies a plurality voting system, which favors the formation of larger mainstream parties and leaves relatively less room for outsider parties. It also typically does not require coalition building. An interesting aspect of the UK case is how mainstream parties, such as the Conservatives, have at times adopted outsider leaders like Boris Johnson, who supported Brexit. Meanwhile, Spain has a proportional representation and a multi-party system, making single-party governments less common. In recent general elections, the mainstream left (PSOE) has formed governments in coalition with the outsider left (Unidas Podemos in 2020 and Sumar in 2024, a coalition of Podemos and Izquierda Unida). This contrast provides a rich context for examining how different electoral systems and party dynamics influence party behavior.

Moreover, the Spanish case provides a valuable opportunity to examine the interactions between mainstream parties and outsiders across the entire ideological spectrum. Previous studies have predominantly focused on the influence of radical right outsider parties, often neglecting the emergence of radical left outsider parties. Spain is one of the few Western European countries where a newly established radical-left anti-elite party, Podemos,[10] has

[9] Results are similar using longer-term effects, such as seven-day decay.

[10] Podemos was founded in 2014.

gained significant support. Additionally, the rise of Vox, a radical right party, since 2019 further enriches this case. The presence of both radical left and right parties allows for an in-depth analysis of party dynamics in a multi-party context.

3.3.2 Political Parties on Youtube

To test my hypotheses, I analyze YouTube videos (both regular and shorts) uploaded on party channels during the electoral campaigns, focusing on the year before the elections. I examine elections since 2015, including the Spanish general elections of 2016, April and November of 2019, and 2023, and the UK general elections of 2015, 2017, 2019, the local elections of 2021, and the Brexit referendum of 2016. A total of 6,014 videos from Spain and 2,455 videos from the UK were posted during these periods, averaging 32 and 11 videos per week in the year before the election for Spain and the UK, respectively (further details in Table 7 and Table 8).[11]

Table 7: Description of the YouTube Videos from Spain

		Subscribers (K)	Most Popular (K)	2016	2019 (A)	2019 (B)	2023	Total
RL	Izquierda Unida	30.4	265	387	384	317	207	1295
	Podemos	148	2400	367	235	211	258	1071
	Sumar	10	621				96	96
MR	Partido Popular	117	1500		27	33	450	510
ML	PSOE	46.7	829	502	294	362	366	1524
RR	Vox	544	4700	193	410	413	502	1518
Total				1449	1350	1336	1879	6014

Note: Period of analysis: one year before general elections. The count corresponds to the number of YouTube videos posted during the period. Subscribers refer to the number of people subscribed to the channel in thousands, and most popular refers to the number of views of the most popular video in thousands.

[11] An assumption of the modeling strategy is that when parties do not post any video, then the saliency is 0.

Table 8: Description of the YouTube Videos from the UK

		Subscribers (K)	Most Popular (K)	2015	2016	2017	2019	2021	N
ML	Labour	53.1	252			10	10	58	78
	Green	14.1	1000	143	63	59	20	63	348
Center	L. Democrats	12.2	356	122	24	207	38	68	459
MR	Conservative	71.3	3700	105	52	54	41	15	267
RR	UKIP	36.3	283	49	37	52	194	31	363
	Reform UK	32.9	864	274	289	188	96	93	940
				693	465	570	399	328	2455

Note: Period of analysis: one year before general elections (or local dor 2021), or one year before the Brexit referendum (2016). The count corresponds to the number of YouTube videos posted during the period. Subscribers refer to the number of people subscribed to the channel in thousands, and most popular refers to the number of views of the most popular video in thousands

Although YouTube has not been studied as extensively as other social media platforms, it stands out as potentially the largest and most engaging platform for online media consumption worldwide (Hosseinmardi et al., 2021). Political parties use YouTube channels during their campaigns, and by 2024, YouTube ads had the widest reach among social networks in Spain and the UK, engaging over 89 percent and 91 percent of users, respectively. Previous research in marketing and communication has demonstrated that YouTube is used not only for advertisements but also to mobilize supporters and provide information about issues (e.g., Vesnic-Alujevic and Van Bauwel, 2014; Sohal and Kaur, 2018; Scherr, Reinemann, and Jandura, 2015). Thus, party channels do not just provide slogans but also cover issue discussions.

I examine the channels of the most competitive parties separately and also group them into party families[12] to analyze the relationship between mainstream and outsider parties across the ideological spectrum. In Spain, the mainstream left (ML) includes PSOE, the

[12]Results in Appendix B.16.

mainstream right (MR) includes Partido Popular (PP), the radical right (RR) includes Vox, and the radical left includes Podemos, Izquierda Unida, and their coalition Sumar. In the UK, the ML includes the Labour Party and the Greens,[13] the MR includes the Conservative Party and the Liberal Democrats (center-right leaning), and the RR includes UKIP and Reform UK.

The data collection was a two-step process. First, I scraped the channels to identify the videos and their IDs during the period of analysis. Then, using the YouTube API, I collected the available transcripts (see Appendix B.3 for further details). The final number of videos by election and party family is available in Table 7 and Table 8. I obtained transcripts for 75% of the videos from Spain and 90% from the UK, which constitute my final sample.[14] To contextualize the sample compared to X (Twitter) studies, dividing it into 140-character chunks (maximum Tweet length) results in 647,242 chunks.

3.3.3 Measurement

This paper aims to characterize the different issues and ideological content political parties use on YouTube during electoral campaigns and to understand how their salience varies over time across parties and their interdependence. I employ several strategies to extract these measures (issues or ideology), combining dictionary methods, supervised machine learning, Wordscores, and deep transfer learning techniques like BERT. The key indicators of interest are populism, issues, negative and positive sentiments, and a proxy for extremeness (ideological differentiation).

3.3.4 Measuring Usage of Populist Rhetoric

To measure populism–defined by anti-elite and pro-people rhetoric appealing to voters' emotions and short-term protectionist policies-I employ a novel supervised machine learning algorithm trained on over a thousand political sentences. This approach addresses some of the challenges faced when using dictionaries (for a discussion see Barberá et al., 2021).

[13]Previous scholars have discussed the evolution of the Green party from a niche party focused on the environment to a broader progressive platform, aligning it more closely with mainstream left-wing politics (Dennison, 2016).

[14]These proportions are distributed evenly among the different parties. Further party family details can be found in Appendix Tables 41-42.

Nevertheless, I replicated the results using established dictionaries on populism, and the results are similar.[15]

Previous research that did not use dictionaries typically approached the study of populism by labeling entire speeches, parties, or individuals as populist, regardless of whether the content specifically exhibited populist traits (e.g., Dai and Kustov, 2022; Norris, 2020; Polk et al., 2017; Meijers and Zaslove, 2021; Di Cocco and Monechi, 2021).[16] This broad labeling introduces noise into the measurement and, in my case, would prevent capturing the dynamics within parties. Additionally, as noted by Bang-Jensen, Colaresi, and Gonzalez-Rostani (2024), this approach likely results in the overfitting of supplementary content, treating it as central to populist narratives and thus impairing the model's ability to generalize.

I rely on the work of Bang-Jensen, Colaresi, and Gonzalez-Rostani (2024), utilizing part-of-speech and dependency parsing tools, going beyond the bag-of-words approach (Park, Colaresi, and Greene, 2018). These tools enable machine learning-based labeling at the token, word, or phrase level rather than at the level of entire texts. This is methodologically significant because it allows concepts to be understood and trained within their contextual relevance. Moreover, it facilitates the creation of fine-grained labels that can be systematically connected, offering a more nuanced and detailed analysis. Bang-Jensen, Colaresi, and Gonzalez-Rostani's innovative approach, Populist-PULSAR (Parsing Unstructured Language into Sentiment-Aspect Representations), aims to measure core populist narratives at the phrase level and identifies context-specific add-on content. This method also tracks the evolution of narrative roles, distinguishing "us" versus "them," identifying "perpetrators" of "violations" against "victims," and "protectors" of "rights" for "beneficiaries." The key insight is that populism's thin-centered conceptualization can be computationally represented as network motifs. As their work is ongoing, I relied on their label annotations.[17]

Using their annotated sentences as training data, I employed `HuggingFace`'s PyTorch transformers[18] (which are considered state-of-the-art in natural language processing, Wolf

[15] I rely on dictionaries previously used by Gennaro, Lecce, and Morelli (2021), which build on Pauwels (2011) and Rooduijn and Pauwels (2011).

[16] Dai and Kustov (2022) attempt to address this challenge by breaking speeches into 10-paragraph chunks, but this method still fails to capture the nuances of videos, which are usually shorter, and even if they are long enough, it will be harder to capture populism intensity.

[17] The authors employed three research assistants who read sentences (out of the speech context) and identified the tokens representing each label (e.g., "them"). The coding was conducted from January 2022 to January 2024 using INCEpTION (an annotator tool). Labels identified by at least two coders were considered to represent the label.

[18] In particular, I use `Transformers`, an open-source library aimed at providing the wider machine learning

et al. 2020) to train models at the token level but within the sentence context to identify each label.[19] I relied on the `DistilBERT` tokenizer to preprocess the data and `PyTorch`—a machine learning library—to train the models.[20] I trained models for three of Bang-Jensen, Colaresi, and Gonzalez-Rostani's labels: "us," "them," and general or specific aspects of "violation." Examples of these labels include the people (us) being stolen from (the violation) by the corrupt elites (them). The decision on which labels were most important was based on the pre-labeling of populist and non-populist sentences in the training set and the comparison of which labels had the highest predictive power. Moreover, unlike Bang-Jensen, Colaresi, and Gonzalez-Rostani's work, which aims to disentangle opposition or support for populism (using labels such as opposition or negation), my study examines party dynamics in the use of populist language, even when used to criticize rivals.[21] Overall, my measure of populism counts the occurrence of any of these three labels, which allows us to gauge the intensity of populism in each video.

3.3.5 Measuring Attention to Political Issues

To identify the issues discussed, I employ two approaches: established dictionaries and latent topic modeling for each country's sample. For the dictionary approach, I utilized unigram and bigram dictionaries to identify issues related to worker and cultural rhetoric (see Appendix B.5- B.6 for details). These dictionaries are based on a close reading of videos and previous qualitative analyses (e.g., Lamont, Park, and Ayala-Hurtado, 2017; Gessler and Hunger, 2022). The pro-worker dictionary includes stem terms such as "worker," "labor," and "job," while the cultural rhetoric dictionary includes terms like "immigr," "border," "values," and "way of life." This cultural rhetoric dictionary builds on previous dictionaries from Gessler and Hunger (2022), Pauwels (2011), and Ruedin and Morales (2019). The score for each issue is determined by counting the occurrences of dictionary words in each video.

My second approach leverages `HuggingFace` transformers and TF-IDF, specifically BERTopic (Grootendorst, 2022). BERTopic, a deep transfer learning technique used to identify latent themes. This method generates document embeddings with pre-trained transformer-based

community with access to these advancements.

[19]These transformed-based models rely on a very large neural network containing complex language models that allow for learning through contextualized embedding for all the documents.

[20]See Appendix B.4 for discussions of the accuracy of these models.

[21]See Appendix for further details (see Figure 33).

language models and clusters these embeddings to create topic representations. Unlike traditional unsupervised machine learning models such as Latent Dirichlet Allocation (LDA Blei, Ng, and Jordan, 2003) or Non-Negative Matrix Factorization (NMF Févotte and Idier, 2011), which use bag-of-words representations, BERTopic preserves the semantic relationships among words. This deep learning model has been shown to outperform classical models that do not use transfer learning (Laurer et al., 2024). The adoption of this type of model for political texts is quite new and has only been implemented recently (Bestvater and Monroe, 2023; Licht, 2023; Widmann and Wich, 2023; Burst et al., 2023; Laurer et al., 2024; González-Rostani, Incio, and Lezama, 2024*b*,*a*).

I identify latent topics across all documents (video transcripts) in each country separately. For clustering, I use BERTopic with `HDBSCAN`, reduced by centrality TF-IDF. Then, I employ OpenAI API to generate topic labels based on one of their Completion of ChatCompletion models, with the number of clusters set to 20. I found that one of the largest clusters did not focus on specific issues but rather on campaigning, with expressions like "the people," "the party," and "what people want," without explicitly addressing particular issues. Since I have other measures regarding party appeals (e.g., populism), I excluded these topics from the analysis. Additionally, some clusters that referred to similar issues were classified as different topics because they addressed slightly different angles and used different words. For example, in the UK, among the top five issues, there were three clusters related to EU integration: one focused on the European Union and parliament, another on the refugee crisis, and another on Brexit and trade deals. In such cases, I merged the topics into similar issues, as also done by Barberá et al. (2019). For presentation purposes, I focus on the top five issues, excluding campaigning topics, and do not present analyses for issues that appeared infrequently.

3.3.6 Measuring Sentiment of the Videos' Content

Another aspect of the communication I will explore is the party dynamics regarding the sentiment of the video content. These indicators are useful for identifying the overall tone of the content (but not the stance).[22] Previous research on emotional language relied heavily on sentiment dictionaries using bag-of-words approaches, which have their typical

[22]For a review of this technique, see Bestvater and Monroe (2023) and Widmann and Wich (2023).

disadvantages (Widmann and Wich, 2023). There are examples of works analyzing sentiment through dictionaries during campaigns (e.g., Hopp and Vargo, 2017) and in news coverage (e.g., Soroka, Young, and Balmas, 2015). Instead, I rely on a pre-trained BERT-based model for sentiment analysis publicly available on the `HuggingFace` hub, with over 1 million users monthly (NLP Town, 2023). I focus on the extremes of emotions, reporting negative emotions as those with 1 star and positive emotions as those with 5 stars.[23] I classified every 140-character chunk and counted how many chunks in the video were classified as negative or positive.

Figures 8-11 illustrate the average attention each party family devoted to the main political issues and ideological content under study. For example, we observe that the ML in the UK paid significantly more attention to worker issues than any other party. Regarding issues in Spain, the RL is the party that paid the most attention to gender issues, followed by the ML.

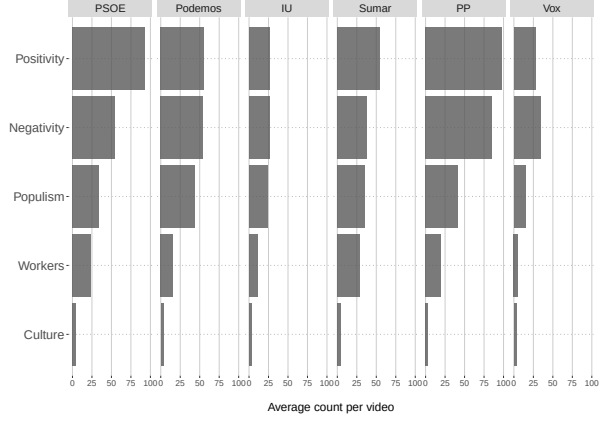

Figure 8: Average Attention by Party in Spain

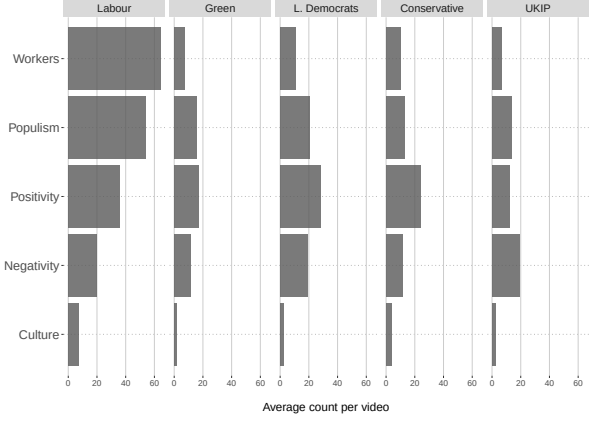

Figure 9: Average Attention by Party in the UK

Note: Attention is represented as the average count per video. Positivity and Negativity count chunks labeled with these sentiments for every 140 characters. Populism, Worker, and Culture count the number of times these terms are used in a video.

[23]The model has been trained on approximately 629,000 product reviews and reports an accuracy of 95% in English. Even though this model was not trained on political text reviews, I expect it will still be useful in predicting the tone of messages.

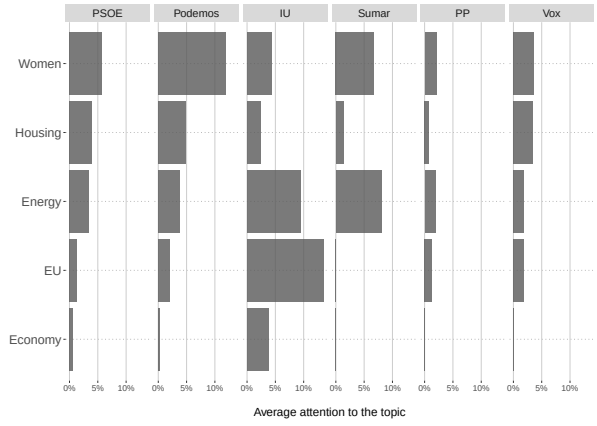

Figure 10: Average Attention by Party in Spain

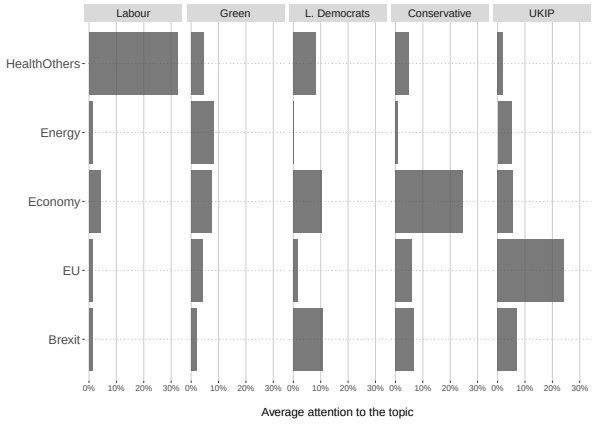

Figure 11: Average Attention by Party in the UK

Note: Attention is represented as the share of issues from the total number of videos by Party. The classification of the issues comes from BERTopic analysis. The selected issues were the largest among the issue-oriented topics, excluding the campaign cluster as it is not considered an issue.

3.3.7 Measuring Partisanship and Extremeness

Previous measures focus on the presence or absence of certain issues or rhetorical characteristics in the debate. However, they do not provide insight into the content or perspective being conveyed. To address this, I use a supervised approach to evaluate the political orientations of each video using Wordscores (Laver, Benoit, and Garry, 2003), serving as a proxy for whether parties are adapting their vocabulary or responding with their own. This strategy assigns a party score of left (-1), center (0), or right (1) based on the parties' established political orientations. This score helps identify terms commonly used by each party family and quantify whether they adopt vocabulary from their rivals. This method follows the approach used by Le Pennec (2021), Lezama (2024) and González-Rostani, Incio, and Lezama (2024*a*).[24]

The steps for this supervised model include pre-processing and vectorizing the documents to ensure only commonly occurring words are included, reducing noise, and focusing on relevant terms. The texts are then grouped by political orientation to capture the distinct linguistic patterns associated with each group. To quantify political orientation, I calculate the relative frequency of each word within the left and right political texts by normalizing the word counts within each category. The difference in these relative frequencies is then

[24]I am grateful to Lezama for providing the code for training the models, which I adapted for my analysis.

computed to generate a score for each word, indicating its association with either left or right political texts. This score ranges from -1 to 1, with -1 representing the left (extreme left in Spain and mainstream left in the UK), 0 representing the center (mainstream parties in Spain—both left and right—and mainstream right in the UK, as there is no radical left), and 1 representing the radical right in both cases.

I replicate this process for each electoral campaign and country, recognizing that words characteristic of one party family in one election may be used by other parties in subsequent elections. Finally, since I am primarily interested in the radicalization when parties respond to each other, I calculate the partisanship score's absolute value to assess the content's extremeness (values further from 0).

3.4 Results

3.4.1 Who Influences Whom?

Figures 12 and 13 display the results of the estimated VAR model through cumulative impulse response functions (IRFs). These cumulative IRFs illustrate how a standard deviation (SD) increase in a party's attention to a specific topic or appeal predicts the cumulative attention that other parties will devote to the same topic over time.[25] The responses are measured over a 15-day period. Contemporaneous relationships were also evaluated and found to be absent, thus the IRFs do not include day 0.[26] Each panel's title indicates the responding party and shows their predicted cumulative attention in terms of SD of the shock. Different colors represent each measure analyzed. The y-axis lists the parties that initiated the impulse shock 15 days prior. For example, the first block (PSOE) and the first row (Vox) indicate how a shock from Vox, the RR, influences PSOE, the ML ($RR \rightarrow ML$). Overall, most significant results are meaningful, as one SD of shock corresponds to approximately 1-2 SD of response.

[25]Since I am interested in the "strength" of the relationship, I will examine how a one-unit increase in surprise attention to an issue by one party leads to certain cumulative attention to that issue by a rival party rather than focusing on how long the impact persists. Yet, the persistence can be seen in IRF in the Appendix B.11.

[26]The effects on day 0 are not statistically significant, justifying the use of VAR instead of SVAR. Figures 38-42 demonstrate this lack of relationship at day 0.

