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Kruikemeier, S.; Vermeer, S.; Metoui, N.; Dobber, T.; Zarouali, B.

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Sanne Kruikemeier* , Susan Vermeer* , Nadia Metoui ,
 Tom Dobber  and Brahim Zarouali 

Abstract

This study examines how mainstream political actors and other organizations use political targeted messages. For this purpose, a data set from ProPublica is used. The study examines 55,918 sponsored Facebook ads that were posted by 236 political actors (i.e., political elites and other organizations) in the United States. (1) Topic classification was used to identify policy issues, (2) network analysis to identify the main policy issues from the various political actors, and (3) Sankey diagrams to visualize microtargeted messages. Our findings indicate that actors focus on traditionally owned issues (i.e., the Democratic Party: environmental policy, social issues, and social welfare; the Republican Party: foreign affairs, law, and government finances). No clear evidence for a focus on wedge issues can be found, however, some first indications (e.g., a focus on reproductive rights, LGBTQ+) are present in a targeted media environment. All in all, the current study helps us to understand in what way political actors deploy targeted messages.

Keywords

Political Communication, Targeted Messages, Facebook, United States, Automated Content Analysis.

(Tar)getting You: The Use of Online Political Targeted Messages on Facebook

The use of online political targeted messages by political elites, but also other organizations that intervene in the political arena (Dobber and Borgesius, 2019), has gained popularity in recent years (Zuiderveen Borgesius et al., 2018; Strömbäck and Kioussis, 2014; Dommett, 2019; Dommett et al., 2020). Data-driven targeting, in particular online, involves the *collection* of vast amounts of personal data, the use of that data to *identify* and *select* specific (groups of) people that might be affected by the message, and subsequently, *sending* these people targeted messages (Zuiderveen Borgesius et al., 2018). Political actors, and other organizations, are increasingly relying on external intermediaries, such as Facebook, to assist with these practices (Dommett et al., 2020; Barrett, 2020).

Data-driven targeting practices also received a growing amount of journalistic attention (Baldwin-Philippi, 2017) and scholarly inquiry (Bodó et al., 2017). Research has focused on the use of data-driven techniques during elections (Kreiss and McGregor, 2018; Kreiss, 2016) from the perspective of political elites (Dobber et al., 2017), discussed the (possible) ways to regulate targeting (Dobber and Borgesius, 2019), and focused on the normative implications of targeting, specifically discussing the challenges

that political targeting brings for democracy (Bayer, 2020; Zuiderveen Borgesius et al., 2018; Barocas, 2012). This latter strand of research argued that, on the basis of democratic theory, targeting might have negative implications for democracy as it could lead to voter manipulation, discrimination, and violations of privacy on a micro-level, and to more power to well-funded parties on a macro-level (Tufekci, 2014). Conversely, targeting might also be an effective tool to reach citizens that are difficult to reach via traditional media and by engaging those who are less interested in politics (Zuiderveen Borgesius et al., 2018).

However, while many claims about the democratic impact of targeting have been made, less attention has been devoted to the actual practice of targeted political messages in the online environment (Bennett and Gordon, 2020), most notably on social media such as Facebook.

Amsterdam School of Communication Research, University of Amsterdam, The Netherlands

*The first two authors contributed equally

Corresponding author:

Sanne Kruikemeier, Susan Vermeer, Nadia Metoui, Tom Dobber, and Brahim Zarouali
 Email: sanne.kruikemeier@wur.nl



Previous work, for instance by Kim et al. (2018), has examined how *outside* anonymous groups run divisive issue campaigns and who they target. Endres (2016) studied the 2012 Republican campaign's targeting efforts in three states. But the way in which *mainstream*, country-wide, political elites and organizations use Facebook ads to target specific audiences received little attention. Hence, the main research question of this paper is *who* (i.e., which political actor), sends *what* type of targeted message (i.e., the actual content) to *whom* (i.e., which targeted audience or individual; based on the ideas of Lasswell, 1948). The current research question answers a crucial, but yet to be explored question in communication science.

Thus, the current study aims to uncover how mainstream political actors and organizations use political targeted messages when targeting specific audiences, by giving insight into the content of such targeted messages, by building on the theory of issue ownership (Lefevere et al., 2015; Petrocik et al., 2003) and of the persuadable voter (Hillygus and Shields, 2008). It will examine the extent to which parties, candidates, and other organizations are associated with specific issues, but it will also focus on parties and candidates addressing issues which might be traditionally *owned* by their opponents. This is specified as "issue trespassing" or "issue convergence" (Walgrave et al., 2015, p. 779), and is expected to be specifically relevant when it comes to political targeting. We focus on sponsored Facebook ads posted in 2018 in the United States to address our aim. Investigating online targeted messages is challenging because of the opacity of the social media ecosystem (see e.g., Chester and Montgomery, 2017) and the limitations of ad archives (see e.g., Leerssen et al., 2019), therefore we use data from ProPublica. In addition, to empirically investigate vast amounts of online data, we analyzed 55,918 sponsored Facebook ads that were posted by 236 political actors.

Targeting in the political arena

Formally, targeting can be defined as the specific alignment and delivery of (commercial) messages at predefined audiences (Schlee, 2013). Most often, it refers to online advertising that is based on personal data the advertiser has about the recipient, such as (socio-) demographics, preferences and interests, social connections, browsing behavior, and location data (Schumann et al., 2014; Stiglbauer and Kovacs, 2018). While it is tested and employed in the commercial sector to a great extent, targeting found their entrance into political campaigning (Chester and Montgomery, 2017). This resulted in the widespread use of a wealth of personal data to mobilize and persuade voters, a practice which has been referred to as political microtargeting (Zuiderveen Borgesius et al., 2018). Much of these data-driven political campaigns are occurring in

(and facilitated by) a highly commercialized social media marketplace. Social media platforms own the most valuable troves of personal data, which they subsequently offer to political actors to reach potential voters (Tufekci, 2014).

Changing campaign dynamics and normative implications of targeting

The practice of political microtargeting has not remained undisputed. In fact, it has recently become the subject of heightened academic and public debate (Baldwin-Philippi, 2017). A first set of concerns in this debate centers around the implications for the individual voter, since political microtargeting offers an innovative method that facilitates voter deception, manipulation, discrimination, and privacy intrusion (Zuiderveen Borgesius et al., 2018; Susser et al., 2019; Leerssen et al., 2019; Chester and Montgomery, 2017). Another set of concerns focus on the implications for our society as a whole, where political microtargeting could lead to a power transfer to wealthy and well-funded political elites (Tufekci, 2014).

Within this normative debate, a specific consequence - exposure to political targeted information about *policy issues* - receives significant attention. It is argued that in a more digitalized media environment, not only the *way* in which candidates communicate about political issues has changed, but also *what* they communicate (Hillygus and Shields, 2008). This can have negative consequences. Diversifying the issues of a political campaign to different voters might lead to a fragmented public sphere where certain groups of people are informed about political issues, while this information is being hidden from other groups (Zuiderveen Borgesius et al., 2018; Tufekci, 2014). This could lead to *four* types of negative consequences. First, following previous work, in a mass-communicated environment, voters are likely to be informed about a limited set of political standpoints that concern specific issues (Zuiderveen Borgesius et al., 2018). Yet, if voters are only interested in the issues they personally care most about, instead of focusing on the overarching issues, they might not engage in deliberative processes with others, such as public debates, about these core issues (Moeller et al., 2016, for a discussion on the common core). Second, by emphasizing different issues to different voters, one voter might assume that a specific issue is central in the political campaign or important to the political party, while another voter might assume that another issue is most important. As a consequence, when these individual voters get repeatedly exposed to targeted messages about these issues, this leads to a biased view of the "issue priorities" of political actors (Zuiderveen Borgesius et al., 2018, p. 89). This view is supported by Bennett and Gordon (2020). They suggest that if one message is directed to one group of voters, and another message to another (group of) voter(s), this might lead to

“more ambiguous political mandates for elected representatives” (p. 3), see also Barocas (2012). Third, microtargeting - ‘dark posts’ - that contain false or disinformation, cannot be countered in real time by fact checkers or journalists. Repeated and exclusive exposure to these targeted messages, could lead to misinformed voters. As noted by others, “[i]n the open, false claims might be challenged; in secret, they may stand unchallenged” (Bennett and Gordon, 2020, p. 3). A last concern relates to the focus on wedge issues. Evidence suggests that targeted messages are more likely to focus on ‘wedge issues’ compared to mass-communicated campaign messages (Bennett and Gordon, 2020; Hillygus and Shields, 2008). Wedge issues, which are issues of divisive nature, such as reproductive rights, LGBTQ+, minimum wage, and immigration, might polarize the electorate especially if they are repeatedly and only targeted with these wedge issues (Hillygus and Shields, 2008; van de Wardt et al., 2014).

However, some scholars note that the use of microtargeting might also have a positive impact, as targeting could make election campaigns more diverse; targeted messages offer relevant information about political issues to voters (Zuiderveen Borgesius et al., 2018). In other words, it is argued that by using targeted messages, political actors can inform voters about policy issues that they are most concerned about. Zuiderveen Borgesius et al. (2018) emphasized that this is less likely in “an exclusive mass-communicated information environment” (p. 86), where there is room for a few issues that are more extensively discussed. Niche or other relevant issues might be ignored. Thus, by targeting specific issues to voters, political actors can emphasize and communicate more diverse issues to the electorate.

Much of these concerns about political microtargeting stem from the fact that the social media advertising ecosystem is difficult to monitor, which undermines efforts to identify, diagnose, and remedy potential harms (Leerssen et al., 2019; Chester and Montgomery, 2017). This opacity is mainly due to the personalized nature of political microtargeting, which makes targeted ads invisible to everyone except the specific users that are targeted by these ads (and thus, these ads are hidden from oversight by ‘critical outsiders’; Shaffer, 2019; Tufekci, 2014). In an attempt to increase transparency, big technology companies, such as Facebook and Twitter, have recently implemented publicly accessible ad archives that include political ads running on their platforms. If designed properly, these archives can be a powerful governance tool that enable monitoring of political advertising. However, recent analyses identified major limitations and weaknesses in these ad archive, and as a result, they have been criticized by researchers who find their contents to be incomplete and unreliable (Edelson et al., 2019, 2020; Leerssen et al., 2019; Mathias and Hounsel, 2018). This has highlighted the need for a more systematic observation and reporting

of political ads on social media (Leerssen et al., 2019). This brings us to the main focus of this article, which will be theoretically underpinned in the next paragraph.

