

RADBOUD UNIVERSITY



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# **Online Political Advertising; A Case Study of the Republican and Democratic Parties in United States**

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## 1 Abstract

Few scholarly articles have examined the field of online political advertising (OPA) in the United States, despite its increasing importance in the political sphere. This is partly due to the limited transparency of platforms, which has hindered our understanding of the actual practices conducted by political advertisers. In an effort to shed light on the complex world of OPA, this exploratory thesis compares the advertising behavior of the Republican and Democratic parties on Facebook and Instagram. By examining their advertising structures and spending patterns, we aim to uncover the strategies employed by both parties to reach voters on these platforms.

Our study provides insights into OPA in the US and offers a clear and structured method for replicating the study in other countries. Additionally, we have included a Proof of Concept code for extracting, formatting, and analyzing data from Facebook. Our findings reveal little difference in the advertising structures of the two parties, with similar spending patterns on their major candidates, and that both parties use Facebook and Instagram mainly for voter mobilization. However, the Republicans focused their spending more heavily on the election year, while the Democrats spread their spending more evenly over the years. Both parties allocate approximately 35% of their total advertising budget to five states, which are either historically supportive of their party or considered swing states.

In terms of advertising structures, the Republican and Democratic parties exhibit similarities, with most candidates utilizing simple structures across a few pages and the main party candidates employing more complex structures with multiple local pages. The Republican party tends to concentrate its spending on its primary candidate, while the Democrats distribute their spending more evenly across their candidates. Unofficial pages affiliated with the Republican party also tend to focus their spending on the primary candidate, while unofficial Democratic pages support a wider range of candidates and causes. The Democratic party has a larger number of pages and a more complex advertising structure overall, potentially indicating a more decentralized approach to advertising.

In comparison to TV advertising, spending on Facebook and Instagram represents a small portion of the parties' overall expenditure, which can reach billions of dollars annually. In addition, the Democrats appear to reach more male voters, while the Republicans focus more on senior citizens (i.e., those over 55 years old). Our findings contribute to the field of online political advertising by providing new insights into the practices and strategies of OPA in the US.

**Keywords:** *online political advertising, case study, elections and campaigns, republican party, democratic party*

## 2 Introduction

The political landscape in numerous democracies is growing as more parties representing diverse ideologies offer themselves for election. Particularly in democratic countries, candidates must make their names known to the public. As a result, political parties across the world spend billions of dollars annually trying to reach the masses [29], to influence their political ideology and behavior, and progressively employ and replicate marketing techniques and language to accomplish that [44].

Historically, there was no legislation on political advertising; consequently, political parties used all forms of advertising, such as radios, newspapers, billboards, and TVs, with little to no constraints. By the end of the 20th century and with the rise of democracy, regulators started to enact more laws to better govern the space of political advertising. The introduced laws included a ban on parties advertising on public TVs in specific countries or placing ads in newspapers during or shortly before elections. These laws may be regarded as the

cause of more online advertising as online platforms are generally not considered publishers and thus do not have to regulate the content posted on their platforms. In contrast, newspapers and TV stations are regarded as publishers and are subject to liability for their advertisements. With recent technological developments, advertisers have shifted to the internet to reach their audience more effectively as people spend more time online than ever before. Online advertising, especially by political parties, is celebrated and frowned upon simultaneously, as it has many advantages, disadvantages, and concerns.

Numerous studies have investigated the effects of (traditional) political advertising on voter turnout ([71]; [21]; [7]; [8]; [92]; [35]; [48]; [59]; [63]), the link between exposure to advertising and democratic attitudes, such as political interest and efficacy ([7]; [30]), and the impact of advertising on candidate impressions ([33]; [43]; [51]). However, using paid ads and practices on social media platforms to reach voters by political parties remains a largely unexplored area of research. This changed somewhat when Facebook made its Ad library accessible to researchers via its Application Programming Interface (API) in 2018 [60], as many researchers started making use of it. For example, Leerssen et al. [57] analyzed how parties in 28 European countries used Facebook Advertising during the 2019 European Parliament elections. However, most papers focus merely on particular events (such as the European Parliament elections, United States presidential election), and use only metadata (such as spend, reach, and engagement).