The results in Figure 12 support Hypotheses 1 and 3 regarding the responsiveness of mainstream parties to outsider parties, particularly those ideologically closer. Outsider parties (row 1, and 3-5 in Figure 12) can influence the ML's attention to their issues or ideological content, with ML being more responsive to RL, particularly to Podemos, which is ideologically closer. ML also responds to RR, but only on certain issues, such as those concerning the working class and the EU, and the magnitude of these effects is smaller than those from RL. In contrast, PP, the MR shows limited responsiveness to outsider parties, except on cultural issues where Vox (RR), IU, and Podemos (RL) influence MR's attention. Additionally, the empirical results show that mainstream parties respond to each other. For instance, MR is influenced by ML's use of populism and their focus on workers and the EU. However, ML is mainly responsive to RL rather than MR.

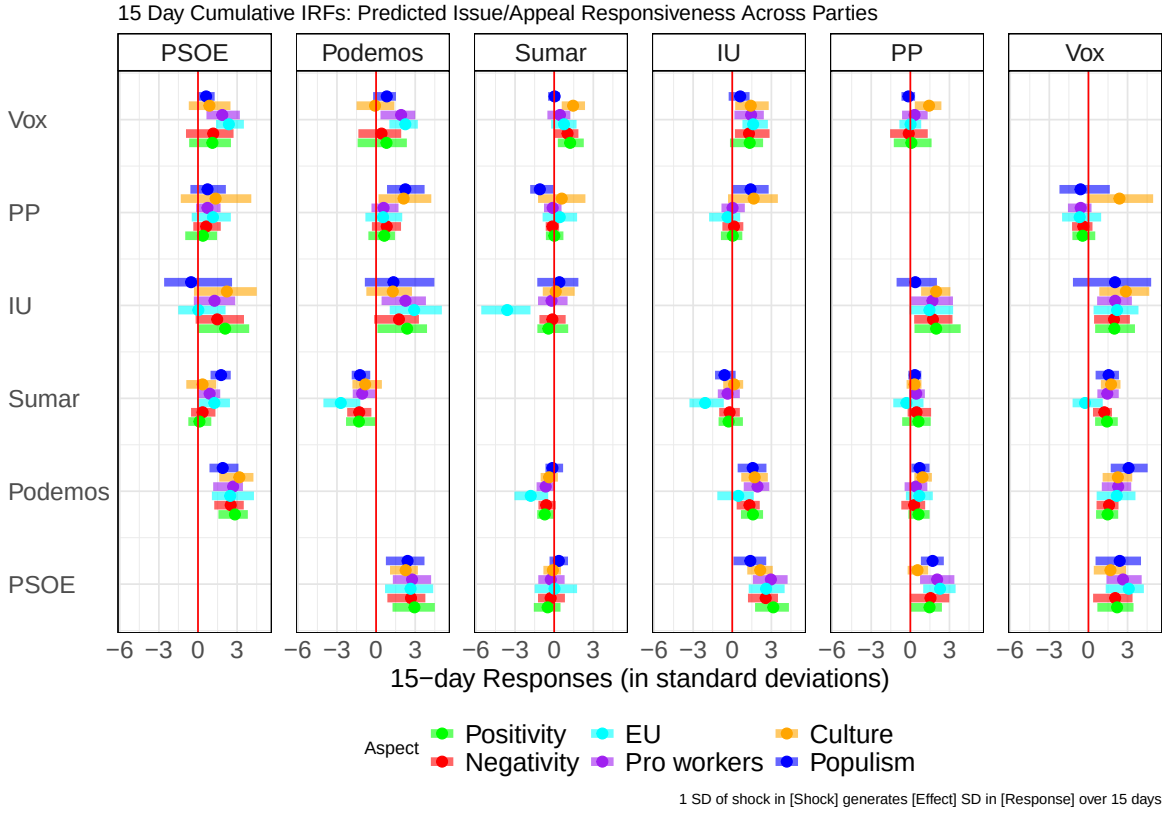

Figure 12: Predicted Issue/Aspect Responsiveness Across Parties, Spain

Note: These plot represents a VAR(4). The coefficients (with 90% confidence intervals) indicate (in SD) how much more cumulative attention the groups in the panel titles paid to a given issue due to the groups in the y-axis increasing the attention to the same aspect 15 days ago. PSOE represents the ML, Podemos, Sumar and IU represents the RL, Vox the RR, and PP the MR.

These results do not support Hypothesis 2, which posits that mainstream parties should

be less responsive to issues they own. This is evident as ML's responses to the EU topic, a more outsider-led issue, are greater than to worker issues. Similarly, MR only responds to shifts in the salience of the cultural issue, a topic typically associated with RR and anti-immigration. These findings, if anything, support the "riding the wave" hypothesis more than the issue ownership hypothesis during electoral campaigns.

When shifting the attention to outsider parties, strong evidence supports their responsiveness to each other (Hypothesis 5). Even more interesting is that outsider parties respond to PSOE, the leading mainstream party in the general elections at the time, and to some extent, to the right, which presents evidence supporting Hypothesis 6. We see that the ML lead the agenda, as the changes in the opposite direction are smaller. For example, the RL's response to a shock from ML in populism is 1.3 times larger than the changes in the opposite direction for Podemos. Additionally, in pro-worker rhetoric, the response is 2.3 times larger when considering IU, which is even more relevant since the shock from IU is not statistically significantly different from zero. Similarly, while ML is only influenced by RR on certain issues, RR responds to shocks on all the issues and appeals from ML.

Figure 13 presents the results for the UK. Mainstream parties are unresponsive to UKIP, the outsider RR, regardless of the topic or aspect analyzed.[27] This does not support Hypothesis 1 (mainstream responding to outsiders) or Hypothesis 2 (responding to specific issues). For instance, the ML is equally unresponsive to labor issues and the EU. Additionally, there is no support for Hypothesis 3, which anticipated the MR (Conservative) to be more responsive to the RR (UKIP). Instead, from a glance at these results estimated separately by country, there seems to be support for Hypothesis 4, suggesting that mainstream responsiveness is stronger in proportional systems with coalition building than in majoritarian systems like the UK.[28] In these contexts, mainstream parties respond to each other. For example, the Labour Party leads in incorporating topics such as cultural rhetoric during the electoral campaign, with ML's effect on MR being about 2 times larger than the reverse (which, in fact, is not statistically different from zero).

Finally, the results for the UK also support the responsiveness of outsider parties to mainstream parties (Hypothesis 6). The RR (UKIP) will likely increase its use of populist

[27] A shock from UKIP only influences populism, slightly increasing its usage for Labour (ML) and decreasing it for the Conservative Party (MR).

[28] Note the comparison across institutions is not formally tested as these are different models by country.

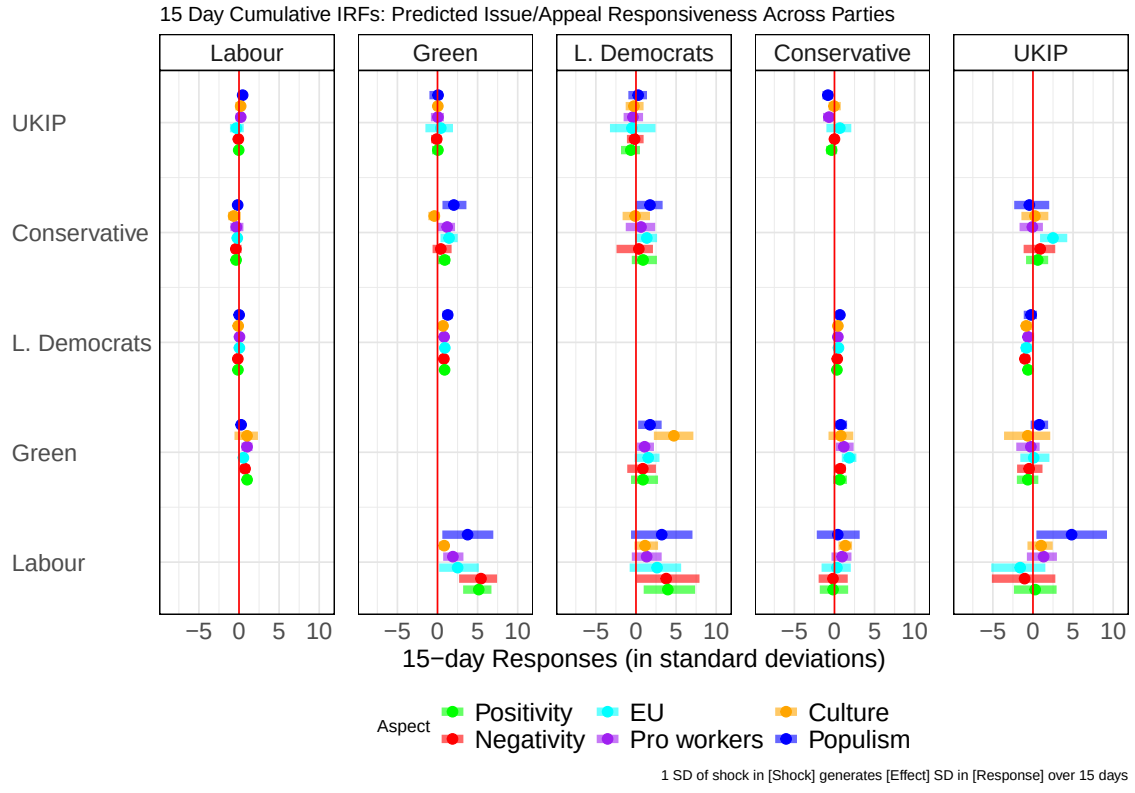

Figure 13: Predicted Issue/Aspect Responsiveness Across Parties, UK

Note: These plot represents a VAR(4). The coefficients (with 90% confidence intervals) indicate (in SD) how much more cumulative attention the groups in the panel titles paid to a given issue due to the groups in the y-axis increasing the attention to the same aspect 15 days ago. UKIP represents the RR, Labour, and Green the ML, Conservatives the MR, and L. Democrats are mainstream parties in the center. Appendix Figure 46 presents a zoom over these results around 2 SD of 0.

appeals and pay more attention to the EU issue following the Labour Party's focus and the Conservative Party's, respectively. The results are replicated when we look at the dynamics regarding the posting of YouTube videos independent of the topic under discussion (refer to Appendix B.14). Moreover, to further examine these dynamics across party families, see Appendix B.16.[29]

If parties specialize in certain issues, they should be particularly interested in responding to and leading relevant issues (as expected by Hypothesis 2). Is their attention to other issues different from the main results? To further analyze the issue ownership hypothesis, Appendix Figure 51 and Figure 52 present the results for other topics identified from the

[29]See Figures 47 and 48 for a replication of the results using a dictionary for populism.

BERT topic analysis. In Spain, this analysis shows that the ML responds to outsiders on several issues but not uniformly to both ideological sides. For example, PSOE (ML) does not respond to housing when the shock comes from the RR, whereas a similar shock from the Podemos or Sumar (RL) generates a strong response. When looking at the UK, UKIP is more responsive to the EU topic than other parties when reacting to mainstream parties (MR). Mainstream parties are responsive to each other when discussing several issues, such as the EU (e.g., Green responding to Labour) and Energy (e.g., Liberal Democrats responding to Green, Green responding to Conservative), among others.

3.4.2 Responsiveness and Accommodation?

The analysis above highlights that party dynamics during elections exist. In a proportional system with outsiders from both sides of the ideological spectrum, the mainstream appears responsive to outsiders, whereas in a majoritarian system, mainstream parties only respond to each other. Outsider parties are responsive to each other (when both sides of the ideological spectrum are present) and to mainstream parties. However, it remains unclear whether, by increasing issue attentiveness and rhetorical characteristics, parties use ideological accommodation. They may have emphasized or blurred their positions while responding (Rovny, 2012). Did parties use more of their rivals' vocabulary to respond during the campaign, or did they use more of their own vocabulary?

To answer these questions, I examine whether there are interdependence dynamics in the ideological scores of their vocabulary. If they did not change the vocabulary used to respond to other parties, we should not see any changes in the ideological score after a shock. Conversely, if we observe an increase in extremeness (absolute value of partisanship, where greater values indicate extremes), it would suggest that parties use more of their ideological vocabulary to discuss these issues. A decline in the extremeness measure would likely indicate more moderated responses; for instance, a negative score for an outsider would mean they are using vocabulary more associated with the center.

Figure 14 and Figure 15 show the results (15-day IRFs) for the models examining the ideological score. The main takeaway is that, in most cases, there is no support for the blurring hypothesis; if anything, there does not seem to be a change. Substantively, this means that even though parties increase attention to issues and rhetorical characteristics

from rival parties, they do not seem to borrow vocabulary from their rivals to sound more extreme or moderate.

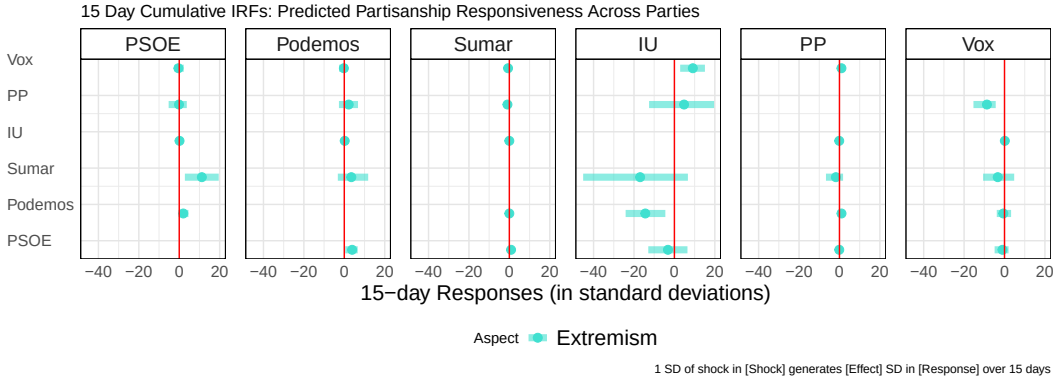

Figure 14: Predicted Changes in Extremeness Across Parties, Spain

Note: These plot represents a VAR(4). The coefficients (with 90% confidence intervals) indicate (in SD) how much more cumulative attention the groups in the panel titles paid to a given issue due to the groups in the y-axis increasing the attention to the same aspect 15 days ago. PSOE represents the ML, Podemos, Sumar and IU represents the RL, Vox the RR, and PP the MR.

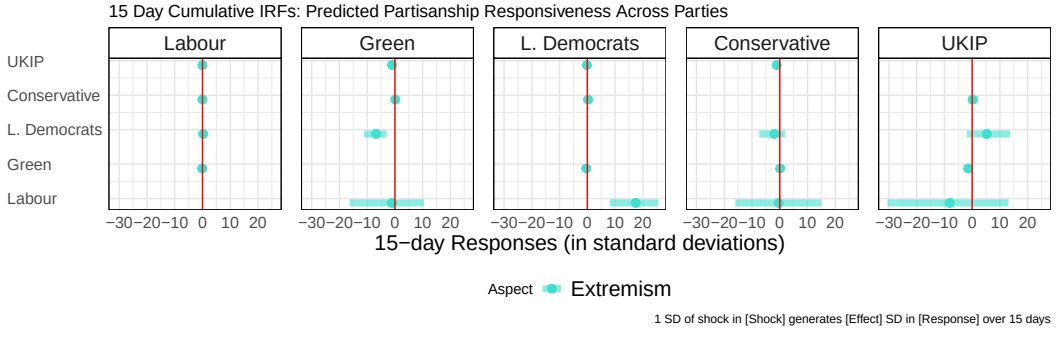

Figure 15: Predicted Changes in Extremeness Across Parties, UK

Note: These plot represents a VAR(4). The coefficients (with 90% confidence intervals) indicate (in SD) how much more cumulative attention the groups in the panel titles paid to a given issue due to the groups in the y-axis increasing the attention to the same aspect 15 days ago.

There are a few exceptions where we reject the null hypothesis of no changes in extremeness. When looking at PSOE, it seems that for the 2023 elections (first elections of SUMAR) an increase of extremeness of Sumar lead to an increase of extremness on the ML. In the fourth panel of Figure 14, when examining IU's responses in Spain, we observe an increase in extremeness when responding to a shock from the RR. This indicates that the RL uses more radical left vocabulary to address the RR.[30] Meanwhile, the RR adjusts their extremeness

[30]Note that when using the partisanship proxy (i.e., without the absolute value of the score), the movement

in response to the MR, moving toward moderation (i.e., when responding to the MR, they use more centrist vocabulary). In the UK, if anything, the center L. Democrats uses more extreme vocabulary (more toward the right) when responding to the RR.

Overall, these results, indicating a lack of ideological accommodation during electoral campaigns, are consistent with findings showing limited position changes when examining the immigration issue (Gessler and Hunger, 2022). However, it is important to note that my analysis covers the entire content of the messages, not just those related to immigration.

3.5 Conclusion

The rise of outsider parties has significantly affected mainstream parties, as many of their former supporters have switched their loyalty to these new parties. However, the intra-campaign dynamics between these parties, particularly who influences whom, remain less understood. Previous research has focused predominantly on how mainstream parties react to outsiders with respect to specific issues (e.g., Abou-Chadi and Krause, 2020; Gessler and Hunger, 2022), leaving a gap in our understanding about the reverse influence. This paper addresses this gap by examining YouTube communications during electoral campaigns from all elections between 2015 and 2023, focusing on Spain and the UK. I have developed temporally-disaggregated measures of issue attention and ideology for these parties with dictionaries, supervised machine learning, Wordscores, and deep learning transformers. Beyond merely describing the use of these tools over time, I have explored alternative models of party dynamics and responsiveness in the short term. This includes investigating whether mainstream parties react to outsiders, how specific issues affect response levels, the role of ideological positions in responsiveness, and, most importantly, whether outsiders respond to mainstream parties and their fellow outsiders.

I analyzed party dynamics using VAR models that account for endogenous relationships in political messaging. This paper's findings shed light on the reciprocal linkages between parties' attention to each other's rhetoric during electoral campaigns. First, I found that mainstream parties showed responsiveness to outsider parties, but this pattern was significant only in Spain. In this multi-party system with coalition bargaining, mainstream parties

is toward the left extreme.

may perceive outsiders as substantial threats due to their potential for gaining parliamentary representation. This may explain the empirical evidence supporting the "riding the wave" hypothesis and the hypothesis of greater responsiveness to ideologically similar rivals, exemplified by the interactions between the mainstream and outsider left. Alternatively, this responsiveness could be a signal about compatibility with the outsider in order to form a coalition government. Interestingly, the reactions of outsider parties to messaging shocks from mainstream parties were even more pronounced than when mainstream parties responded to outsiders. Additionally, I found that outsider parties are responsive to other outsider parties. Despite being at opposite ends of the ideological spectrum, these parties still compete for a similar voter base and thus engage with each other. Meanwhile, in the UK, mainstream parties were responsive to each other, and the outsider right party was influenced by the mainstream parties, but not vice versa. Furthermore, my work provides limited empirical support for the issue ownership hypothesis. Finally, I documented that although parties increase attention to issues and rhetorical characteristics from rival parties, there is limited empirical evidence of ideological accommodation.

This study's central concern has been to determine whether the mainstream-outsider relationship is one-way (from outsider to mainstream). The empirical evidence shows that it is not, at least in the short term. In fact, the findings indicate that mainstream parties have a greater ability to set the agenda during the electoral campaign. Moreover, electoral responsiveness primarily involved issues salience and rhetorical characteristics rather than ideological content. These results are consistent with recent evidence of short-term responsiveness, particularly on the issue of immigration, where outsider right parties influence mainstream parties (Gessler and Hunger, 2022; Hutter and Kriesi, 2022). Additionally, the lack of empirical evidence for ideological accommodation is consistent with null results regarding mainstream parties adopting anti-immigration positions in response to outsiders (Gessler and Hunger, 2022).

While outsiders do influence mainstream parties, this influence may be overestimated compared to the impact mainstream parties have on outsiders, especially during electoral campaigns. To reconcile these seemingly contradictory findings with previous scholars' assertions that mainstream parties are primarily responsive to outsiders and that issue ownership drives this responsiveness (e.g., Adams and Somer-Topcu, 2009; Abou-Chadi and Krause, 2020), it is essential to consider that, in the long term, after electoral results are known,

parties may adjust their strategies. However, this does not mean they merely imitate outsiders in day-to-day interactions. This has important normative implications for democratic politics. During campaigns, outsiders follow mainstream discussions, and this responsiveness rarely triggers political polarization.

Although my analysis is limited to two cases, I believe these findings are likely generalizable to other contexts. For instance, the results from Spain may reflect patterns in other multi-party systems like Greece, where outsiders exist at both ends of the ideological spectrum. Similarly, the inter-responsiveness between mainstream and outsider parties is also likely in multi-party systems with outsiders on a single end of the ideological spectrum, such as in Germany. Meanwhile, the results from the UK could apply to other majoritarian systems where outsider parties emerge.

Furthermore, my analysis focuses on the YouTube usage of parties, but other social media platforms could be relevant. However, since YouTube content is often replicated across other platforms such as X (Twitter), Facebook, and Instagram, I anticipate that these results will be replicated with those platforms as well. The rising central role of YouTube in citizens' news and political content consumption underscores the growing importance of this tool (Schomer, 2020; Konitzer et al., 2020; Hosseinmardi et al., 2021).

