

## Mapping the e-petition ecosystem through Social Media: mobilization in the EU across issues and ideologies

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We study petition-related mobilization on Social Media across issues and ideologies. Using calls to sign petitions on X in the seven most spoken EU languages, we build the first multi-platform, multi-language map of the e-petitioning ecosystem. To ensure cross-language and cross-ideology comparability, we infer call for signatures' issues using ManifestoBERTa and users' ideological orientation via Ideology Scaling methods calibrated using expert survey data. We classify active individuals into an ontology of mobilization types. Results show that e-petition activism is issue-specific and short-lived, with only a small portion of individuals engaging in sustained mobilization. We characterize differences in e-activism across the Left-Right spectrum, with Right-leaning users being most active on issues like political corruption and traditional morality, while environmental protection sees low engagement levels compared to its reach.

*Keywords: Online Petitioning; Online mobilization; Petitioning ecosystem; Petitions; Social Media;*

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## Introduction

The growing interplay between e-petitioning, Social Media (SM) and online communities underscores a structural shift in contemporary advocacy and lobbying, where the dynamics of e-petition are not merely reflected but actively shaped by online activity and algorithmic amplification (Huszár et al., 2022). SM activity influences online political participation (Ruess et al., 2023) and petitions' traction, embedding them into the mechanics of online public discourse, mobilization, activism, lobbying and the informal influencing of policy and legislation (Ranchordás, 2017). This phenomenon, coupled with the growing potential for opinion monitoring and manipulation via private SM platforms, calls for an additional research effort (in the directions suggested by Ruess et al., 2023), to better understand how digital media shape petition-driven engagement, mobilization, and legislative influence within, and beyond, liberal democracies.

To address this, we analyse online engagement on SM related to petitions. Studying how it is shaped across issues, ideological positionings and languages. Differently from previous studies that focus on a single petitioning issue (Clark and Lomax, 2024) or petition platform website (e.g., [petitions.whitehouse.gov](https://petitions.whitehouse.gov) in the work of Dumas et al., 2015), this research conceptualizes e-petitioning as a phenomenon unfolding within a socio-technical ecosystem composed of numerous petitioning platforms, dozens of socio-political issues, thousands of petitions, and millions of engaged individuals. To our knowledge this is the first study first to adopt a cross-issue, multi-petition and multi-platform perspective. We specifically aim to understand: **(RQ1)** how petition-related activity varies across EU languages and platforms; **(RQ2)** the characteristics of audiences involved and their mobilization patterns; **(RQ3)** which issues are discussed; and **(RQ4)** how activity, reach, and engagement differ by issue, user ideological orientation, and language.

These questions map how petition content circulates on SM in the EU, considering linguistic, ideological, and issue-based factors; providing a multidimensional view of e-petition mobilization.

To address these questions, first, we collected all X posts with occurrences of keywords related to petitioning and signing in 7 EU languages (German, French, Italian, Spanish, Polish, Dutch, and Romanian), second, we analysed the URLs of these posts and identified wherever they pointed towards an online petition. This allowed us to identify the first comprehensive set of petition platforms that dominate the European petitioning ecosystem, enabling a cross-language and cross-issue study of e-petitioning SM discourse and mobilization dynamics. We hence collected and studied all X posts referring to these platforms, published between February 19th, 2023 and November 4th, 2024.

By classifying and analyzing these calls for support, we map how petition-related content is

discussed and shared on SM. We used automated text classification, including multi-language inference of political issues referred to in posts calling to sign petitions, with ManifestoBERTa (Burst et al., 2023). This to categorize posts by issue, which we then examined as a function of language and users' Left-Right orientation, using the dataset of ideologically-positioned X users across Europe developed by Ramaciotti et al. (2024a, 2024b).

This study offers a replicable approach to characterise and analyze these dynamics and their relevance in terms of mobilization patterns. For what concerns our empirical contribution, our multi-language analysis demonstrates that petitioning issue coverage and reach vary significantly by language and political orientation. For example, in Italy, petitions on traditional morality exhibit traction among Right-leaning users. Meanwhile, environmental protection, which is widely covered across languages, sees relatively low engagement levels compared to its reach, particularly in French- and German-speaking communities.

The remainder of the paper is structured as follows. In the *Research background and positioning* section, we synthesise prior work on digital mobilisation and activism, e-petitioning, and SM engagement, identifying our research positioning and gaps that our study seeks to bridge. Next, the *Data & Methods* section motivates and details our data collection, processing, and analysis design, including the use of computational techniques. In the *Results* section, we present and discuss our findings. In the *Limitations of the Study* we highlight the main limitations and acknowledge their potential impact on the validity of our findings. These limitations are further detailed in the Supplementary Information<sup>1</sup>. Finally, the *Conclusion* we summarise and discuss broader implications of our findings.

## **Research background and positioning**

### ***E-petitioning and democratic participation***

E-petitioning has emerged as an instrument of participation, linking traditional democratic engagement with the dynamics of contemporary mobilization and activism (Mosca and Santucci, 2009). Beyond the collection of signatures, e-petition campaigns and media echoes can generate additional effects (Mosca and Della Porta, 2009). As highlighted by Würzler (2001), petitions—and their content—carry “*causes, motives, and aims, the rhetoric, language, and legitimation, the course, escalation, and radicalization, the intention, success, and failure of conflicts on all levels*”. The same is true for e-petitions (Escher and Riehm, 2017) which, through their online

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<sup>1</sup> Supplementary information and code related to the paper are available at this link: [https://github.com/carlosantagiustina/mapping\\_the\\_epetition\\_ecosystem\\_through\\_social\\_media](https://github.com/carlosantagiustina/mapping_the_epetition_ecosystem_through_social_media)

mediatisation, compel thousands of citizens to learn about and take a stance on issues that concern fellow citizens. This can in turn provoke more debate, heighten societal tensions, and homophilic behaviour around specific issues or events, particularly on SM (Asher et al., 2019), thereby reshaping how societal issues related to a petition are understood, contested and integrated in the political agenda (Lindner and Riehm, 2009).

A growing body of literature situates e-petitioning within the broader context of digital participatory democracy (Jungherr and Jürgens, 2010). This modality of participation enables a wide range of actors to articulate grievances, mobilize support, and demand accountability from governing bodies—all with a few clicks. Some works (such as that of Hale et al., 2014) have argued that the low barriers to entry offered by e-petitioning platforms have facilitated citizen activation and engagement. Other studies (Lee et al., 2014) have found a negative correlation between the political and the digital divide, suggesting that “*e-democracy might be potentially beneficial to alleviate the long worried negative effects of the political divide in democratic polity*”. However, factors such as digital literacy and education (Lindner and Riehm, 2011), socio-economic status (Schradie, 2011; 2019) algorithmic curation (Poell and Van Dijck, 2018) can influence whether and how online political audiences become aware of these petitions and ultimately support them, reducing the inclusiveness of e-petitioning ecosystems.

### ***Petitions as focusing events and issue expanders***

Petitions are often related to focusing events (Birkland, 1995). Focusing events, such as, e.g., the Exxon Valdez oil spill of 1989 (Birkland, 1998a), are occurrences that capture widespread public attention on specific issues and, through their discoursivization on new and traditional media, exert pressure on voters and decision-makers, creating mobilization windows of opportunity for policy and/or legislation change. More specifically, Birkland (1998b) defines a focusing event as “*an event that is sudden; relatively uncommon; can be reasonably defined as harmful or revealing the possibility of potentially greater future harms; has harms that are concentrated in a particular geographical area or community of interest; and that is known to policy makers and the public simultaneously*”. A petition can in itself play the role of a focusing event, acting as an attention catalyst in relation to one or more pre-existing events/anecdotes, which can be tied together and acquire momentum through a compelling and unifying issue-narrative (Bailey and Mattei, 2013).

### ***Symbolic action and political agenda setting***

Petitions can exert more socio-political pressures if they form part of a large body of similar mobilizations (Würgler, 2001). This is because their symbolic power lies in their ability to document public dissent and the volition of citizens and other policy stakeholders, generate solidarity among like-minded actors, and demonstrate the urgency of specific issues to political elites (Zavestoski et al., 2006). Hence, even when petitions do not lead to immediate policy changes, their visibility in media can contribute to long-term shifts in societal debates and public opinion (Margetts et al., 2015). By influencing public discourse, mobilizing support, and pressuring policy makers to act, e-petitions also play an important role in the agenda-setting process. Lindner and Riehm (2009) argue that e-petitions function as low entry-barrier tools for political participation, enabling large-scale engagement and fostering issue visibility.

### ***Social Media and e-petitioning***

X/Twitter's news-feed-like design enables networks to form around shared interests or concerns without requiring mutual consent, allowing content to reach a broader audience rapidly. Jalali et al. (2016), which examined the diffusion process of an e-petition, found, for example, argue that targeting the appropriate audience can significantly increase the number of signatures, highlighting the importance of strategic petition sharing behaviors on SM.

However, Chadwick and Dennis (2017) argued that the affordances of SM platforms can lead to *echo chambers* of petitions that can reinforce pre-existing beliefs, potentially limiting the effectiveness of campaigns in reaching diverse audiences. Asher et al. (2019) also show that Twitter discussions on e-petitions tend to “*take place within similar networks, with homophily predominating in Twitter*”. However, their study is inconclusive regarding the effects of e-petitions on polarization. SM users' motivations—whether driven by a desire to support affected individuals or to express concern or discontent with institutions—have also been found to shape the overall success of a petition (Lee and Hsieh, 2013). The role of influencers and SM celebrities is also significant (Wright, 2015; Lindner and Riehm, 2011), as their endorsements can exponentially increase a petition's reach.