The content of microtargeting: issue ownership, wedge issues, and social media posts

To understand *what* political actors talk about online when using targeted messages (i.e., the policy issue they focus on), we turn to issue ownership theory (Petrocik et al., 2003; Walgrave et al., 2015). To give a short definition, “issue ownership means that some political parties are affiliated with specific issues, and considered best able to deal with them” (Walgrave et al., 2015, p. 778). For instance, Democrats are associated with issues like social welfare, education, health care, the environment, and abortion, while Republicans ‘own’ other issues, such as taxes, defense, crime, trade, and the economy (Petrocik et al., 2003; Banda, 2015; NBC/Wall Street Journal, 2018; NPR/PBS NewsHour/Marist, 2019)

Studies investigating the consequences of issue ownership found that issue ownership affects citizens’ vote choice, albeit dependent on party preferences and issue salience. For instance, Bélanger and Meguid (2008) found that issue ownership affects voting decisions, but only for people who also consider the issue to be important. As argued by the same authors, in general, when parties are perceived to be more competent on a specific issue, voters are more likely to support that party. Thus, issue ownership theory might explain, to some extent, why policy issues are important in explaining how voters make up their minds (Hillygus and Shields, 2008). It is therefore not surprising that previous research showed that parties have a preference to discuss owned issues, for instance, in television advertisement (Brazeal and Benoit, 2008). Moreover, more recent work on issue ownership investigated the extent to which parties address issues *owned* by other parties (Banda, 2016; Kaplan et al., 2006; Tresch et al., 2015); this is defined as “issue trespassing” or “issue convergence” (Walgrave et al., 2015, p. 779). Research found that over the course of campaigns, political candidates respond to each other by strategically addressing issues owned by their opponents (Banda, 2015). This effect is often found in competitive political environments. By focusing on television advertisements, Banda (2015) asserts that candidates mention their opponents’ owned issues more often over the course of time, showing evidence for issue convergence. Furthermore, whether or not it is possible to ‘steal’ an already owned issue from an opponent also depends on the party system. In two-party systems, issue convergence (thus the presence of overlapping issues) is more likely (Walgrave et al., 2015; Egan, 2013).

Issue convergence is particularly relevant when it comes to microtargeting. By deploying targeted messages, political actors are “[a]rmed with information on which

individuals are the most likely to agree (or oppose) their position on any number of issues” (Endres, 2016, p.771). Using this personal information from voters, parties can design more issue-based persuasion strategies (Endres, 2016). Thus, by focusing on an issue that is owned by an opponent, political targeting might increase the likelihood that a political actor can ‘steal’ that issue. For instance, a Republican candidate might ‘send’ an ad about ‘air pollution solutions’ to undecided voters who care about the environment in order to change their vote choice (environment is an issue owned by the Democratic Party). Since issue ownership might affect citizens’ vote choice, this can be a strategic move to persuade voters.

If we turn to the empirical work that has been conducted on politicians’ (organic) social media posts, we find some interesting results. Borah (2016) observed that, in 2008 and 2012, most presidential candidates use Facebook posts to promote the campaign. Approximately one out of three posts were about policy issues. The study also shows that Republicans attack their opponent more often in their posts. Another study, focusing on the Justin Trudeau’s use of Instagram in 2015, showed that various issues were covered in the posts. The posts contained official announcements related to policy issues, such as employment, social development, economy, youth, health, and the environment. The study also shows that official statements were announced, and other posts covered specific events (Lalancette and Raynauld, 2019). Even more interesting, a study, focusing on Senate candidates’ use of Twitter and messaging via broadcast media (i.e., campaign advertising), showed that only a small minority of ads in broadcast media contained no topic, while on Twitter, more than half of the tweets had no issue content (Bode et al., 2016). This resonates with the idea that social media posts might be more often focused on the campaign, on attacking opponents, and they might include more often information about the politicians themselves, instead of focusing on policy issues (Yarchi and Samuel-Azran, 2018).

Taken together, based on these insights, it can be expected that targeted messages overlap, due to issue convergence. However, it might be safer for political actors to pay for messages that are focused on owned-issue to mobilize voters, instead of attracting new voters. Based on these considerations, we expect that:

(H1a): Political actors affiliated with the Republican Party are more likely to use Republican-owned issues than Democratic-owned issues in targeted messages.

(H1b): Political actors affiliated with the Democratic Party are more likely to use Democratic-owned issues than Republican-owned issues in targeted messages.

In addition, previous research indicates that targeted messages might focus more on ‘wedge issues’ compared

to mass-communicated campaign messages (Bennett and Gordon, 2020; Hillygus and Shields, 2008). Hillygus and Shields (2008) argue that voters – who disagree on specific issues with their preferred party – are more likely to be persuaded, especially when it comes to issues that they care about. By emphasizing this issue to receptive voters (and thus highlighting internal conflict), political actors can attract these voters. Because the targeting technologies make it easier to identify receptive voters, Hillygus and Shields (2008) argue that the use of wedge issues is more likely. They support their argument by showing that direct mails (a form of targeted content) contain more wedge issues (such as abortion and gay marriage) compared to television advertising. Thus, when using mainstream media, political actors are more likely to use “consensual policy issues”, and when using targeted communication, they are more likely to focus on wedge issues (Hillygus and Shields, 2008, p. 169).

Based on the work of Hillygus and Shields (2008), we also focus on typical wedge issues to examine closely how these more contentious issues are used in targeted messages. Based on Gimpel (2019), we focus on the issue of immigration, as he suggested that since 2016, voters “began to align their policy views with the positions of their favored political parties” (p. 467) and that “[t]he association between party identification and immigration policy views reaches a local peak by 2018” (Gimpel, 2019, p. 473). Furthermore, we focus on divisive issues, based on previous work by Hillygus and Shields (2008) and on the issues which were in 2018 of importance in the public debate. These are reproductive rights, LGBTQ+, gun control, and environment. Based on the arguments of the ‘persuadable voter’, we expect that political actors focus more on divisive issue compared to non-profit organizations. We pose the following hypothesis:

(H2): Political actors affiliated with the Republican and Democratic party are more likely to focus on divisive issues in targeted messages (i.e., immigration, reproductive rights, LGBTQ+, gun control, and environment) than non-profit organizations.

It is important to note that we direct our focus on mainstream politics, by including political parties and candidates. In addition, we also included political action committees (PACs) as they often used targeted ads. Lastly, non-profit organizations are included because they are the baseline in our second hypothesis.

Lastly, this study examines who political actors target (i.e., the audiences) using issue-based targeted messages. In other words, who do political actors reach with their issue choices. Insights in the reach of targeted ads received little attention. Kim et al. (2018) focused on anonymous divisive issue campaigns and found that these campaigns targeted specific demographic groups. People with a low

income, received more targeted ads about immigration and racial conflict. People with an average income, were targeted with issues about nationalism. They also found that, compared to other ethnic groups, whites receive more targeted ads about immigration and nationalism. So, while this study offers important insights, it does not focus on mainstream political actors. Endres (2016) found that the Republican Party in 2012 was only partially successful in identifying potential wedge issues of specific voters. The Republican campaign's predictions were "right much of the time, but are far from perfect" (p. 773). However, this study focuses on the 2012 election in three states (Florida, Virginia, and Colorado), and on only one political actor: the republican campaign. Since then, targeting capabilities have evolved and insights into the targeted audience of US-wide political elites are still left to be desired. Based on these considerations, and because a lack of research, the following research question is asked:

(RQ1) How does the audience that is targeted (in terms of gender, age, and political affiliation) vary depending on the divisive issues mentioned in the targeted messages of political actors affiliated with the Republican and Democratic Party?

Method

This study takes a multi-method approach to examine political targeted messages on Facebook¹. First, topic classification was used to identify policy issues in sponsored political ads. Second, we used network analysis to identify the main policy issues from various political actors (i.e., political elites and other organizations). Finally, we visualize the targeted audience by using Sankey diagrams.

The ProPublica data set

In this work, we study the political ads data set collected by ProPublica, an American non-profit newsroom. The database includes ads that ran on Facebook in the period before the 2018 U.S. midterm elections. ProPublica asked users to install a browser extension that automatically collected advertisements on their Facebook pages and sent them to ProPublica's servers. They used a machine learning classifier to select which ads were likely political. The data set includes, for example, the title, message, images, the advertiser, targeting information (e.g., related to age, gender, education, ethnicity, country, interests, language), as well as the number of users who have indicated that the ad is political. When examining the data, we found that more Facebook ads were coming from actors from the Democratic Party. We believe that this is caused by the people who installed the browser plugin. We want to point out that the biased sample is an important limitation in this study.

The selection of the accounts happened in two steps. In the first step, we selected 200 accounts with the most sponsored ads in the ProPublica political ads dataset. Four coders coded all 200 different accounts and have distinguished various types of actors as well as their political leaning. This was done in a deductive and inductive manner. We first defined the actors before the start, which resulted in a list of seven actors and one "other category". However, we did not find actors in our list for each category, so after discussion among the coders, we slightly changed this in the list that can be found in the next paragraph. Furthermore, we used popular sources and online databases (such as www.opensecrets.org, websites, and newspapers) to code the actors. The first step led to an overrepresentation of democratic sources. To increase the number of conservative sources in our data set, in a second step, we coded an additional 800 accounts – and added 36 Republican accounts. All sources were double coded by another coder, which resulted in a score of .97, indicating conceptually valid and useful output. In case of disagreement, we discussed the discrepancy.

In total, our data set includes 55,918 sponsored Facebook ads by 236 actors (see Table 1). We distinguished the following types of actors: *Political parties and organizations* ($n = 7$; Democrat = 2, Republican = 5; e.g., @democrats), *Political candidates* ($n = 72$, Democrat = 47, Republican = 22, other = 3; e.g., @betoorourke, @DonaldTrump), *PACs* ($n = 44$; Democrat = 24, Republican = 16, other = 3, e.g., @PlannedParenthoodAction, @WorkingFamilies), *Public figures* ($n = 3$; e.g., @shaunking), *Non-profit organizations* ($n = 83$; e.g., @amnestyusa, @worldwildlifefund), *Businesses* ($n = 9$; e.g., @4oceanBracelets), and *Other* ($n = 19$; e.g., @nytimes²).

Automated content analysis of targeted ads

We used TextRazor to obtain a better understanding of the content of the ads. TextRazor is a commercial service comprised of different modules for text extraction. In this work, we focus on the Topic Tagging module that leverages an ensemble of automated techniques to assign topics to the ads. TextRazor has a very large knowledge base (based on Wikipedia, DBpedia, and Wikidata) to automatically assign hundreds of thousands of different topics at different levels of abstraction to political targeted ads. The models used by TextRazor are trained on this knowledge base. Based on a score ranging from 0 to 1, TextRazor determines the relevance of this topic to the processed text. We set the threshold to .80, representing a somewhat high relevance of the topic to the processed text. Next, to examine whether the methods included in the commercially available software of TextRazor are optimal for our data set, and to prevent wrong or biased results (Grimmer and Stewart, 2013), we validated the output. Since the topics of interest are not defined a priori, it is not possible to use a so-called gold

Table 1. Sample size description.

	Sponsored ads			Unique topics
	Accounts	Non-classified	Classified	
Political Organizations & Candidates				
<i>The Democratic Party</i>	49	3,285	11,167	2,429
<i>The Republican Party</i>	27	895	1,410	752
<i>Other</i>	3	119	245	696
PACs				
<i>The Democratic Party</i>	24	2,228	6,573	2,290
<i>The Republican Party</i>	16	375	633	676
<i>Other</i>	3	196	851	714
Public Figures	3	140	517	451
Non-profit Organizations	83	7,598	13,963	4,575
Businesses	9	503	1,551	601
Other	19	1,679	1,987	2,333
Total	236	17,018	38,897	7,586

standard (Maier et al., 2018). Instead, two coders double coded the returned topics for 120 political ads—the number of correct identified topics set against the number of total identified topics for each ad—resulting in a score of .92, indicating conceptually valid and useful output.