In summary, this study is one of the few[31] that demonstrates how social media platforms enable the day-to-day investigation of political parties' strategic behavior and short-term responsiveness to their competitors. Additionally, I have employed NLP tools, including advanced deep learning transformers, to disentangle the characteristics of political messages. This work may serve as a template for more detailed analyses of party competition, and researchers may find the new efficient measure of populism particularly useful. Both templates can potentially address numerous other research questions. For example, while I analyzed accommodation by examining the ideological score of the language used by parties, the study does not yet consider political stances. Emerging tools, such as those from OpenAI, have been used to identify pro and anti positions on issues like immigration (González-Rostani, Incio, and Lezama, 2024*a*). Applying similar tools to analyze whether parties shift their stances in response to rival shocks is crucial for understanding democracy and accountability. Future research could further explore these issues. Another avenue for future research could be

[31]Examples include Barberá et al. (2019); Gilardi et al. (2021); Gessler and Hunger (2022); Hutter and Kriesi (2022); Klüver and Sagarzazu (2016).

to study local elections. At the local level, examining party communication channels may reveal different dynamics of responsiveness. Are these dynamics similar to those observed in general elections and national party channels? Do they differ, and if so, what explains these deviations? Exploring these questions could provide valuable insights and shed light on the local electoral dynamics of political representation. Another extension for future work could be to explore more "grass-roots" and less formally organized communication strategies, such as alternative platforms like Telegram.

Appendix B Who Influences Whom? Analyzing the Interplay of Mainstream and Outsider Parties in Social Media Campaigns

B.1 UK and Spain elections

The following tables provide a summary of the key dates and events related to the elections held in Spain and the UK over recent years. These include the first official announcement dates, the actual election dates, the individuals or authorities responsible for calling the elections, and additional comments to provide context for each event.

B.1.1 Spain Elections

Table 34: Significant Dates and Events in Spanish Politics

First Official Day	Election	Who	Comment
28-May-23	23-Jul-23	Pedro Sanchez	Before May 23 there were the general elections.
17-Sep-19	10-Nov-19	Pedro Sanchez	After unsuccessful negotiations to build a government.
15-Feb-19	28-Apr-19	Pedro Sanchez	After the 2019 General State Budget was voted down by the Congress of Deputies on 13 February 2019.
3-May-16	26-Jun-16	King Felipe VI	Deadlock after 2015 election. King Felipe VI dissolved the parliament on May 3, 2016, which triggered the repeat election scheduled for June 26, 2016.

B.1.2 UK Elections

Table 35: Significant Dates and Events in the UK Politics

First Official Day	Election	Who	Comment
30-Mar-15	7-May-15	Fixed-term Parliaments Act 2011	It was the only general election held under the rules of the Fixed-term Parliaments Act 2011.
20-Feb-16	23-Jun-16	David Cameron	The Brexit referendum was officially announced by Prime Minister David Cameron on February 20, 2016.
18-Apr-17	8-Jun-17	Theresa May	
29-Oct-19	12-Dec-19	Boris Johnson	
	6-May-21	Boris Johnson	Local elections, initially scheduled for May 2020 but were postponed due to the COVID-19 pandemic.

B.2 Descriptives Youtube

Table 36: Available Transcripts YouTube Videos from Spain in the Dataset

	2016	2019 (A)	2019 (B)	2023	Total	%
MR	0	19	24	386	429	84%
ML	405	247	194	283	1129	74%
RL	532	360	373	516	1781	72%
RR	161	273	277	441	1152	76%
Total	1098	880	844	1240	4491	75%

Note: The proportion refers to the total over the available ones.

Table 37: Available Transcripts YouTube Videos from the UK in the Dataset

	2015	2016	2017	2019	2021	Total	%
ML	105	61	65	27	117	375	88%
MR	205	71	236	68	79	659	91%
RR	287	310	221	264	105	1187	91%
Total	597	442	522	359	301	2221	90%

Note: The proportion refers to the total over the available ones.

B.3 YouTube Data Collection Steps

The data collection process was conducted using Python, focusing on extracting video links from YouTube channels and subsequently obtaining the available transcripts for these videos. The following steps outline the methodology used:

1. Building the YouTube API Client: Utilizing the `googleapiclient.discovery` module, I built the YouTube API client. This allowed for efficient retrieval of video lists from specified channels by leveraging the YouTube Data API.
2. Retrieving Video Details: I retrieved detailed information about each video, including the title, publication date, and URL link, from the specified channels. This was done within defined date ranges.
3. Fetching Video Transcripts: The next step involved obtaining the transcripts for the identified videos. For this purpose, I employed the `YouTubeTranscriptApi`, which facilitated the extraction of textual content directly from YouTube.
4. Language Filtering: To ensure that the transcripts met the research requirements, an additional step was incorporated to filter transcripts based on the desired language. The `YouTubeTranscriptApi` supports specifying a language code during the transcript retrieval process. In this study, English transcripts were specifically targeted and retrieved.
5. Translating Non-English Transcripts: For videos that had transcripts in Spanish, the YouTube API obtained them in English. This ensured consistency and comprehensibility of the data for analysis.

B.4 Measuring Populism

My measure of populism relies on the work in progress by Bang-Jensen, Colaresi, and Gonzalez-Rostani (2024). I thank the authors for allowing me to use their annotated sentences. I will provide some examples of how their labeling annotation works to identify which part of the speech refers to populism.

B.4.1 Donald Trump's example from Bang-Jensen, Colaresi, and Gonzalez-Rostani (2024)

Donald Trump's Inaugural Address was a prototypical example of a mixed populist-programmatic speech. He includes language that mirrors populism and nationalist economic and foreign policies.

Sentence 1:

$$\texttt{For too long,}\ \Big[\overbrace{\texttt{a small group in our nation's Capital}}^{them}\ \texttt{has}\ \overbrace{\texttt{reaped the rewards of government}}^{+valence}\Big]\ \texttt{while}\ \Big[\overbrace{\texttt{the people}}^{us}\ \texttt{have}\ \overbrace{\texttt{borne the cost.}}^{-valence}\Big]$$

Sentence 2:

$$\Big[\overbrace{\texttt{Washington}}^{them}\ \overbrace{\texttt{flourished}}^{+valence}\Big]\ \texttt{but}\ \Big[\overbrace{\texttt{the people}}^{us}\ \texttt{did}\ \overbrace{\texttt{not share in its wealth.}}^{-valence}\Big]$$

Sentence 3:

$$\Big[\overbrace{\texttt{We}}^{Us}\ \texttt{will}\ \overbrace{\texttt{bring back our jobs.}}^{+valence}\Big]$$

Sentence 4:

$$\Big[\overbrace{\texttt{We}}^{Us}\ \texttt{will}\ \overbrace{\texttt{bring back our borders.}}^{+valence}\Big]\ \Big[\overbrace{\texttt{We}}^{Us}\ \texttt{will}\ \overbrace{\texttt{bring back our wealth.}}^{+valence}\Big]$$

$$\texttt{And}\ \Big[\overbrace{\texttt{we}}^{Us}\ \texttt{will}\ \overbrace{\texttt{bring back our dreams.}}^{+valence}\Big]$$

B.4.2 The labels

Bang-Jensen, Colaresi, and Gonzalez-Rostani (2024) annotated 22 different labels to identify parts of speech, aiming to capture various motifs, including both populism and anti-populism. My simplified version focuses on the most relevant labels for identifying populism and training those to predict its presence. Given my interest in the dynamics of populism (even when they may be opposing), I accept the potential sacrifice of distinguishing whether populist words are used in opposition.

Among the labels they trained are those intended to identify support or opposition to populism. Examples include NEG (negation), JAOo (judgment of opposition), JHn (judgment holder, not the speaker), JHs (judgment holder on the speaker), JAOs (judgment of agreement), JGTg (when something is given), and JGTt (when something is taken). Additionally, they have contextual labels such as time and place, and they use adjectives to quantify.

Figure 33 represents the logistic regression coefficients with the dependent variable being a dummy indicating whether a sentence was labeled as populist by a hand coder (the first step of Bang-Jensen, Colaresi, and Gonzalez-Rostani's sample stratification). This figure predicts populism based on the different labels.

This analysis shows that violations (general or specific), them, negation, opposition, and US labels are the strongest predictors of populism (indicated by green coefficients). For my proxy of populism, since I am not interested in opposition or negation, I rely only on the violation, them, and us labels. Note that labels such as protection or issues labeled as neutral are not predictive of populism and may even indicate the opposite (indicated by red coefficients). Therefore, I exclude these positive valence labels.

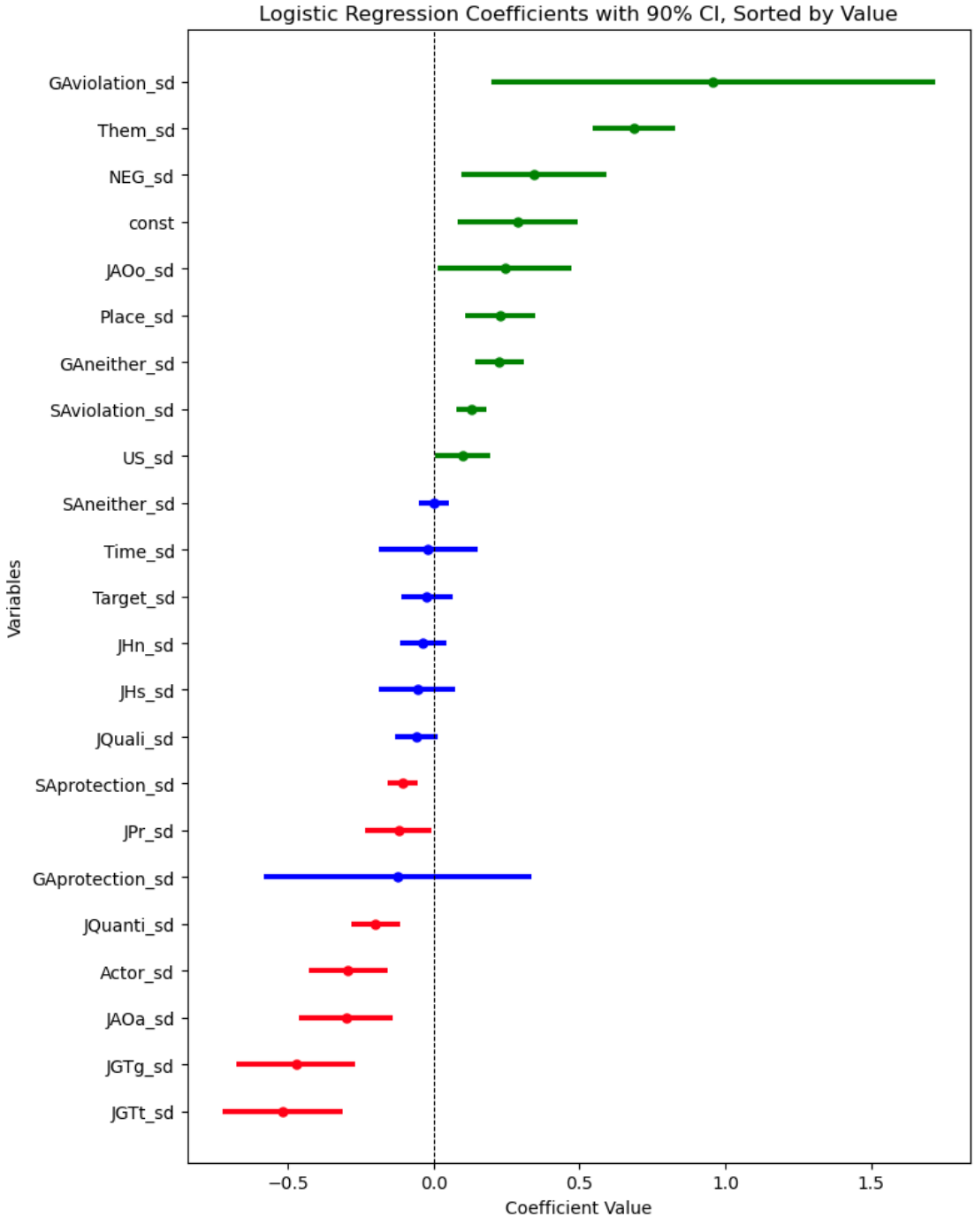

Figure 33: Logistic Regression Coefficients with 90% of CI sorted by value

Note: The sample refers to all the training sentences by Bang-Jensen, Colaresi, and Gonzalez-Rostani (2024). The DV is a hand-coding made by the authors to stratify the sample into populist and non-populist sentences. The IV (predictors) are the different labels annotated by research assistants.

B.4.3 Models

I relied on token classification: (`https://huggingface.co/docs/transformers/tasks/token_classification`). Each model was trained over 100 epochs, with a weight decay of 0.01. Then, the best model was saved and pushed into the hub.

Table 38: Performance Metrics for Different Labels

Label	Recall	F1	Accuracy
SAviolation	0.36798	0.47898	0.91332
Them	0.67391	0.65263	0.96959
US	0.72000	0.76596	0.97537

B.4.4 My proxy of populism

My proxy of populism counts the occurrence of three labels: "us," "them," and "violations" per video. This method is comparable to using a dictionary; however, the labels were trained on thousands of politicians' speeches rather than relying on a predetermined list.

$$\text{Populism Score}_j = \text{Count}_{\text{us},j} + \text{Count}_{\text{them},j} + \text{Count}_{\text{violations},j}$$

Where:

- j represents a specific video.
- $\text{Count}_{\text{us},j}$ is the number of occurrences of the "us" label in video j.
- $\text{Count}_{\text{them},j}$ is the number of occurrences of the "them" label in video j.
- $\text{Count}_{\text{violations},j}$ is the number of occurrences of the "violations" label in video j.

B.5 Measuring Issues - Dictionaries

- **Culture Dictionary:** The culture dictionary includes words and bi-grams that capture discussions related to cultural issues. These terms are indicative of topics such as immi-

gration, religion, sexual orientation, terrorism, and national heritage. Below is the list of words and bi-grams used:

  - Words: immigr, border, wall, heritage, values, culture, inclusion, enforcement, muslim, christian, islam, gay, lesbian, lgbt, terrorism, undocumented, way of life, illega, asyl, migrat, migrant, migrier, xenophob, tradition, invasion, deport

  This dictionary was created building on the previous dictionaries of Gessler and Hunger (2022), which were adapted from Pauwels (2011), and Ruedin and Morales (2019).

- **Worker Dictionary:** The worker dictionary consists of words and bi-grams related to employment, labor issues, and economic conditions affecting workers. The terms focus on job security, wages, manufacturing, unions, and the effects of globalization. Below is the list of words and bi-grams used:

  - Words: factory, factories, job, employ, unemploy, worker, labor, wage, paid, fair, unfair, manufactur, union, steel, hardwork, pay, hire, decent, trade, autoworker, deindustrialization, industr, globalization, offshor
  - Bi-grams:
    * middle class
    * hard work
    * bring back
    * brit first
    * forgotten man
    * blue collar
    * brit hands
    * hire brit
    * buy brit
    * brit made
    * lai off
    * people work at

  For the case of Spain, instead of 'brit', I used references to Spain and Spanish workers. This dictionary was created building on Gonzalez-Rostani (2021).

B.6 Measuring Issues - BERTopic

I employ the deep "language knowledge" model of BERT (Bidirectional Encoder Representations from Transformers), BERTopic. BERT is a transformer, based on a neural network architecture for processing sequences of data such as text (Vaswani et al., 2017).

Table 39: BERT - Spain

Representation	Open AI label	Group
['going', 'people', 'party', 'government', 'spain', 'want', 'say', 'know', 'country', 'like']	General Political Discussions	Campaign
['going', 'party', 'government', 'spain', 'people', 'want', 'country', 'know', 'say', 'socialist']	Government and Political Activities in Spain	Campaign
['ah', 'oh', 'foreign', 'orthe', 'goo', 'ugh', 'thank', 'purpose', 'round', '12']	General Political Discussions	Campaign
['javier', 'spain', 'going', 'boxing', 'say', 'people', 'party', 'want', 'spaniards', 'dont']	General Political Discussions	Campaign
['vote', '28', 'envelope', 'documentation', 'mail', 'post', 'safe', 'safely', 'abandonment', 'office']	Political Strategies and Elections	Campaign
['vox', 'going', 'people', 'spain', 'government', 'party', 'say', 'spaniards', 'snchez', 'want']	Vox Party and Spanish Politics	Campaign
['budgets', 'budget', 'debate', 'government', 'party', 'general', 'political', 'year', 'social', 'important']	Economic Policies and Employment	Economy
['tax', 'fiscal', 'illusion', 'companies', 'financial', 'taxation', 'information', 'transparency', 'multinationals', 'european']	Taxation and Financial Policies	Economy
['party', 'government', 'energy', 'law', 'country', 'social', 'popular', 'going', 'measures', 'think']	Government Policies on Energy	Energy
['energy', 'renewables', 'renewable', 'climate', 'going', 'say', 'thank', 'report', 'like', 'know']	Renewable Energy and Climate Change	Energy
['european', 'europe', 'union', 'war', 'people', 'going', 'countries', 'government', 'refugees', 'spain']	European Union and War	EU
['sahrawi', 'sahara', 'morocco', 'western', 'human', 'border', 'camps', 'international', 'refugee', 'people']	Immigration and Border Control	EU
['burgos', 'people', 'going', 'spain', 'want', 'party', 'years', 'government', 'country', 'said']	Regional Focus on Burgos and Local Politics	Housing
['pro', 'city', 'going', 'health', 'people', 'government', 'years', 'social', 'party', 'want']	Urban Development and Health Initiatives	Housing
['housing', 'law', 'right', 'rental', 'people', 'know', 'believe', 'rent', 'going', 'homes']	Housing Laws and Rental Rights	Housing
['women', 'violence', 'law', 'going', 'people', 'sexual', 'government', 'rights', 'want', 'country']	Women and Violence Legislation	Women
['education', 'educational', 'students', 'school', 'teachers', 'european', 'university', 'law', 'public', 'democratic']	Education Reforms and Policies	Other
['corruption', 'eh', 'case', 'cases', 'transparency', 'believe', 'party', 'law', 'popular', 'anticorruption']	Law Enforcement and Public Safety	Other
['venezuela', 'venezuelan', 'international', 'crisis', 'prisoners', 'solidarity', 'elections', 'solution', 'european', 'leopoldo']	International Relations and Crisis	Other
['animals', 'animal', 'dog', 'dogs', 'think', 'hunting', 'dont', 'law', 'abuse', 'protection']	Animal Rights and Protection	Other

Table 40: BERT - UK

Representation	Open AI label	Larger label
['people', 'know', 'think', 'just', 'want', 'thats', 'im', 'party', 'like', 'um']	General Political Discussions	Campaign
['um', 'know', 'think', 'people', 'party', 'uh', 'just', 'need', 'going', 'im']	Casual Political Conversations	Campaign
['liberal', 'im', 'joined', 'join', 'pm', 'democrats', 'polling', '10', 'day', 'involved']	Political Campaigning and Polling	Campaign
['conference', 'applause', 'thank', 'motion', 'labour', 'people', 'party', 'government', 'chair', 'support']	Political Conferences and Support	Campaign
['people', 'economy', 'nuclear', 'uh', 'schools', 'country', 'want', 'government', 'weve', 'going']	National Economic and Social Policies	Economy
['data', 'european', 'internet', 'market', 'rules', 'online', 'roaming', 'digital', 'protection', 'states']	Digital Market and Data Protection	Economy
['trade', 'eu', 'ttip', 'canada', 'european', 'deal', 'states', 'commission', 'agreement', 'free']	Trade Agreements and Policies	Economy
['tax', 'multinationals', 'european', 'states', 'commission', 'panama', 'committee', 'rulings', 'countries', 'member']	Taxation and Financial Regulations	Economy
['energy', 'climate', 'warming', 'gas', 'green', 'change', 'temperature', 'kelvin', 'emissions', 'global']	Climate Change and Energy Policies	Energy
['food', 'waste', 'organic', 'european', 'new', 'eu', 'products', 'gmos', 'water', 'farmers']	Agriculture and Food Safety	Energy
['leave', 'deal', 'european', 'eu', 'britain', 'union', 'trade', 'people', 'brexit', 'country']	Brexit and Trade Deals	EU-Brexit
['sex', 'motion', 'prison', 'uh', 'thank', 'conference', 'prize', 'um', 'people', 'brexit']	Conference Discussions and Brexit	EU-Brexit
['european', 'europe', 'parliament', 'eu', 'commission', 'union', 'states', 'citizens', 'member', 'new']	European Union Governance	EU
['eu', 'european', 'europe', 'refugees', 'member', 'states', 'turkey', 'syria', 'people', 'ukraine']	European Refugee Crisis	EU
['police', 'people', 'asylum', 'britain', 'prison', 'need', 'country', 'officers', 'immigration', 'crime']	Law Enforcement and Immigration	EU
['nhs', 'health', 'people', 'care', 'know', 'mental', 'really', 'government', 'loneliness', 'just']	Healthcare and Mental Health	Health
['um', 'vaccine', 'know', 'think', 'like', 'vaccines', 'pandemic', 'yeah', 'uh', 'going']	Vaccine Discussions and Pandemic Response	Health
['children', 'parents', 'adoption', 'parental', 'unaccompanied', 'leave', 'refugees', 'europe', 'child', 'childrens']	Child Welfare and Refugee Issues	Health
['women', 'gender', 'men', 'male', 'female', 'mean', 'sports', 'womens', 'violence', 'woman']	Gender Issues and Women's Rights	Other
['film', 'films', 'cinema', 'european', 'prize', 'lux', 'polish', 'europe', 'movie', 'finalists']	European Cinema and Film Awards	Other

B.7 Measuring Sentiment

I relied on bert-base-multilingual-uncased-sentiment model (NLP Town, 2023), which is a pre-trained language model available in HuggingFace hub. It is based on the BERT architecture, specifically designed to handle multiple languages and provide sentiment analysis capabilities. This model is "multilingual" and "uncased," meaning it can process text from various languages without differentiating between uppercase and lowercase letters.