### *Characterizing audiences mobilized by e-petitions*

Jungherr and Jürgens (2010) provide a set of criteria for classifying petition signatories based on their mobilization patterns. This classification was used to group petition signatories from the German *Petitionsausschuss* (the online petition platform of the German parliament) into four categories (Activism consumers, Hit-and-run activists, New lobbyists, Single-issue stakeholders), using three individual-level variables: (i) the number of issues discussed by an individual; (ii) the number of petitions referred to by an individual; and (iii) the time frame of an individual's activity related to petitioning. Instead of petition signatures, which have been extensively studied through petition platforms, this work focuses on petition-related SM activity that can serve to identify different types of online political mobilization. Despite the growing role of digital platforms in political activism, the classification of petition-related user mobilization on SM has been largely overlooked. To address this gap, we shift the focus from petition signatures to petition-related activity metrics, which can serve as proxies for identifying different forms of political mobilization.

**Table 1. Mobilization types.**

versions Categories	Framework for petition signing Description from Jungherr and Jürgens (2010)	Framework for social media mobilization (this study)
Activism consumers	Users who co-signed multiple petitions, which fall under a large group of topical categories, regardless of the time frame.	All those who post about multiple petitions or platforms, and petitioning issues, regardless of the time frame.
Hit-and-run activists	All those users who co-signed multiple petitions, falling into similar topical categories, but who used the petition system only over a short period of time.	All those who post about multiple petitions or platforms but only in relation to a single issue, and for a limited period of time.
New lobbyists	All users who co-signed multiple petitions, which fell in similar topical categories, and who used the petition system over an extended period of time.	All those who post about multiple petitions or platforms in relation to a single issue over an extended period of time <sup>2</sup> .
Single-issue stakeholders	All users who cosigned only one or two petitions, and who did not fall into any of the other categories.	All those who post about only one petition and platform, who do not fit into any of the other categories.

*Note.* The first column presents user types as described by Jungherr and Jürgens (2010) for signatories of petitions. The second column provides our new categorization for social media mobilization, along with proposed type identification criteria.

In this context, Table 1 presents the original categorization by Jungherr and Jürgens' (2010) alongside a new SM version, adapted for analyzing petition-related mobilization patterns in virtual agoras. In one important respect, we depart from Jungherr and Jürgens (2010). Specifically, they use

<sup>2</sup> In our work, we define New lobbyists as users who (i) did multiple posts referring to petitions, (ii) have at least one year between their first and last posts, and (iii) who post exclusively about a single issue.

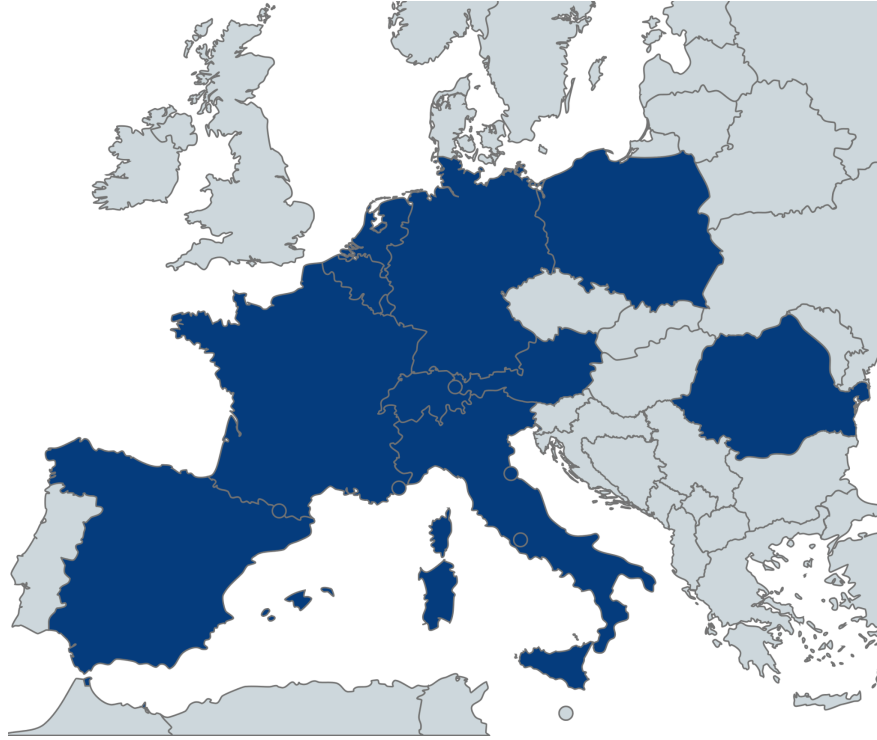
a three-week threshold to distinguish New lobbyists from Hit-and-run activists, whereas we use a one-year threshold. We depart from their threshold because mobilization for e-petitions on SM differs in a substantial aspect from e-petition signing on dedicated platforms, as an individual can sign an e-petition only once, while the same user can share and repost messages about the same e-petition multiple times, and, in our dataset, this occurs 11.8% of the time. These platform affordances being so different, can change the temporal profile of user engagement. Moreover, in our dataset, among petition URLs observed at least twice, over 20% remain present on SM for three weeks or longer, which means that a threshold of three weeks risks misclassifying the repeated promotion of single petitions as New lobbyistism. For this reason, and because we want the label as New lobbyist only the actors who sustain mobilization efforts for a single issue across substantially longer time horizons than Hit-and-run activists, we adopt a much more demanding threshold. Practically, this means a user must demonstrate repeated public mobilizing activity related to the same issue within a 12-month window to be classified as a New lobbyist, allowing us to better distinguish these actors from short-term, single issue sharers (i.e., Hit-and-run activists). As a robustness check, Figure S.5 in the Supplement shows how the number of New lobbyists by language would vary by choosing a different threshold.

## **Data & Methods**

### ***EU-study motivation***

To study petitioning at a cross-country level, one would ideally want to target and delimit petition platforms from multiple countries, separately capturing petition platform related SM activity within each targeted country and then aggregating the data. However, due to the way these petitioning platforms operate, and how data from SM like X can be retrieved, this approach presents significant challenges: Many petition platforms are not confined to a single country and individuals can sign and share and support petitions across national borders. Moreover, retrieving SM data based on geographic origin is often imprecise or unfeasible, as only a small fraction of users allow SM to access their geolocation. Additionally, petition discussions frequently occur within transnational networks and communities, further complicating country-specific targeting and analysis. Given these limitations, a more effective strategy is to focus on linguistic communities and their petitioning platforms. Since language largely determines how users engage with petitions and discuss them online, analyzing petition-related discourse in different languages provides a way to approximate cross-country patterns while also capturing interactions that transcend national boundaries. Therefore, in this work, we study SM activity on X related to petitions and petition platforms in German, French, Italian, Spanish, Polish, Dutch, and Romanian. This selection

provides a wide coverage of the European population (more than 70% of the EU population according to the Eurobarometer - Europeans and their languages 2023 survey<sup>3</sup>) through its seven most widely spoken languages, offering valuable insights into how petitioning unfolds across Europe, as shown in Figure 1.



**Figure 1. Map of European countries whose official languages have been included in the data collection process (in blue).**

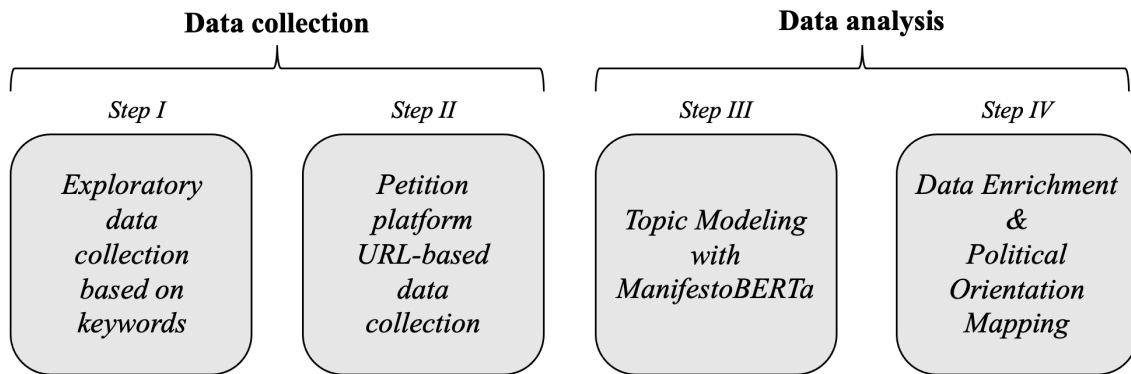
By analyzing SM posts in multiple languages that mention petition platforms used in the European countries where these languages are spoken, we can compare how petitions are discussed online, which issues gain traction, and how engagement varies depending on languages.

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<sup>3</sup> <https://europa.eu/eurobarometer/surveys/detail/2979>

## ***Research operationalization***

Our research pipeline consists of four steps, represented in Figure 2.



**Figure 2. Research operationalization and steps summary.**

In *Step I - exploratory data collection based on keywords*, we use language-specific queries to identify X posts related to e-petitioning. This to compile a list of petition platforms' URLs. In *Step II - petition platform URL-based data collection*, we collect posts containing URLs linked to identified petitioning platforms. In *Step III - topic modeling with ManifestoBERTa* we categorize the thematic content of posts. Finally, *Step IV - data enrichment & political orientation mapping* we incorporate information on individuals' ideological orientation. Here follow technical details for each step.