In total, we identified 7,586 unique topics (at a .80 level) for 38,897 sponsored Facebook ads (see Table 1). TextRazor could not classify 17,018 sponsored ads (approximately 30 percent). This is in line with previous work, for example Bode et al. (2016) indicated that 5.9 percent ad airings (on television) have no issue content, whilst issue mentions are much less prevalent on social media (i.e., 54.2 percent of tweets have no issue content). In our data set, the identified topics vary from general topics, such as Politics ($n = 20,543$), Government ($n = 17,635$), Health ($n = 3,342$), Law ($n = 7,836$), Elections ($n = 5,333$), and Economy ($n = 1,185$), to more specific topics, such as Human rights ($n = 2,950$), Immigration ($n = 1,408$), Gender equality ($n = 986$), Climate change ($n = 648$), Tax ($n = 440$), Electoral fraud ($n = 281$), Gun violence ($n = 193$), and Brexit ($n = 5$).

Analysis

We use a network approach to obtain a better understanding in political targeted messages on Facebook. We use topics as nodes, whilst edges were created for topics that co-occurred in the same targeted ad. First, a Python script was developed to iterate through each of the 55,918 ads and create edges between topics within the same ad (e.g., *Environment - Global warming*). The edges between topics have been saved and imported in R. We used the package *igraph* to conduct network analyses, as it is capable of handling large graphs efficiently (Csardi and Nepusz, 2006).

The ties within these networks formed an undirected graph, as edges in the graph do not have an associated

direction. We employ weighted edges to indicate the strength of a relationship between two topics. The value of the relationship (i.e., weight) is added as an edge attribute. We created different topic-networks for different types of actors.

Finally, we explore targeting information—an array of one or more of Facebook’s “Why am I seeing this?” disclosures provided to users of the plug-in. We use Sankey diagrams to visualize political targeted messages. We focus on three different types of personal data, namely age (i.e., <18, 18-35, 36-50, 51-65, >65), gender (i.e., women, men, unspecified), and political leaning (i.e., very conservative, conservative, moderate, liberal, very liberal).

Results

To obtain a better understanding in targeted messages on Facebook, we have created different topic-networks for both political elites as well as other organizations.

Who sends what type of message?

Political Organizations and Candidates. First, we focus on political organizations and candidates—representing 2,712 unique topics in 16,757 sponsored ads (see Table 1). There was some degree of overlap on topics ($n = 459$). Political funding ($n = 391$), Foreign electoral intervention ($n = 313$), and Russia intelligence operations ($n = 311$) are the most common topics for the Democratic Party that do not occur in sponsored ads by accounts affiliated with the Republican Party. The most common non-overlapping topics for the Republican Party are News media manipulation ($n = 138$), Criticism of journalism ($n = 138$), and Fake news ($n = 78$).

To obtain a better understanding in sponsored ads on Facebook, we first turn our attention to political actors affiliated with the Democratic Party. The top 50 topics for

the Democratic Party can be found in Table 6, including topics such as Politics, Elections, and Political events. Next, we created a topic-network for sponsored ads created by political actors affiliated with the Democratic Party. In total, the topic-network consists of 2,429 nodes (i.e., topics), and 77,161 edges (i.e., topics that co-occurred in the same sponsored ad). To obtain a better understanding of the main issues from the various political organizations and candidates, we use a community detection approach. Networks are often characterized by clustering, which is hard to judge by eye. There are many existing community detection approaches (Luke, 2015). As we employ undirected and weighted networks, we rely on the Louvain community detection algorithm in *igraph* (Csardi and Nepusz, 2006). Modularity is fairly acceptable (.41), suggesting that the Louvain algorithm has done a sufficient job at detecting subgroup structure in our topic-network. “Modularity is a measure of the structure of the network, specifically the extent to which nodes exhibit clustering where there is greater density within the clusters and less density between them” (Luke, 2015, p.115). The membership function reveals that 44 different subgroups have been identified. We examined the six largest clusters in Table 2. Looking at these six clusters, we can see a clear divide between various issues. Political organizations and candidates affiliated with the Democratic Party mainly focus on Social issues, Social welfare, and Environmental issues.

We conducted comparable analyses for politicians affiliated with the Republican Party. The top 50 topics for the Republican Party can be found in Table 7, including topics such as Government, Donald Trump, and Public opinion. The topic-network consists of 752 nodes, and 12,368 edges. Again, we identified multiple clusters within this topic-network ($n = 29$; modularity = .55). We examined the six largest clusters in Table 2. Looking at these six clusters, we can see a clear divide between various issues. In comparison with the Democratic Party, political organizations and candidates affiliated with the Republican Party increasingly focus on Foreign affairs, Law and Economy. Interestingly, two large clusters of political actors affiliated with the Republican Party relate to Environmental (e.g., Climate change policy, Air pollution) and Health care issues.

Political Action Committees - PACs. Second, we turn our attention to political action committees (PACs)—representing 2,541 unique topics in 9,809 sponsored ads (see Table 1). The top 50 topics for PACs affiliated with the Democratic Party can be found in Table 6 and for the Republican Party in Table 7. Again, there was some degree of overlap on topics ($n = 427$). Human reproduction ($n = 529$), Women’s rights ($n = 519$), and Brett Kavanaugh ($n = 509$) are the most common topics for the Democratic Party that do not occur in sponsored ads by accounts affiliated with the Republican Party. The most common non-overlapping topics for the Republican Party are Legal

Table 2. The six largest clusters of sponsored ads by political parties and candidates.

Party	Cluster	Size	Label	Topics
D	1	419	Politics	e.g., Activism, Elections, Fundraising, Polling, State Government of the United States, Voter turnout
D	2	379	Social welfare	e.g., Child welfare, Soft drugs, Education, Health policy, Retirement
D	3	353	Social issues	e.g., Abortion, Violent crime, Feminism, Gender equality, Weapons
D	4	325	Local politics	e.g., Florida Democrats, Montana politicians, Ohio local politicians, Politics of Pennsylvania
D	5	288	Environment	e.g., Climate change, Natural resources, Sustainability
D	6	144	Foreign affairs	e.g., Immigration policy of Donald Trump, International relations, Trump wall, Impeachment, Trade disputes
R	1	121	Politics	e.g., Presidency of Donald Trump, Politics of the United States, Primary elections, Make America great again, Voting
R	2	104	Foreign affairs	e.g., Afghanistan, Military operations, United States Navy, Warfare
R	3	86	Law	e.g., Public law, United States federal law, Crime, Illegal immigration, Law enforcement
R	4	77	Economy	e.g., Government finances, Tax, Employment, Unemployment
R	5	66	Health care	e.g., Health economics, Medical research, Therapy, Health care reform
R	6	61	Environment	e.g., Climate change policy, Natural disasters, Air pollution, Greenhouse gases

Note. D = accounts affiliated with the Democratic Party; R = accounts affiliated with the Republican Party.

concepts ($n = 32$), Politics of Montana ($n = 23$), Montana Legislature ($n = 23$).

The network of the Democratic PACs consists of 2,290 nodes, and 67,859 edges. Again, we identified multiple clusters within this topic-network ($n = 47$; modularity = .46). We examined the six largest clusters (see Table 3). Looking at these six clusters, we can see a clear divide between

Table 3. The six largest clusters of sponsored ads by Political Action Committees.

Party	Cluster	Size	Label	Topics
D	1	339	Environment	e.g., <i>Biodiversity, Climate change, Pollution</i>
D	2	322	Local politics	e.g., <i>Kansas Democrats, Government of Illinois, United States Senators from Ohio</i>
D	3	298	Law & Foreign affairs	e.g., <i>Electoral fraud, Impeachment, Diplomacy, Warfare</i>
D	4	286	Social issues	e.g., <i>Sexual abuse to Refugees, Racism, Police misconduct, Motherhood, Mass murders, Gun violence, Gender, Crime</i>
D	5	226	Education	e.g., <i>Education policy, Schools, Higher education, Information management, Facebook</i>
D	6	157	Politics	e.g., <i>Protests, Activism, Election campaigning, Polling</i>
R	1	165	Political institutions	e.g., <i>Members of the United States Congress, United States Department of Defense Officials, United States House of Representatives</i>
R	2	104	Foreign affairs	e.g., <i>Foreign relations, Diplomacy, Military, National security, Warfare</i>
R	3	63	Economy	e.g., <i>Fiscal policy, Income, Wealth, Tax, Government finances</i>
R	4	62	Local politics	e.g., <i>related to Arizona and Wisconsin</i>
R	5	55	Donald Trump	e.g., <i>Political career of Donald Trump, Presidency of Donald Trump, Trump family, Russia Intelligence Operations, Election controversies</i>
R	6	45	Law	e.g., <i>Constitutional law, National Supreme Courts, Jurisprudence</i>

Note. D = accounts affiliated with the Democratic Party; R = accounts affiliated with the Republican Party.

various policy issues. PACs affiliated with the Democratic Party focus on Environmental issues, Law & Foreign affairs, Social issues, and Education.

We conducted comparable analyses for Republican PACs, which consists of 676 nodes, and 13,991 edges.

Again, we identified multiple clusters within this topic-network ($n = 21$; modularity = .59). We examined the six largest clusters in Table 3. In comparison with the Democratic Party, PACs affiliated with the Republican Party increasingly focus on Foreign affairs, Economy, Law, and Donald Trump.

Non-profit Organizations. Finally, we focus on sponsored ads from non-profit organizations (4,575 unique topics in 21,561 sponsored ads; see Table 1). We present the top 50 topics present in sponsored ads from non-profit organizations in Table 8. The network of non-profit organizations consists of 4,575 nodes, and 170,517 edges. We identified multiple clusters within this topic-network ($n = 67$; modularity = .57). We examined the six largest clusters in 4, including Environment, Social Issues, and Multiculturalism & Religion.

Coming back to our hypotheses (H1a en b), we find mixed evidence. It seems that political actors affiliated with the Democratic party focus on Democratic owned-issues (such as Environment, Social welfare, and Social issues), while they also focus on Republican owned-issues (such as Foreign affairs). Likewise, political actors affiliated with the Republican party focus on Republican owned-issues (such as Economy, Law, and Foreign affairs), while they also focus on Democratic owned-issues (such as Environment and Health care).

Policy issues

As a next step, we use the output of our topic-networks to examine five policy issues—as mentioned in our theoretical framework—namely: (1) Environment ($N_{ads} = 4,188$, $N_{topics} = 294$, e.g., Global warming, Environmental issues, Greenhouse gas, Sustainability), (2) Immigration ($N_{ads} = 1,606$, $N_{topics} = 76$, e.g., Immigration law, Refugees, Trump wall), (3) Reproductive rights ($N_{ads} = 339$, $N_{topics} = 31$, e.g., Abortion law, Birth control, Planned Parenthood), (4) LGBTQ+ ($N_{ads} = 1,406$, $N_{topics} = 52$, e.g., Gay pride, LGBT, Same-sex marriage referendum), and (5) Gun control ($N_{ads} = 860$, $N_{topics} = 52$, e.g., Gun politics, High school shootings, American gun control activists). As shown in Table 5, political actors and PACs affiliated with the Democratic Party focus on wedge issues, such as Reproductive rights and LGBTQ+, whereas political actors and PACs affiliated with the Republican Party focus on Immigration. Again, a clear focus on Environment is found for non-profit organizations. These findings indicate that we find mixed evidence for H2. While we found that political actors affiliated with the Republican and Democratic party focus, to some extent, on wedge issues, also the non-profit organizations do (which is, not surprisingly, environmental issues).

Table 4. The six largest clusters of sponsored ads by non-profit organizations.

