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Birds of a feather petition together? Characterizing e-petitioning through the lens of platform data

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Abstract

E-petitioning platforms are increasingly popular in Western democracies and considered by some lawmakers and scholars to enhance citizen participation in political decision-making. In addition to social media and other channels for informal political communication, online petitioning is regarded as both an instrument to afford citizens a more important role in the political process and allow them to express support for issues which they find relevant. Building on existing pre-internet systems, e-petitioning websites are increasingly implemented to make it easier and faster to set up and sign petitions. However, little attention has so far been given to the relationship between different styles of usage and the causes supported by different groups of users. The functional difference between signing paper-based petitions versus doing so online is especially notable with regard to users who sign large numbers of petitions. To characterize this relationship, we examine the intensity of user participation in the German Bundestag's online petitioning platform through the lens of platform data collected over a period of five years, and conduct an analysis of highly active users and their political preferences. We find that users who sign just a single petition favor different policy areas than those who sign many petitions on a variety of issues. We conclude our analysis with observations on the potential of behavioral data for assessing the dynamics of online participation, and suggest that quantity (the number of signed petitions) and quality (favored policy areas) need more systematic joint assessment.

Keywords

e-petitioning, political participation online, behavioral data, content analysis

Introduction

The internet's potential to enhance political participation has attracted considerable interest in recent years, both in academia and among lawmakers, activists, and members of civil society (Bimber, 1999, Chadwick 2006, Dahlgren, 2005). An increasing array of platforms, from social media services and discussion forums to e-government sites are at the disposal of political actors, and the relevance of such platforms in the political process is increasingly discussed (Bennett and Segerberg, 2012, Couldry, 2015, Gil de Zuniga et al, 2009). The extent to which online petitioning contributes to political deliberation more broadly remains a point of debate in the literature, partly because it is contested who exactly is represented online across different national, cultural, and linguistic communities. Along with initiatives for enhancing e-government, increasingly attention is directed at other, less formal types of participation. A number of parliamentary initiatives, such as the Parliamentary Commission on the Digital Society (Germany) and the Commission on Decision-Making in a Digital Society (UK) have sought to draw civil society stakeholder closer to debates on e-democracy. Yet, there is still a limited understanding of the potentials and constraints of online participation, partly due to the challenges in successfully distinguishing between different modes and degrees of engagement in digital platforms.

Governmental online petitioning platforms allow citizens to engage with lawmakers and rally around issues that they find relevant. By contrast to social media channels, which can be appropriated for informal political communication, the political aspirations of e-petitioning platforms are clearly visible. Building on existing pre-internet systems for collecting petitions, e-petition sites are increasingly common in parliamentary democracies as part of a concerted effort to make it easier for citizens to participate in politics and promote a sense of political efficacy (see Böhle and Riehm, 2013, for an comprehensive overview of e-petitioning in the European Union). In contrast to technical innovations to previously unmediated democratic processes, such as online

voting, the outcomes of online petitions have no binding political consequences. The logic that persists across e-petitioning platforms is that when enough signatures have been collected for a particular cause, the parliamentary petition committee will review the petition, with the potential for a public debate on the issue it addresses. E-petitioning platforms are in this line of thinking intended to complement, rather than replace, other components of e-democracy, and are tied to the hope of being able to enhance direct democracy and e-government services through a more immediate participation of citizens. Due to its relative ease of use and low cost, online petitioning has been described as a largely effective instrument for tapping the political interests of citizens on different levels, particularly in relation to social grievances (Alathur et al., 2012, Yang, 2009). Its success is a central interest to actors across the political spectrum, for its assumed potential to aid citizen participation and foster a feeling of efficacy among the electorate. Following this direction of thought, Yasseri et al. call e-petitions ‘one of a growing portfolio of internet-based democratic innovations’ (2013, p. 2) and Linder and Riehm argue that ‘the e-petition system can be viewed as a small but nonetheless noteworthy contribution to increased institutional responsiveness’ (2011, p. 21). Not all scholars are this optimistic. In his overview of parliamentary petition mechanism, Hough (2012) critically asks whether petitioning constitutes ‘a parliamentary black hole’ (p. 480). In his analysis of e-petitioning in the UK and Germany he differentiates three functions of petitions: to provide a link between parliament and citizen (a), to inform policy development (b), and to affect policy change (c). He argues that online petitions perform relatively well on the first aspect, less well on the second, and not well at all on the third, concluding that ‘few petitions systems demonstrably enable citizens to influence the outcome of parliamentary debate and/or affect policy development’ (Hough, 2012, p. 483).

E-petitioning platforms also represent an interesting data source for researchers seeking to learn more about the dynamics of political engagement in online spaces, both quantitatively and

qualitatively (Briassoulis, 2010). While the internet is widely regarded as a platform that enables political mobilization, such mobilization takes on many forms, and involves a broad range of actors, from lobby groups, corporations, and non-governmental organizations to private citizens. E-petitions are merely one form of participation that is intended to offer a chance at shaping the political process for these actors, though they are arguably targeted primarily at private individuals. Exploratory content-based research on e-petitioning platforms has been carried out to predict the success of petitions, to trace the network relations of petitions to each other, and to determine whether anonymous signing has an impact on user behavior (Jungherr and Jürgens, 2010, Schmidt and Johnsen, 2014, Yasseri et al, 2013). The present study contributes to this body of scholarship, and simultaneously points to particular methodological opportunities afforded by behavioral data drawn from online platforms in general. Our central aim is to develop a new perspective on online participation by taking into consideration how intensely users contribute. As we will show, user groups delineated through quantitative indicators can also exhibit qualitative differences. At the same time, seeing petitioners largely through the lens of behavioral data also comes with conceptual restrictions and should accordingly be subject to careful theoretical reflection and debate among scholars.