This exploratory thesis is split into three significant contributions. First, we highlight the differences and similarities in political advertisement structures between the two major contemporary political parties and that of unofficial political organizations (such as Political Action Committees, 501(c)(4) groups, and much more) affiliated with the party in the United States and provide insight into their practices regarding their advertising structure and cash flows. Second, the actual political advertising behavior and strategies used by official party pages and members on Facebook ranged over the past four years, with a breakdown of the details and concrete comparisons between the two parties. Last, we also contribute by providing a well-structured and largely automated method to demystify the advertising structure and the money flow, allowing our study to be replicated easily (in other countries).

The remainder of this manuscript is organized as follows: first, context regarding the background of OPA and related work is provided in Section Background and related work. The relevance of this paper follows this in Section Relevance. Next, Section Methodology elaborates on our methodology, as each subsection represents a phase of the study. The results and findings are addressed in Section Results. Section Limitations and future work highlights the limitations we faced. Discussion on the implications of this study are presented in Section Discussion. Finally, Section Conclusion contains the overall conclusion of this research and suggestions for future work.

### 3 Background and related work

While there is no universally agreed-upon definition for **Political advertising**, a commonly used definition is the following:

*“The communication process by which a source (usually a political candidate or party) purchases the opportunity to expose receivers through mass channels to political messages with the intended effect of influencing their political attitudes, beliefs, and/or behaviors” [49]*

**Political advertising** is a practice that has existed for a long time. However, recent technological developments and their mass adoption have enabled advertisers (including political parties) to reach their audience on different platforms and target specific groups of people. This practice is also known as political **micro-targeting**, a marketing strategy that leverages consumer data and data-mining techniques to make

decisions at a granular level about which end-user to target with which ad message [58]. In political communications, micro-targeting is used to deliver persuasive messages tailored to different groups of electorates. Micro-targeting is often viewed as a double-edged sword as it allows advertisers to fine-tune their audience instead of mass-spreading the same message to everyone. However, it may also enable them to draw multiple, possibly contradicting, images of themselves to different groups of people. Furthermore, the vast amounts of data gathered allow advertisers to target specific groups of people, leading to many privacy concerns.

### **3.1 The use cases and effects of political advertising**

As mentioned in the Introduction Section, political parties may use advertisements to reach the public and influence people's political ideology. There are, however, additional reasons to employ advertisements by parties. For instance, parties could even use advertisements to alter their political position. Parties that seek to be identified with a different set of ideals or attract a different set of voters tend to attempt to change their positioning through advertising. However, while positioning is undoubtedly a crucial issue for party strategists, there are limits to how flexible a party can be with its positioning. Indeed, a party's positioning is limited by the traditions and policies it has endorsed over time and by the preferences of party members and representatives. Moreover, parties generally have deep-seated differences that take years to change. Thus, the "political baggage" is carried from one election to the next and can only be changed in the long run [6].

Another motivation for advertising is maintaining and reinforcing relationships with their current voter base and constituency, while at the same time trying to get swing voters who previously voted for the party to vote for them again. Lastly, voter mobilization is a theme that gains significant attention in online advertising, especially near the voting days [10], [40], [16].

Political advertising may not affect everyone, but a population segment certainly does get influenced. While it may not gain the party what they ultimately want, namely more voters, Franz et al. [29] have found considerable evidence that political advertising is convincing - and that its effect depends on the characteristics of the viewer. Stein et al. show something similar, namely, that the effects of media on voters are generally contingent; the effects may be significant, though only sometimes and with part of the people [85]. Furthermore, various studies of the impact of television advertising on voting choice have shown that advertising does matter ([47]; [65]; [73]; [74]; [87]; [90]; [17]). The exposure to televised political advertisements was shown to impact factors including name recognition, knowledge levels about the candidates' issue stances, and image attributes ([9]; [50]; [64]; [90]). Viewers' ratings of candidates, perceptions of the political process in general, and subsequent political behavior are similarly impacted by exposure to political television advertising ([7]; [47]; [53]; [52]; [61]; [88]).