Cluster	Size	Label	Topics
1	770	Politics	e.g., <i>United States presidential campaigns, United States Constitutional law, Supreme courts, Presidencies of the United States, Barack Obama, Donald Trump, Bernie Sanders</i>
2	651	Environment / Global warming	e.g., <i>Sustainable energy, Nuclear materials, Waste management, Rain forest, Oil companies, Global environmental issues, Climate change, Clean water rule, Agriculture</i>
3	602	Social issues	e.g., <i>Violence, Sexism, Race and law, Human rights, Gun violence, High school killings, Gender inequality, Discrimination</i>
4	534	Environment / Ecosystems	e.g., <i>Wildlife, Plants, Animal welfare, National parks, Forest governance, Environmental ethics</i>
5	382	Multiculturalism & Religion	e.g., <i>Christianity, God, Mythology, Marriage, as well as Racism, Latin American people, Islam and women</i>
6	308	Education	e.g., <i>Education, Homeschooling, Higher education, as well as Information management, Facebook, Digital technology</i>

Who sends what type of targeted message to whom?

To answer our research question, we link three targeting criteria, namely age, gender, and political leaning, to five policy issues. We use Sankey diagrams to visualize our findings. The arrows have a width proportional to the flow quantity presented (in percentages). The absolute values are visualized in Appendix C. Figure 1(a) presents the percentage of sponsored Facebook ads targeting *age* (N = 52,979). Categories are not mutually exclusive. Based on our data set, we found that political parties, candidates, PACs as well as non-profit organizations seem to rarely target Facebook users younger than 18 years. As shown in Figure 1(b), political candidates and PACs affiliated with the Republican Party mainly target ads related to Immigration to specific age groups. Political candidates affiliated with the Democratic Party mainly target ads related to LGBTQ+ to specific age

Table 5. Percentage of policy issues in sponsored Facebook ads.

	1	2	3	4	5	N _{ads}
Political Organizations & Candidates						
<i>The Democratic Party</i>	1.3%	1.1%	1%	1.6%	<1%	14,452
<i>The Republican Party</i>	<1%	4.0%	<1%	<1%	<1%	2,305
PACs						
<i>The Democratic Party</i>	2.2%	<1%	7.2%	6.9%	1.3%	8,801
<i>The Republican Party</i>	<1%	2.1%	<1%	<1%	<1%	1,008
Non-profit Organizations	17.7%	6.3%	1.7%	2.9%	2.8%	21,561
N _{ads}	4,188	1,666	339	1,406	860	
N _{topics}	294	76	31	52	52	

1 = Environment, 2 = Immigration, 3 = Reproductive rights, 4 = LGBTQ+, 5 = Gun control.

groups. Finally, non-profit organization mainly target messages about Environment. Yet, no clear divide between age groups can be found.

Next, Figure 2(a) presents the percentage of sponsored Facebook ads targeting *gender* (N = 2,961; men = 931, women = 2,030) in our data set. Political candidates affiliated with the Democratic Party primarily choose to target women, whereas political candidates affiliated with the Republican Party also target men. Next, as visualized in Figure 2(b), political parties, candidates, PACs, and non-profit organizations rarely target men about Reproductive rights, Gun control, and Environment. In this dataset, political candidates affiliated with the Democratic Party target both men and women about LGBTQ+ and Immigration.

Finally, Figure 3(a) presents the percentage of sponsored Facebook ads targeting *political leaning* (N = 2,885). Categories are not mutually exclusive. Based on our data, it seems that political candidates and PACs affiliated with the Democratic Party as well as non-profit organizations primarily choose to target (very) liberal Facebook users, whereas political candidates and PACs affiliated with the Republican Party often target moderate as well as (very) conservative Facebook users. Interestingly, as visualized in Figure 3(b), political candidates affiliated with the Republican Party target very liberal Facebook users with sponsored ads about Immigration. Political candidates PACs affiliated with the Democratic Party rarely target (very) conservative Facebook users about Reproductive rights, LGBTQ+, Immigration, Environment, and Gun control.

Conclusion & Discussion

The purpose of this study was to get more insights into how and which mainstream political actors use sponsored ads by

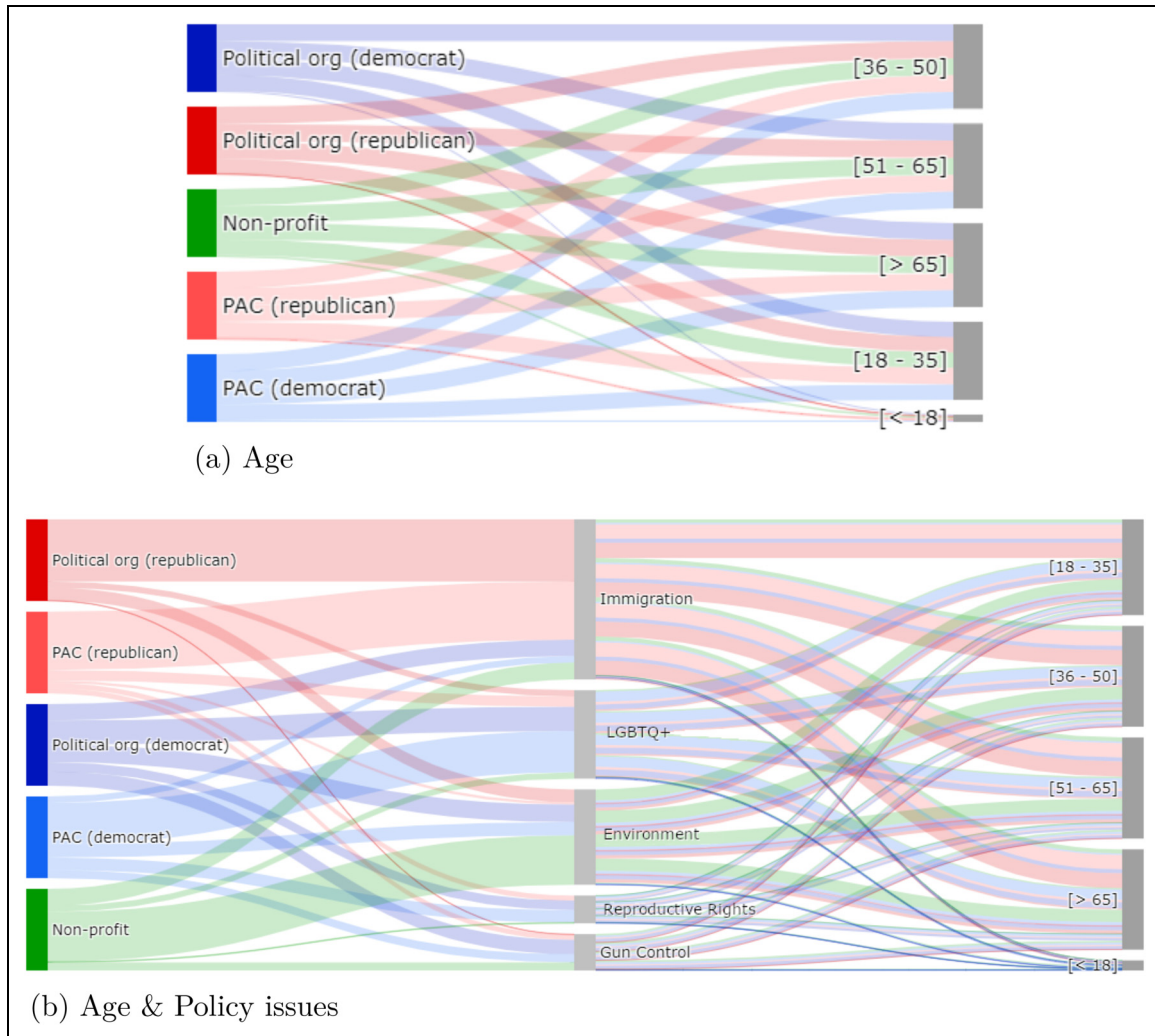


Figure 1. Percentage of policy issues in sponsored Facebook ads targeting age. (a) Age; (b) Age & Policy issues

investigating the issues mentioned in almost 56,000 political Facebook ads using a data base from ProPublica. Additionally, we examined the audience that was targeted with these specific messages. Studying the actual content of targeted messages is important, as it helps us to understand in what way political actors deploy this strategy during and after election campaigns, as the content may affect support for political actors and policies. Research showed that targeted ads can mobilize (younger) voters (Haenschen and Jennings, 2019), however, many worry about the detrimental effects of manipulation, loss of privacy, and demobilization among voters (Zuiderveen Borgesius et al., 2018). Yet, as we discussed, investigating online targeted messages is challenging because of the opacity of the social media ecosystem (see e.g., Chester and Montgomery, 2017) and the limitations of ad archives (see e.g., Leerssen et al., 2019). We believe that this is an important reason why the actual content of targeted ads is rarely examined on a large scale. The research has some

interesting findings. First, based on the ProPublica data set, we showed that Democratic political candidates mainly focus on *social issues*, *social welfare*, and *environmental issues*. The PACs that are affiliated with the Democratic Party focus most often on *environmental issues*, *law and foreign affairs*, *social issues*, and *education*. Republican candidates focus more on *foreign affairs*, *law* and *economy* in their Facebook ads. PACs affiliated with the Republican Party increasingly focus on *foreign affairs*, *economy*, *law*, and *Donald Trump*. These findings are largely in line with issue ownership theory (Petrcik et al., 2003; Walgrave et al., 2015): it seems that the candidates focus more on traditionally owned issues. However, we also found – for the largest clusters in our data set – some evidence of issue convergence (Walgrave et al., 2015). For instance, political actors affiliated with the Republican Party focus also on *environmental issues* (e.g., climate change policy, air pollution). This indicates that, while often targeting voters with ‘owned issues’, in