Building on prior research on political participation online generally, and research into e-petitioning platforms in particular, we put forward a set interrelated questions:

1. How many signatures do different groups of users, based on their level of activity, contribute proportionally?
2. What are the thematic preferences of the users within these groups?
3. What are the policy implications of serial petitioners for the democratic potential of e-petitions?

Our questions place special emphasis on serial petitioners (i.e. users who sign multiple petitions over an extended period of time) given the potential similarities between highly-active e-petitioners and social media users, thus foregrounding an issue that calls for ample theoretical and methodological debate in the social sciences: A small group of highly active users contributes an over-proportional share of the total activity. This has important consequences for the underlying assumptions on which e-petitioning platforms are built. While the same user cannot sign the same petition twice, she can sign any number of petitions, and as we will describe, some individuals sign hundreds of petitions within weeks. Even though a large portion of users only signs a single petition, never to return to the site, some users return on a regular basis over the course of several years.

Prior research on e-petitioning and political activism online

Online deliberation on political issues takes a variety of different forms. From participating in political debate in online discussion forums and actively spreading political messages via social media to endorsing particular content by liking or retweeting it, various types of political actors, issues, and forms of engagement, can be differentiated (Ausserhofer and Maireder, 2013, Bastos and Mercea, 2015, Larsson and Kalsnes, 2014). While the impact of these forms of activism is not yet fully understood, it has been suggested that engaging in ‘clicktivism’ does not further other forms of political engagement due to its low threshold, and may even deter users from participating in other ways (Schumann and Klein, 2015). Existing studies of online petitions have emphasized a range of aspects, particularly in relation to the methodological possibilities afforded by petition data, such as modeling success over time, tracing topical relationships between petitions and investigating the influence of anonymity on signing. Fewer studies have so far investigated the motives of participants, or addressed the relation of petition policy areas to the participation of

particular user groups, though there is a general anticipation of an affinity towards internet-related issue among avid petitioners. Furthermore, the existing literature largely ignores differences with regard to level of participation, treating users as a relatively homogenous mass.

In their study of the European parliament's platform PETI, Cruickshank and Smith (2009), make the observation that conceptually, petitioning can be regarded as a hybrid form between pure representative democracy and direct democracy. In this context, it is often stressed that beyond the immediate question of success or failure for a given petition, the option to participate and to be able to communicate with the legislature is in itself important. Cruickshank and Smith (2009) highlight not only the different technical and legal implications of e-petitions across European countries, but also point to the variance in success between national electorates. Within this body of scholarship, electronic petitions are often championed as instruments of representative democracy despite considerable differences between the demographics of internet users and non-users. In Germany, 86% of the population use the internet at least occasionally, with 72% accessing it every day or almost every other day (Seybert and Reinecke, 2014). This is higher than the European Union average at 78%, but lower than the United Kingdom at 92%. In another Eurostat survey, half of German internet users reported having used some form of e-government service, such as online tax reporting, less than in France with 60%, but more than in the UK (Seybert and Reinecke, 2013). These figures suggest that while the early experiments with e-petitioning may have reached only a small portion of the electorate, current implementations should have achieved a more representative adoption.

Linder and Riem (2011) conduct an in-depth survey of e-petitions, comparing them with traditional, typically paper-based petitions. Among other differences they find a considerably lower satisfaction with the e-petitioning process than with the traditional procedure, which they speculate could be a result of the large number of unsuccessful petitions in online platforms, in contrast to

the much lower overall volume of petitions in offline systems. They furthermore speculate whether e-petitions could be associated with a shift towards new issues and topics, as groups of citizens with particular agendas, such as internet freedom, are overrepresented – a sort of medium bias of online petitioning. Finally, they inquire whether issue profiles emerge based on preferences for certain topics paired with socio-demographic aspects, a point that we will return to in the course of this paper. The lower degree of satisfaction which they find among users of online petitions could also be interpreted as an indicator for secondary gratifications in petitioning, such as connecting to others or being entertained, which may play a lesser role in offline petitioning.

Yasseri, Hale, and Margetts (2013) draw on data from the UK Government's national petition platform (epetitions.direct.gov.uk) for their study. They analyze a dataset of over 20,000 petitions, very few of which achieve the 10,000 signatures necessary for consideration by the petition committee. In total, those petitions garner seven million signatures, making them relatively comparable to the platform discussed in this study. They introduce the metric of an average outreach factor which describes the likelihood of a petition to attract further signatures, a process that ends after 24 hours, when the petition's success becomes extremely unlikely. The analytical aim of predicting a petition's success draws a somewhat limited picture of the questions raised by online participation or broadly, notwithstanding the policy appeal and the practical relevance of such models. Similar to the prediction of election results, the prediction of petition success seems somewhat at odds with the democratic considerations that underpin the motivation to implement instruments for online participation in the first place, methodological considerations aside (cf. Tumasjan et al., 2010, Jungherr et al., 2012).

Panagiotopoulos et al. investigate the intersection of social networking groups and online petitions to describe the relation between topics that receive both debate and broad support on social networking sites such as Facebook, yet fail to achieve a high number of signatures. The

authors uncover interesting disparities between causes that are popular, such as campaigning for the introduction of an additional national holiday, but receive few signatures (2011, p. 8). They also point to weaknesses in the design of to-date petition platforms as not inviting discourse, but rather limiting the role of petitioners artificially to that of rubber stampers providing push-button legitimacy to causes proposed by established political actors, a criticism echoed in principle by Alathur et al.'s case study of e-petitioning on environmental issues in India (2012).