### **3.2 Development and types of online political advertising**

Before the recent technological advances, mass media similarly targeted everyone, delivering possibly irrelevant ads for some voters, such as single-issue voters or voters with a long history of voting for the same party. However, targeting voters with ads tailored to them is more efficient than displaying ads to more people than necessary, not to mention the cost associated with reaching more voters than necessary. Nowadays, fine-tuned targeting to the groups a party wants to target is viable while being cheaper and faster. As a result, parties began using it increasingly more and nowadays adopted it to the degree that every party relies on it to a certain limit. By campaigning online, parties can communicate their message directly to voters and impact the political debate. In addition, by advertising across different media types, political ads can target audiences that might not otherwise have paid attention to the election, establish name recognition, stress essential issues, and attract awareness to the shortcomings of their opponents.

Online political advertising takes many forms; for instance, Krushinski et al. [56] introduced the digital political marketing model for Facebook based on Beldin's work [13], which distinguishes the following types of media:

- **Owned media:** Refers to the organic content published on pages, channels, and websites owned by the political party at a negligible cost. This content appears on the feeds of the party's followers, search results, when individuals explicitly visit the party's website, or any official page linked to the party. What characterizes this advertising method is its low cost, direct reach to supporters, and control over the frequency of posts, which makes it attractive for campaigns with limited resources or engaging followers.
- **Paid media:** Refers to content a political party creates, sponsors, and pays for to target selected users' feeds, search results, and video suggestions. By combining big data and Artificial Intelligence (AI), advertising platforms offer political parties the means to reach an electorate they would not otherwise have reached while providing scalable prices and customizable filters. Paid media comes in different shapes and forms. For example, we can distinguish between two types of Paid media on Facebook. Sponsored posts are owned media posts that are boosted to be delivered to specific users who are not necessarily followers. On the other hand, advertisements are stand-alone posts that are not published on owned media (i.e., not visible to the page followers) and are only delivered to users who match criteria set by the advertisers. *Our work focuses on this media category, namely, Paid media.*
- **Earned media:** Refers to the result of all forms of engagement (shares, comments, and likes) users have with a political advertiser's owned and paid media, sometimes also called "going viral". This type of media plays a significant role in promoting owned and paid media even further. With engagement being a key factor in assessing media's relevance for users [14], earned media can extend owned and paid media's reach to be visible to a segment of users who are not necessarily immediate followers of the party or paid media's target users.

The main benefits of social media advertising are the lowering of expenses and the increase in outreach. Furthermore, online advertising has evolved tremendously over the last few decades. With the advances in data science and AI, it has become possible through advertising platforms such as Facebook Ads to tailor advertisements to target specific groups of users on the receiving end. These advertising platforms have enabled entire industries to thrive (e-commerce, for example). However, they have also become a viable tool for political parties to promote their agendas, run their election campaigns, and reach potential voters they would not otherwise reach. Combined with the relative lack of regulations, OPA became a highly desirable advertising medium. There are also many concerns regarding social media advertising, but the most prevalent ones are privacy concerns, negative feedback from customers, and time intensity [39].

### 3.3 Advertising on Facebook

Online political advertising on social media platforms, particularly Facebook, has recently garnered significant attention. The low cost and ability to customize ads and target specific audiences make OPA an attractive option for political campaigns ([28]; [15]). Furthermore, it enables parties to target voters that may not be reachable because of time and place constraints of other marketing outlets ([91]; [81]).

However, OPA also raises concerns related to privacy, negative customer responses, and the time-intensive nature of ad management [39]. Despite these potential disadvantages, the lack of regulations in the OPA industry has contributed to its growth as a medium for political parties to promote their agendas and reach potential voters.

### 3.4 Concerns over political advertising

There have been growing concerns among scholars due to the use of online advertising platforms for political micro-targeting (PMT). For instance, from an information rights perspective, Bayer [12] argues that while PMT violates the privacy rights of those targeted, it may also violate the information rights of those who were not targeted and were unaware of the political message to which others were exposed. Additionally, the author states that the practice of PMT distorts the public discourse, which harms the democratic process.