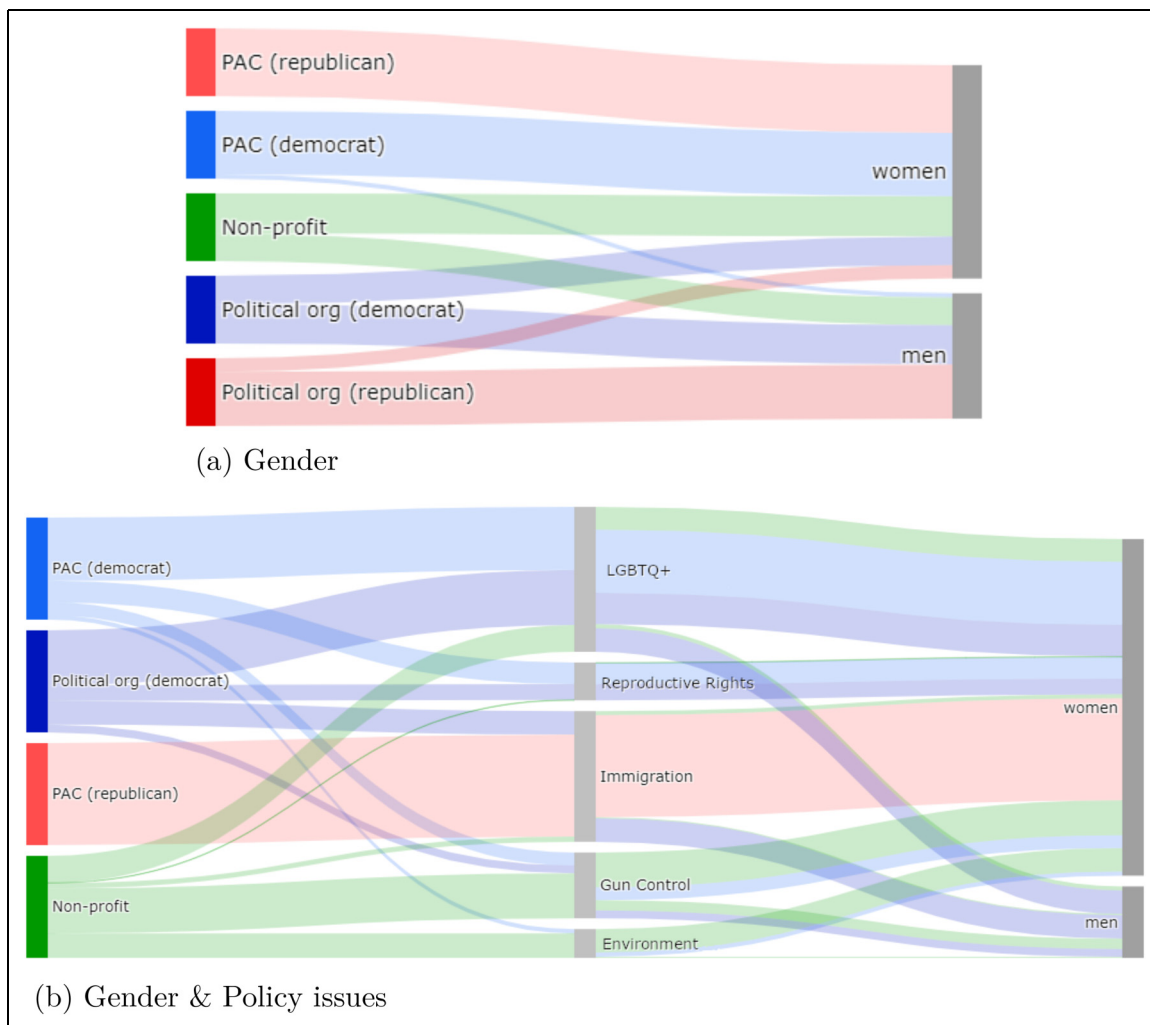


Figure 2. Percentage of policy issues in sponsored Facebook ads targeting gender. (a) Gender; (b) Gender & Policy issues

some instances, in 2018 and in our data set, political actors are also buying Facebook ads to target an issue owned by the other party (as it was the case for the Republican Party). It is thus likely that by focusing on these ‘stolen’ issues, targeted ads seem to be used for issue-based persuasion strategies. This is consistent with previous work by Endres (2016). It is also not surprising to find that non-profit organizations are focusing on issues, such as *the environment, social issues, and multiculturalism and religion*.

Second, we found in the data that non-profit organizations focus on the issues of *Environment* and *Immigration*. The Republican candidates and organizations focus slightly more on issues of *Immigration*, while the PACs affiliated with the Democratic Party focus more the issue of *Reproductive rights* and *LGBTQ+*. This shows, interestingly, some modest evidence of an increased focus on wedge issues (but for the issue of gun control – no pattern could be found). This might indicate that of an increased focus on wedge issues in a more targeted media environment, which is in line with Hillygus and Shields (2008), yet future work

needs to investigate whether this finding holds, in particular as our data is not representative.

Third, we examined three targeting criteria, namely age, gender, and political leaning. The results gives some first indication how political actors and other organizations target audiences, in our data set for instance more women than men, particularly about wedge issues (e.g., *LGBTQ+*, *Reproductive rights*, *Environment*). Besides, political actors affiliated with the Republican Party seem to target both moderate as well as (very) conservative Facebook users, and seem to target very liberal users about *Immigration*. Political actors affiliated with the Democratic Party rarely target (very) conservative Facebook users about wedge issues. We could not find a clear divide between age groups. Again, future work needs to investigate these findings using more representative data.

These findings implicate, from a societal perspective, that different citizens receive different pieces of political information, which could advance more fragmentation.

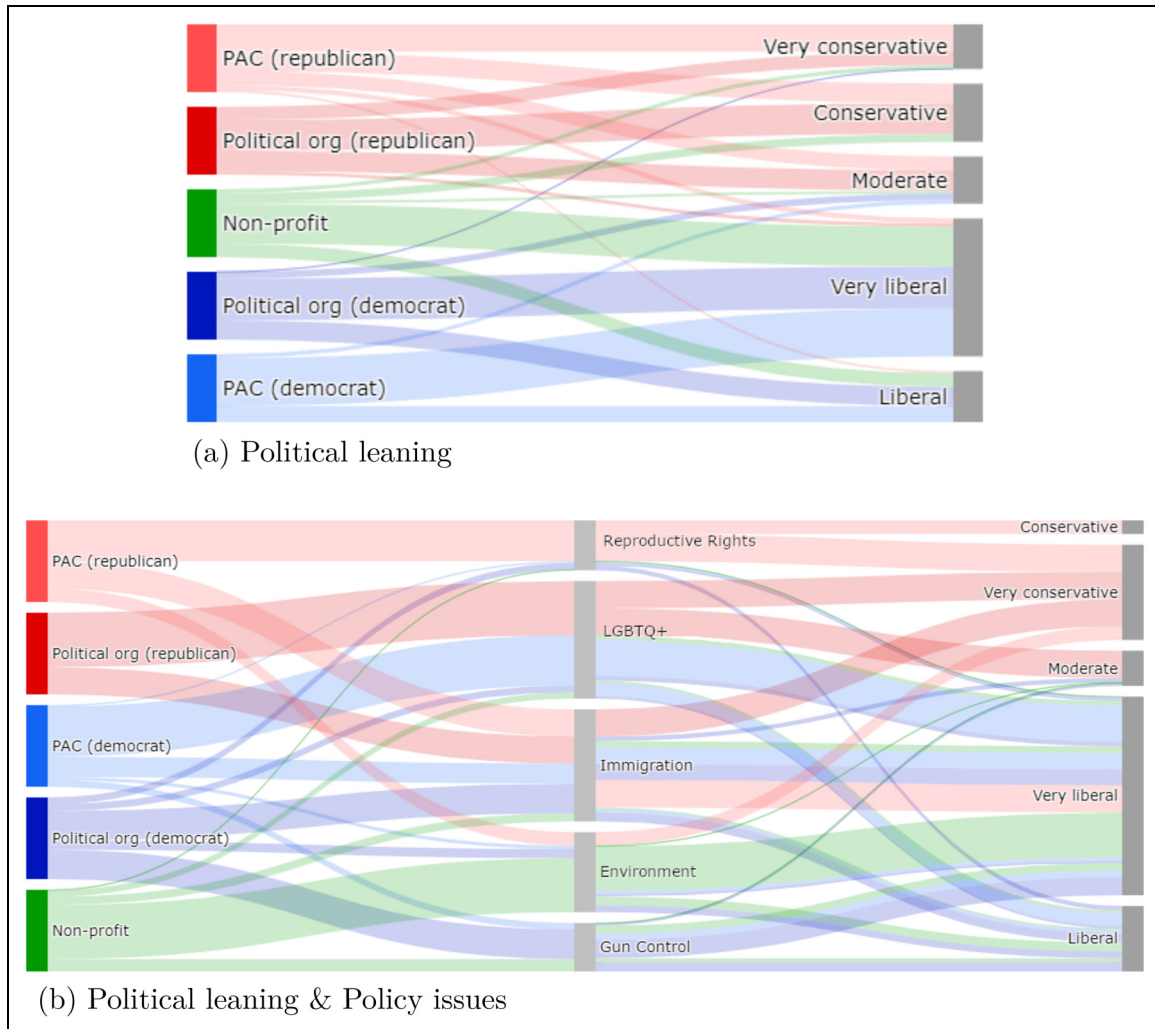


Figure 3. Percentage of policy issues in sponsored Facebook ads targeting *political leaning*. (a) Political leaning; (b) Political leaning & Policy issues

Indeed, Bennett and Pfetsch (2018) as well as Waisbord (2016) warned that fragmentation might lead to the disappearance of a shared common ground. In any case, a targeted focus on different and wedge issues reinforces the already existing inequalities of the US electoral system where persuadable voters receive much more political information than voters perceived to be less persuadable (Hillygus and Shields, 2008). From an individual citizen position, a focus on specific issues can on the one hand be beneficial because this strategy provides the citizen with insights on personally relevant issues. On the other hand, focusing on certain issues and ‘hiding’ other information might lead to false citizen’ perceptions about issue priorities. A citizen might wrongly assume that, say, abortion is a priority because that citizen sees many ads about abortion, while in reality only a relatively small group of citizens gets to see ads about abortion (see e.g., Zuiderveen Borgesius et al., 2018). From a candidate’s perspective,

running a targeted campaign means communicating many different specific pieces of policy information to relatively small groups might raise questions about mandate interpretation (Hillygus and Shields, 2008).

Furthermore, an important contribution of this research is its adherence to open data principles. As an important ingredient of the open science paradigm (Dienlin et al., 2020), open data refers to the practice of opening up one’s data and code and uploading it to a public repository (Klein et al., 2018). The data is available on the website of ProPublica, which is updated on a daily basis, and contains political advertisements that ran on Facebook. We made our code publicly available on the Open Science Framework (see Footnote 1). With this open-source approach, we aim to contribute to research transparency and data re-usability, as well as ensure that our findings are reproducible and provide a solid basis for future collaborations (Van Atteveldt et al., 2019; Dienlin et al., 2020).

Finally, we address limitations of the study and discuss directions for future research. The first limitation relates to the breadth and depth of our data. Using automated content analysis, we are able to examine a broad span of Facebook ads. However, this also results in a large amount of topics under scrutiny. By zooming in on the six most important clusters, and thus the most often included policy issues in the Facebook ads, we gain more in-depth knowledge about these specific topics. However, this also means that we cannot focus on all other, smaller clusters (policy issues) in our data-set. This would also make less sense empirically, due to the long tail (a lot of smaller clusters of topics are only a few times included in our data-set). So, consequently, the breath of our approach comes at the expense of the depth. The approach we used, might be considered a ‘mass media approach’ instead of a ‘tailored media approach’. In other words, we did not merely focus on niche topics discussed in targeted Facebook ads, while those might be also very important when it comes to microtargeting. However, it would be less valid to focus on them as we were not sure whether or not they are actually niche topics (due to the fact the data is not representative). Yet, future work could focus on these more specific targeting practices.

The second limitation is related to the type of data. The data we used included more Facebook ads coming from actors from the Democratic Party. We believe that this is caused by the people who installed the browser plugin, which are probably democratic voters. While we do not make any claims about the representativeness of our data, we want to acknowledge this is an important limitation of our study. We still believe the data-set has advantages over the Facebook ad archive. But we encourage future work, that uses content analyses, to work with a representative sample of targeted ads.


The third limitation relates to the use of a commercial off-the-shelf natural language processing tool (i.e., TextRazor). This tool involves a proprietary algorithm to conduct topic modeling on large data-sets. This means that the exact formulation of the algorithm—the source code—is not publicly available for scrutiny. In such instance, the software is essentially a black box: it is difficult to understand its internal workings (Trilling and Jonkman, 2018). Although we took steps to validate the output of TextRazor (see our method section), we have to acknowledge the potential challenges that this commercial tool introduces with respect to providing full transparency of the current findings (Broussard, 2016; Busch, 2014).