An important aspect that underpins the widespread political interest in online petitions is to counter voter frustration and to empower citizens. Lee et al., in their study of the Taiwanese e-petitioning platform, argue quite optimistically that '[t]he usage of e-democracy mechanism here could alleviate problems associated with unequal political participation' (2014, p. 38). Before the background of digital divide research, they address the question of whether e-petition platforms are at all viable given the fact that the groups most need of being heard are at the same time those who are not represented online. They cite research that indicates a correlation between digitization and political participation, but also caution that: 'In the case of Taiwan, it would seem that the citizens' petitioning mechanism have generally been "hijacked" to become a tool of the political parties, with the participants invariably being found to be supporters of the various political parties, and acting as a result of the mobilization of local factions or political forces, such that a very high degree of inequitable participation is discernible' (Lee et al., 2014, p. 43). While the case of Taiwan differs from the usage of e-petitioning in European countries, the issue that online platforms provide a skewed representation of political opinions in the population is one that also informs the perspective taken in this paper. Lee et al.'s important contribution emphasizes that the affordances of online petitions are not equally distributed across population and are likely to underrepresent those who generally take no interest in political issues. As with other digital divide research, the

authors find indications that age and education play a large role in the willingness to participate and the attitude towards both e-democracy and the internet in general.

Finally, Jungherr and Jürgens (2010) conducted a study of a total of 886 petitions submitted between October 2008 and January 2010 to the German Bundestag's online petitioning platform (epetitionen.bundestag.de). They registered just short of half a million users on the platform who contributed slightly over one million signatures. The authors apply a range of techniques to differentiate between different types of users (occasional petitioners vs. serial petitioners) and different types of petitions by theme, which they exploit in the course of a network analysis of co-signature pattern. In addition, they identified a 'co-signing overspill': During periods when a eventually very successful petition was open for signatures, other petitions attracted more supporters, too. Schmidt and Johnsen (2014) confirmed this effect with a broader dataset of 2.653 petitions signed between October 2008 and February 2013. They also investigated the effect of the introduction of the pseudonymous co-signing option in 2012 and found no significant change in the amount of signatures. However, since then the majority of co-signers are using a pseudonym rather than having their real name displayed in the public list of signatures, pointing to a strong 'default effect' (i.e. choice of a preselected option) in the technical design of the interface, as users now have to deliberately choose to reveal their real name.

Survey results are helpful to contextualize the information that can be gleaned from observational data. Like other online activities, e-petitioning platforms are useful to users on different levels of gratification. Send and Schildhauer (2014) describe e-petitions as a very popular means of participation, not just in political discourse, but also in commercial and cultural contexts (p. 7). They conducted a survey based on a nationally representative sample of people in Germany aged 18 or older (n=504), of which 248 engaged in some way in processes of online participation). Of those familiar with online petitioning, 48% stated that they had signed a petition at some point.

In marked contrast, only 4% had actively created a petition, highlighting that the two processes are mutually independent and do not necessarily attract the same individuals. The authors argue that many users are not aware of the fact that they can themselves create petitions, whereas the availability of petitions that can be signed can be considered common knowledge. Survey respondents were also strongly interested in the possibility to create petitions themselves, whereas the option of signing them drew a medium level of enthusiasm (p. 28). Send and Schildhauer interpret the divergence between great interest in creating petitions and a low level of actual activity with the fact that petitions are relatively complex to create, whereas signing them is quite easy. One of the most interesting findings of the study is the low investment in terms of time required by users signing online petitions. Unsurprisingly, all other types of activities surveyed by the authors require a greater time investment than signing petitions, which is at the same time carried out by a large portion of users. A conclusion drawn from this by Send and Schildhauer is that a greater time investment is in a sense detrimental to broad usage: Those forms of political engagement that were most widely used by those surveyed were also those that take the least time. We see a secondary effect as a result of our analysis: That the low threshold of participation encourages, for better or worse, bursts of activity in which users contribute many signatures to a variety of causes in a single session. The discussed research results also point to the fact that the thematic preferences of different users groups, identified by their level of participation in the platform, has hardly been examined to this date, although platform data makes such analyses feasible.

E-petitioning and serial activism

The perceived relevance of e-petitioning platforms is the result of conscious efforts made particularly in Europe in past decades to revitalize political decision-making and to afford a more active role to citizens. Some see a legitimacy crisis for democracy in general, and identify the rise

of informal and nontraditional approaches to participation as an attempt to curb political apathy (Wright, 2012, p. 453). However, another aim lingers, namely to mobilize those citizens that would otherwise not participate in political discourse. This aim is generally prioritized over providing a venue for individuals who are highly politically active in the first place and regard the ability to contribute to an online petitioning platform as another avenue for effective political expression and change. Lee et al. (2014) make this point, and it is also latently present in other studies. Wright (2012, p. 457) differentiates between three types of particularly active participants who contribute to the success of individual petitions by supporting them through different channels and in different stages of their development. Graham and Wright (2014) label highly active contributors as ‘super participants’ and argue that their relevance has to date not been sufficiently taken into account in research on online political discourse. They focus their analysis of contributors to online discussion groups on the type of contributions and differentiate between *super-posters*, *agenda-setters* and *moderators and facilitators*. While our own categorization will be more simplistic, we will argue that both duration and volume distinguish different kinds of contributors as saliently as different communicative behaviors do.

A growing body of research investigates not only these configurations of actors and themes in social media platforms, but also the roles taken on by different actors by virtue of how they use a platform or service. Himmelboim et al. (2009) examine posting behavior in political discussion newsgroups and find that certain users act as discussion catalysts -- individuals who contribute content from traditional mass media sources that serves as a point of departure for debates and prompts others to respond. Graham and Wright (2012) point out that in the context of platforms such as Twitter, a small, highly active minority typically contributes a large percentage of the activity, and Wright (2012) accordingly focuses his analysis on those users, arguing that their influence is underestimated, and their hyperactivity means that they are often cast in a negative

light because they are assumed to crowd out 'ordinary' users. In research on political discourse on Twitter in relation to a broad range of activist themes, Bastos et al. (2012) found that a small share of users was active under hundreds of different hashtags, particularly those that were politically charged. Bastos et al. (2012) refer to such users as *serial activists*.