Borgesius et al. [15], on the other hand, discuss how PMT threatens not only users' privacy but also impacts political parties and public opinion. Regarding the threat to users' privacy, PMT requires collecting, storing, and processing personal data on a massive scale. This threat becomes even more severe in the event of a data breach. Moreover, PMT can also be used to manipulate voters, influence their engagement, suppress voter turnout for opponents, or even misleadingly present a political party as a one-issue party to each voter, which can lead to a distorted view of the political party's priorities.

As for political parties, Borgesius et al. [15] shed light on two substantial threats. The first is how OPA and PMT can be expensive, thus favoring the parties with more financial resources. The second is the growing power of the intermediaries connecting political parties to the electorate. In another study by Baum et al. [11], exploring users' privacy concerns, the results indicate that although users are generally opposed to targeted ads, and possibly more so for political than commercial ones, they do not seem to exhibit a higher level of privacy concerns. Nevertheless, micro-targeting of voters also poses severe risks, such as the violation of privacy, data breaches, a decline in political understanding and pluralism, manipulation, and the ostracization of certain groups ([15]; [69]).

Furthermore, there have been growing transparency concerns relating to (OPA). However, online consent to advertisements is ambiguous. For example, Europe's last political ads transparency proposal was heavily criticized [68] and described as lenient as it does not apply when explicit consent is obtained from the voters. Moreover, multiple shortcomings regarding scoping issues and enforcement of the proposal were also highlighted. Several scholars have argued that the risks are increasing as technology advances, and that the potential harm of these practices is exacerbated by new data mining methods that have increased the amount and accuracy of voter information. Contemporary political advertising campaigns lean on elaborate voter profiling fed by readily available databases related to citizens' online behaviors, including their social media usage.

Nonetheless, personalized OPA has a high potential to diversify political campaigns, reaching those who have opted out of exposure to conventional media, thereby enhancing citizens' political understanding and mobilizing citizens on issues they may consider relevant. Kruikemeier et al. [55] explored the persuasiveness of personalized ads through persuasion knowledge, which stands for people's personal beliefs and knowledge about advertising motives and tactics [31]. The study's results suggest that users generally can distinguish between regular Facebook posts and personalized ads. Additionally, high scores of persuasion knowledge measures indicate that they also understand that political ads are often persuasive messages paid for by a political party.

### 3.5 Regulations of political advertising In the US

In this section, we explain the political landscape in the US and discuss what is permitted and what is not regarding political advertising. The structure of the government has been shown to affect political advertising. In fact, all studies of political communication processes need to consider the variations in political structures and processes, political culture, and the organization of the media ([42]; [86]). In addition, a country's electoral system is expected to impact political parties' campaign strategies significantly and hence on the

design of electoral advertising [76]. However, in the US, there is little regulatory oversight of the content of political advertising, let alone of OPA. For example, the Federal Communications Commission (FCC) and Federal Election Commission (FEC) require that political advertisements be supplied with a disclaimer. However, while the FCC regulates TV, online platforms are self-regulated, meaning that they are often not responsible for the content of the platform themselves nor held responsible for the content themselves.

FCC regulations [18] dictate that broadcasters allow all qualified candidates for political office to buy an equal amount of advertisement time at the lowest unit charge. Furthermore, regulations demanded transparency from political parties who run the advertisements. For example, the FCC demands parties to mention the name of the group that purchased the advertising time in the ad, if the advertisement is a part of the candidate's campaign efforts, or whether another political action group paid for the spot. On the other hand, political advertisements on social media networks can conceal themselves without regulation. For example, the FEC has issued guidelines [19] for ads and disclaimers on all public communications by a political committee. However, Haenschen et al. [41] discovered that Google and Facebook frequently sought and obtained exemptions from the requirement that advertisers must include standard disclaimers.

As a result, and while efforts have been taken to increase transparency regarding OPA, the legal framework still allows online advertising platforms much freedom, negatively impacting transparency.