To conclude, we have merely focused on analyzing textual content. We have not analyzed visuals (e.g., images and videos) belonging to targeted messages. Previous work has already indicated that images are not only easier to recall, but they can also communicate information in a much more efficient and emotional way. To obtain a better understanding of the role of visuals in


political targeted messages, future work should focus on using computational methods to automatically study and extract key information from many images and videos.


The findings in this study on political targeted messages provide new insights into the continuous campaign efforts of political elites. We found that political actors affiliated with the Republican and Democratic Party are more likely to use both Republican-owned and Democratic-owned issues in targeted ads issues, indicating strategies that prioritize issues that already owned (issue ownership) and focusing on issues owned by the opponent (convergence). No clear evidence for a focus on wedge issues can be found, however, some first indications of this are present. We also found some first indications about the strategic targeting practices, for instance, political actors affiliated with the Republican Party target very liberal users about immigration. On the other hand, we found an absence of this in other instances. Political actors affiliated with the Democratic Party rarely target (very) conservative Facebook users about wedge issues. Whether these practices were actually part of a larger campaign strategy cannot be answered in this study, but our findings give a first notion about potential strategies.

ORCID iDs

Sanne Kruikemeier  <https://orcid.org/0000-0002-8053-8200>

Susan Vermeer  <https://orcid.org/0000-0002-9829-8057>

Nadia Metoui  <https://orcid.org/0000-0001-6690-2937>

Tom Dobber  <https://orcid.org/0000-0002-6657-4037>

Brahim Zarouali  <https://orcid.org/0000-0003-1042-4635>

Notes

1. All code is made publicly available on Open Science Framework (OSF): https://osf.io/pn8ct/?view_only=f04246d06ca447ec8ec147166ac702d7
2. Five Facebook pages were private or suppressed and no additional background information could be found.

References

- Baldwin-Philippi J (2017) The myths of data-driven campaigning. *Political Communication* 34(4): 627–633. DOI: 10.1080/10584609.2017.1372999
- Banda KK (2015) Competition and the dynamics of issue convergence. *American Politics Research* 43(5): 821–845. doi:10.1177/1532673X14564570
- Banda KK (2016) Issue ownership, issue positions, and candidate assessment. *Political Communication* 33(4): 651–666. doi:10.1080/10584609.2016.1192569
- Barocas S (2012) The price of precision: Voter microtargeting and its potential harms to the democratic process. In: *Proceedings of the first edition workshop on Politics, elections and data*. pp. 31–36.
- Barrett B (2020) Evolution of the digital political advertising network: A longitudinal analysis of platforms’ rise to dominance over four election cycles. In: *the 2020 annual International Communication Association conference, virtual*

- conference. the 2020 annual International Communication Association conference.
- Bayer J (2020) Double harm to voters: Data-driven micro-targeting and democratic public discourse. *Internet Policy Review* 9(1): 1–17. doi:10.14763/2020.1.1460
- Bélanger É and BM Meguid (2008) Issue salience, issue ownership, and issue-based vote choice. *Electoral Studies* 27(3): 477–491. doi:10.1016/j.electstud.2008.01.001
- Bennett C and Gordon J (2020) Understanding the “micro” in micro-targeting: An analysis of facebook digital advertising in the 2019 federal canadian election. *Canadian Journal of Communication* 46(3): 1–29.
- Bode L, Lassen DS, Kim YM, et al. (2016) Coherent campaigns? campaign broadcast and social messaging. *Online Information Review* 40(5): 580–594. doi:10.1108/OIR-11-2015-0348
- Bodó B, Helberger N and de Vreese CH (2017) Political micro-targeting: A manchurian candidate or just a dark horse? *Internet Policy Review* 6(4): 1–13. doi:10.14763/2017.4.776
- Borah P (2016) Political facebook use: Campaign strategies used in 2008 and 2012 presidential elections. *Journal of Information Technology & Politics* 13(4): 326–338.
- Brazeal LM and Benoit WL (2008) Issue ownership in congressional campaign television spots. *Communication Quarterly* 56(1): 17–28. doi:10.1080/01463370701839172
- Broussard M (2016) Big data in practice: Enabling computational journalism through code-sharing and reproducible research methods. *Digital Journalism* 4(2): 266–279. doi:10.1080/21670811.2015.1074863
- Busch L (2014) Big data, big questions: A dozen ways to get lost in translation: Inherent challenges in large scale data sets. *International Journal of Communication* 8: 1727–1744.
- Chester J and Montgomery KC (2017) The role of digital marketing in political campaigns. *Internet Policy Review* 6(4): 1–20. doi:10.14763/2017.4.773
- Csardi G and Nepusz T (2006) The igraph software package for complex network research. *InterJournal Complex Systems*. <http://igraph.org>.
- Dienlin T, Johannes N, Bowman ND, et al. et al (2020) An agenda for open science in communication. *Journal of Communication* doi:10.1093/joc/jqz052
- Dobber T, Fathaigh RÓ and Borgesius FJZ (2019) The regulation of online political micro-targeting in Europe. *Internet Policy Review* 8(4): 1–20. doi:10.14763/2019.4.1440
- Dobber T, Trilling D, Helberger N, et al. (2017) Two crates of beer and 40 pizzas: The adoption of innovative political behavioural targeting techniques. *Internet Policy Review* 6(4): 1–25. doi:10.14763/2017.4.777
- Dommett K (2019) Data-driven political campaigns in practice: Understanding and regulating diverse data-driven campaigns. *Internet Policy Review* 8(4): 1–18. doi:10.14763/2019.4.1432
- Dommett K, Kefford G and Power S (2020) The digital ecosystem: The new politics of party organization in parliamentary democracies. *Party Politics* 27(5): 847–857. doi:10.1177/1354068820907667.
- Dommett K, Temple L and Seyd P (2020) Dynamics of intra-party organisation in the digital age: A grassroots analysis of digital adoption. *Parliamentary Affairs* 74(2): 378–397. doi:10.1093/pa/gsaa007.
- Edelson L, Lauinger T and McCoy D (2020) A security analysis of the facebook ad library. In: *2020 IEEE Symposium on Security and Privacy (SP)*.
- Edelson L, Sakhuja S, Dey R, et al. (2019) An analysis of united states online political advertising transparency. *arXiv preprint arXiv:1902.04385*.
- Egan PJ (2013) *Partisan Priorities: How Issue Ownership Drives and Distorts American Politics*. New York: Cambridge University Press.
- Endres K (2016) The accuracy of microtargeted policy positions. *PS: Political Science & Politics* 49(4): 771–774. doi:10.1017/S1049096516001645
- Gimpel JG (2019) From wedge issue to partisan divide: The development of immigration policy opinion after 2016. In: *The Forum*, volume 17. De Gruyter, pp. 467–486.
- Grimmer J and Stewart BM (2013) Text as data: The promise and pitfalls of automatic content analysis methods for political texts. *Political analysis* 21(3): 267–297.
- Haenschen K and Jennings J (2019) Mobilizing millennial voters with targeted internet advertisements: A field experiment. *Political Communication* 36(3): 357–375. doi:10.1080/10584609.2018.1548530
- Hillygus DS and Shields TG (2008) *The Persuadable Voter: Wedge Issues in Presidential Campaigns*. Princeton: Princeton University Press.
- Kaplan N, Park DK and Ridout TN (2006) Dialogue in american political campaigns? an examination of issue convergence in candidate television advertising. *American Journal of Political Science* 50(3): 724–736. doi:10.1111/j.1540-5907.2006.00212.x
- Kim YM, Hsu J, Neiman D, et al. (2018) The stealth media? groups and targets behind divisive issue campaigns on facebook. *Political Communication* 35(4): 515–541. doi:10.1080/10584609.2018.1476425
- Klein O, Hardwicke TE, Aust F, et al. (2018) A practical guide for transparency in psychological science. *Collabra: Psychology* 4(1): 1–15. doi:10.1525/collabra.158
- Kreiss D (2016) *Prototype Politics: Technology-intensive Campaigning and the Data of Democracy*. New York: Oxford University Press.
- Kreiss D and McGregor SC (2018) Technology firms shape political communication: The work of microsoft, facebook, twitter, and google with campaigns during the 2016 u.s. presidential cycle. *Political Communication* 35(2): 155–177. doi:10.1080/10584609.2017.1364814
- Lalancette M and Raynauld V (2019) The power of political image: Justin Trudeau, instagram, and celebrity politics. *American Behavioral Scientist* 63(7): 888–924. doi:10.1177/0002764217744838
- Lasswell HD (1948) The structure and function of communication in society. In L. Bryson (Ed.), *The communication of ideas* (pp. 37–51). New York: Harper and Row.
- Leerssen P, Ausloos J, Zarouali B, et al. (2019) Platform ad archives: Promises and pitfalls. *Internet Policy Review* 8(4): 1–21. doi:10.14763/2019.4.1421
- Lefevre J, Tresch A and Walgrave S (2015) Introduction: Issue ownership. *West European Politics* 38(4): 755–760. doi:10.1080/01402382.2015.1039375
- Luke DA (2015) *A User's Guide to Network Analysis in R*. New York: Springer.
- Maier D, Waldherr A, Miltner P, et al. et al (2018) Applying lda topic modeling in communication research: Toward a valid and reliable methodology. *Communication Methods and Measures* 12(2–3): 93–118.

Mathias NJ, Hounsel A and Hopkins M (2018) We tested face-book’s ad screeners and some were too strict. *The Atlantic* <https://www.theatlantic.com/technology/archive/2018/11/do-big>.

Moeller J, Trilling D, Helberger N, et al. (2016) Shrinking core? exploring the differential agenda setting power of traditional and personalized news media. *Info* 18(6): 26–41. doi:10.1108/info-05-2016-0020

NBC/Wall Street Journal (2018) Issue poll. <http://www.pollingreport.com/dvsr.htm>.

NPR/PBS NewsHour/Marist (2019) Issue poll. <http://www.pollingreport.com/dvsr.htm>.

Petrocik JR, Benoit WL and Hansen GJ (2003) Issue ownership and presidential campaigning, 1952–2000. *Political Science Quarterly* 118(4): 599–626.

Schlee C (2013) *Targeted Advertising Technologies in the ICT Space: A Use Case Driven Analysis*. New York: Springer.

Schumann JH, von Wangenheim F and Groene N (2014) Targeted online advertising: Using reciprocity appeals to increase acceptance among users of free web services. *Journal of Marketing* 78(1): 59–75. doi:10.1509/jm.11.0316

Shaffer K (2019) *Data Versus Democracy: How Big Data Algorithms Shape Opinions and Alter the Course of History*. New York: Apress.

Stiglbauer B and Kovacs C (2018) Need for uniqueness determines reactions to web-based personalized advertising. *Psychological Reports* 122(1): 246–267. doi:10.1177/0033294118756353

Strömbäck J and Kiousis S (2014) Strategic political communication in election campaigns. *Political communication* 18.

Susser D, Roessler B and Nissenbaum H (2019) Technology, autonomy, and manipulation. *Internet Policy Review* 8(2): 1–22.

Tresch A, Lefevere J and Walgrave S (2015) ‘steal me if you can!’ the impact of campaign messages on associative issue ownership. *Party Politics* 21(2): 198–208. doi:10.1177/1354068812472576

Trilling D and Jonkman JG (2018) Scaling up content analysis. *Communication Methods and Measures* 12(2-3): 158–174.