Serial activists are politically motivated internet users who resort to online and social media to engage in protest movements, often across transnational borders. The term dates from the late 1990s and early 2000s and has been used to refer to users engaging in political activities online who may otherwise not be dedicated activists (Zuckerman, 2008). Bastos and Mercea (2015) argue that such activists constitute a distinct new type of political actor, investing a large part of their time in the support of a variety of causes online. Following their findings, serial activists present clear dimensions of magnitude (volume of posted messages), space (engagement across transnational protests) and time (posting of protest messages over extended periods). Contrary to early accounts of this group, Bastos and Mercea (2015) reported that their continued commitment to contentious politics and prolific protest communication on Twitter frequently helped coordinating actions conducted as part of physical protest. Following the arguments put forth by Wright (2012) and Bastos and Mercea (2015), we focus on the role and potential impact of this particular type of behavior in online petitioning.

Data and methods

In the following, we will briefly introduce the platform under study and describe our analytical approach. Since 2005 the German parliament (the *Bundestag*) has operated an online e-petition system to augment its previously analog system for submitting petitions. Its 'role model' (Lindner and Riehm, 2011, p. 1) was a similar system introduced by the Scottish parliament in 2000 as a reaction to the re-establishment of the Scottish legislature. While the parliamentary petition

committee is in principle concerned with all petitions that are submitted to the platform, it was decided at the launch of the platform that a petition that garnered 50,000 co-signatures in the course of three weeks after being submitted would receive a public hearing before the *Petitionsausschuss*, or Parliamentary Committee on Petitions. In 2008 the system was revised and extended based on a prior two-year trial. The signatory period was extended to six weeks, and in addition to being able to publicly initiative and co-sign petitions, users can also participate in public debate. The system differentiates between all petitions submitted electronically (*Onlinepetition*) and public e-petitions designed explicitly for online signing (*Öffentliche Petition*), the key difference being that public petitions have a preamble that is published on the website, and which can be supplemented with further information. In what follows, we discuss public petitions exclusively. Among those public petitions that attracted a large number of signatures was a petition introduced by the German Association of Midwives that lobbied for better pay and social security (over 105,000 signatures), a petition that opposed internet filtering (over 134,000 signatures), and a petition that opposed a ban on violent computer games (over 73,000 signatures). We conduct an analysis of the aggregate signature data stored in the platform over a five-year period. We deliberately restrict ourselves to a descriptive approach that relates users in particular activity groups to the policy areas and subjects of individual petitions with which they are associated.

Results

Our analysis is based on data on 2,650 petitions available for signature between October 2008 and February 2013. A total number of 1.3M users contributed 3.5M signatures to these petitions. Our analytical focus is on the users of the platform, which we group into four types according to their level of involvement: *Singlets*, who sign just one petition, *returnees*, who sign 2 to 23 petitions, *highly active* users who sign 24 to 118 petitions and *hyperactive* users, who sign between 119 and

1,981 petitions. Our choice of types is not arbitrary. The median number of signed petitions per registered user is one, while highly active users and hyperactive users represent the most active 1% and 0.1% of all users, respectively. Returnees represent the bridge between these extremes, being 'somewhat' active. Figure 1 shows the users in relation to their ranked activity on the platform (log-log scale) to underline the skewed composition of the four groups. Table 1 provides a summary of the four types, along with their absolute size, their share of users, their share of total signatures, and their share of signatures among the 50 most successful petitions.