**Step I - Exploratory data collection based on keywords** Identifying SM posts that refer to petitions is a complex task. Relying solely on keywords such as petition or sign may exclude a significant portion of content related to petitioning campaigns, as users can promote and support petitions without explicitly mentioning these terms. For example, a user advocating against energy waste by local authorities might write:

*"Our cities are wasting massive amounts of energy. Join us in demanding real change—click the link and make your voice heard!"*

In this case, the post supports a petitioning campaign but avoids direct mention of the words petition or sign, making keyword-based detection ineffective. To address this challenge, we developed a two-step data strategy. In the first phase, we designed a language-specific keyword-based query for each of the studied languages (see Table S.1 in the Supplement). This initial query, which, for each language, contains words like “*sign*”, “*signed*”, “*signature*”, and “*help*”, as well as the word “*petition*”, translated into our selected languages, allowed us to identify

more than 1.7 million unique posts on X, which pointed to nearly 38 thousand unique URLs from more than 700 web domains. We ranked the domains by number of occurrences, manually inspecting them to select (up to) the 30 most used, that correspond to a petition or petition platform, on each selected language. Through this identification and delimitation protocol, we identified the 84 most used platforms that concentrate the majority of petitions circulated online. This platform list includes, for example, official parliamentary petitioning platforms, such as *epetitionen.bundestag.de*, as well as popular private platforms like *avaaz.org* and *change.org*, along with a diversity of thematic platforms (e.g., *animalwebaction.com*). We note that, while mapping petitioning platforms by language does not perfectly correspond to individual EU countries, our two-step data strategy ensures that the platforms included are active in the targeted EU linguistic communities and primarily serve users associated with the corresponding EU countries, as detailed in Table S.3 in the Supplement.

**Step II - Petition platform URL-based data collection** Building on the identified petition platform domains from Step I, we conducted a second phase of data collection, shifting from a keyword-based approach to a URL-based strategy. This step involved collecting all posts that contained at least one URL from one of our 84 petitioning platforms, rather than relying on keywords. By doing so, we ensured a precise and unambiguous mapping of SM posts to petitioning platforms, allowing for a comprehensive analysis of e-petitioning dynamics across multiple languages. Our final query parameters are shown in Table S.2 in the Supplement.

This method offers several advantages. First, it ensures a precise and unambiguous mapping of SM posts to petitioning platforms, eliminating the risk of false positives that might arise from keywords. Unlike keyword queries, which require extensive fine-tuning for different languages and cultural contexts, URLs of petitioning platforms remain consistent across linguistic areas. This enhances comparability and minimizes potential biases introduced by language-dependent keyword selection. Therefore, this URL-based approach is more robust to linguistic and contextual variations.

In total, 164 370 posts matching the query were retrieved through X's API. Posts were published from Feb. 19, 2023 to Nov. 04, 2024. These posts contain URLs referring to 53 different petition platforms, representing 63.10% of the 84 targeted platforms. In other words, 31 of the 84 platforms identified in Step I, were not used by any user on X for the course of our collection period in Step II. The retrieved posts were published by a population of 75 076 unique users (77 006 unique user-language pairs), with an average of 2.19 posts per user. On average, each user mentions 1.07 platforms, showing that X users tend to focus on petitions from a single platform.

**Step III - Topic Modeling with ManifestoBERTa** To infer and compare the issues covered by e-petitions across multiple platforms and languages, we need a multilingual ontology to annotate our dataset and align results across languages, ensuring comparability. ManifestoBERTa (Burst et al., 2023), a transformer-based language model, was specifically designed for classifying multilingual texts, particularly in the context of political communication. It is a fine-tuned version of a pre-existing transformer model (BERTa), trained on Manifesto Project’s manifestos collected from multiple countries (see Burst et al., 2023), including those where the target languages in our study are spoken. The model can identify socio-political issues within texts and categorize them into a predefined issue ontology, enabling us to study a broad range of societal issues referenced in multilingual political textual corpora, such as social media discussions related to petitions in multiple EU languages.

To enhance the usability and interpretability of issues, we enact an issue aggregation phase to simplify classification results. This process consists of removing the “: Positive” / “: Negative” suffixes from issue labels, and grouping the Positive and Negative versions of an issue, if any, into a single category without suffix. On one hand, this aggregation step reduces redundancy and makes the classification more user-friendly, allowing us to work with a smaller number of issues. Second, for short SM texts, identifying not only the issue but also the stance towards it can be challenging even for a fine-tuned transformer-based model like ManifestoBERTa, especially if the stance is expressed in posts through slang or emojis that are not part of the vocabulary the model was trained on.

ManifestoBERTa infers, for each post, an issue score distribution: each issue is assigned a score ranging from 0 to 1, indicating the model’s weighted confidence that the post discusses an issue, with all issue scores summing to one for each post. The issue aggregation step is performed by summing the issue scores by post for the merged issue categories<sup>4</sup>. Recent works have also relied on ManifestoBERTa for issue inference (Lupacheva, 2025; Ivanusch, 2025). In both cases, given the high granularity of the Manifesto Project ontology, the observed validation metrics are considered common and rather good. More details about the ManifestoBERTa model and its usage, as well as the issue aggregation step, are available in section S.3 in the Supplement, while in section S.4 we present Human- and LLM-based validation of ManifestoBERTa annotations. In the remainder of the paper, we refer to the outputs of ManifestoBERTa as “issue confidence scores”. While these scores are weighted confidence metrics, they are model-dependent outputs that should be treated as noisy, yet informative, signals, which can be used for interpreting the ranking and

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<sup>4</sup> Constitutionalism: Negative & Constitutionalism: Positive; European Community/Union: Negative & European Community/Union: Positive; Foreign Special Relationships: Negative & Foreign Special Relationships: Positive; Labour Groups: Negative & Labour Groups: Positive; Military: Negative & Military: Positive; Multiculturalism: Negative & Multiculturalism: Positive; National Way of Life: Negative & National Way of Life: Positive; Protectionism: Negative & Protectionism: Positive; Traditional Morality: Negative & Traditional Morality: Positive;

mixing of issues within posts related to e-petitions. For additional details please refer to the *Limitations of the Study* section and the Supplement.

**Step IV - Data Enrichment & Ideological Orientation Mapping** To enhance our analysis and explore how supported petitioning issues vary as a function of users' ideology, we integrate external data to map the political orientation of a subset of users who created posts in our sample. Specifically, we leverage the dataset of European MPs and their followers on X/Twitter by Ramaciotti et al. (2024a, 2024b), that identifies, for the targeted EU countries, SM users who follow Members of Parliament (MPs) and assigns them a political orientation score based on the ideological positioning of the MPs they follow. This dataset comprises the EU countries that were targeted through language specific queries. All these countries had, at the time the data was downloaded, a high share of MPs with active X accounts<sup>5</sup>. MPs-follower networks have been shown to be spatializable in ideology dimensions using scaling methods in several contexts on Twitter (Barberà, 2015; Barbera et al., 2015). The cited dataset includes a Left-Right scaling of MPs and their followers, calibrated using the Chapel Expert Survey (CHES; Jolly et al. 2022) data to provide spatial reference (i.e., reference positions on the Left-Right scale for far-Left, Center, and far-Right parties and individuals). This allows assigning a value ranging from 0 (far-Left) to 10 (far-Right) to MP followers, which approximate users' political alignment in a continuous ideological space.

Ramaciotti et al. (2024a, 2024b) validated these Left-Right positions by comparing them with independent, text-based classifications derived from users' profile bios, which were translated into English and annotated using a language model (Zephyr-7b-beta) to assign categorical labels along the Left vs. Right dimension. Their results demonstrate a generally high coherence between network-inferred positions and text-based annotations, confirming the reliability of inferred Ideological Orientations across European countries.

A relatively large share of the users who published posts referring to petition platforms are followers of MPs for whom political orientations have been inferred in Ramaciotti et al. (2024b): In total, 31 875 mentions of petitioning platforms (12.67% of the total mentions) appear in 22 005 posts (13.39% of all posts), created by 9 005 distinct users (12.13% of total users) who fall into this category.

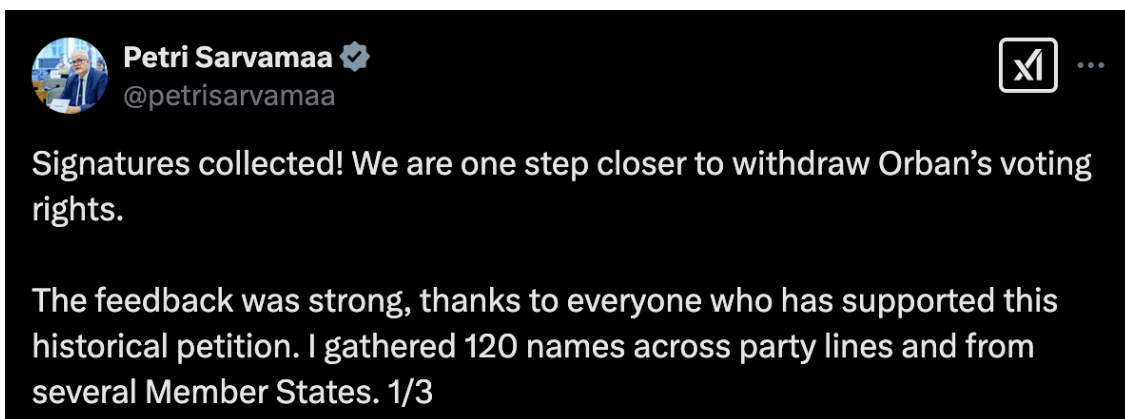
SM users who follow Members of Parliament (MPs) and engage in petition-related discussions are relevant actors in the e-petitioning ecosystem, as they are more likely to be visible to policymakers

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<sup>5</sup> 196/210 for Belgium, 881/925 for France, 676/805 for Germany, 469/606 for Italy, 197/225 for the Netherlands, 486/560 for Poland, 468/615 for Spain, with Romania being the exception in terms of X usage among MPs (81/466)

and elected representatives who are also active on these SM platforms. Moreover, since MPs and other political representatives increasingly rely on SM as a tool for gauging public sentiment and understanding the concerns of their supporters, petition-related activity from their followers can serve as an informal reference point for assessing grassroots mobilization around specific issues.