Tufekci Z (2014) Engineering the public: Big data, surveillance and computational politics. *First Monday* 19(7) doi:10.5210/fm.v19i7.4901..

Van Atteveldt W, Strycharz J, Trilling D, et al. (2019) Computational communication science—toward open computational communication science: A practical road map for reusable data and code. *International Journal of Communication* 13: 3935–3954

van de Wardt M, De Vries CE and Hobolt SB (2014) Exploiting the cracks: Wedge issues in multiparty competition. *The Journal of Politics* 76(4): 986–999. doi:10.1017/S0022381614000565

Walgrave S, Tresch A and Lefevere J (2015) The conceptualisation and measurement of issue ownership. *West European Politics* 38(4): 778–796. doi:10.1080/01402382.2015.1039381

Yarchi M and Samuel-Azran T (2018) Women politicians are more engaging: Male versus female politicians’ ability to generate users’ engagement on social media during an election campaign. *Information, Communication & Society* 21(7): 978–995. doi:10.1080/1369118X.2018.1439985

Zuiderveen Borgesius FJ, Möller J, Kruikemeier S, et al. (2018) Online political microtargeting: Promises and threats for democracy. *Utrecht Law Review* 14(1): 82–96. doi:10.18352/ulr.420

Appendix A

Top 50 topics

Table A1. Top 50 topics: actors affiliated with the Democratic Party.

Political Candidates	PACs
Politics	Politics
Politics of the U.S.	Politics of the U.S.
Government	Government
U.S.	U.S.
American politicians	Public sphere
Presidency of the U.S.	Law
Donald Trump	American politicians
American political people	Presidency of the U.S.
Public sphere	Federal government of the U.S.
Trump family	Human activities
Presidents of the U.S.	Donald Trump
Political career of Donald Trump	Elections
Federal government of the U.S.	Executive branch of the U.S. government
Law	Presidents of the United States
Elections	Trump family
Executive branch of the U.S. government	Political career of Donald Trump
Presidency of Donald Trump	Health
Human activities	Democracy
U.S. presidential campaigns	Voting
Presidencies of the U.S.	Political events
Political events	Social issues
Donald Trump controversies	Health care
November events	Accountability
Voting	U.S. law
Presidencies	Presidency of Donald Trump
Democracy	Medicine
Accountability	American political people
Trump administration controversies	Policy
Candidates for President of the U.S.	Presidencies of the U.S.
Criticisms of companies	Presidencies
Justice	Supreme Court of the U.S.
Aftermath of events	Reproductive rights
Republican Party (U.S.)	November events
U.S. presidential administration controversies	Abortion
Political careers	Human rights
Legislative branch of the U.S. government	National supreme courts
Controversies	Human reproduction
Politicians	Women’s rights
U.S. presidential candidates	U.S. federal courts
Political law	Brett Kavanaugh
Parliamentary procedure	Health economics
Group decision-making	Women
Social institutions	Health sciences
Social issues	

(continued)

Table A1. Continued

Political Candidates	PACs
	Pregnancy with abortive outcome
Federal elections of the U.S.	Civil rights and liberties
Health	Medical law
Political corruption	Birth control
Policy	Supreme courts
Supreme Court of the U.S.	Sexual health
Courts	Family planning

Appendix B

Topic-networks

Political Parties and Candidates. First, we focus on political candidates affiliated with the Democratic Party. The largest cluster (n = 419) covers (i) politics and political institutions, including *Activism, Elections, Fundraising, Political events, Polling, State Government of the United States, and Voter turnout*. The second largest cluster (n = 379) covers (ii) social welfare and various social issues, including *Child welfare, Soft drugs, Education, Health policy, Medical and Health organizations*, as well as *Labor and Retirement*. The third cluster (n = 353) covers (iii) mainly social issues, varying from *Abortion*, to *Violent crime, Feminism, Gender equality, LGBT politics, and Weapons*. The fourth cluster (n = 325) covers (iv) local politics, such as *Florida Democrats, Montana politicians, Ohio local politicians, and Politics of Pennsylvania*. The fifth cluster (n = 288) covers topics related to (v) environmental policy, such as *Climate change, Natural resources, Sustainability, and Fossil fuels*. The final cluster (n = 144) concerns (vi) (foreign) politics, such as *Immigration policy of Donald Trump, International relations, Trump wall, Russian interference in the 2016 United States elections, Impeachment, Trade disputes, United States–European relations*.

We conducted comparable analyses for politicians affiliated with the Republican Party. The largest cluster (n = 121) covers (i) politics and political institutions, such as *Presidency of Donald Trump, Politics of the United States, Primary elections, Make America great again, and Voting*. The second largest cluster (n = 104) covers (ii) foreign affairs and defense, including *Afghanistan, Military operations, United States Navy, and Warfare*. The third cluster (n = 86) covers (iii) law, including *Public law, United States federal law, Crime, Illegal immigration, Legal documents, and Law enforcement*. The fourth cluster (n = 77) covers (vi) economic policy, such as *Government finances, Tax, Employment, and Unemployment*. The fifth cluster covers (iv) health care policy, such as *Health economics, Medical research,*

Table A2. Top 50 topics: actors affiliated with the Republican Party.

Political Candidates	PACs
Politics	Politics
Government	Government
Politics of the U.S.	Presidency of the U.S.
U.S.	U.S.
Elections	Elections
Human activities	Donald Trump
Presidency of the U.S.	Trump family
American politicians	Democracy
Public sphere	Voting
Presidents of the U.S.	Political events
November events	Political career of Donald Trump
Donald Trump	November events
Political career of Donald Trump	Presidents of the U.S.
Trump family	Public sphere
Executive branch of the U.S. government	Accountability
Presidencies	Law
Political events	Human activities
Presidency of Donald Trump	American politicians
Candidates for President of the U.S.	Presidency of Donald Trump
Federal elections of the U.S.	Executive branch of the U.S. government
Voting	Federal elections of the U.S.
Political careers	Justice
Mass media	Public law
Communication	Political careers
Public opinion	Donald Trump controversies
Media manipulation	Social institutions
News media	National supreme courts
News	Courts
Media bias	Government information
News media manipulation	Legislative branch of the U.S. government
Media analysis	Virtue
Journalism	Constitutional law
Criticism of journalism	Health
Entertainment	Health economics
Presidencies of the U.S.	Health care
Democracy	Economics of service industries
Social institutions	Health policy
Donald Trump controversies	Medicine
Law	Federal government of the U.S.
Policy	Judiciaries
Economy	Ethical principles
Economies	Separation of powers
International relations	Legal concepts
Federal government of the U.S.	Republican Party (U.S.)
Accountability	Public finance
American political people	Health care reform
Political science	Government finances
Deception	American political people
Human migration	Economy
Psychological manipulation	Montana state senators

Table A3. Top 50 topics: non-profit organizations

Politics
Government
Human activities
Public sphere
Law
U.S.
Politics of the U.S.
Natural environment
Social issues
Human right
Justice
Donald Trump
Social institutions
Environmental issues
Trump family
Health
Political career of Donald Trump
Human rights abuses
Policy
Elections
Federal government of the U.S.
Political events
Immigration
Voting
Nature
Executive branch of the U.S. government
Crime
Crimes
Democracy
Human migration
Presidency of the U.S.
Presidents of the U.S.
Violence
Accountability
Applied ethics
Presidency of Donald Trump
Energy
Environment
Group-decision making
Societal collapse
Parliamentary procedure
Global warming
Refugees
International relations
Climate change
Forced migration
Aftermath of events
Organisms
Civil rights and liberties
Identity politics

Therapy, Health care reform. The final cluster (n = 61) concerns (v) environmental policy, including *Climate change policy, Natural disasters, Air pollution, and Greenhouse gases.*

Political Action Committees - PACs. Second, we turn our attention to political action committees (PACs). The largest

cluster (n = 339) covers (i) environmental policy issues, such as *Biodiversity, Climate change, and Pollution.* The second largest cluster (n = 322) relates to (ii) local politics, such as *Kansas Democrats, Government of Illinois, and United States Senators from Ohio.* The third cluster (n = 298) relates to (iii) issues concerning law, foreign policy, and defense, such as *Sexual harassment, Electoral fraud, Impeachment, Diplomacy, Foreign relations of the United States, and Warfare.* The fourth cluster (n = 286) deals with (iv) social issues, varying from *Sexual abuse to Refugees, Racism, Police misconduct, Motherhood, Mass murders, Gun violence, Gender, and Crime.* The fifth cluster (n = 226) covers (v) social welfare and digital technology issues, including *Education policy, Schools, Higher education, as well as Information management, Facebook, and Privacy law.* The final cluster (n = 157) deals with (vi) elections, such as *Protests, Activism, Election campaigning, and Polling.*

We conducted comparable analyses for PACs affiliated with the Republican Party. The largest cluster (n = 165) covers (i) political institutions, such as *Members of the United States Congress, United States Department of Defense Officials, United States House of Representatives.* The second largest cluster (n = 104) covers (ii) foreign affairs, and defense, such as *Foreign relations, Diplomacy, Military, National security, and Warfare.* The third cluster (n = 63) covers (iii) economic policy, such as *Fiscal policy, Income, Wealth, Tax, Government finances.* The fourth cluster (n = 62) covers (iv) local politics, particularly related to Arizona and Wisconsin. The fifth cluster (n = 55) covers topics related to (v) Donald Trump (e.g., *Political career of Donald Trump, Presidency of Donald Trump, Trump family, as well as Russia Intelligence Operations, Election controversies, and Media Manipulation.* The final cluster (n = 45) concerns (vi) law and order, such as *Constitutional law, National Supreme Courts, and Jurisprudence.*

Non-profit Organizations. Finally, we focus on sponsored ads from non-profit organizations. The largest cluster (n = 770) covers (i) politics and political institutions, such as *United States presidential campaigns, United States Constitutional law, Supreme courts, Presidencies of the United States, Barack Obama, Donald Trump, and Bernie Sanders.* The second largest cluster (n = 651) relates to (ii) environmental policy related to energy policy, including *Sustainable energy, Nuclear materials, Waste management, Rain forest, Oil companies, Global environmental issues, Climate change, Clean water rule, and Agriculture.* The third cluster (n = 602) covers (iii) social issues, including *Violence, Sexism, Race and law, Human rights, Gun violence, High school killings, Gender inequality, and Discrimination.* The fourth cluster (n = 534) deals with (iv) nature, such as *Wildlife, Plants, Animal welfare, National parks, Forest governance, Environmental ethics.*

The fifth cluster (n = 382) covers topics related to (v) multiculturalism and religion, such as *Christianity, God, Mythology, Marriage*, as well as *Racism, Latin American people*, and *Islam and women*. The final cluster (n = 308)

concerns (vi) social welfare and digital technology issues, including *Education, Homeschooling, Higher education*, as well as *Information management, Facebook*, and *Digital technology*.