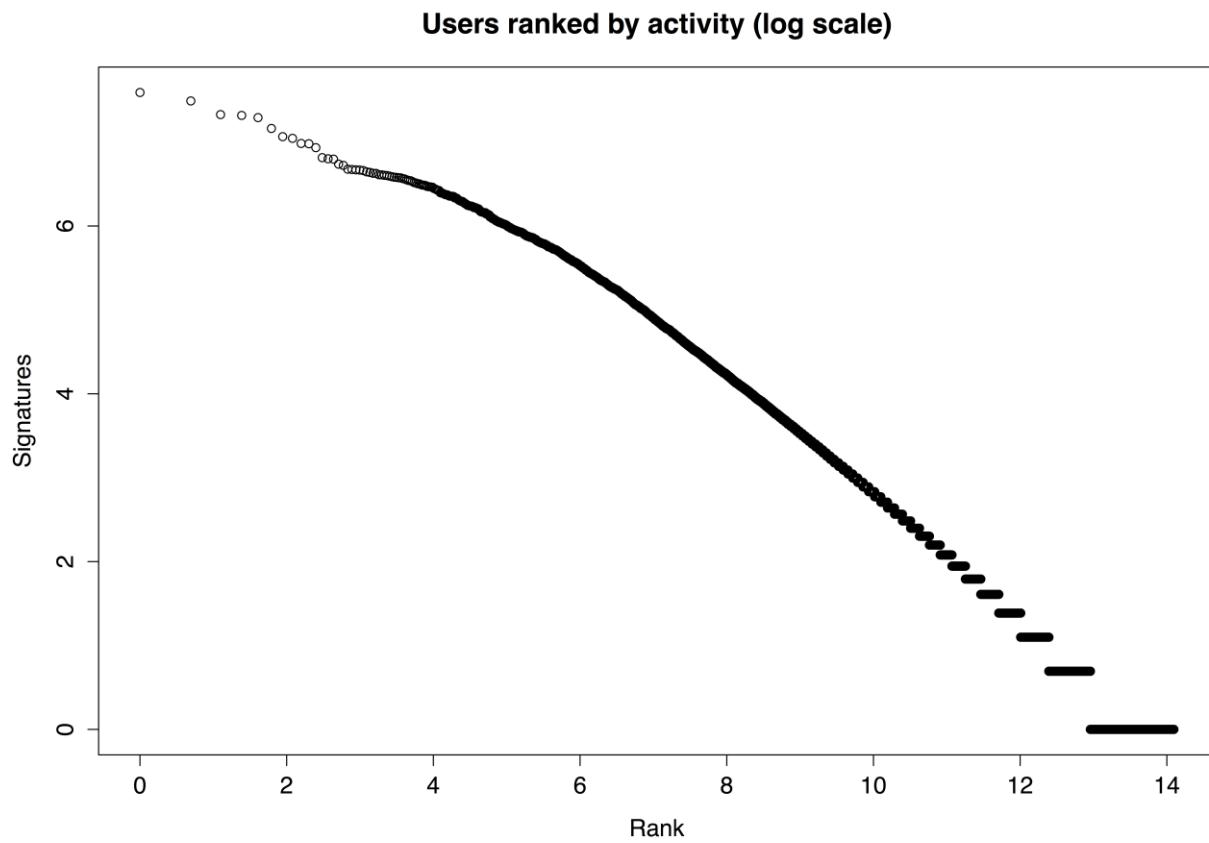


Figure 1: Users ranked by activity (log scale)

Table 1: User groups by number of total users, share of users, signatures, and signatures among the 50 most successful petitions (%)

| Users type | # of users | % of total users | % of signatures all petitions | % of signatures top 50 petitions |
|---------------|------------|------------------|-------------------------------|----------------------------------|
| singleton | 898,614 | 68 | 25.8 | 35.2 |
| returnee | 410,200 | 31 | 49.2 | 55.9 |
| highly active | 12,377 | .9 | 15.6 | 7.1 |
| hyperactive | 1,323 | .1 | 9.4 | 1.8 |
| | 1,322,514 | 100% | 100% | 100% |

The relation of these groups to their share of overall signatures underscores how skewed their respective participation is. The most active 1% of users contribute 25% of all signatures, and the most active third accounts for 75% of total signatures. This pattern also holds across time: The percentage contributed by highly active and hyperactive users never dips under 20% of all annual signatures, and even amounts to a total of 33% of signatures in 2012. Another interesting statistic is the proportion of single signers in successful petitions. They contribute an average of 35% of signatures to the 50 most successful petitions, ten percent more than for all petitions. Returnees also hold a larger share of signatures for successful petitions than for the total. Conversely, the numbers decrease dramatically for highly active and hyperactive users, who have half and one tenth the share in the most successful petitions. While the likelihood of signing less successful petitions increases as one contributes more signatures, the dynamics of this suggest that serial petitioners are not as effective in influencing petition success as may be projected on the basis of their overall activity, a point to which we will return. Table 2 shows the distributions by gender among the groups.

Table 2: Gender distributions by user groups (%)

| Gender | Singleton | Returnee | Highly active | Hyperactive |
|---------------|------------------|-----------------|----------------------|--------------------|
| female | 47.9 | 35.7 | 28.5 | 23.8 |
| male | 52.1 | 64.3 | 71.5 | 76.2 |
| | 100% | 100% | 100% | 100% |

While the gender distribution of the platform among single signers is relatively balanced (47.9% female and 52.1% male users), this difference becomes much more pronounced among returnees, highly active, and hyperactive users (23.8% female and 76.2% male in the latter group). Table 3 shows the distribution by urban vs. sub-urban areas. We defined urban areas as those with a population density of 1,500 residents or more per square kilometer (Federal Statistical Office, 2013). Our calculation is based on the first two digits of the postal code (the ‘postal region’) as provided by the users, which was then used to calculate the mean population density for that area.

Table 3: Urban vs. sub-urban residency by user groups (%)

| Location | Singleton | Returnee | Highly active | Hyperactive |
|-----------------|------------------|-----------------|----------------------|--------------------|
| sub-urban | 57 | 56.7 | 58 | 59.2 |
| Urban | 43 | 43.3 | 42 | 40.8 |
| | 100% | 100% | 100% | 100% |

Though there is a slightly stronger representation of users from the sub-urban category, this represents normal population patterns. Fluctuations between the groups, which are quite minimal, are likely to be a product of chance. We thus see a clear gender pattern, with males overrepresented in the serial petitioners group, but no tendency in user group distributions that can be attributed to differences between urban and suburban residents. In the next step, we examine the relation of groups by activity level to policy areas. Table 4 shows the thematic preferences of users across the four groups that we have defined.

Table 4: Share of signatures across policy areas by user groups (%).

Note that columns, rather than rows, add up to 100.

| Petition policy area | Singleton | Returnee | Highly active | Hyperactive |
|-------------------------|-----------|----------|---------------|-------------|
| Consumer protection | 5.6 | 49.2 | 28.1 | 17.2 |
| Economy | 14.4 | 45.1 | 23.9 | 16.7 |
| Education & Science | 28.4 | 52.3 | 12.9 | 6.4 |
| Environment | 19.8 | 57.6 | 15.8 | 6.8 |
| Finance & Taxes | 27.4 | 45.6 | 16.6 | 10.4 |
| Health | 39.8 | 43.5 | 10.1 | 6.5 |
| Interior | 15.7 | 49.1 | 22.5 | 12.7 |
| Justice | 29.7 | 52.7 | 11.2 | 6.3 |
| Labor | 5 | 41.6 | 30.1 | 23.3 |
| Media | 25.3 | 59.6 | 11.1 | 4.1 |
| Parliament & Government | 5.9 | 49.7 | 29.4 | 15 |
| Social | 37.3 | 44.4 | 10.9 | 7.4 |
| Transport | 20 | 29.8 | 22 | 18.2 |
| Other | 5 | 42.3 | 29.9 | 22.8 |

Visible differences emerge between the groups when examining their respective share of signatures across policy areas. More than a third of signatures in the Health and Social categories comes from singletons, while they account for less than six percent of signatures in the Consumer protection, Labor, and Parliament & Government categories. Conversely, hyperactive users contribute between 4% (Media) and 23% (Labor). Over 80% of signatures for Health come from singletons and returnees combined, while less than half of signatures for Labor petitions do. To summarize, highly active users are particularly interested in Labor, Consumer Protection, Transport and the Economy. Meanwhile the areas of Health, Social issues, Justice, and Education & Science are most important among sporadic contributors. By contrast to these differences, some areas (Finance & Taxes) show comparably low deviation from the group mean, suggesting that certain policy areas are less strongly associated with individual user groups than others. The characterization through the relation of user groups to policy areas can be further refined by directly

examining the percentage share of each group among the 50 most successful petitions by signatures, the results of which are shown in Table 5.