The model has been fine-tuned on a large corpus of text for the specific task of sentiment analysis, making it adept at understanding and categorizing text into different sentiment classes, such as positive, negative, and neutral.

B.8 Measuring Partisanship and Extremeness

To mathematically represent the strategy of assigning a partisan score to each video based on the political orientation of candidates, follow these steps:

1. **Pre-processing and Vectorization**: Let $D = \{d_1, d_2, \ldots, d_n\}$ be the set of documents (video transcripts).

   Pre-process each document to tokenize and normalize the text, removing stop words and non-informative terms.

   Vectorize the documents to create a term-document matrix X, where X_{ij} represents the frequency of term t_j in document d_i.
2. **Grouping by Political Orientation**:

   Let $P = \{p_1, p_2, \ldots, p_k\}$ be the set of political orientations (left, center, right).

   Group documents by their known political orientation $p \in P$.
3. **Calculating Relative Frequencies**: - For each term t_j, calculate the relative frequency within each political orientation group:

   $$f_{pj} = \frac{\sum_{d_i \in P_p} X_{ij}}{\sum_{d_i \in P_p} \sum_{t_k} X_{ik}}$$

   where P_p is the set of documents with political orientation p, and X is a term-document matrix where each element X_{ij} represents the frequency count of term t_j in document d_i.

4. **Computing Partisan Score**: Compute the partisan score S_j for each term t_j as the difference in relative frequencies between left and right orientations:

$$S_j = \frac{f_{\text{right},j}}{f_{\text{right},j} + f_{\text{left},j}} - \frac{f_{\text{left},j}}{f_{\text{right},j} + f_{\text{left},j}}$$

5. **Aggregating Scores for Each Document**: For each document d_i, compute the document's partisan score PS_i by averaging the scores of terms within the document:

$$PS_i = \sum_{t_j \in d_i} p_{wj} \times S_j$$

where p_{wj} is the relative frequency of term t_j in document d_i.

6. **Calculating Extremeness of Content**: Calculate the absolute value of the partisan score for each document to measure the extremeness:

$$E_i = |PS_i|$$

By following these steps, we can quantify the political orientation and extremeness of the content in each video, identifying whether parties are adapting their vocabulary or responding with their own.

B.8.1 Examples

The following lists provide examples of words that score high as left or right in political orientation for each country studied.

- **UK**
  - **Left:** retirement, defeating, internationalism, accessibility, struggles, articulate
  - **Right:** communist, tea, syndrome, lobbyists, loser, cuban, currency

Spain

-
  - **Left:** planets, intersectionality, interventionist, layoffs, disasters, discarded, narrative
  - **Right:** abolishing, drunks, usurped, deceptions, podemistas, islamist, fundamentalism, taliban, demagogy

B.9 Descriptives Measures Spain

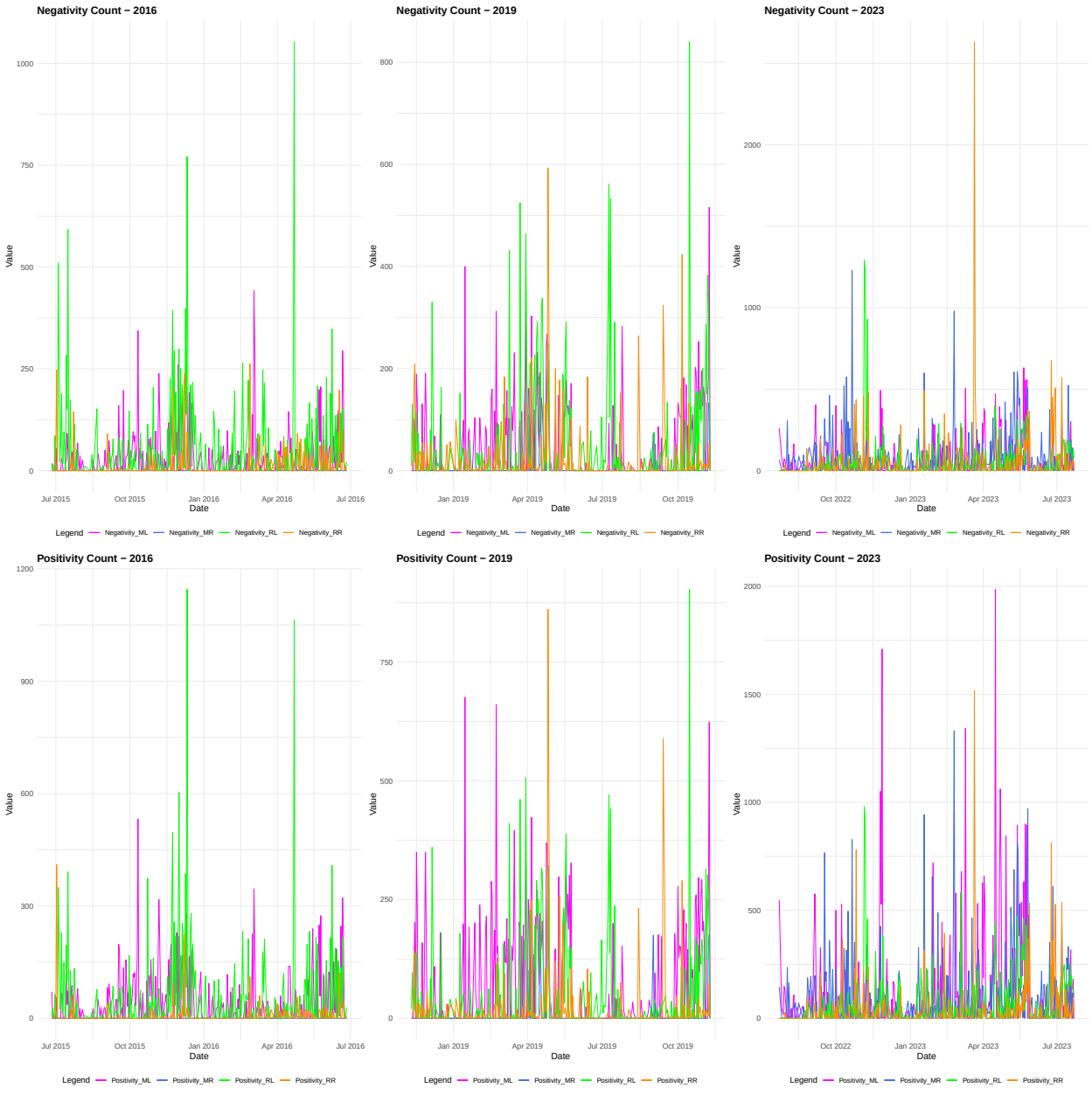

Figure 34: Times Series Plot Spain - Issue/Aspects Emphasis over Time, part I

Figure 35: Times Series Plot Spain - Issue/Aspects Emphasis over Time, part II

B.10 Descriptives Measures UK

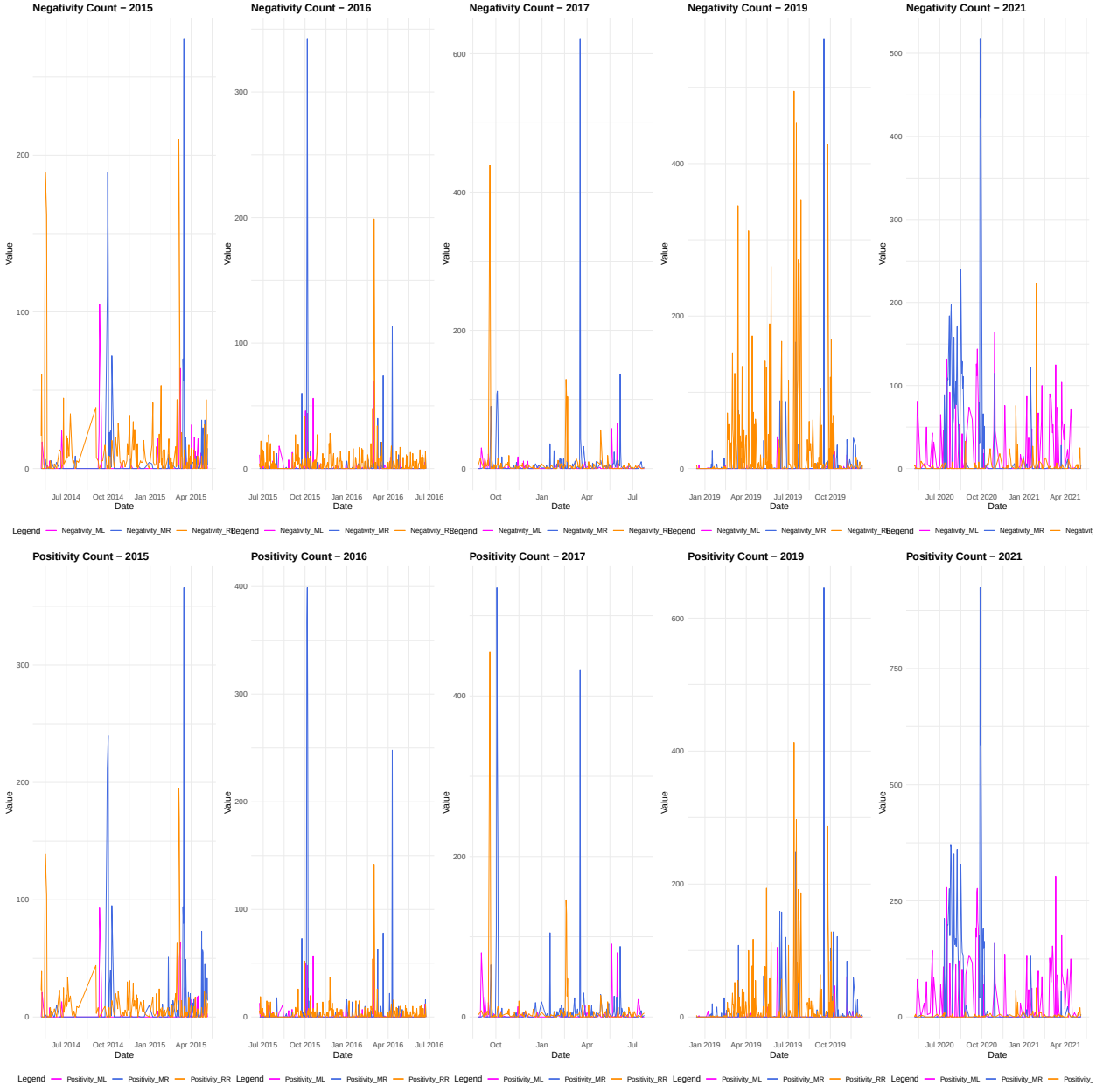

Figure 36: Times Series Plot UK- Issue/Aspects Emphasis over time - part I

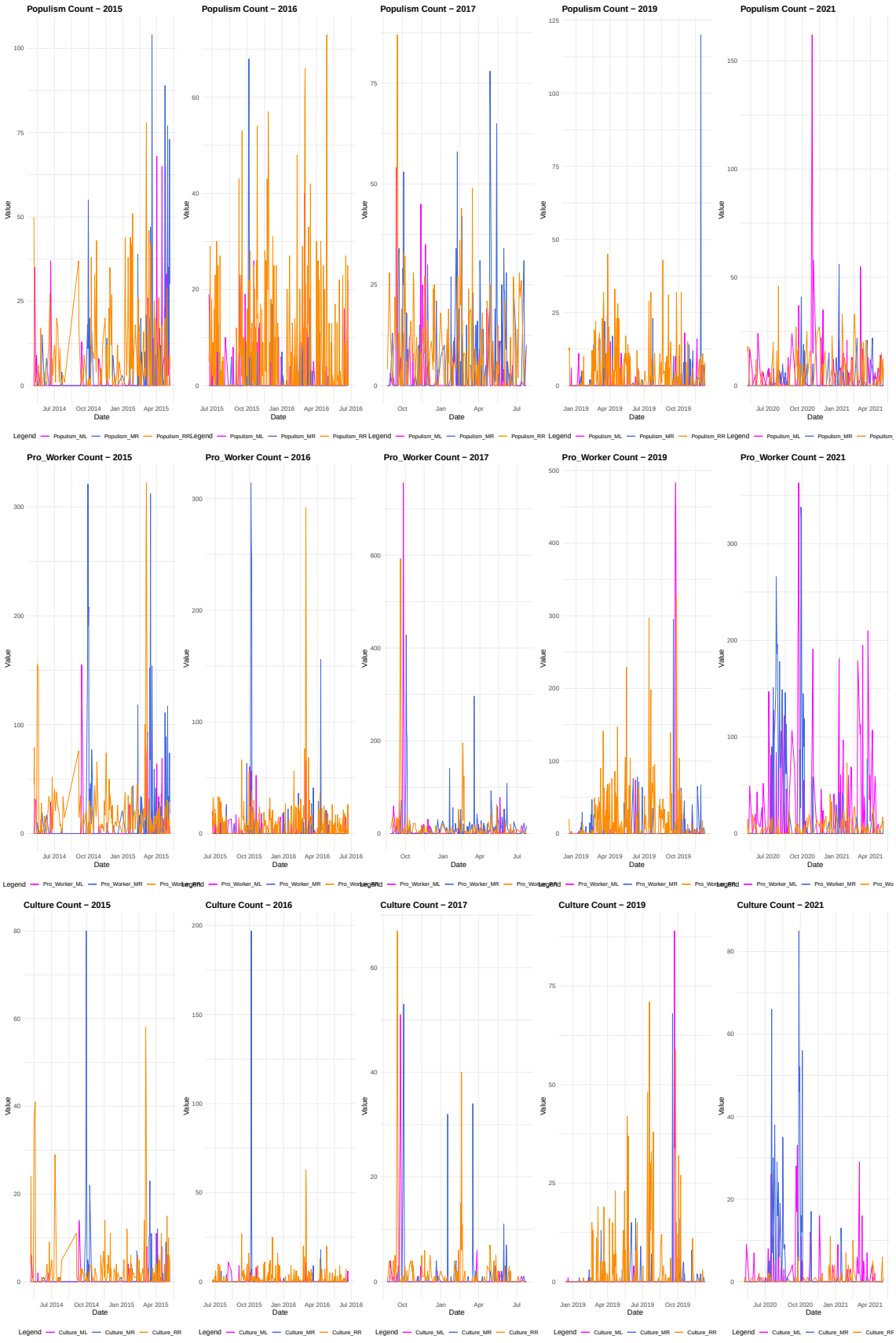

Figure 37: Times Series Plot UK: Issue/Aspects Emphasis over Time

B.11 VAR specifications with two endogenous parties and the remaining exogenous.

These models present VAR combinations that look at the endogenous relationship between two parties and leave the other ones as exogenous. The results are mainly similar to this specification.

The results also allow the possibility of contemporaneous relationships varying in order.

B.11.1 Spain VAR Specification & IRF: Exploring Contemporaneous Relationship

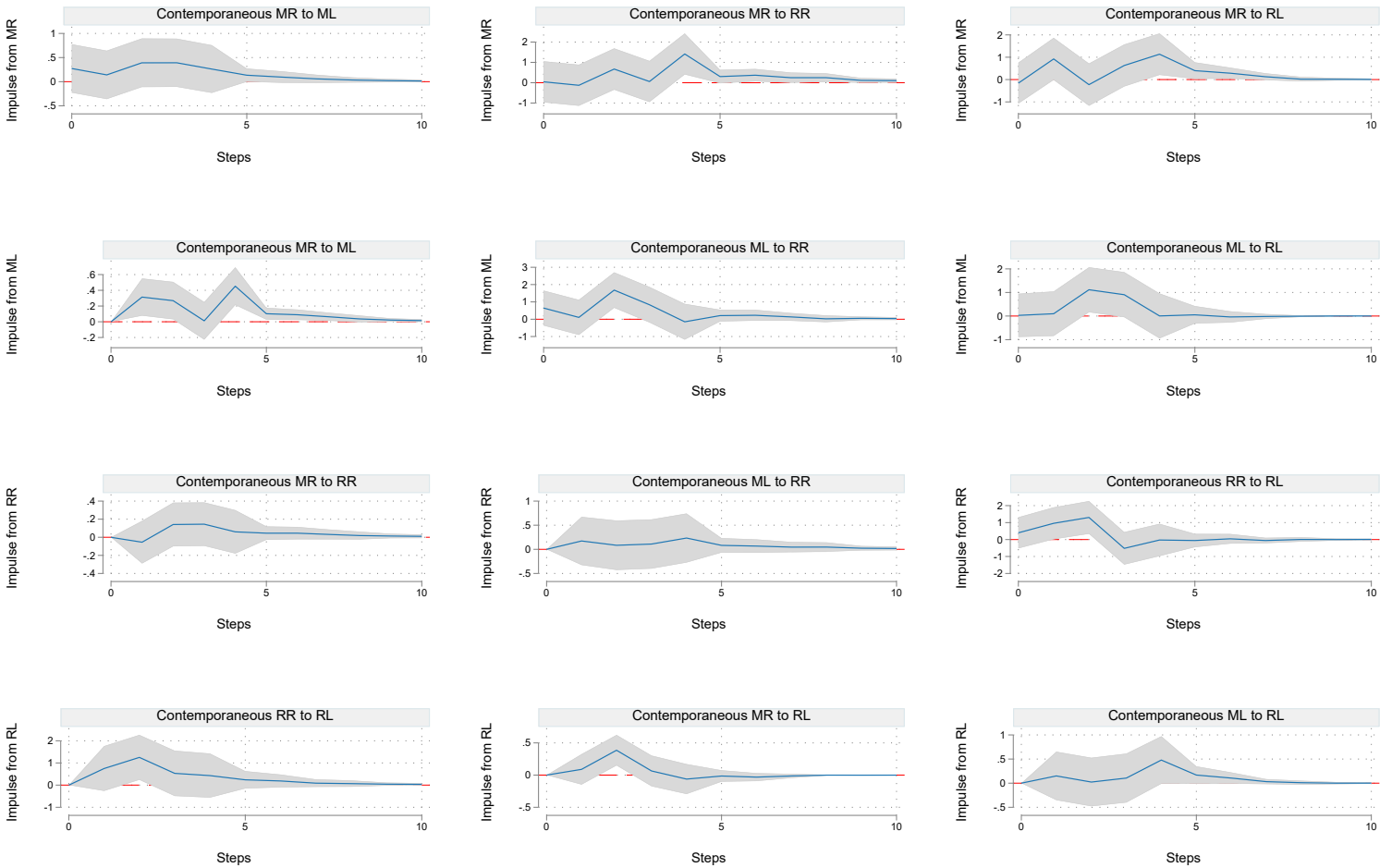

Figure 38: Spain IRF - Populism Part I

Note: All the models are estimated to look at the relationship between two parties, while the other two are kept as exogenous. There is an exogenous variable for periods too. This is a VAR (4). The contemporaneous relationship is assumed one way; the other way appears in Figure 39

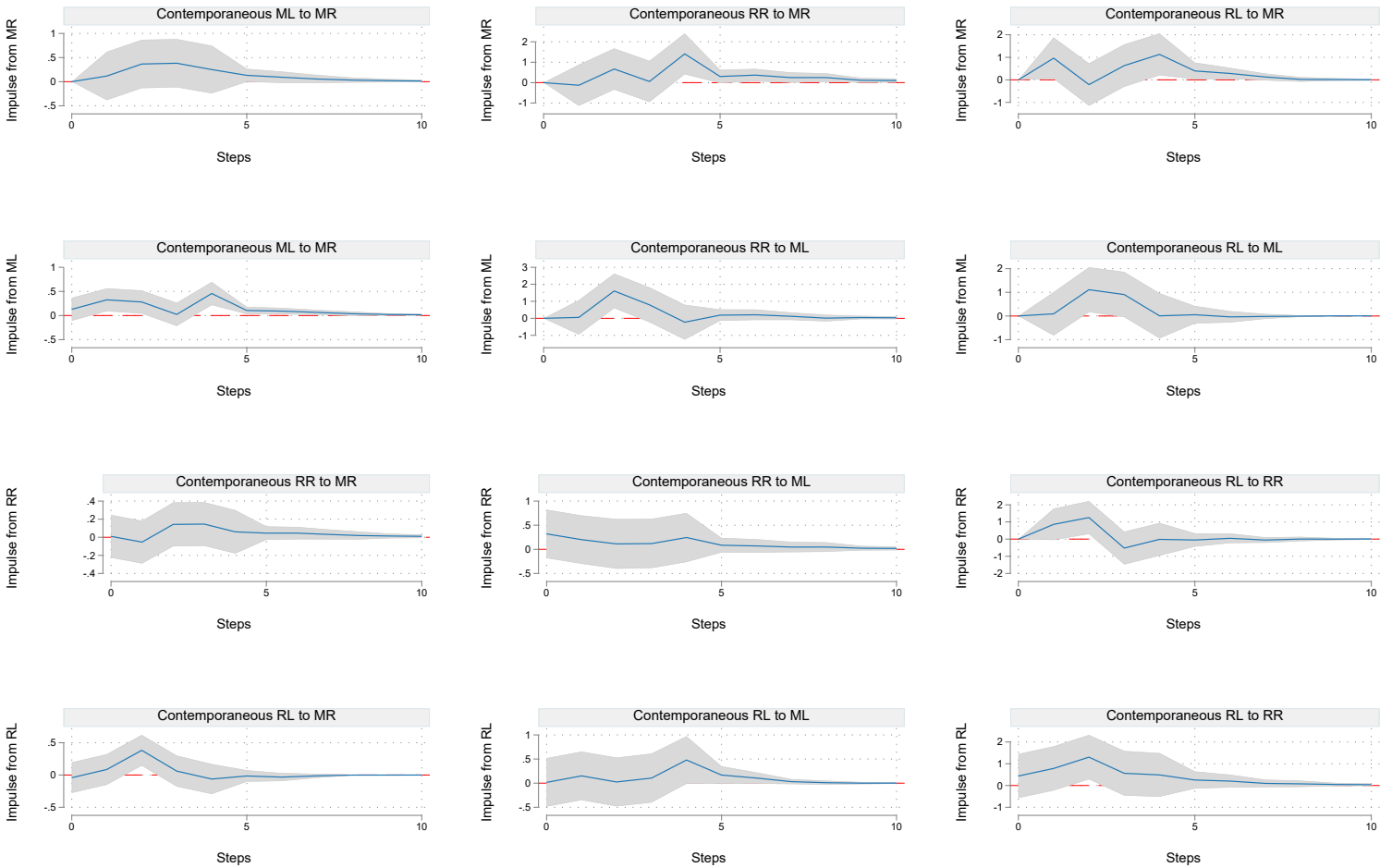

Figure 39: Spain IRF - Populism Part II

Note: All the models are estimated to look at the relationship between two parties, while the other two are kept as exogenous. There is an exogenous variable for periods too. This is a VAR (4). The contemporaneous relationship is assumed one way; the other way appears in Figure 38