Appendix C

Sankey diagrams

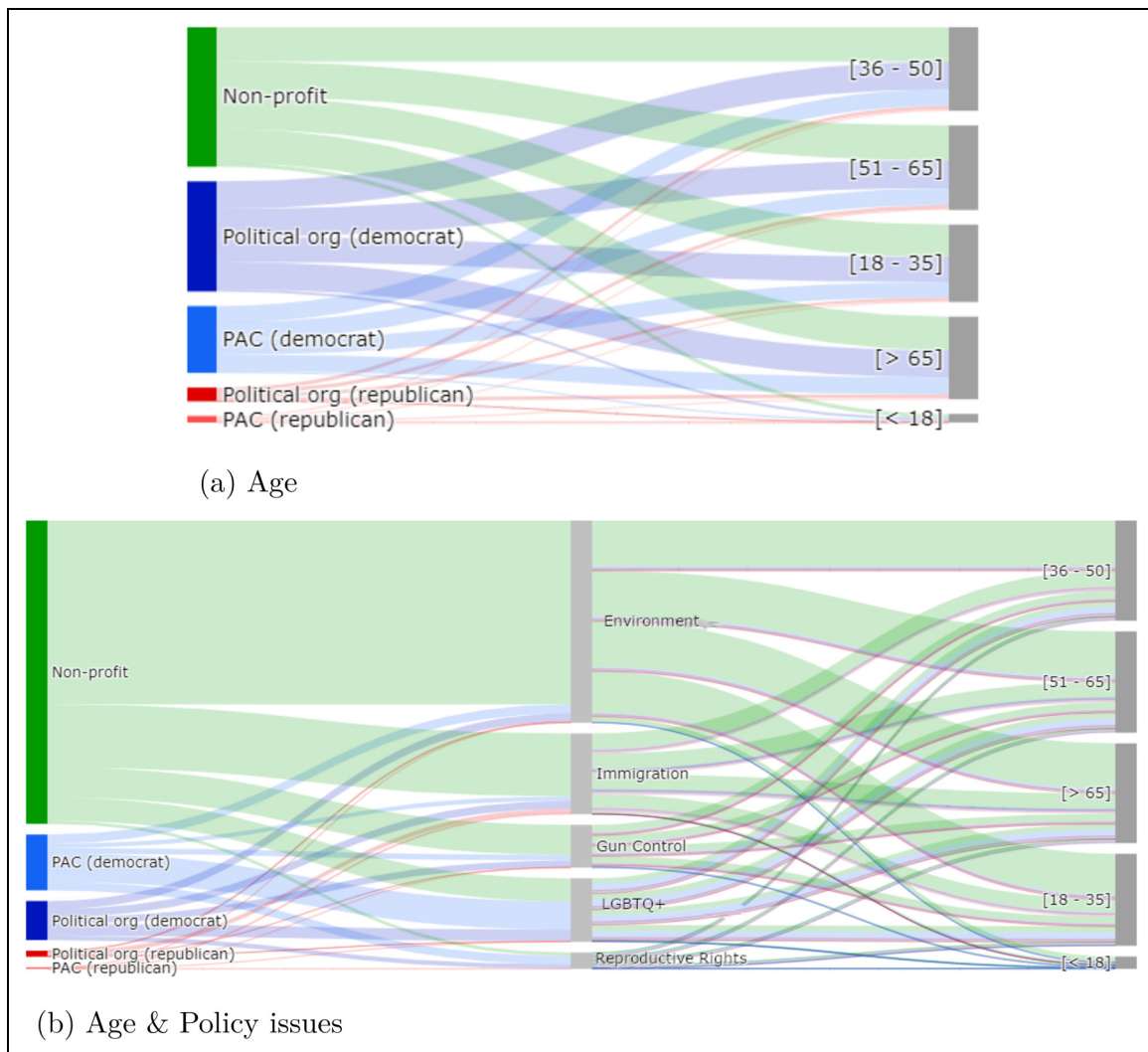


Figure C1. Policy issues in sponsored Facebook ads targeting age. (a) Age; (b) Age & Policy issues

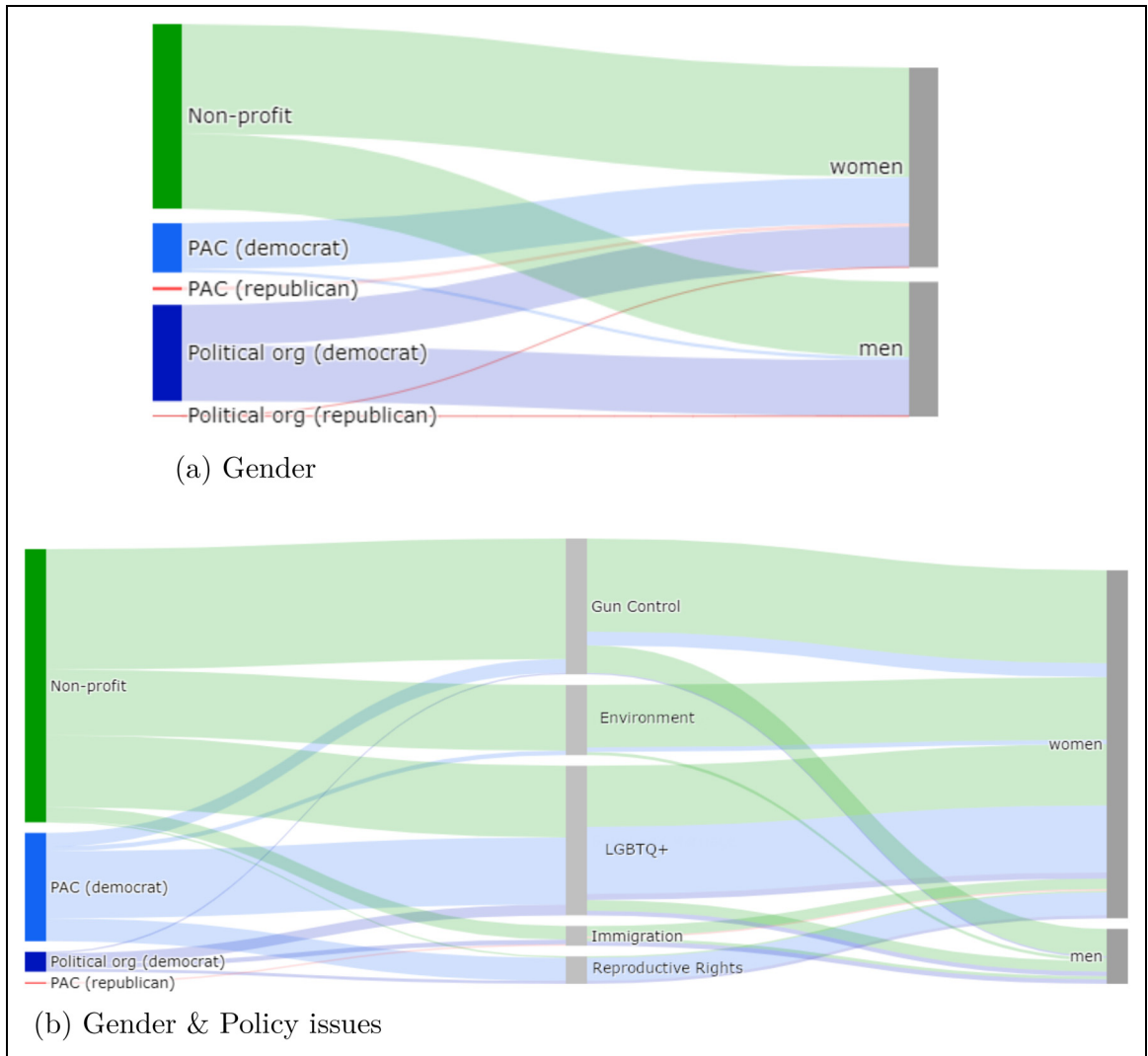


Figure C2. Policy issues in sponsored Facebook ads targeting gender. (a) Gender; (b) Gender & Policy issues

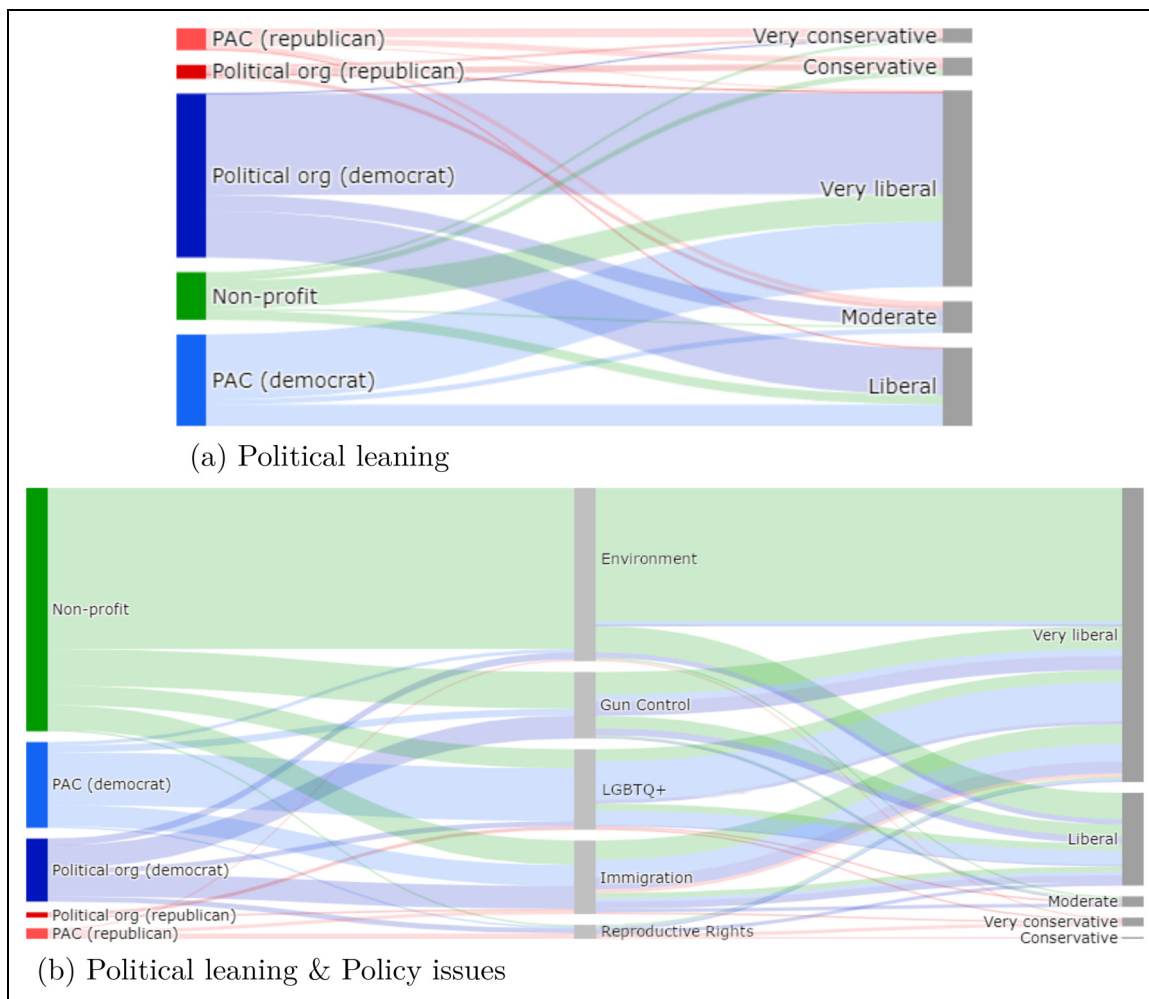


Figure C3. Policy issues in sponsored Facebook ads targeting *political leaning*. (a) Political leaning; (b) Political leaning & Policy issues