Table 5: Share of signatures per group for the 50 most successful petitions (%).
Note that columns, rather than rows, add up to 100.

| # | Petition topic | Singleton | Returnee | Highly active | Hyperactive |
|----|---|-----------|----------|---------------|-------------|
| 1 | internet (website blocking) | 38.2 | 58.1 | 3.2 | 0.5 |
| 2 | Pharmaceuticals (biopharmaceuticals) | 49.4 | 47.9 | 2.3 | 0.4 |
| 3 | Civil law (GEMA I) | 47.4 | 49.3 | 2.9 | 0.4 |
| 4 | Care professions (midwives) | 63.5 | 34.3 | 1.8 | 0.4 |
| 5 | Public pensions (obligatory payments) | 55 | 43.4 | 1.4 | 0.2 |
| 6 | Nuclear energy (exit) | 41.8 | 53.2 | 4.2 | 0.8 |
| 7 | Public order (video games) | 35.8 | 59.8 | 3.9 | 0.6 |
| 8 | Copyright (GEMA II) | 52.2 | 44.3 | 2.9 | 0.5 |
| 9 | Penal code (data retention) | 26.6 | 66.2 | 6.1 | 1.1 |
| 10 | Copyright (ACTA) | 39.2 | 55 | 4.8 | 0.9 |
| 11 | Sales tax (ballet/dance/music schools) | 64.8 | 34.4 | 0.7 | 0.1 |
| 12 | Reforming social security (basic income) | 45 | 51.2 | 3.2 | 0.5 |
| 13 | Genetic engineering (GMOs) | 28 | 64 | 6.6 | 1.3 |
| 14 | Universities (guaranteed grad placement) | 47.9 | 47.9 | 3.7 | 0.5 |
| 15 | Tax policy (financial transaction tax) | 35.7 | 57.5 | 5.7 | 1.1 |
| 16 | Arms (paintball) | 25.2 | 67.1 | 6.7 | 0.9 |
| 17 | Public health insurance (psychotherapy) | 61.3 | 36.1 | 1.9 | 0.8 |
| 18 | Farming (privatization of public waters) | 45.2 | 49.7 | 4.2 | 1 |
| 19 | Data protection (ELENA) | 21.2 | 65.9 | 10.9 | 2 |
| 20 | Scientific research (open access) | 21.8 | 66.4 | 10 | 1.8 |
| 21 | Nuclear energy (exit) | 9.7 | 75.7 | 12.1 | 2.5 |
| 22 | Arms (semi-automatic weapons) | 76.8 | 21.4 | 1.3 | 0.5 |
| 23 | Copyright (ancillary press copyright) | 17.8 | 73.5 | 7.3 | 1.3 |
| 24 | Addiction (cannabis legalization) | 45.5 | 45.5 | 7.3 | 1.6 |
| 25 | Animal protection (trade with dog puppies) | 34 | 57.8 | 6.6 | 1.6 |
| 26 | Law of obligation (copyright infringement warnings) | 35 | 54.7 | 8.3 | 2 |
| 27 | Energy policy (renewable energy from Norway) | 38 | 55.3 | 5.3 | 1.4 |
| 28 | Pharmaceuticals (veterinarians) | 71.7 | 25.8 | 1.8 | 0.7 |
| 29 | Public health insurance (natural medicine) | 6.4 | 82.4 | 9.3 | 2 |
| 30 | Data protection (full body scanners) | 5.8 | 75.3 | 16 | 2.9 |
| 31 | Public health insurance (rate parity) | 23.3 | 62.6 | 11 | 3.1 |
| 32 | Right of residence (visa waiver for Turkish tourists) | 85.5 | 11.7 | 2.1 | 0.8 |

| | | | | | |
|----|--|------|------|------|-----|
| 33 | Doctors (treatment documentation) | 51.3 | 42 | 4.6 | 2.1 |
| 34 | Financial policy (ESM I) | 32.4 | 56.4 | 8.6 | 2.6 |
| 35 | Financial policy (ESM II) | 24.9 | 64.2 | 8.3 | 2.6 |
| 36 | Federal police (racial profiling) | 39.4 | 55.7 | 3.9 | 1 |
| 37 | Civil law (GEMA III) | 11.3 | 73.9 | 12 | 2.8 |
| 38 | Animal protection (animal transports) | 1.7 | 81.4 | 13.2 | 3.7 |
| 39 | Copyright (circumvention of copy protection) | 0.8 | 79.9 | 16.3 | 2.9 |
| 40 | Income taxes (personal study) | 60.7 | 34.3 | 3.9 | 1.1 |
| 41 | Unemployment benefits (legal aid) | 34.9 | 54.7 | 8.3 | 2.1 |
| 42 | Right to asylum (residency obligation) | 26.9 | 63.6 | 7.6 | 2 |
| 43 | Financial policy (ESM III) | 25.1 | 61.7 | 9.9 | 3.3 |
| 44 | Public health insurance (bilateral transnational agreements) | 35.2 | 55.9 | 6.5 | 2.4 |
| 45 | Nuclear energy (renewable energy) | 2.2 | 74.3 | 18.7 | 4.9 |
| 46 | Care professions (remuneration of psychotherapy trainees) | 46.3 | 51 | 2.1 | 0.5 |
| 47 | Nuclear energy (liability) | 3.6 | 70.7 | 20 | 5.6 |
| 48 | Constitution (LGBT) | 41.2 | 48.4 | 8.1 | 2.3 |
| 49 | Compensation of the president | 19.9 | 64.5 | 11.2 | 4.3 |
| 50 | Nuclear energy (EURATOM treaty) | 6.4 | 69.7 | 18.2 | 5.7 |