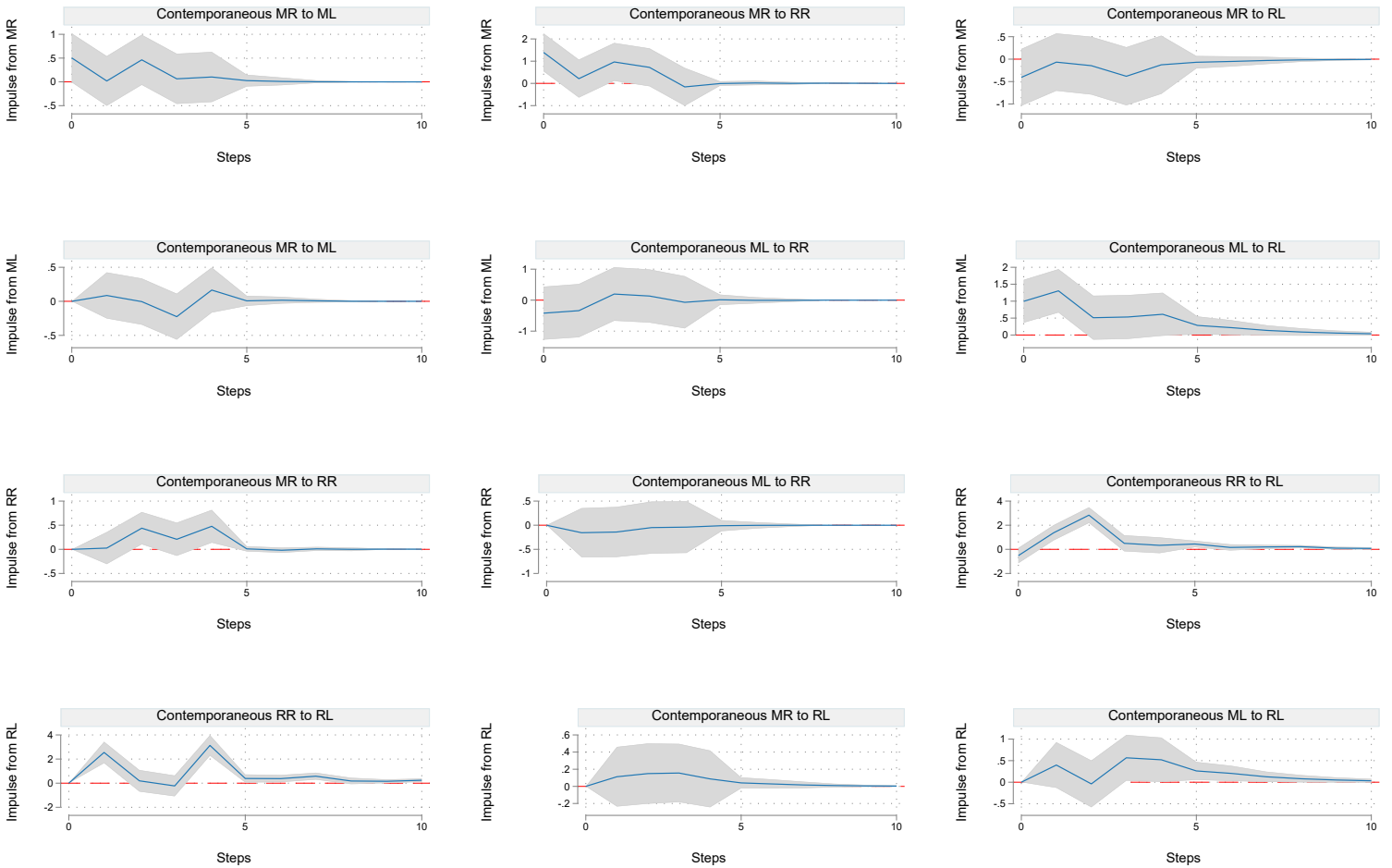

Figure 40: Spain IRF - Culture

Note: All the models are estimated to look at the relationship between two parties, while the other two are kept as exogenous. There is an exogenous variable for periods too. This is a VAR (4).

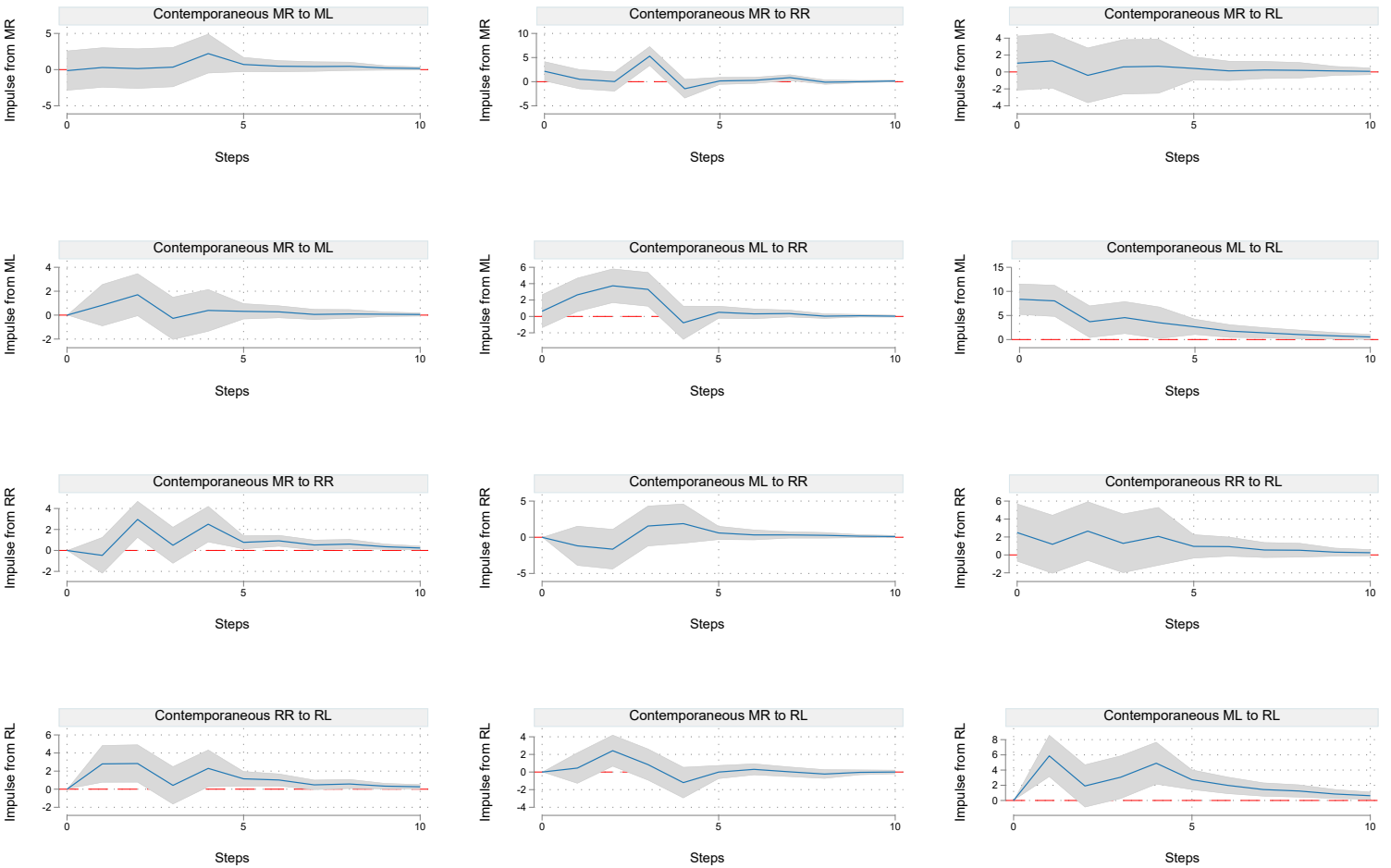

Figure 41: Spain IRF - Worker's rhetoric

Note: All the models are estimated to look at the relationship between two parties, while the other two are kept as exogenous. There is an exogenous variable for periods too. This is a VAR (4).

B.11.2 UK VAR Specification & IRF: Exploring Contemporaneous Relationship

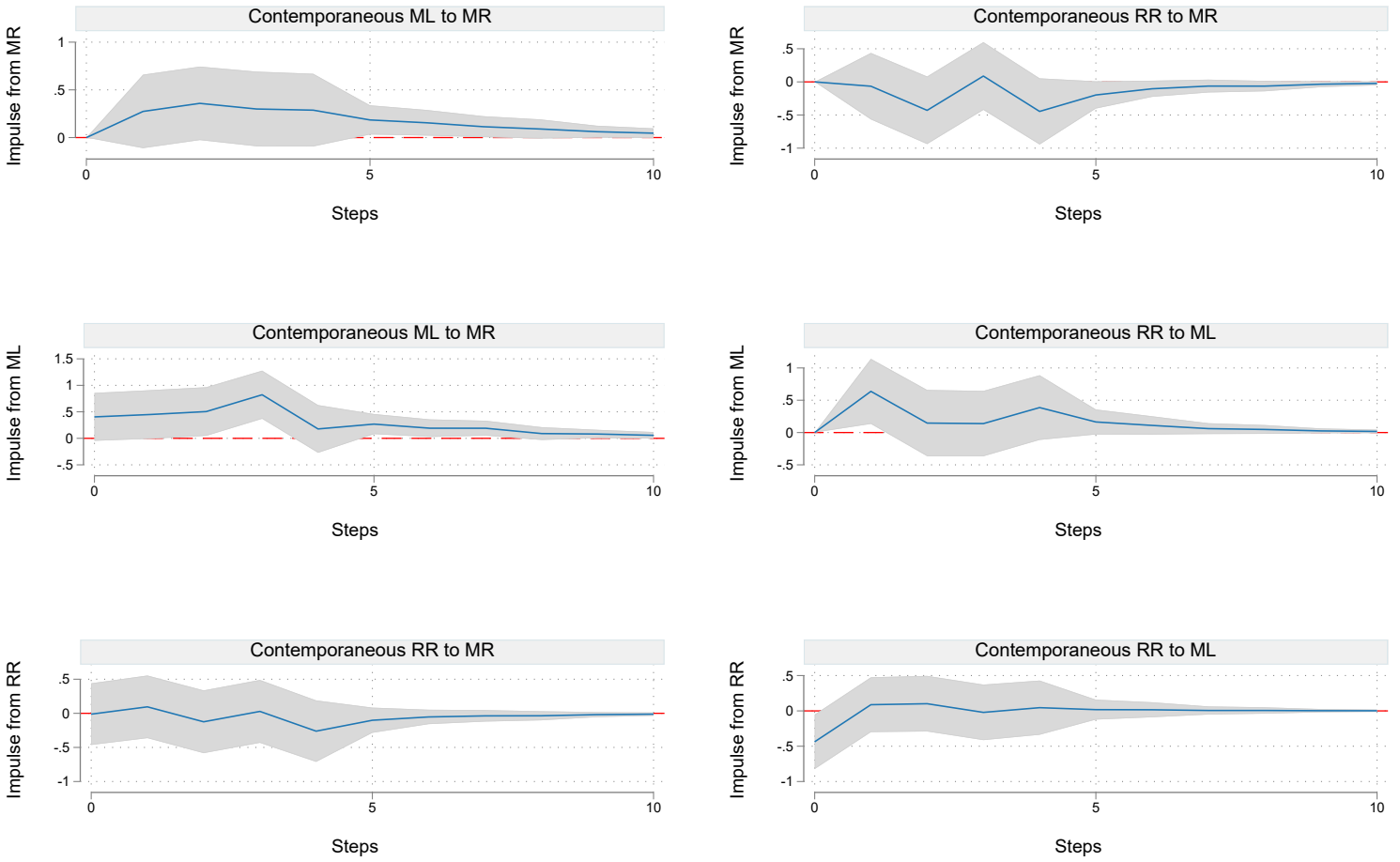

Figure 42: UK IRF - Populism Part I

Note: All the models are estimated to look at the relationship between two parties, while the other one is kept as exogenous. There is an exogenous variable for periods too. This is a VAR (4).

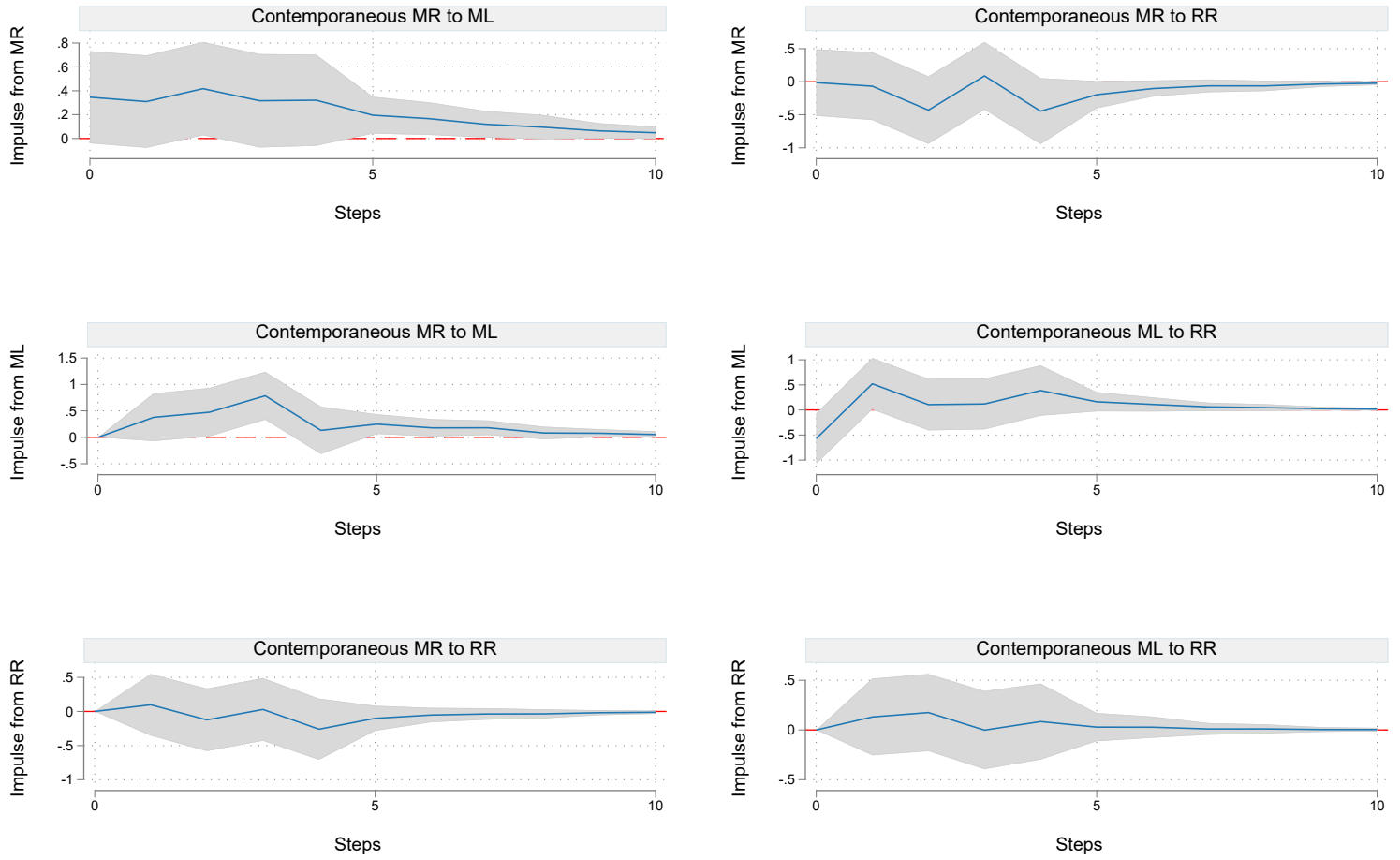

Figure 43: UK IRF - Populism Part II

Note: All the models are estimated to look at the relationship between two parties, while the other one is kept as exogenous. There is an exogenous variable for periods too. This is a VAR (4).

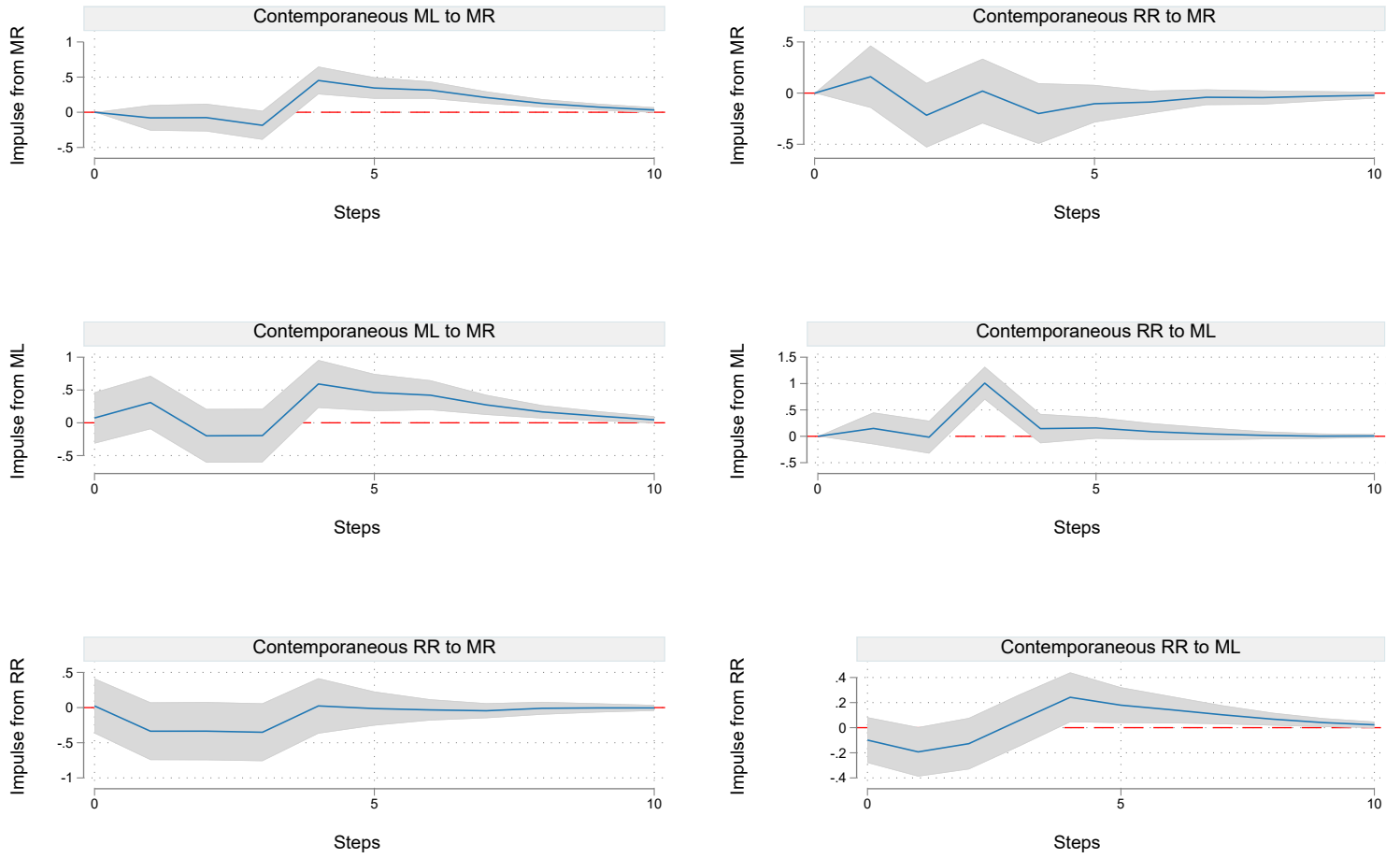

Figure 44: UK IRF - Culture

Note: All the models are estimated to look at the relationship between two parties, while the other two are kept as exogenous. There is an exogenous variable for periods too. This is a VAR (4).