As politicians use SM as a communication channel to maintain and strengthen their support base, when they observe significant petition-related engagement among their followers, they may be incentivized to react, by: endorsing the petition, offering a policy position on the issue, or engaging in dialogue with petition supporters. This can contribute to a feedback loop where petitioning activity among politically engaged users increases the likelihood of an MP's response, which in turn can further amplify the petition's visibility and legitimacy. For an example of a post published by a European MP, refer to Figure 3.



**Figure 3: Example of a post on X by Petri Sarvamaa (@petrisarvamaa), a Finnish Member of the EU Parliament at the time of the post (Jan 12, 2024), expressing support for a petition.**

*Note.* Source URL: <https://x.com/petrisarvamaa/status/1745813641482371485>

### *Politically oriented mobilization and petitioning dynamics*

Since petitions serve as a mechanism for political mobilization, different ideological groups may prioritize distinct issues. Enriching our dataset with information about the political orientation (i.e., ideology) of MP followers can therefore provide valuable insights into ideology-driven issue expansion.

Also, a mapping of users' ideological orientations enables us to analyze the extent to which petitioning through specific platforms functions as an echo chamber within political orientation subgroups versus a bridge for cross-ideological mobilization. This is relevant as petitions are mainly

intended to influence policy making bodies, therefore broad-based mobilization could have a higher likelihood of triggering institutional responsiveness.

Finally, incorporating political orientation data allows for cross-linguistic comparisons of partisan petitioning dynamics. Political landscapes and partisan issue alignments vary across countries and languages, and what constitutes a Left-leaning or Right-leaning issue in one country may not map directly onto another. By analyzing issue coverage, reach and engagement across different linguistic contexts, we can assess whether certain issues systematically attract more mobilization from particular ideological groups across all languages (and therefore countries) or if issue-ideology alignments are context-dependent.

By integrating ideological positionings into our analysis, we thus move beyond a descriptive study of petitioning trends and toward a more nuanced understanding of how e-petitions function within ideology-embedded political systems. This provides a more fine-grained perspective on the dynamics of digital activism and political engagement in the digital public sphere, and the role of petitions in shaping political discourse across ideological divides.

### *Social-media metrics and e-petitioning*

While petition signing is an important proxy for the public support a petition has received, it is ultimately just one of many intermediate goals within a broader advocacy strategy. The final objective of any petition is to exert pressure on policymakers to enact policy or legislative change, and while the number of signatures serves as a visible and quantifiable indicator of public support and might serve to trigger referenda, it is not the sole indicator and determinant of a petition's impact and influencing pressure.

SM activity records related to e-petitioning also play an important role, as they can shape both the direct and indirect effects that a petition produces, as well as the type and intensity of pressure it exerts on elected officials, policymakers, and political institutions. Here follows a description of the metrics employed in this work and of their role—and effects—with respect to the impact of e-petitions:

- *Volume of posts*: The volume of posting activity related to a petition, which is here computed as the sum of original posts (excluding retweets) containing the unique URL referring to that petition, can serve as an indicator of its salience in the digital public sphere. A high volume of posts signals attention and may create the perception of a demand for action. Policymakers often observe SM discourse to assess which issues are gaining traction

and require responsiveness. When a petition generates a sustained level of activity it might become harder for policymakers to ignore it.

- *Reach scores*: reach of petition-related posts determines whether a petition will enter the general public's field of perception. Visibility is a precondition for mobilization, and a petition that has little reach cannot attract signatures or spark debate. Reach score measures the number of users that have seen a given post, affecting a petition's ability to enter public discourse. We acquire reach scores via Meltwater's data access to X's API<sup>6</sup>, enriching X's data with estimations of reach, inferred from the number of impressions provided by X. This means that we take reach scores as a conservative estimate of the number of users that have seen a post.
- *Engagement scores*: Engagement with petition-related posts reflects the post content's capacity to activate a reaction and hence to trigger support. High engagement scores, which are here computed as the sum of likes, shares (i.e., retweets), and replies, indicate not only the salience of a petition-related issue but also the intensity of one of the first levels of public mobilisation, that is precisely engagement with petition related content.

Another important dimension is *repeated mobilization* by a user for petitions from a specific petitioning platform, revealing a deeper level of commitment and alignment to a specific platform-community. This form of fidelization also reflects competition among platforms to align with user/base values and convince individuals to champion their causes rather than offering one-time support to a petition. Finally, *cross-platform issue-specific support* adds another layer to the analysis. When users support multiple petitioning campaigns related to the same issue across platforms, it suggests broader issue resonance.

SM metrics described above capture different forms of influence which shape public and institutional responses to petitioning. By relating activity metrics (i.e., volumes of posts) to reach metrics, we can understand how effective posts are in reaching online audiences that can become aware of the existence and nature of the petition. Also, by analyzing the relationship between reach and engagement scores, we can assess how effective is the process of mobilization of online supporters, per user reached.

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<sup>6</sup> For details about these metrics refer to <https://help.meltwater.com/fr/articles/7540564-the-main-metrics-in-radarly>

## Results

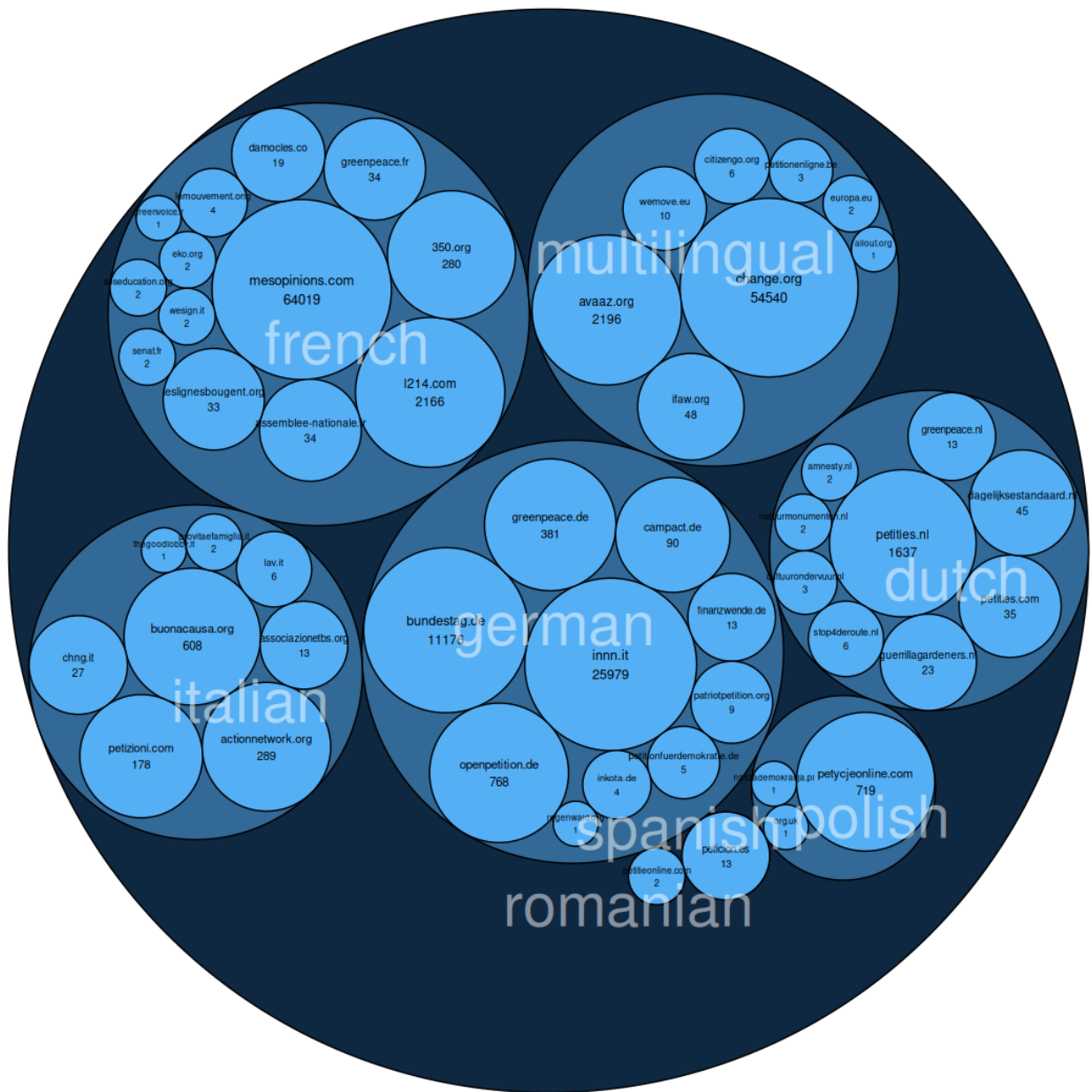
To explore how petitions are discussed and shared on SM across Europe, we analyse posting activity levels by language. French-language petitioning activity dominates with 129 649 posts (51.53%), followed by German with 39 663 posts (15.76%) and multilingual petition platforms with 76 924 posts (30.57%). Dutch petitioning activity is relatively low at 2 781 posts (1.11%), despite platform diversity. Italian (1 266 posts, 0.50%) and Polish (1,308 posts, 0.52%) show similarly low activity levels, with Italian lagging despite a larger population. Romanian (3 posts) and Spanish (24 posts) have almost no presence, each relying on a single “national” platform<sup>7</sup>. Figure 4, illustrates how many posts in the dataset refer to each petitioning platform, by language, revealing variations in platform usage within each linguistic group.

In the French-language cluster, a few large platforms, like *mesopinions.com* (64 019) or *l214.com* (2 166), dominate the discussion, suggesting that most of the petition-related posting activity in French on X gravitates around a small number of national platforms. The German-language cluster also features similar patterns, with domains like *innn.it* (25 979) and *bundestag.de* (11 176), which refers to the petitioning platform of the Bundestag (*epetitionen.bundestag.de*), dominating in terms of activity. However, as for French, numerous other mid-sized platforms indicate a rather balanced spread of petition-related references across X. Activity in Italian is centered around three platforms—*buonacausa.org* (608), *actionnetwork.org* (289), and *petizioni.com* (178)— while the Dutch group is dominated by a single platform, *petities.nl* (1 637), followed by others with similar but much lower coverage.