Participation from serial petitioners does not seem to be a reliable predictor of petition success, at least not for those users who sign very large numbers of petitions (Table 5). The picture that emerges is one in which participation from users who sign just one petition indicates the success of a petitions more reliably than highly active and hyperactive users do. The data in Table 5 also suggests the activation of different publics for separate issues. The petitions on Firearms, the Sales Tax, and Care Professions bring audiences to the platform which do not contribute to any other issues. The most extreme case is a petition on the right of residence (which is aimed at introducing a visa waiver for Turkish tourists traveling to Germany), to which 85% of all signatures are contributed by users who sign no other petitions. In the returnees group, the petitions on public health insurance, copyright, animal protection, and nuclear energy stand out. Finally, the two separate petitions on nuclear energy are both heavily signed by highly and hyperactive active users.

In both cases, hyperactive users comprising only 0.1% of the total user base contribute over 5% of all signatures. The same applies to digital rights issues such as copyright and data protection, which are also pushed forward predominantly by serial petitioners. This is in marked contrast to the petition on dropping the visa requirement for Turkish tourists, the petition on semiautomatic weapons and the petition on veterinarians. The latter two both call for legal changes to which particular interest groups -- gun owners and pet owners -- are opposed. By contrast, the first petitions aims to simplify visiting relatives for the families of Turkish residents, an issue that mobilizes a constituency otherwise not engaged in online petitioning.

These cases, as well as a petition on taxing ballet schools, and the midwives and psychotherapy petitions, are characteristic for interest groups affected by particular laws. By contrast, returnees supply the highest percentages of support for the petition on natural medicine (which seeks to make natural and established medical practices covered by insurance policies legally equivalent) and animal transports (which seeks to make them illegal in their current form). Petitions on environmental issues (phasing out nuclear power, promoting renewable energy) follow. Nuclear energy in particular is a pivotal area for serial petitioners among the top 50. On this topic they contribute much more substantially than they do in the other policy areas. It is noteworthy that some individual petitions have a strong mobilizing effect that draws users who otherwise would not contribute, whereas others seem to benefit from spillover effects and casual signing within the same session.

Temporal dynamics among highly active and hyperactive users

So far our analysis has examined the signature distribution of the four activity groups among policy areas and for particularly successful petitions. In the following, we briefly describe the temporal dynamics among highly active and hyperactive users. While there is a relation between being active

for a longer period of time and signing more petitions, this is not a linear relationship. A few users sign over one thousand petitions in three to four months, while others take more than a year for a comparable count. This suggests that users treat petitioning differently based on individual criteria, and that signing a large number of petitions in a single session is common among certain users, but not others. A typical pattern among users who contribute a large number of signatures is to sign many different petitions on very divergent areas in a single sitting. A large number of users then leaves, sometimes for very long periods, only to return for another ‘binge’ during which another series of petitions is signed. A second group of users contributes signatures only sporadically, but returns on a more regular basis to contribute again and again. Users therefore differ not just in terms of their level of participation, but also in terms of how evenly their contributions are distributed across a certain time span.

Figures 2 and 3 show individual petition signing patterns for four different users over a four year period. While the first two show irregular patterns of signing, the last two return to the site on a regular basis to sign one or more petitions. The patterns exemplified above suggest that spillover effects are more significant among some users than others. Highly active and hyperactive users both sign large numbers of petitions in a single sitting and over longer stretches of time. They also contribute signatures across virtually all policy areas, suggesting that they are not following a clearly defined agenda, and are not mobilized through offline professional or interest-based networks, but browse the website to make relatively spontaneous signatures.

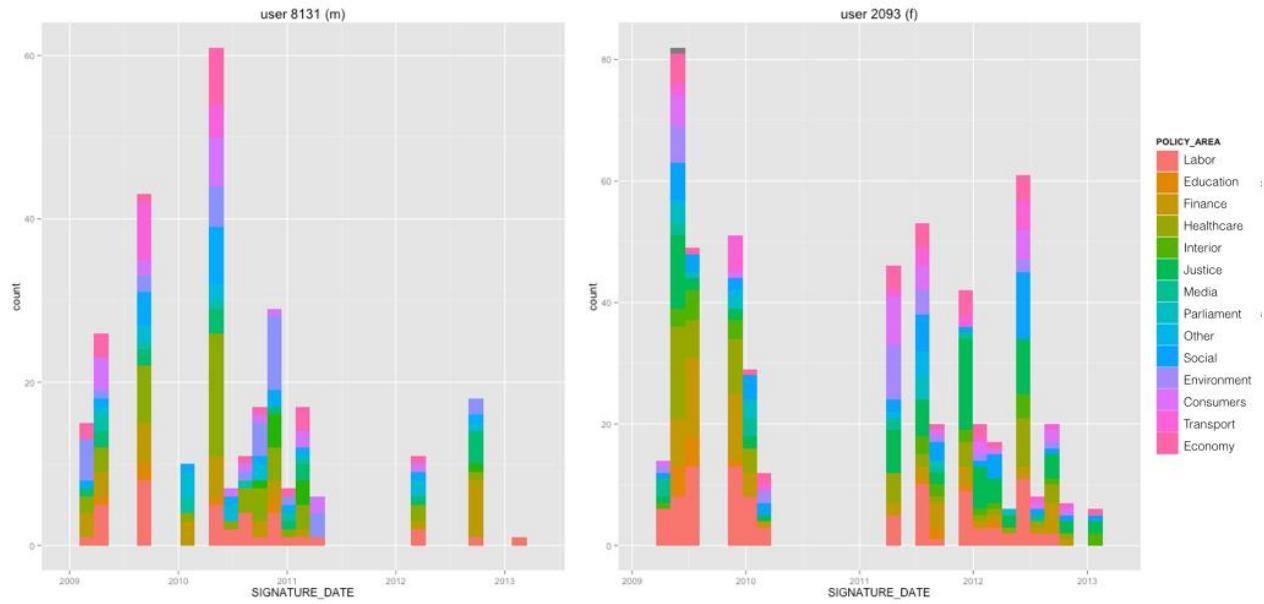


Figure 2: Two users show high peaks of activity (25+ signatures on a single day), interrupted by long breaks. The activity is characterized by signatures across a broad range of political subject areas.