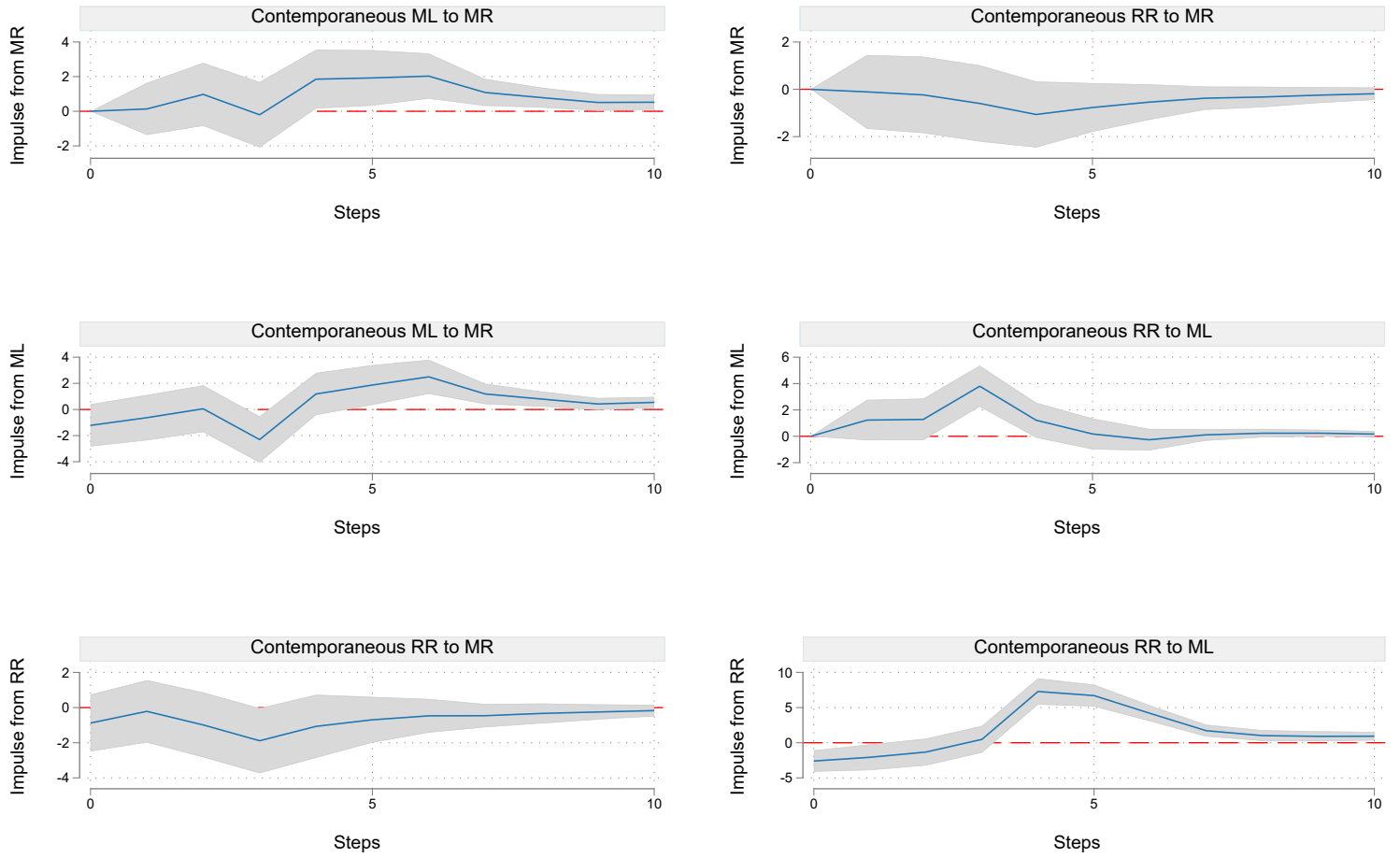

Figure 45: UK IRF - Worker's rhetoric

Note: All the models are estimated to look at the relationship between two parties, while the other two are kept as exogenous. There is an exogenous variable for periods too. This is a VAR (4).

B.12 Results UK (zoom)

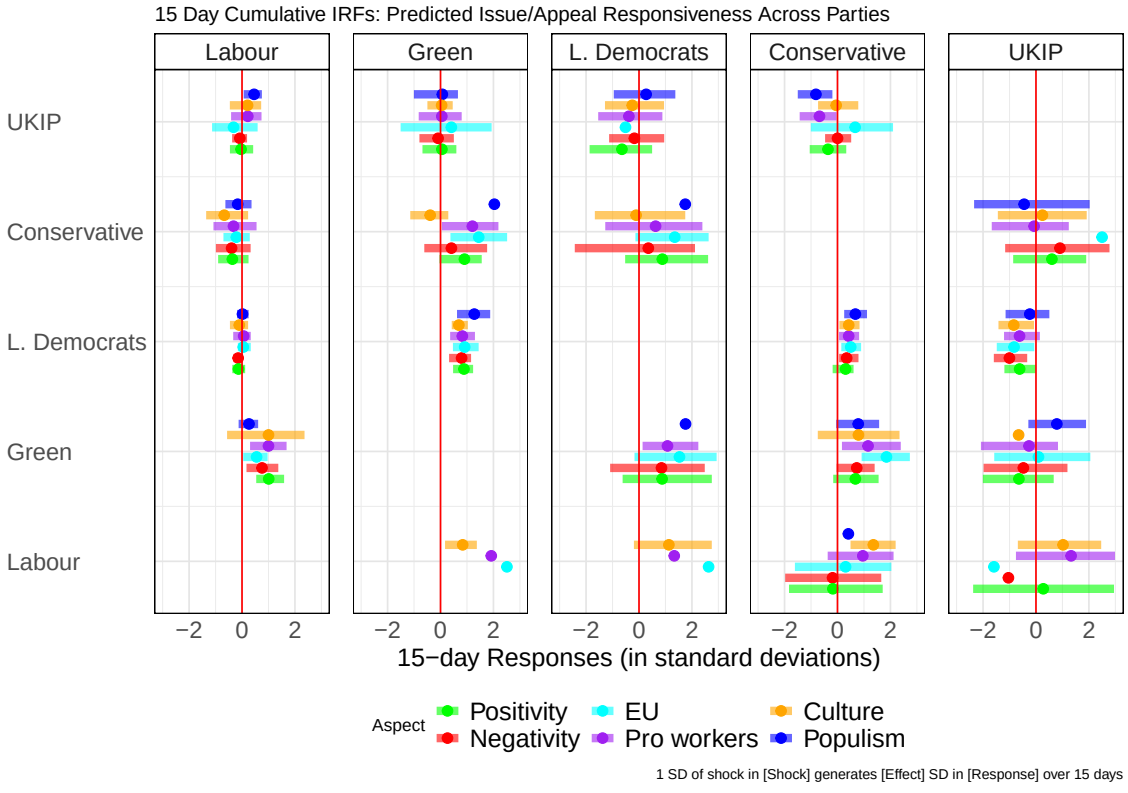

Figure 46: Predicted Issue/Aspect Responsiveness Across Parties, UK

Note: These plot represents a VAR(4). The coefficients (with 90% confidence intervals) indicate (in SD) how much more cumulative attention the groups in the panel titles paid to a given issue due to the groups in the y-axis increasing the attention to the same aspect 15 days ago.

B.13 Validation of Populism

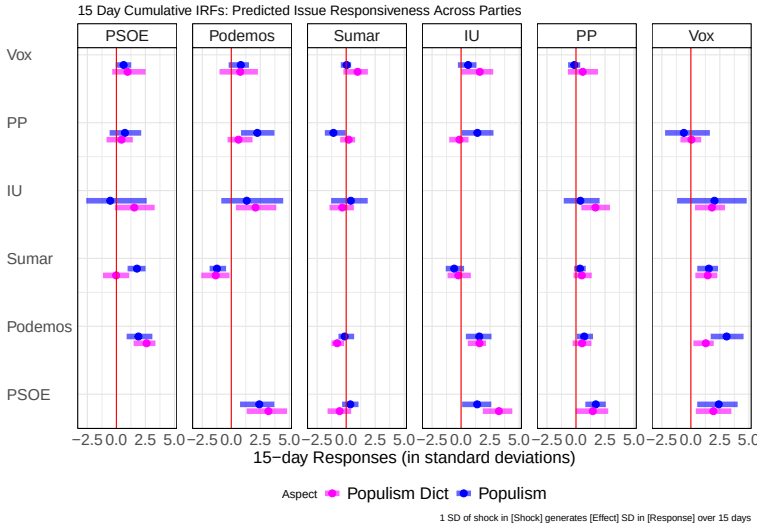

Figure 47: Cumulative IRF, Spain Populism

Note: These plot represents a VAR(4). The coefficients (with 90% confidence intervals) indicate (in SD) how much more cumulative attention the groups in the panel titles paid to a given issue due to the groups in the y-axis increasing the attention to the same aspect 15 days ago.

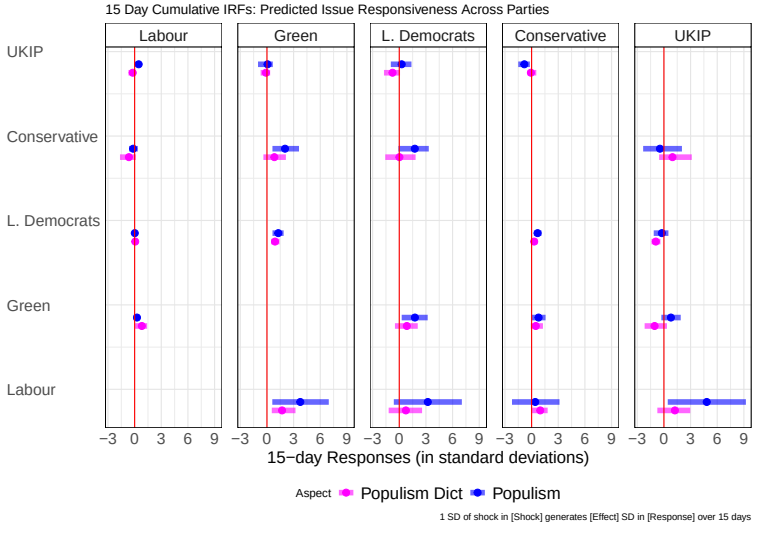

Figure 48: Cumulative IRF, UK Populism

Note: These plot represents a VAR(4). The coefficients (with 90% confidence intervals) indicate (in SD) how much more cumulative attention the groups in the panel titles paid to a given issue due to the groups in the y-axis increasing the attention to the same aspect 15 days ago.

B.14 Cumulative IRF - N

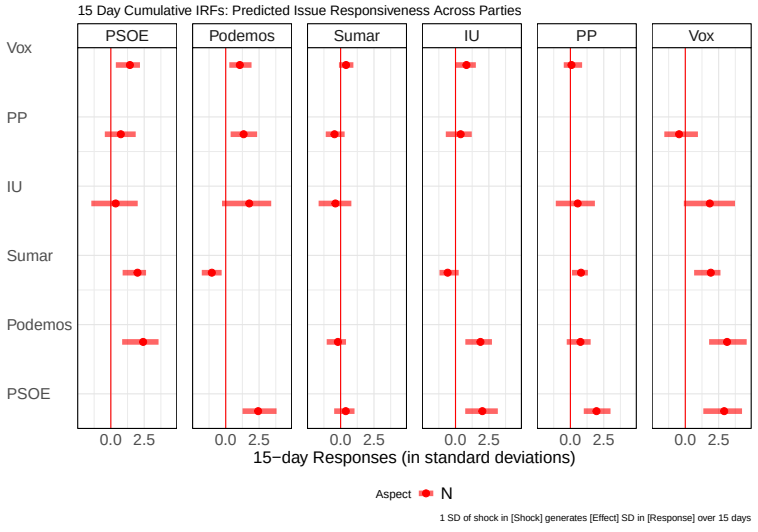

Figure 49: Cumulative IRF, Spain N (Total Number of Videos)

Note: These plot represents a VAR(4). The coefficients (with 90% confidence intervals) indicate (in SD) how much more cumulative attention the groups in the panel titles paid to a given issue due to the groups in the y-axis increasing the attention to the same aspect 15 days ago.

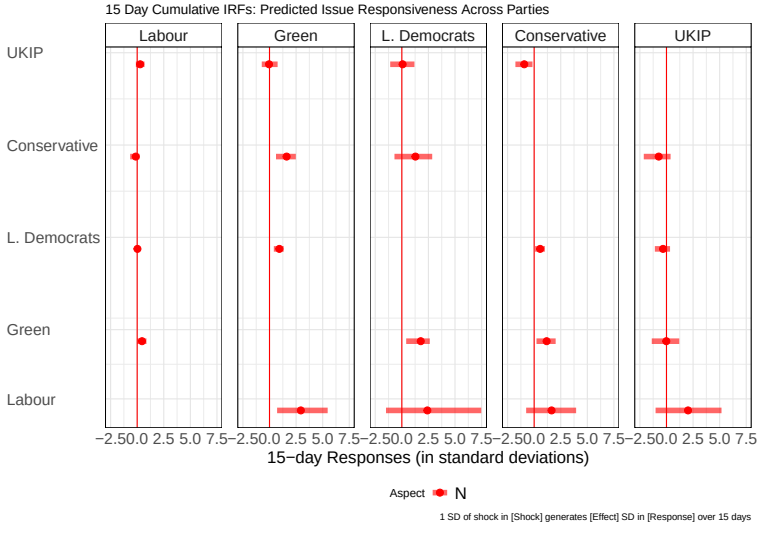

Figure 50: Cumulative IRF, UK N (Total Number of Videos)

Note: These plot represents a VAR(4). The coefficients (with 90% confidence intervals) indicate (in SD) how much more cumulative attention the groups in the panel titles paid to a given issue due to the groups in the y-axis increasing the attention to the same aspect 15 days ago.

B.15 Results by Issue

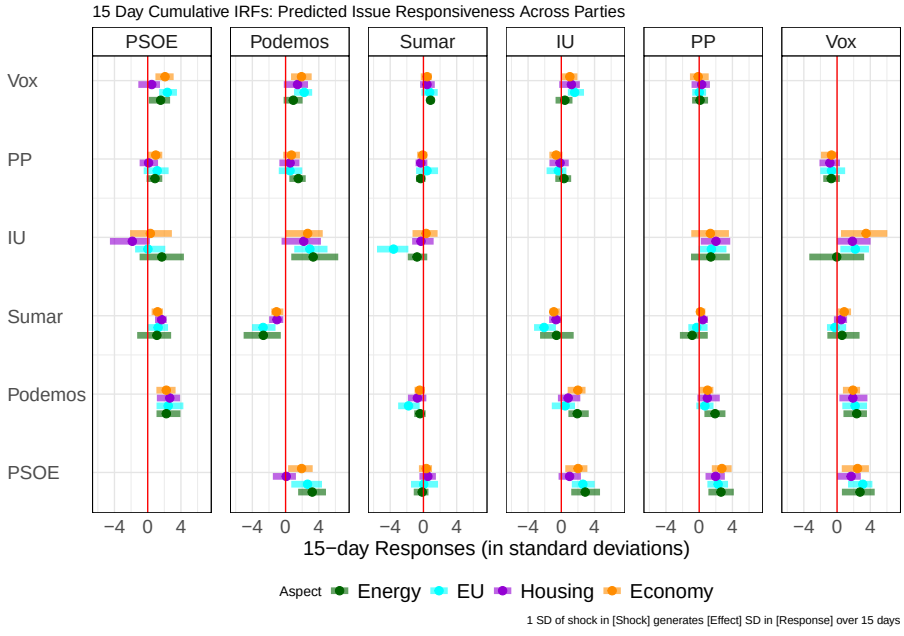

Figure 51: Cumulative IRF, Spain

Note: These plot represents a VAR(4). The coefficients (with 90% confidence intervals) indicate (in SD) how much more cumulative attention the groups in the panel titles paid to a given issue due to the groups in the y-axis increasing the attention to the same aspect 15 days ago.

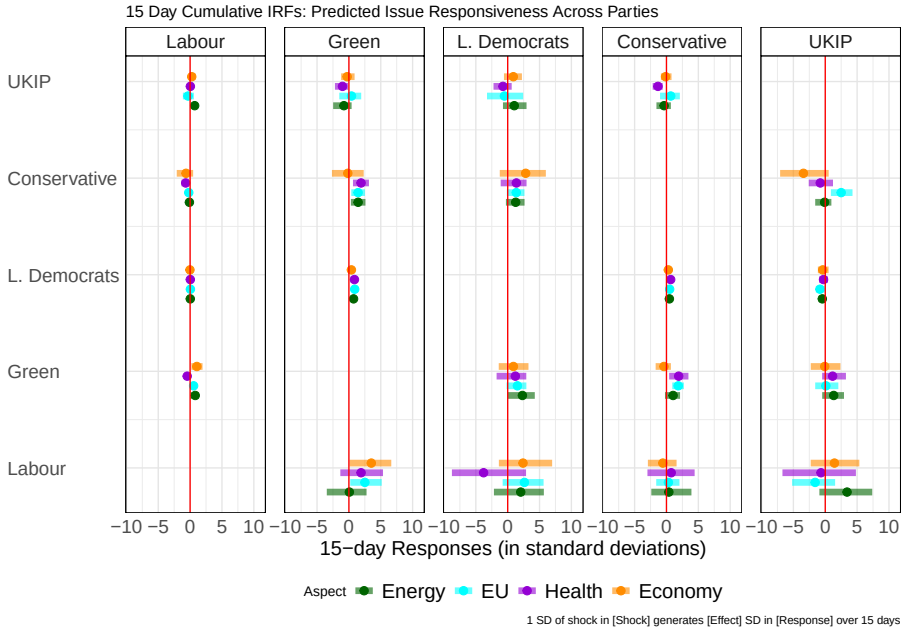

Figure 52: Cumulative IRF, UK

Note: These plot represents a VAR(4). The coefficients (with 90% confidence intervals) indicate (in SD) how much more cumulative attention the groups in the panel titles paid to a given issue due to the groups in the y-axis increasing the attention to the same aspect 15 days ago.

B.16 Results by Party Family

B.16.1 Description by Party Family

I examine the channels of the most competitive parties, grouping them into party families to analyze the relationship between mainstream and outsider parties across the ideological spectrum. In Spain, the mainstream left (ML) includes PSOE, the mainstream right (MR) includes Partido Popular (PP), the radical right (RR) includes Vox, and the radical left includes Podemos, Izquierda Unida, and their coalition Sumar. In the UK, the ML includes the Labour Party and the Greens,[1] the MR includes the Conservative Party and the Liberal Democrats (center-right leaning), and the RR includes UKIP and Reform UK.

[1]Previous scholars have discussed the evolution of the Green party from a niche party focused on the environment to a broader progressive platform, aligning it more closely with mainstream left-wing politics (Dennison, 2016).

Table 41: Description of the YouTube Videos from Spain

	Most Popular (K)	Subscribers (K)	2016	2019 (A)	2019 (B)	2023	Total	Total Transcript
Mainstream Left	829	46.7	502	294	362	366	1524	1129
Mainstream Right	1500	117		27	33	450	510	429
Radical Left	3286	188.4	754	619	528	561	2462	1781
Radical Right	4700	544	193	410	413	502	1518	1152
Total			1449	1350	1336	1879	6014	4491

Note: Period of analysis: one year before general elections. In 2019, there were two elections; A refers to April, and B refers to November. The count corresponds to the number of YouTube videos posted during this period. Subscribers refer to the number of people subscribed to the channel in thousands, and most popular refers to the number of views of the most popular video in thousands. Total transcripts refer to the available transcripts for the videos.

Table 42: Description of the YouTube Videos from the UK

	Most Popular (K)	Subscribers (K)	2015	2016	2017	2019	2021	Total	Total Transcript
Mainstream Left	1252	67.2	143	63	69	30	121	426	375
Mainstream Right	4056	83.5	227	76	261	79	83	726	659
Radical Right	1147	69.2	323	326	240	290	124	1303	1187
Total			693	465	570	399	328	2455	2221

Note: Period of analysis: one year before general elections (or local for 2021), or one year before the Brexit referendum (2016). The count corresponds to the number of YouTube videos posted during this period. Subscribers refer to the number of people subscribed to the channel in thousands, and most popular refers to the number of views of the most popular video in thousands. Total transcripts refer to the available transcripts for the videos.

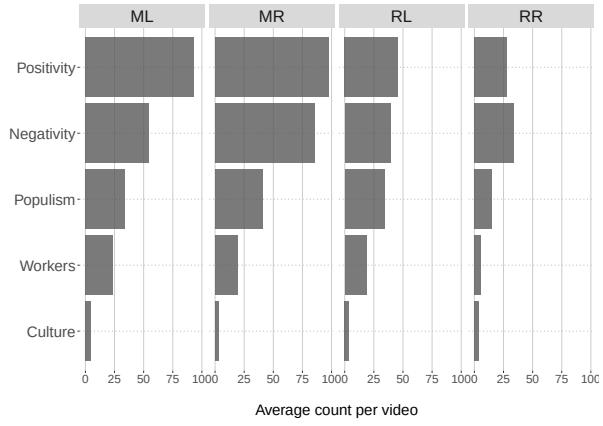

Figure 53: Average Attention by Party in Spain

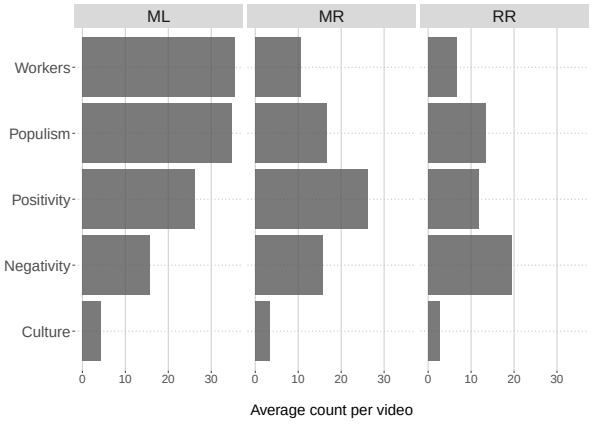

Figure 54: Average Attention by Party in the UK

Note: Attention is represented as the average count per video. Positivity and Negativity count chunks labeled with these sentiments for every 140 characters. Populism, Worker, and Culture count the number of times these terms are used in a video. Graph by party family.