The Polish language cluster also shows a concentration of activity on a single platform, *petycjeonline.com* (719). Romanian- and Spanish-language platforms appear minimally represented. Finally, the multilingual cluster displays a few high-activity, in particular *change.org* (54 540) and *avaaz.org* (2 196), alongside a scattering of international platforms with medium and small coverage on X.

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<sup>7</sup>However, we remark that multilingual platforms, like *change.org*, are highly used (also) by spanish-speaking and romanian-speaking individuals.



**Figure 4: Hierarchical circle plot of the number of posts in the X dataset referring to a specific petitioning platform, by language.**

*Note.* Circle width equal to  $\log(1+N)$ , where  $N$  represents the number of posts referring to the platform (i.e., contain one or more URLs whose domain is that of the petitioning platform).

### *Characterising the petitioning community on X*

To characterise users, we analyze the distribution of users by the number of distinct petitions and platforms mentioned in their posts and number of issues discussed<sup>8</sup>. We find that most individuals discuss only one or a few distinct issues and support only one or a few petitions. The majority of users engaging with petitions participate on a very limited scale, focusing on a very small number of issues. Table 5, shows the distribution of individuals by activity pattern type and by language.

French-speaking users are largely Hit-and-run activists, with over 83% engaging in short-term single-issue mobilization. Despite this, they also have the highest share of New lobbyists (5.13%), indicating that while most users engage briefly, a small fraction remains active over time on a single issue. In contrast, German-speaking users are mostly Single-issue stakeholders (79.77%), meaning they punctually support a single issue. Also, a non negligible share of German-speaking individuals (15.49%) fall into the Activism consumers category, suggesting that many individuals engage in multiple issues<sup>9</sup>. Polish-speaking users follow a pattern similar to the French-speaking group, with a large majority (over 85%) classified as Hit-and-run activists, but, differently from the French group, they have no New lobbyists. The Italian-speaking group presents a more balanced distribution, with 64.96% Single-issue stakeholders and 23.36% Hit-and-run activists, indicating a mix of focused single-issue engagement and more punctual mobilization.

Multilingual platforms' user base has a significant proportion of Single-issue stakeholders (67.15%) and Hit-and-run activists (27.67%) but very few New lobbyists (0.03%). This suggests that the majority of users engaging through these multilingual platforms tend to participate more sporadically and rarely maintain long-term engagement in petitioning causes across longer time frames, yet, there is a non-negligible share of Activism consumers (5.15%) that engage on numerous issues and petitions. Comparing these patterns, there is a clear difference between the French and Polish communities, where Hit-and-run activism is most common, and the German, Italian and multilingual platform communities, which show a stronger presence of short-termed and single issue mobilization (i.e., Single-issue stakeholders). Interestingly, in all linguistic communities, except the French one, the New lobbyists category remains extremely small.

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<sup>8</sup> We remind the reader that issues have been inferred using ManifestoBERTa (see *Data and Methods* section) and that we here consider only the issue with the highest confidence score for each post, meaning that users who have posted only once can discuss just one issue. This simplification is necessary to project users' mobilization patterns in these two dimensions in a more straightforward manner.

<sup>9</sup> We remark that the distribution of users across categories for German platforms looks very similar to that inferred by Jungherr and Jürgens (2010, Table 7), which is exclusively based on *Petitionsausschuss* petitioning platform signature records. This suggests that the proposed identification criteria capture, at the aggregate level, similar figures to those based uniquely on signatures.

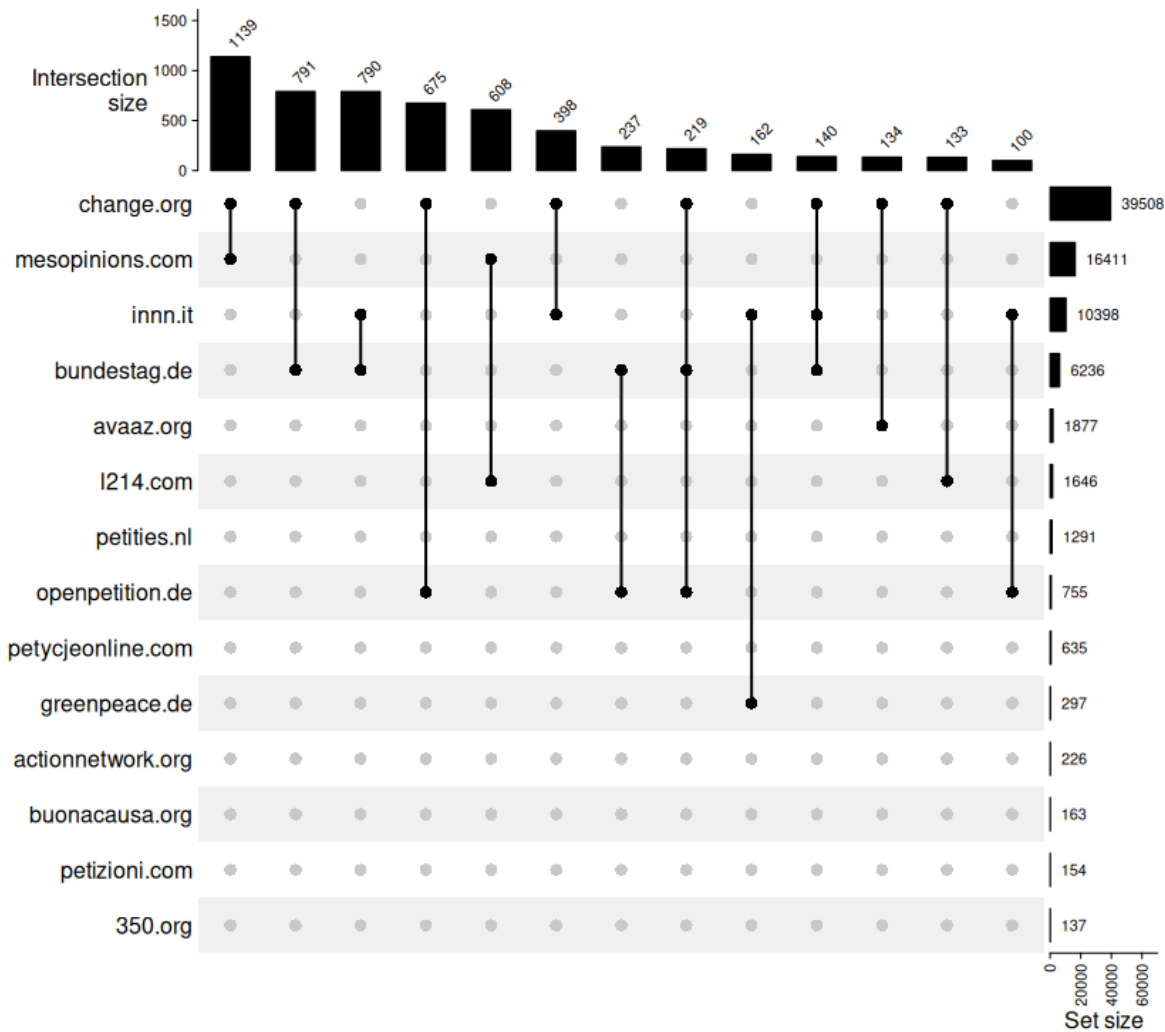
**Table 2. Number and share of users by user category and language.**

Platform Language Categories	Dutch	French	German	Italian	Polish	Spanish	Romanian	Multilingual
N. Activism consumers (% of lang.)	78 (5.76%)	1 315 (7.86%)	2 547 (15.49%)	64 (11.68%)	20 (3.14%)	0 (0%)	0 (0%)	2 126 (5.15%)
N. Hit-and-run activists (% of lang.)	803 (59.26%)	13 992 (83.66%)	748 (4.55%)	128 (23.36%)	545 (85.56%)	10 (83.33%)	1 (50%)	11 424 (27.67%)
N. New lobbyists (% of lang.)	4 (0.30%)	858 (5.13%)	30 (0.18%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	13 (0.03%)
N. Single-issue stakeholders (% of lang.)	470 (34.69%)	559 (3.34%)	13 114 (79.77%)	356 (64.96%)	72 (11.30%)	2 (16.67%)	1 (50%)	27 726 (67.15%)
Tot. N. users by platform language	1 355	16 724	16 439	548	637	12	2	41 289

Note: To distinguish between Hit-and-run activists and New lobbyists, we define a threshold of one year between the first and last posts on a specific issue: users who exceed this threshold are categorized as New lobbyists. The Activism consumer category includes all users that published at least two posts and whose dominant posts' issue (i.e., that with the highest confidence score) is not always the same. All other criteria are specified in Table 1.

Results suggest that activism on X is largely issue-specific and that most users do not engage in a broad or sustained manner. Those with longer engagement periods tend to participate in discussions that cover a wider range of issues and petitions, though such users remain a minority. Finally, we find that there is a small yet non-negligible fraction of users in France who engage with a single issue across many distinct petitions over long time frames, aligning with the New Lobbyists user category pattern first described by Jungherr and Jürgens (2010).

Figure 5, representing communities on X that engage through their posts with various petition platforms, highlights platform(s)' community size and overlaps. The vertical histogram on the right indicates that *change.org* (39 508 users) has the largest community, followed by *mesopinions.com* (16 411) and *innn.it* (10 398). Black dots and vertical connecting lines indicate community intersections between platforms.



**Figure 5: Number of users by platform(s) community.**

*Note.* A user is considered part of a petitioning platform(s)' community if they have published at least one post containing a URL linking to that platform(s)' domain(s). The vertical histogram on the left shows community size by platform, for platforms with at least 100 users, while the horizontal histogram on the top represents platforms' community intersections of at least 100 users.