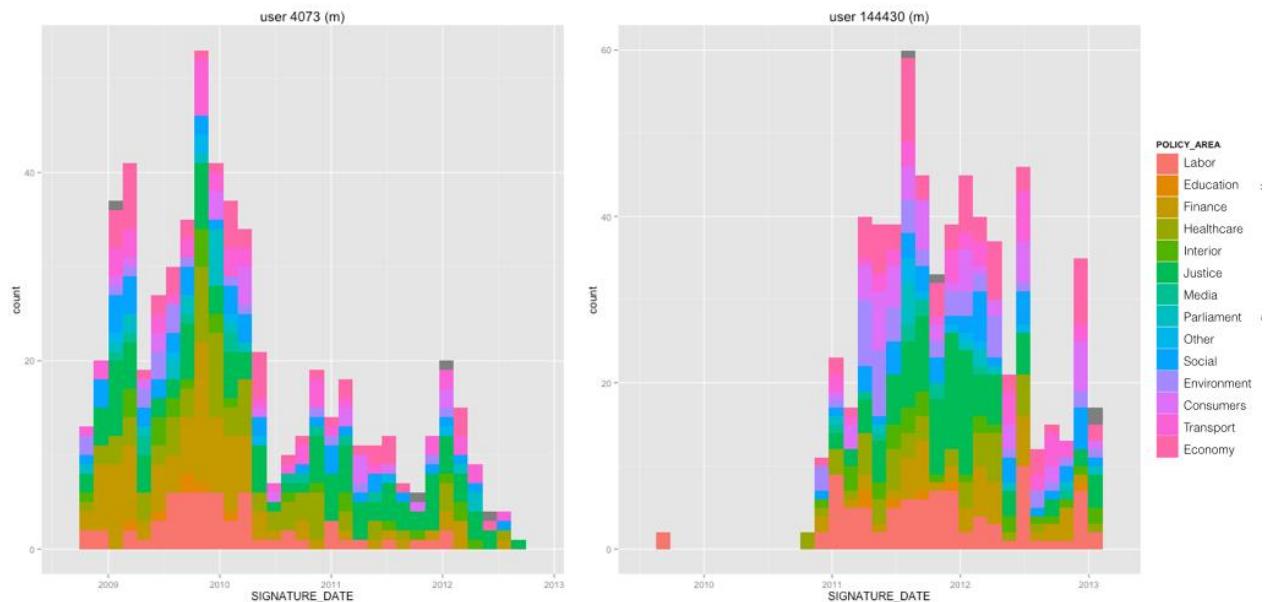


Figure 3: The first user signs petitions on a regular basis, with brief periods of inactivity. The second signs two petitions, then stays inactive for a long period to return to more sustained activity.

Discussion

In this paper, we have first differentiated four groups of petitioners based on their volume of signatures, and then related this quantitative difference to qualitative characteristics of the policy areas and individual petitions which the members of these groups support. We compared highly active and hyperactive users who sign petitions on a regular basis over longer periods with those who spontaneously sign a large number at once. This temporal pattern sheds new light on the dynamics of online participation and is at odds with the idea that petitions necessarily stem from grassroots collective action in which citizens engage equally to issues that they deem important. Instead, some contributors sign large numbers of petitions spontaneously, out of habit, or both, while others sign just once and do not engage otherwise. It is an open question what implications if any this should have for e-petitioning websites. Single signers are more often female than those who are serial signers, and they contribute to a different set of issues compared to highly active and hyperactive individuals. The policy areas around which they rally are more immediately tied to professions or interest groups (midwives, psychotherapists, pet and gun owners) than those of serial petitioners (environment, privacy online). The participation of single signers is also a better predictor of petition success than that of serial petitioners.

The highly uneven dynamics of participation in the online petitioning platform examined in this paper is potentially challenging to the claim that such platforms advance direct democracy. This problem arises on two conceptually independent levels. Firstly, particular users sign a particularly large number of petitions, which can be regarded as extending their influence beyond that of ‘ordinary’ users. On the other hand, the likelihood of serial petitioners signing less successful petitions should be associated with their level of activity. As only a few petitions are successful, users signing large number of petitions are more likely to sign unsuccessful petitions. Secondly however, the fact that men are much more strongly represented than women in the

hyperactive group of users is relevant, not merely in itself, but because other factors may also be particular to the group of highly active users, for example that upholding long and sustained patterns of participation is only possible if one has a large amount of time at one's disposal. Petitioning is often regarded as not purely relevant for its potential to shape the political decision-making process, but also because it allows minority groups to be heard. Our findings suggest that while this is true, such platforms may present particular dynamics of community-building that both over- and under-represent the population it is supposed to represent, along with their own specific biases. Gunkel highlights this problem when asking: 'this new easiness and effortlessness of protests and petitions [...] allows us to engage in discussions about politics on a global scale [...] stating one's own political position is only a mouse click away [...] but what does an ethical approach to these not necessarily new, but rather intensified, possibilities of political mobilizing look like?' (2013, p. 78). Before a discussion of the ethical issues of petitioning that Gunkel has in mind can even begin, a critical assessment of the weight of individual voices in e-petitioning platforms seems a necessary prerequisite.

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