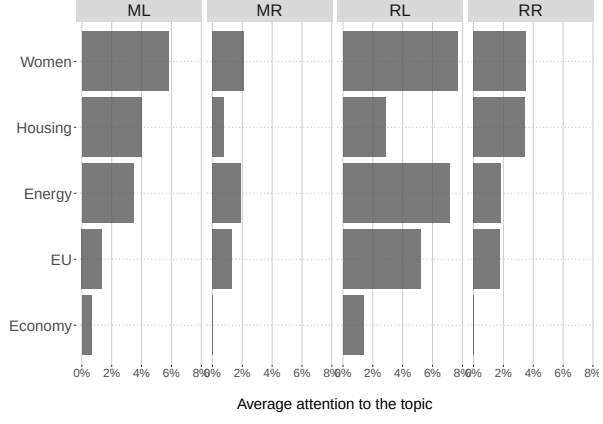

Figure 55: Average Attention by Party in Spain

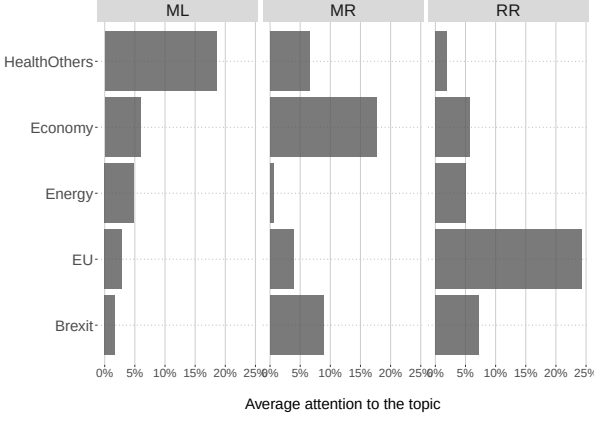

Figure 56: Average Attention by Party in the UK

Note: Attention is represented as the share of issues from the total number of videos by Party. The classification of the issues comes from BERTopic analysis. The selected issues were the largest among the issue-oriented topics, excluding the campaign cluster as it is not considered an issue. Graph by party family.

B.16.2 Issues and Ideology

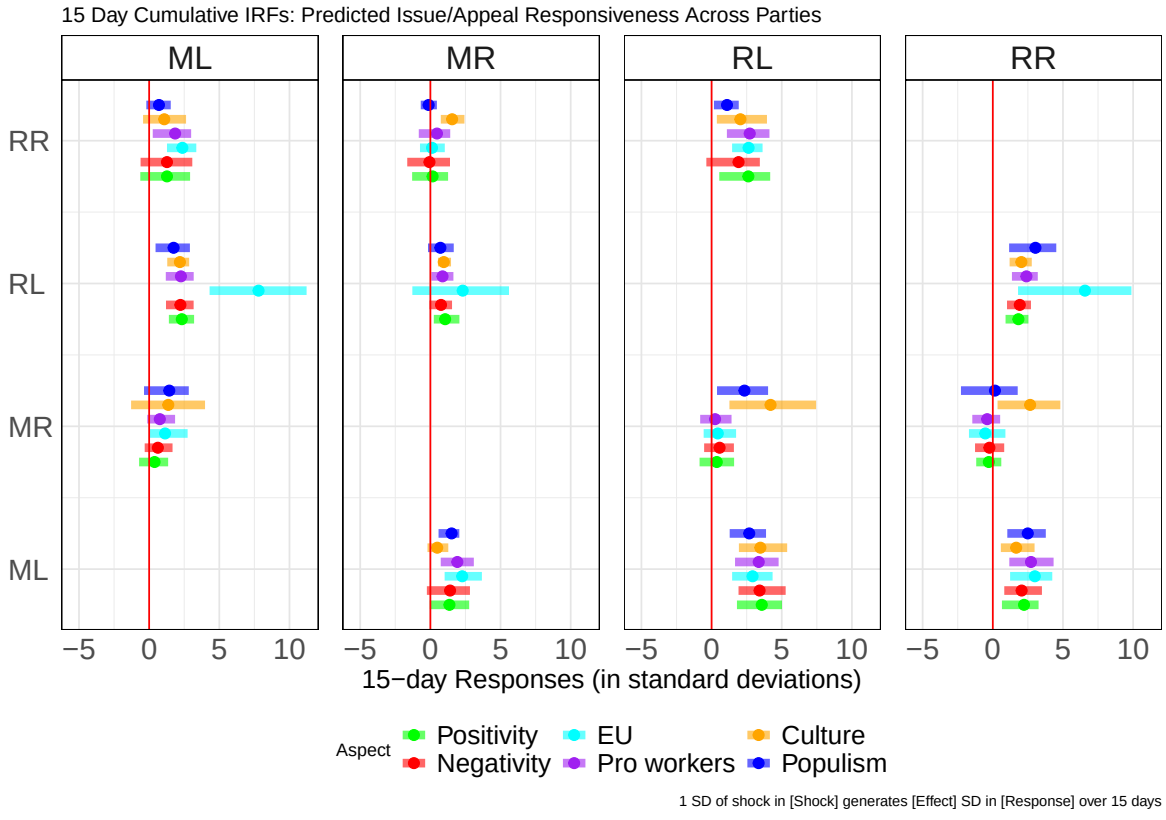

Figure 57: Predicted Issue/Aspect Responsiveness Across Parties, Spain by Party Family

Note: These plot represents a VAR(4). The coefficients (with 90% confidence intervals) indicate (in SD) how much more cumulative attention the groups in the panel titles paid to a given issue due to the groups in the y-axis increasing the attention to the same aspect 15 days ago.

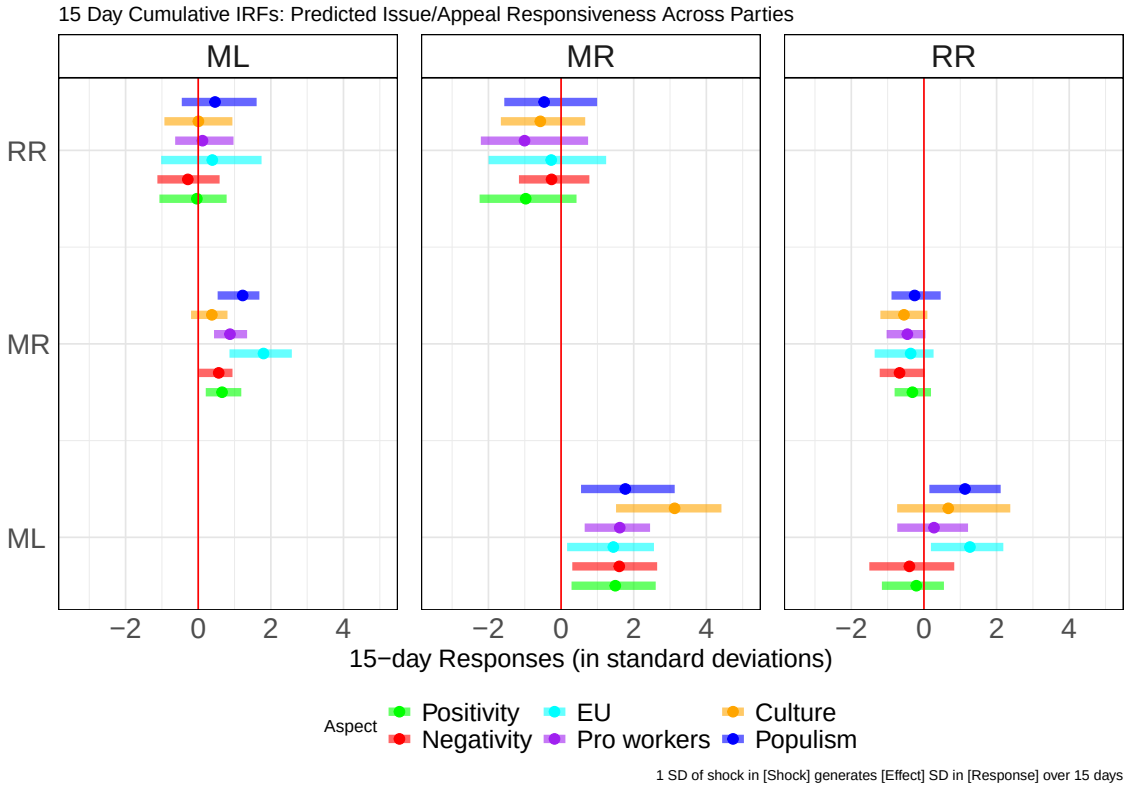

Figure 58: Predicted Issue/Aspect Responsiveness Across Parties, UK by Party Family

Note: These plot represents a VAR(4). The coefficients (with 90% confidence intervals) indicate (in SD) how much more cumulative attention the groups in the panel titles paid to a given issue due to the groups in the y-axis increasing the attention to the same aspect 15 days ago.

B.16.2.1 Additional Issues

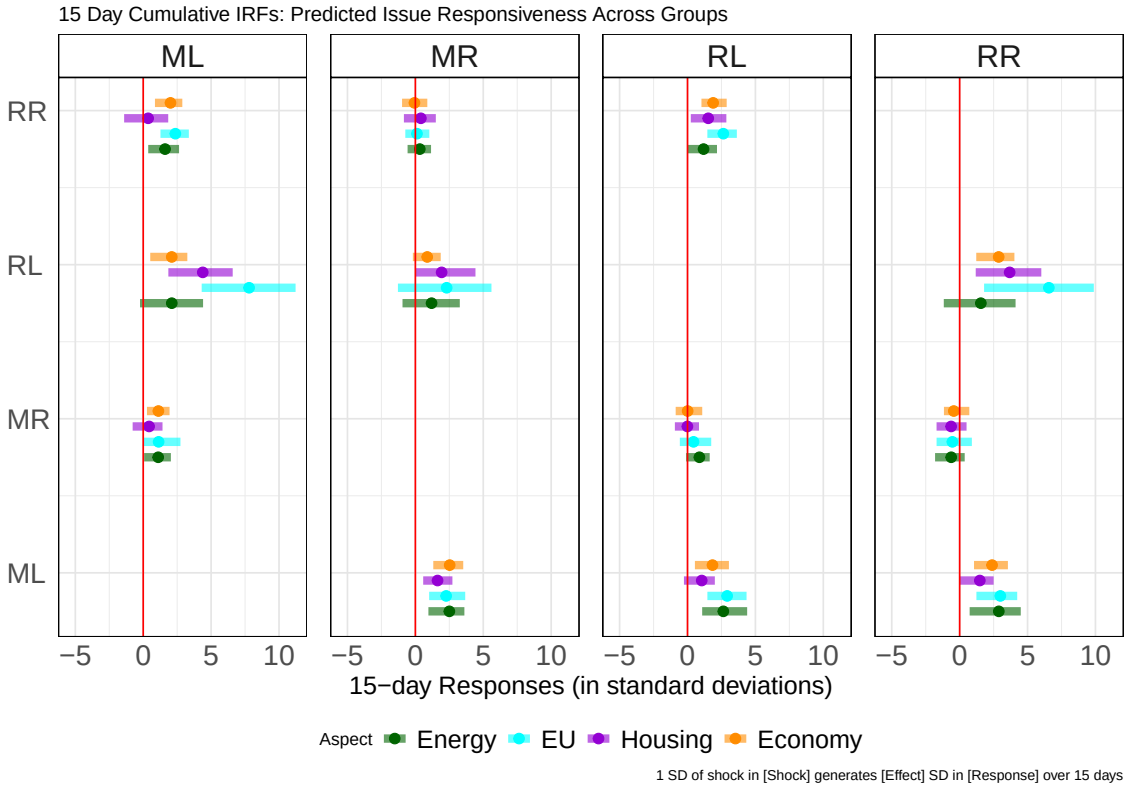

Figure 59: Cumulative IRF, Spain by Party Family

Note: These plot represents a VAR(4). The coefficients (with 90% confidence intervals) indicate (in SD) how much more cumulative attention the groups in the panel titles paid to a given issue due to the groups in the y-axis increasing the attention to the same aspect 15 days ago.

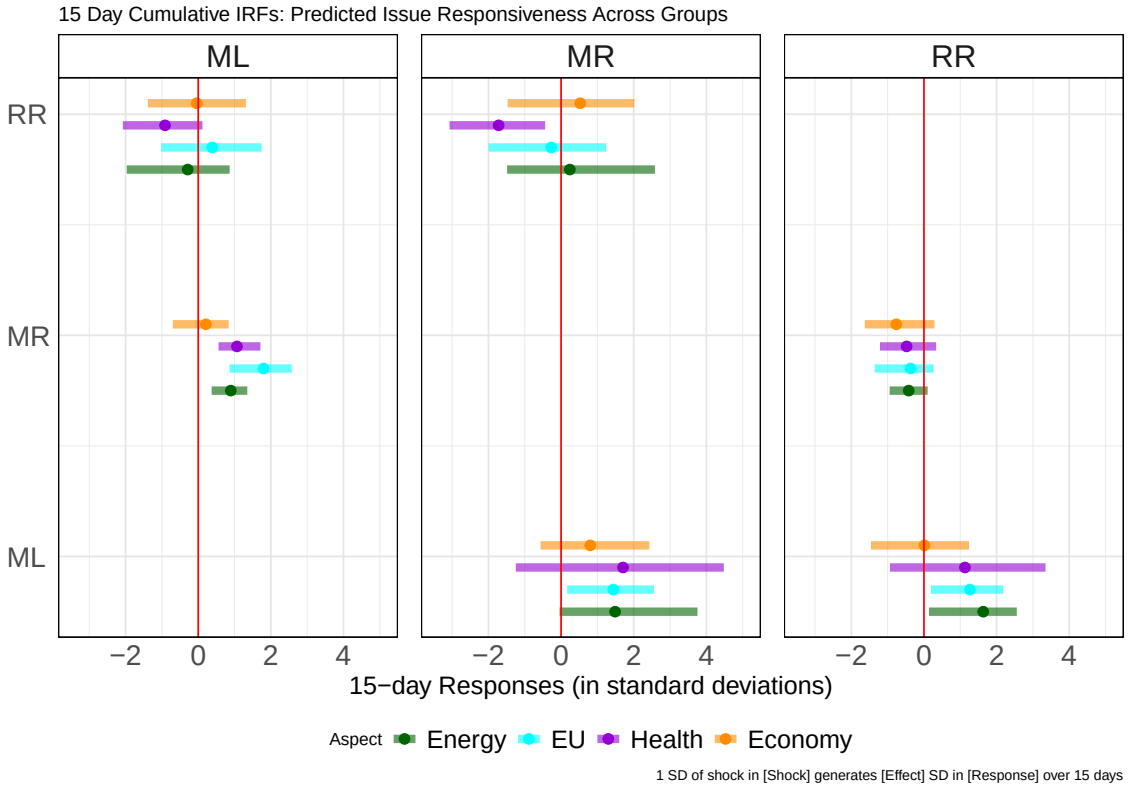

Figure 60: Cumulative IRF, UK by Party Family

Note: These plot represents a VAR(4). The coefficients (with 90% confidence intervals) indicate (in SD) how much more cumulative attention the groups in the panel titles paid to a given issue due to the groups in the y-axis increasing the attention to the same aspect 15 days ago.

B.16.3 Extremeness

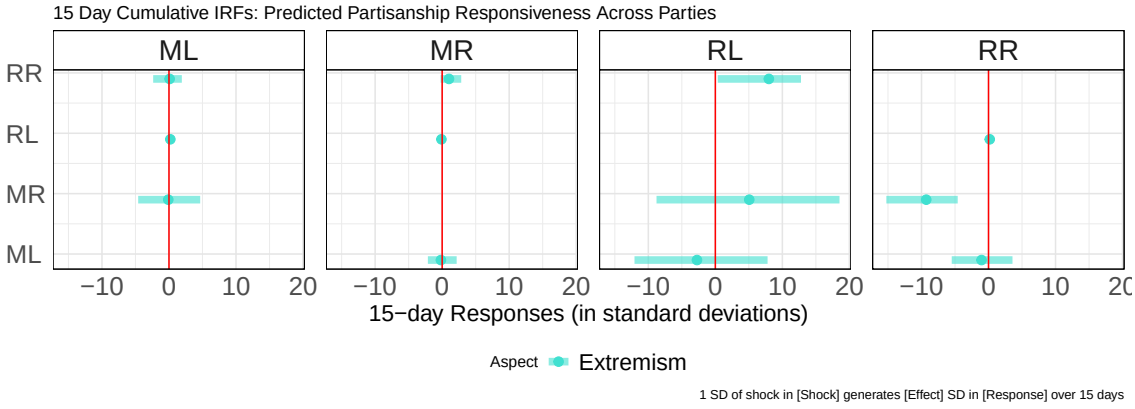

Figure 61: Predicted Changes in Extremeness Across Parties, Spain by Party Family

Note: These plot represents a VAR(4). The coefficients (with 90% confidence intervals) indicate (in SD) how much more cumulative attention the groups in the panel titles paid to a given issue due to the groups in the y-axis increasing the attention to the same aspect 15 days ago.

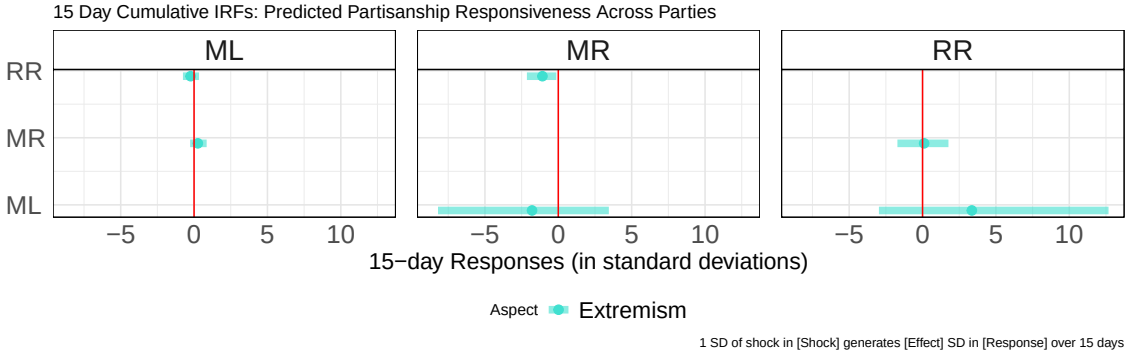

Figure 62: Predicted Changes in Extremeness Across Parties, UK by Party Family

Note: These plot represents a VAR(4). The coefficients (with 90% confidence intervals) indicate (in SD) how much more cumulative attention the groups in the panel titles paid to a given issue due to the groups in the y-axis increasing the attention to the same aspect 15 days ago.

B.16.4 Number of Videos

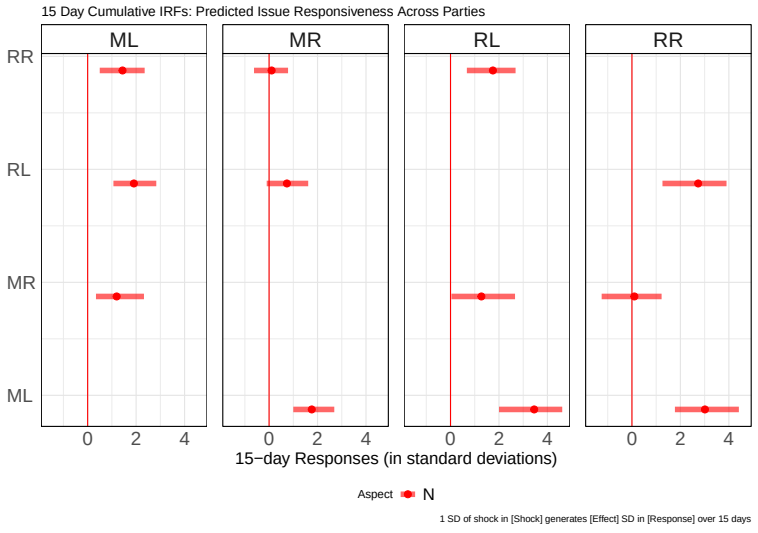

Figure 63: Cumulative IRF, Spain N (Total Number of Videos) by Party Family

Note: These plot represents a VAR(4). The coefficients (with 90% confidence intervals) indicate (in SD) how much more cumulative attention the groups in the panel titles paid to a given issue due to the groups in the y-axis increasing the attention to the same aspect 15 days ago.