The largest intersection (1 139 individuals) includes *change.org* and the French platform *mesopinions.com*. Another notable overlap occurs between *change.org* and *bundestag.de*. This community is relevant as it engages with both official petitioning initiatives, such as those related to the Bundestag, and more informal grassroots campaigns on *change.org*.

Figure 5 shows that while some petition platforms maintain distinct user bases on X, a considerable number of individuals engage with multiple petitioning platforms and contribute to cross-platform mobilization through their posting activity. Additional complementary results are available in section S.7 in the Supplement.

### *Number of mentioned campaigns and distribution of activity across campaigns, by platform*

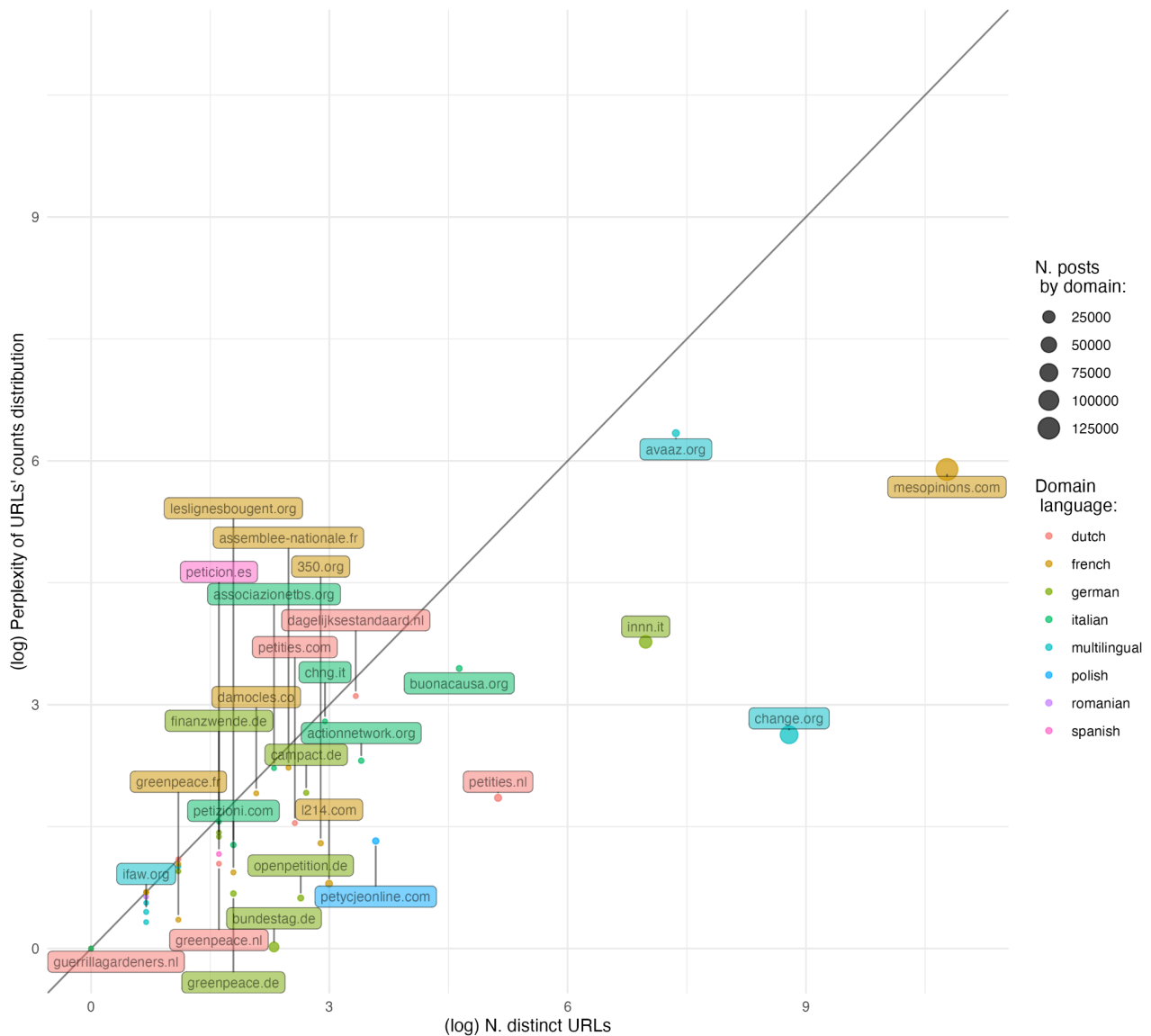
Assuming that distinct URLs represent distinct petitions, we compute for each petition platform the logarithm of the perplexity of the distribution of post counts by URL (i.e., petition). The formula and computational details used to compute URL-specific perplexity scores are detailed in section S.6 of the Supplement.

Figure 6 highlights the distribution of posting activity related to different petitions across petitioning platforms. The x-axis represents the logarithm of the number of distinct URLs referring to a domain, capturing the diversity of petitions shared from that platform. A higher value on the x-axis suggests that a broader range of petitions from the platform was discussed on X. While the y-axis shows the logarithm of the perplexity of the distribution of post counts by URL referring to a specific platform, reflecting how evenly distributed the posting activity is across the different petitions for each platform.

The diagonal ( $y = x$ ) line serves as a benchmark for a symmetrical distribution of URL counts referring to a given domain (i.e., same volume of activity). Domains that fall close to this line have posting activity that is evenly distributed across different petitions. In other words, petitions from that platform tend to receive a similar coverage on X in terms of posting activity. Domains that fall far below the diagonal line show a significant asymmetry in posting activity by URL.

Change.org stands out with a large number of distinct petition URLs and a massive post volume. However, it sits far below the diagonal, revealing a strong asymmetry in engagement: while many petitions are shared from *change.org*, only a few receive the majority of attention on X. This likely reflects the platform's global reach and tendency to host a few viral petitions that overshadow more niche petition campaigns. *Mesopinions.com* also displays a substantial distance from the diagonal line. Although this French platform hosts a large number of distinct petitions discussed on X, the perplexity reveals that the posting activity related to those remains heavily skewed toward a select few, indicating an uneven distribution of activity on X across petitions.

Domains that lie closer to the diagonal line, such as the German platform *bundestag.de* or the Dutch platform *guerrillagardeners.nl*, display a rather uniform distribution of activity across petitions. This suggests that users on X engage similarly with various petitions from these platforms.



**Figure 6: Scatter plot of the Perplexity of the distribution of URLs' counts (log), considering all URLs referring to a specific domain, as a function of the number of distinct URLs referring to that domain.**

*Note.* Circle colour represents the domain's language. Circle size represents the number of posts containing an URL referring to that domain. Perplexity score computational details are presented in section S.6 of the Supplement.

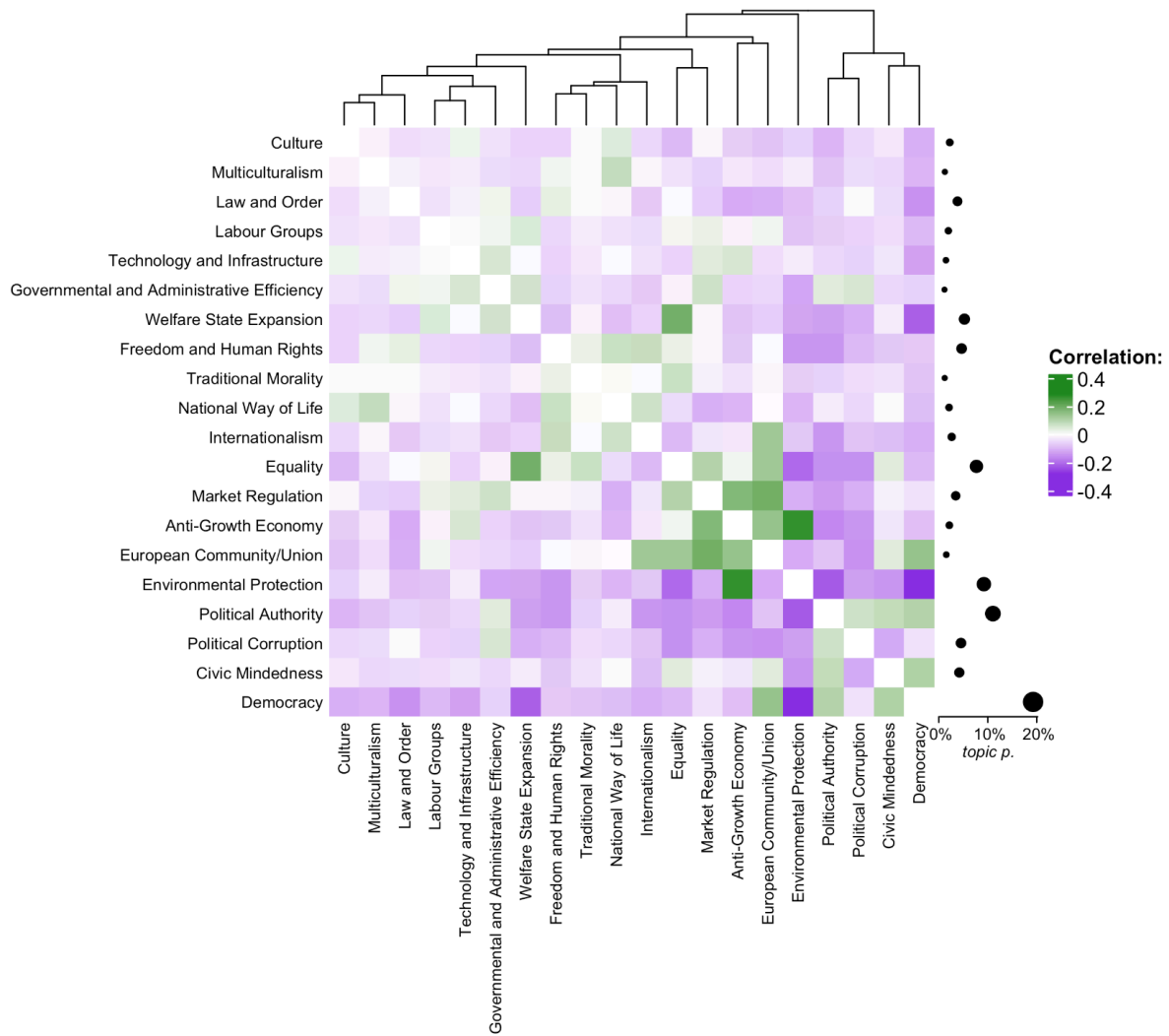
### *Distribution of petition-related activity across issues*

To identify issues discussed in posts related to e-petitions and understand how they relate to one another, we classify petition-related posts using the ManifestoBERTa (see the Data & Methods section). The model provides weighted issue confidence scores, indicating the inferred likelihood that a post is related to specific issues (refer to sections S.3 and S.4 of the Supplement for details). Additionally, we analyze the relations between issues by examining how issues' scores correlate,

revealing patterns of thematic synergy and overlap in posts. Figure 7 reveals the correlation structure of issues discussed in posts related to petitioning. On the right side of the figure, circles represent an average score of different issues.

The largest issue corresponds to Democracy, with an average score of around 19.3%. Political Authority, at roughly 11%, follows suit and is closely trailed by Environmental Protection (9.2%), Equality (7.7%), Welfare State Expansion (5.2%). Other issues, such as Freedom and Human Rights (4.6%), Political Corruption (4.5%), Civic Mindedness (4.2%), Law and Order (3.8%), and Market Regulation (3.5%) have smaller, yet still relevant, overall prevalence in SM petitioning discourse.

The structure of the correlation matrix, and the hierarchical clustering on the top, reveal cohesive blocks of issues that tend to be discussed together. One cluster is centered around Democracy and includes Political Authority, Civic Mindedness, and Political Corruption. This cluster also highlights the emphasis on institutional trust and democratic engagement in posts related to petitioning. Another important cluster is centered around the issue of Equality, which is positively correlated with Market Regulation, Welfare State Expansion, Freedom and Human Rights, and Traditional Morality. This block reveals that economic fairness, social protection, and individual freedoms are deeply intertwined in petitioning activity on X. The presence of the Traditional Morality in this cluster also suggests that ethical concerns and traditional values likely play a role in shaping how people advocate for social and economic policies related to Equality. A third cluster includes issues such as Government and Administrative Efficiency, Technology and Infrastructure, and Labour Groups. The correlation within this cluster points to a focus on structural and economic factors, where concerns about governance efficiency intersect with technological solutions and their impacts on labor-related issues. This cluster reflects a pragmatic and techno-centric demand for improved administration efficiency and lower bureaucracy.



**Figure 7: Heatmap representing the Pearson correlations among weighted issue confidence scores at the observation (i.e., post) level.**

*Note.* Issue scores were inferred using the ManifestoBERTa model. By computing correlations among issue scores we can assess the extent to which different issues are mixed within observations, effectively mapping the overlap (and confusion) between pairs of issues. Issues with an average score below 1% were excluded from the plot. The issues are ordered using the Hclust algorithm, with clustering results shown in the subplot at the top of the figure. The circles subplot on the right side of the figure shows average scores of issues (topic  $p$ ), with circle size proportional to the square root of average issue scores across all posts in the dataset. Values on the diagonal of the correlation matrix (all equal to 1) were omitted from the plot.

Some notable positive correlations link different thematic blocks together through bridging pairs of issues. One relatively high correlation is that between Environmental Protection and Anti-Growth Economy, indicating that discussions about environmental policies often include concerns about limiting economic expansion. Additionally, Market Regulation and Government and Administrative Efficiency are positively correlated, suggesting that regulatory policies are frequently discussed in the context of governance efficiency and effectiveness. Another strong correlation is observed

between European Community/Union and Internationalism, as well as between European Community/Union and Freedom and Human Rights, emphasizing that transnational and human rights issues are closely linked in petitioning discourse related to the role of EU institutions. Finally, the positive correlation between European Community/Union and Democracy suggests that discussions about Europe and European integration often touch upon democratic principles, reinforcing the idea that democracy is seen as a key issue within the context of EU governance and integration.

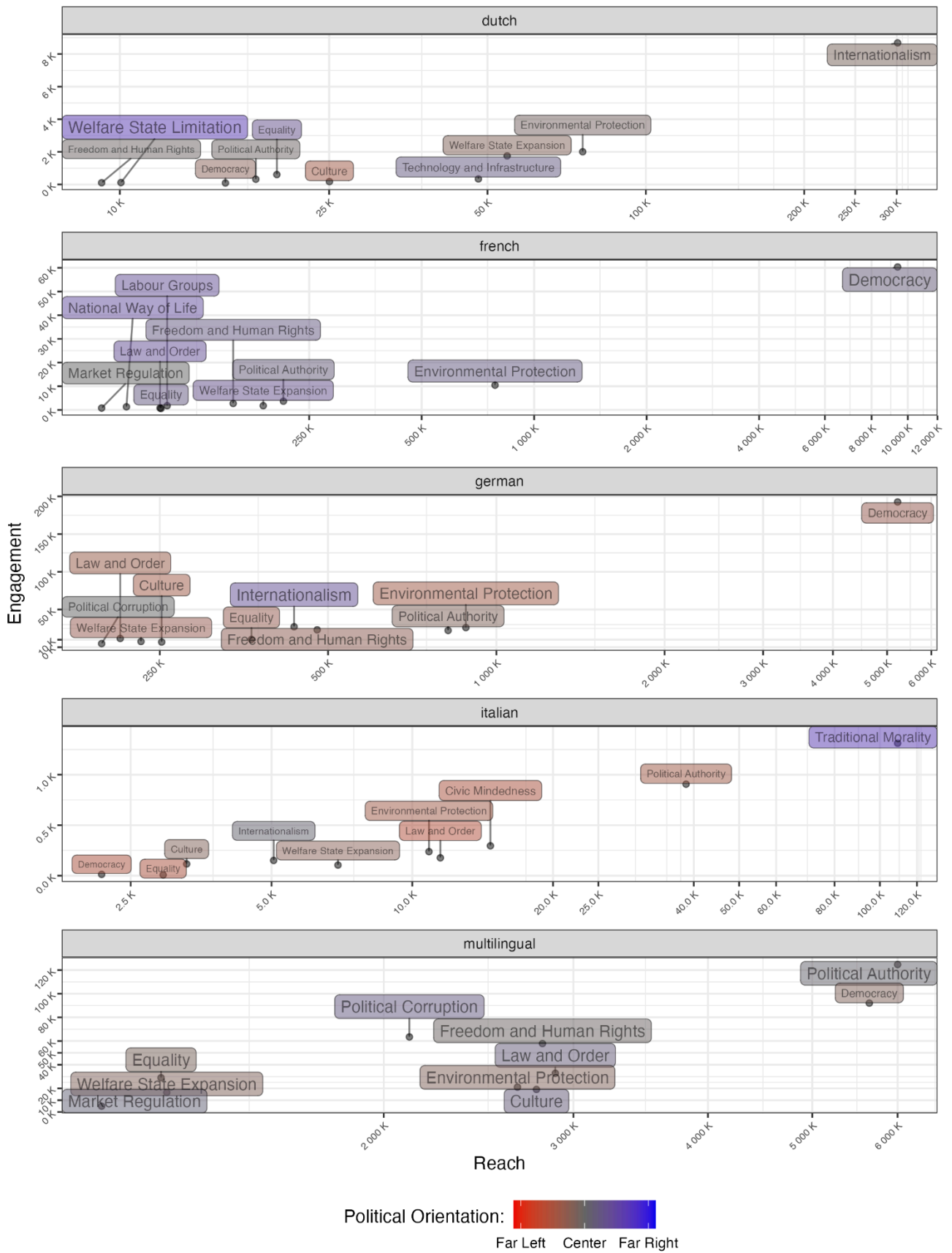
### *Petitioning issues reach and engagement by language and political orientation*

In Figure 8, we show the total reach (x-axis) and engagement (y-axis) for petition-related posts' issues, including the top 10 issues by reach for each language, also showing, through a colour scale, the average political orientation of users discussing a specific issue.

In Dutch-language petitioning, Welfare State Limitation is the most frequently discussed Right-leaning issue, but it does not generate the highest reach or engagement. Instead, Internationalism and Environmental Protection, discussed more by Centrist and Center-Left users, achieve significantly higher engagement despite lower overall activity.

Similarly, Welfare State Expansion surpasses Welfare State Limitation in both reach and engagement, aligning more with centrist positionings. In French-language petitioning, Democracy stands out with the highest reach and engagement, while Environmental Protection, mostly discussed by Center-Right users, reaches a broad audience but sees relatively lower engagement. Other issues, like Market Regulation and Welfare State Expansion, though widely discussed, fail to generate the same level of attention and engagement.

German activity frequently covers Environmental Protection, Internationalism, and Freedom and Human Rights, though these issues do not dominate in engagement. Freedom and Human Rights and Environmental Protection are commonly discussed by Left-leaning users, while Internationalism is more Right-leaning. Internationalism surpasses Environmental Protection in engagement despite having similar reach, yet it is Democracy—mostly discussed by Left-leaning users—that achieves the highest engagement and reach despite lower posting volume. In Italian-language petitioning, while Left-leaning issues like Political Authority and Freedom and Human Rights are frequently covered, they do not perform as well as Traditional Morality, a Right-leaning issue that dominates in both reach and engagement. Internationalism follows as another highly engaging Right-leaning issue. Unlike other languages, Environmental Protection in Italy sees relatively high engagement compared to its reach.