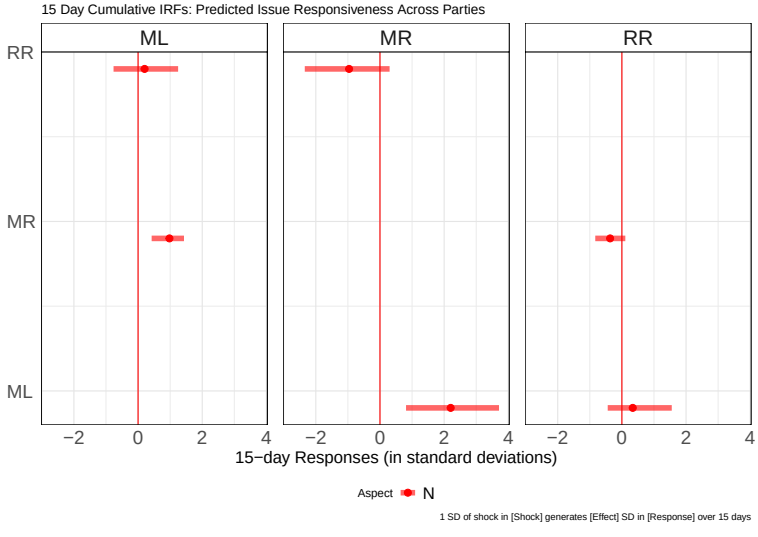

Figure 64: Cumulative IRF, UK N (Total Number of Videos) by Party Family

Note: These plot represents a VAR(4). The coefficients (with 90% confidence intervals) indicate (in SD) how much more cumulative attention the groups in the panel titles paid to a given issue due to the groups in the y-axis increasing the attention to the same aspect 15 days ago.

B.17 Additional exogenous variable: Closeness to the election

B.17.1 Issues and Ideology

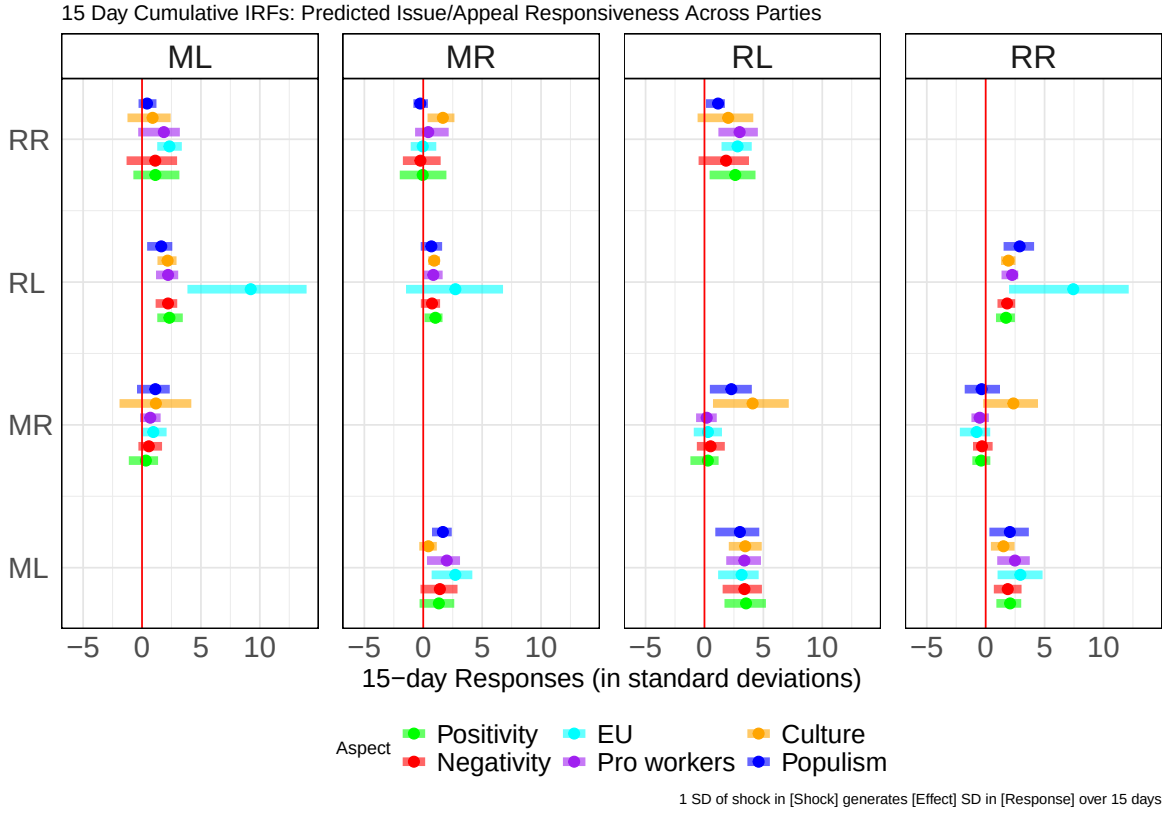

Figure 65: Predicted Issue/Aspect Responsiveness Across Parties, Spain with Closeness to the Election

Note: These plot represents a VAR(4). The coefficients (with 90% confidence intervals) indicate (in SD) how much more cumulative attention the groups in the panel titles paid to a given issue due to the groups in the y-axis increasing the attention to the same aspect 15 days ago.

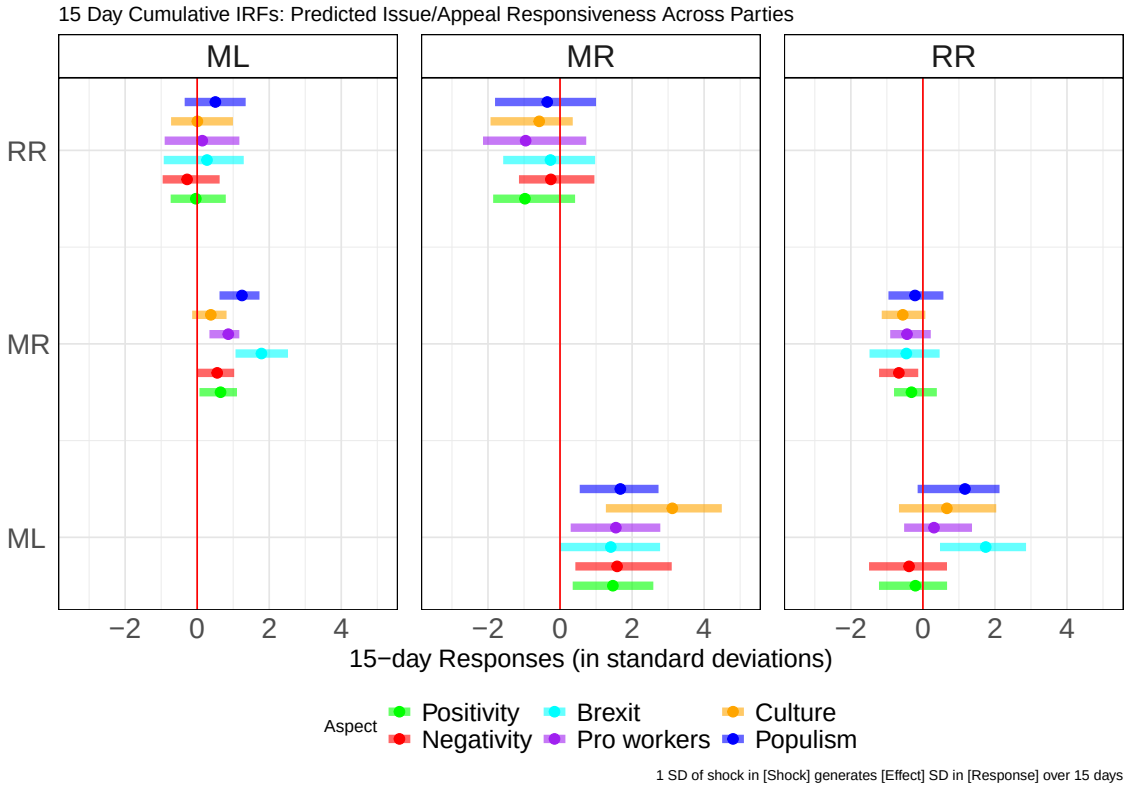

Figure 66: Predicted Issue/Aspect Responsiveness Across Parties, UK with Closeness to the Election

Note: These plot represents a VAR(4). The coefficients (with 90% confidence intervals) indicate (in SD) how much more cumulative attention the groups in the panel titles paid to a given issue due to the groups in the y-axis increasing the attention to the same aspect 15 days ago.

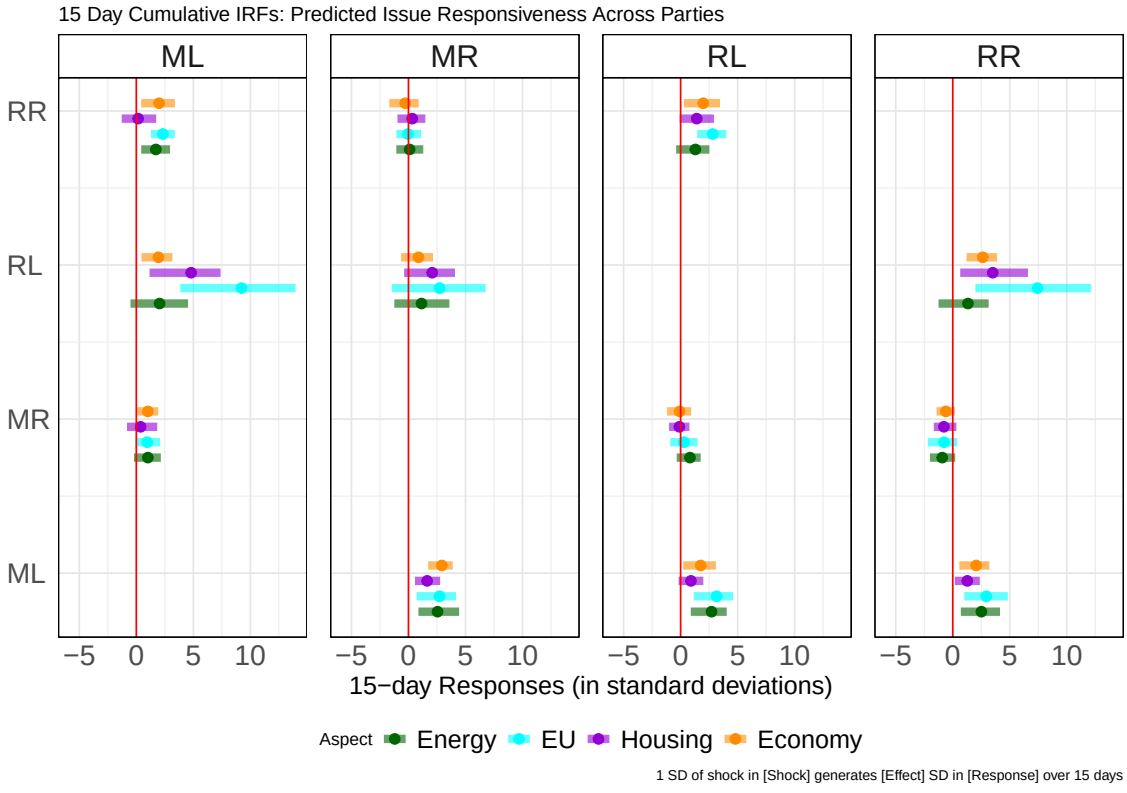

Figure 67: Cumulative IRF, Spain with Closeness to the Election

Note: These plot represents a VAR(4). The coefficients (with 90% confidence intervals) indicate (in SD) how much more cumulative attention the groups in the panel titles paid to a given issue due to the groups in the y-axis increasing the attention to the same aspect 15 days ago.

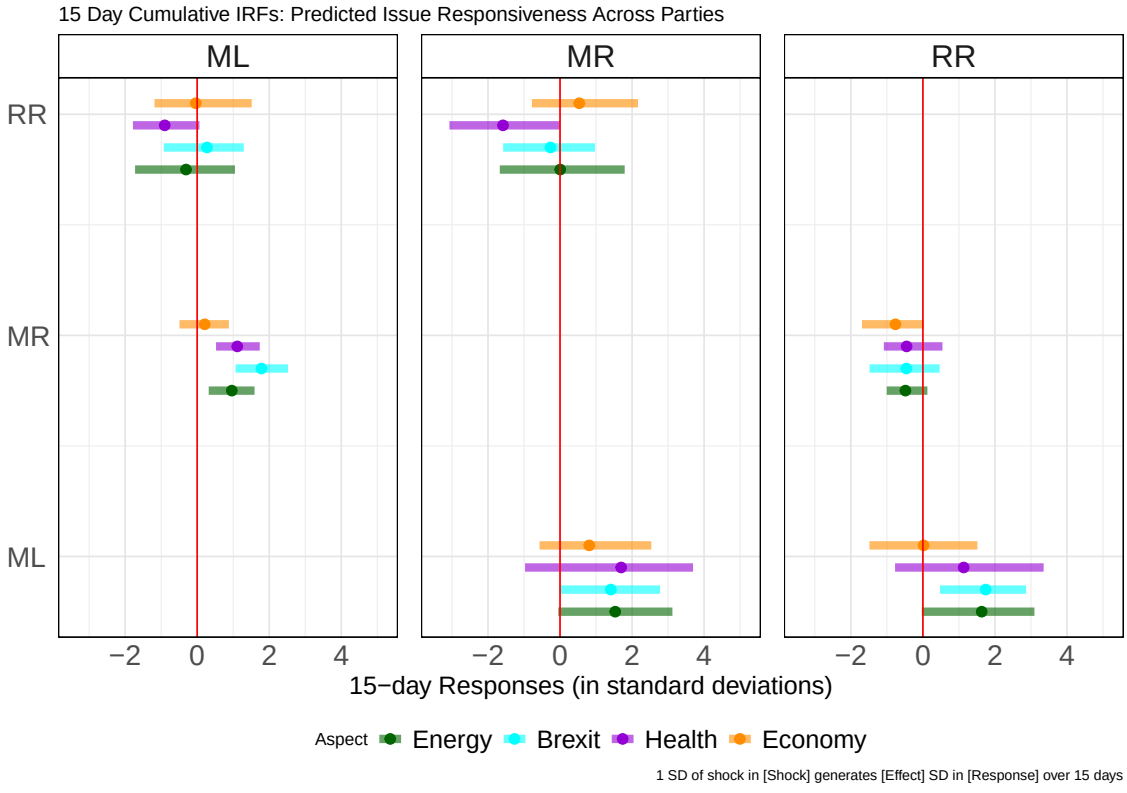

Figure 68: Cumulative IRF, UK with Closeness to the Election

Note: These plot represents a VAR(4). The coefficients (with 90% confidence intervals) indicate (in SD) how much more cumulative attention the groups in the panel titles paid to a given issue due to the groups in the y-axis increasing the attention to the same aspect 15 days ago.

B.17.2 Extremeness

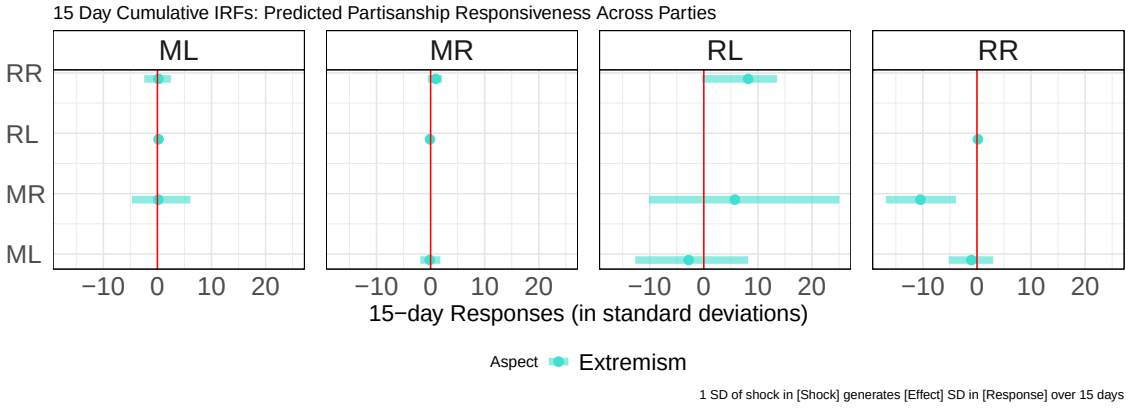

Figure 69: Predicted Changes in Extremeness Across Parties, Spain with Closeness to the Election

Note: These plot represents a VAR(4). The coefficients (with 90% confidence intervals) indicate (in SD) how much more cumulative attention the groups in the panel titles paid to a given issue due to the groups in the y-axis increasing the attention to the same aspect 15 days ago.

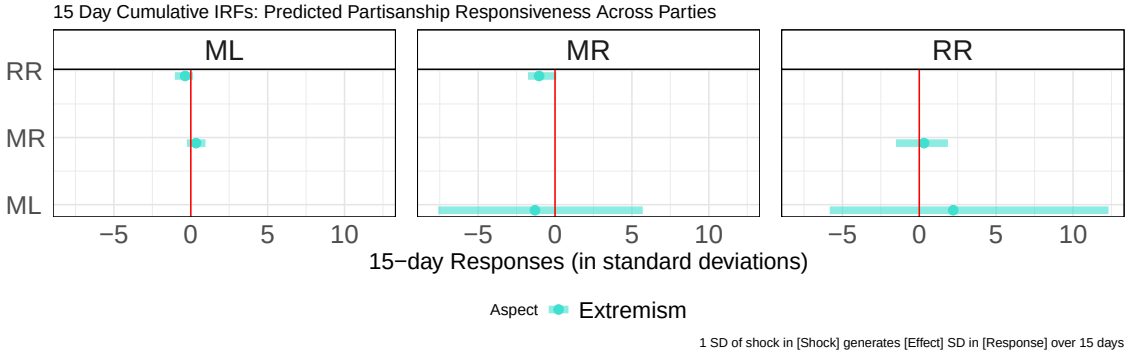

Figure 70: Predicted Changes in Extremeness Across Parties, UK with Closeness to the Election

Note: These plot represents a VAR(4). The coefficients (with 90% confidence intervals) indicate (in SD) how much more cumulative attention the groups in the panel titles paid to a given issue due to the groups in the y-axis increasing the attention to the same aspect 15 days ago.

B.17.3 Number of Videos

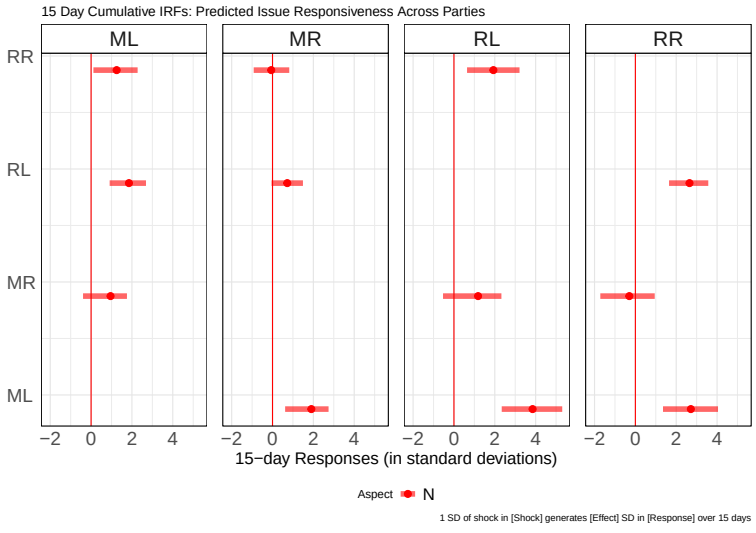

Figure 71: Cumulative IRF, Spain N (Total Number of Videos) with Closeness to the Election

Note: These plot represents a VAR(4). The coefficients (with 90% confidence intervals) indicate (in SD) how much more cumulative attention the groups in the panel titles paid to a given issue due to the groups in the y-axis increasing the attention to the same aspect 15 days ago.

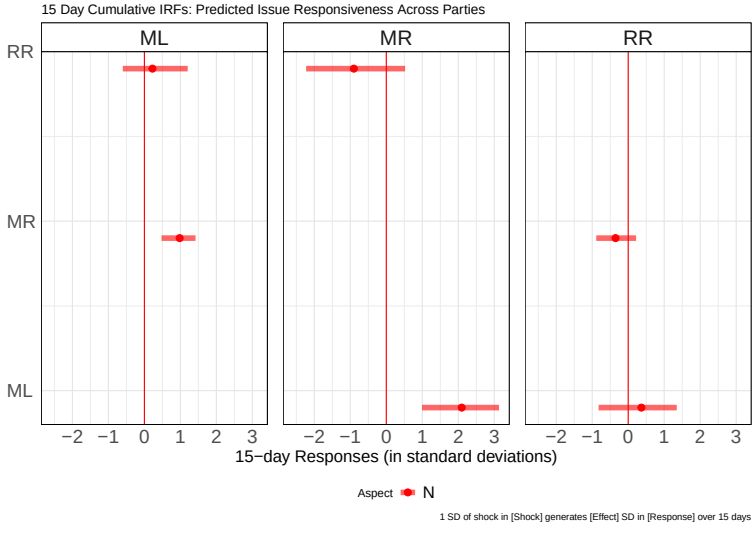

Figure 72: Cumulative IRF, UK N (Total Number of Videos) with Closeness to the Election

Note: These plot represents a VAR(4). The coefficients (with 90% confidence intervals) indicate (in SD) how much more cumulative attention the groups in the panel titles paid to a given issue due to the groups in the y-axis increasing the attention to the same aspect 15 days ago.