**Figure 8: Total reach (x-axis) and engagement (y-axis) for the top issue of petition-related posts, shown for the top 10 issues by reach in each language.**

*Note.* The size of each issue label is a monotonic nonlinear transformation of the number of occurrences of the issue as a posts' main issue (i.e., that with the highest confidence score for a given post), normalized by the frequency of the top ranked issue (by weighted confidence score) within the specified language. Spanish and Romanian were omitted due to an insufficient number of posts. The color scale, based on the European Left-Right colour scheme (Casiraghi et al. 2023), is used to represent issue-specific average Political Orientations, inferred only through MP followers. Characteristics related to these users only affect the color of the issues and do not the computation of Engagement or Reach metrics. Engagement metrics are aggregate scores computed across the entire user population, not only for users for whom political orientation can be inferred.

In multilingual petitioning, Political Authority and Democracy, both close the center of the political spectrum, achieve the highest engagement and reach. Environmental Protection, Freedom and Human Rights, Law and Order, and Culture hold significant reach but generate relatively low engagement, whereas Political Corruption, a Right-leaning issue, stands out for its high engagement despite lower reach.

Figure 8 reveals some interesting patterns regarding the relationship between reach and engagement, as well as the political leanings of different issues. One clear trend is that predominantly Left-leaning issues, like Environmental Protection and Freedom and Human Rights, often attract significant discussion and reach. But their high reach does not always translate to high engagement levels. This suggests that while these issues have broad appeal, they may not elicit strong (affective?) responses and broad mobilizations. The consensus around these issues could also explain lower levels of engagement. Internationalism (for Dutch) and Traditional Morality (for Italian), both Right-leaning issues, show much higher engagement levels. This suggests that issues with broader ideological appeal might provoke higher engagement and mobilization levels.

The issue of Democracy stands out across multiple linguistic communities, including French, German and multilingual platforms, where it achieves both high reach and engagement despite having a relatively low volume of activity. This suggests that Democracy is a resonant issue across political divides. The widespread importance of democratic life likely drives emotional responses and active participation in petitioning, even when the volume of posts is relatively low with respect to other issues. Issues that tend to be polarizing, like Political Corruption and Equality in multilingual platforms, also tend to drive higher engagement per user reached.

### **Limitations of the study**

#### ***ManifestoBERTa-based issue inference***

A relevant limitation of this study concerns the use of ManifestoBERTa to infer policy issues from petition-related social media posts. Although ManifestoBERTa is a widely used multilingual

transformer-based classifier (Lupacheva, 2025; Ivanusch, 2025) grounded in a well-established ontology (Burst et al., 2023), it was trained and fine-tuned on quasi-sentences extracted from political party manifestos. Petition-related posts on social media may differ from this training set as they are typically more informal and noisy, and can combine calls to action with partial or implicit references to policy content. We note that this mismatch may also affect classification accuracy.

Moreover, while ManifestoBERTa outputs weighted issue confidence scores in the  $[0,1]$  interval that sum to one for each observation, these scores should not be interpreted as calibrated probabilities, as they are potentially sensitive to class imbalance in the training data.

Inferred issue scores may hence exhibit over- or under-confidence for specific issues and/or score ranges. In this study, we view ManifestoBERTa's weighted issue confidence scores as possibly noisy, yet informative, signals of issue presence and mixing/confounding within posts, rather than as precise probability estimates of issues' prevalence. Our view is supported by our human-based validation exercise (detailed in Section S.4 of the Supplement), which indicate a substantial overlap between the top-3 issues identified by the model and those assigned by human annotators, suggesting that (also) non-first-ranked issue scores produced by ManifestoBERTa carry meaningful information about an issue's presence and mixing.

To assess the robustness of ManifestoBERTa annotations we also examined the consistency of inferred issues across posts referring to the same petition-related URL. As detailed in Section S.5 of the Supplement, we find high levels of consistency. For URLs observed at least twice, the vast majority of posts share the same top-ranked issue label as the modal label for that URL. This suggests that, despite potential miscalibration issues, the model behaves in a stable and systematic manner when applied to repeated observations of the same latent object (i.e., the petition).

### ***Partial coverage in ideological mapping***

A second limitation of this work concerns users' political orientations. Ideological positions, drawn from Ramaciotti et al. (2024a), are available only for a subset of users, primarily those who follow Members of Parliament. This results in incomplete coverage relative to the full population of users engaging in petition-related discussions on X.

We explicitly assess differences between users with and without inferred ideological positions by conducting Kolmogorov–Smirnov tests on aggregate engagement and reach metrics. These tests indicate that the two populations differ statistically, confirming that ideological coverage is selective rather than random. Consequently, results that explicitly rely on ideological information should be interpreted as characterizing the behavior and positioning of a politically attentive subpopulation, rather than the entire universe of petition-related users. At the same time, this limitation does not

compromise results that are computed over the full user population. For instance, Figure 8 reports aggregate engagement and reach metrics across all users discussing each issue, irrespective of whether their ideological position is known.

### *Mapping platforms and languages*

A final limitation concerns the mapping of petitioning platforms and languages to EU countries and peoples. The identification of platforms used for petitioning in the selected EU countries follows directly from our two-step data collection strategy. As detailed in Table S.3 of the Supplement, platforms were identified based on their appearance in the collected data and subsequently validated through manual inspection to ensure that they primarily serve specific linguistic communities within the EU. This approach does not guarantee that all petitions referenced on these platforms exclusively concern a single EU country or exclusively European issues. Some petitions may address transnational topics, such as trade agreements between the EU and non-EU countries, or mobilize EU citizens around issues occurring outside the EU. However, our data strategy ensures that all included platforms operate in the specified languages and host user communities that are predominantly associated with the corresponding EU linguistic contexts.

The mapping of language to country is necessarily more complex for widely spoken languages. Nevertheless, this limitation is mitigated by the fact that the major platforms selected in the first data collection step are either country-specific (e.g., national parliamentary petition platforms) or strongly centered on EU-based communities.

### **Conclusion**

Our study provides an EU-level analysis of the e-petitioning ecosystem, focusing on SM platform activity across multiple languages and political orientations. By adopting a multi-platform, multi-issue perspective, we map how petitions circulate and mobilize support in the digital public sphere.

Our analysis highlights distinct patterns of activism across linguistic communities on X. French- and Polish-speaking communities exhibit short-term, issue-specific engagement, as reflected in the high proportion of Hit-and-run activists. In contrast, German-speaking users are mostly Single-issue stakeholders, indicating a more punctual participation rather than a broader engagement across time and issues. Italian and multilingual communities show a more balanced distribution, with a mix of Single-issue stakeholders and Hit-and-run activists. Long-term issue-specific lobbying remains rare across all linguistic-communities except the French one. Moreover, the resemblance between the

distribution of German-speaking users across categories and previous findings by Jungherr and Jürgens (2010) —based on petition signature records— indicates that the adapted categorization criteria capture similar mobilization patterns across contexts (petition platforms Vs SM). These findings suggest that petition-related activism on X tends to be short-lived, with only a small fraction of users maintaining long-term engagement on a single cause.

We observe that issues exhibit distinct patterns of engagement and reach, shaped by linguistic and ideological factors. While some issues demonstrate broad appeal across multiple linguistic communities, reach-engagement ratios vary significantly. For instance, Right-leaning issues, such as Traditional Morality in Italy, tend to garner both high reach and engagement, while issues like Freedom and Human Rights exhibit more variable engagement. Similarly, Political Corruption tends to spark high engagement across multilingual platforms, while Environmental Protection, despite high activity volumes, triggers relatively lower engagement compared to its reach. We also observe that Democracy tends to transcend ideological barriers more than others, particularly in multilingual and French-speaking communities.

From a methodological perspective, by combining issue and ideological orientation mapping with user classification, we provide a replicable approach for studying online issue-based mobilizations related to petitioning.

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## Supplementary Materials

We provide a supplementary information PDF document (available at this link: [https://github.com/carlosantagiustina/mapping\\_the\\_epetition\\_ecosystem\\_through\\_social\\_media/blob/main/supplement.pdf](https://github.com/carlosantagiustina/mapping_the_epetition_ecosystem_through_social_media/blob/main/supplement.pdf)) containing seven sections, each offering additional materials and insights into the data, framework, methodologies, robustness checks, and results discussed in the manuscript.

Additionally, we supply anonymized data and the code used in the study. Details are provided in the Data and Code Availability Statement.

## Ethics Statement

Informed consent was not required for this study, as the data collected from X is publicly available through the platform's interface. Only publicly accessible user posts were retrieved and included in the analysis. Posts from users with restricted privacy settings were not accessible and are therefore excluded by design from the data collection.

## Data and Code Availability Statement

To comply with GDPR regulations and X/Twitter's terms of service, we have produced, and made available on GitHub at this link ([https://github.com/carlosantagiustina/mapping\\_the\\_epetition\\_ecosystem\\_through\\_social\\_media](https://github.com/carlosantagiustina/mapping_the_epetition_ecosystem_through_social_media)), an anonymized version of the data and the code used to generate the results and create the figures (Figs. 4-8) and Table 2 presented in the main paper. The code also allows the creation of many of the figures and tables from the Supplement where possible without violating GDPR regulations or X/Twitter's terms of service.

## Competing Interests

The authors declare that they have no competing interests related to this work. There are no financial, personal, or professional relationships that could be perceived as influencing this research or its findings.

### Authors' Contribution Statement

Conceptualization: all (C.S., P.R.);  
 Methodology: all (C.S., P.R.);  
 Formal Analysis: all (C.S., P.R.);  
 Investigation: all (C.S., P.R.);  
 Data Curation: P.R.;  
 Software: all (C.S., P.R.);  
 Visualization: C.S.;  
 Writing – Original Draft Preparation: all (C.S., P.R.);  
 Writing – Review & Editing: all (C.S., P.R.);  
 Funding Acquisition : P.R.;

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