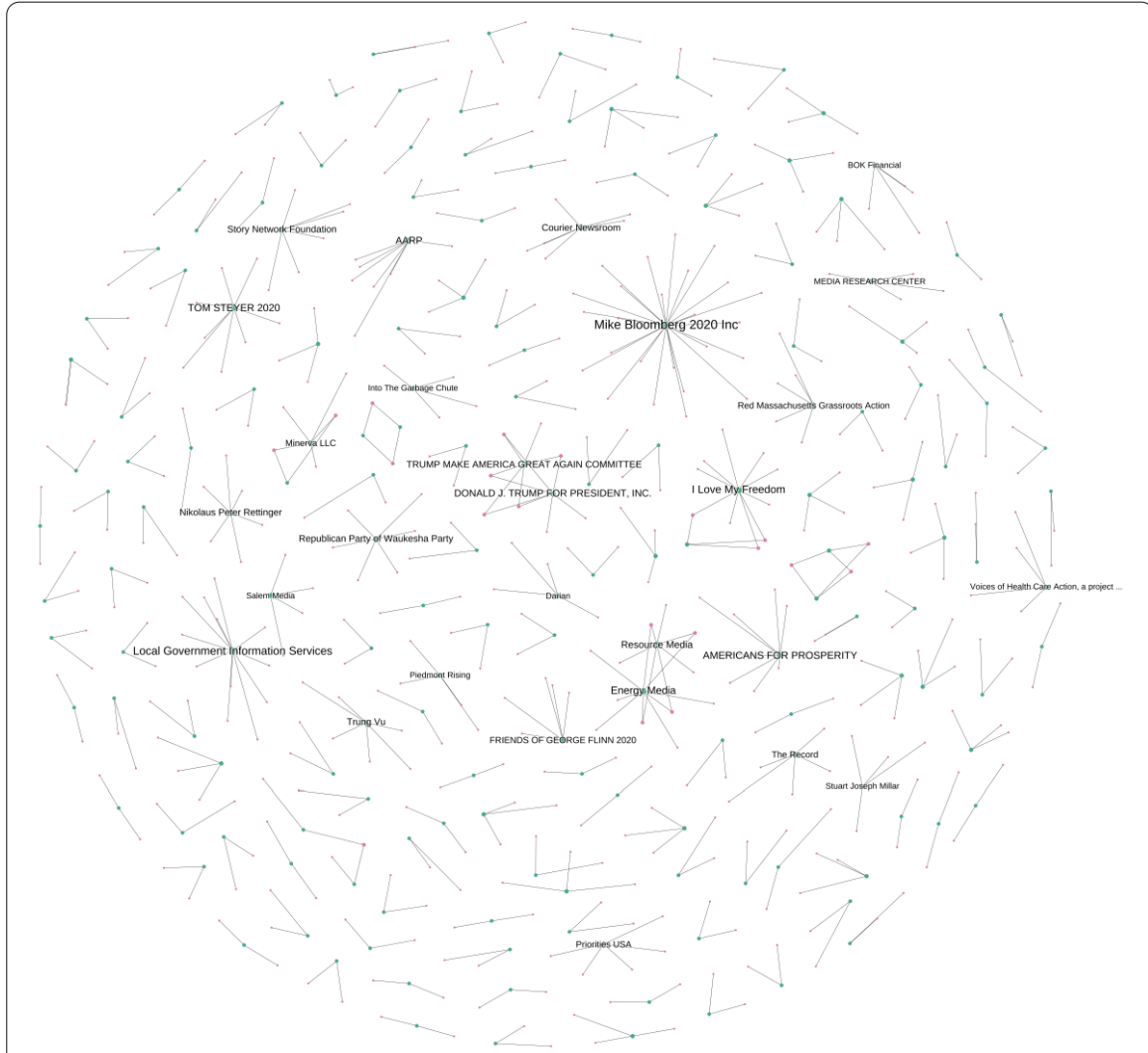
### 3.6 Advertising strategies and practices

Despite their many differences, scholars have found some similarities between the two major parties in the U.S. when they examined what the top issues were that they covered and with which they associated their party. A study of the 2010 midterm election by Fowler et al. [27] compared the topics discussed by the two parties. Their results suggest that both parties shared the issues of *employment* and *taxes* as the top two major issues, in terms of focus and spending. On the other hand, *Health care* and *economy* also belonged in the top 10 issues for both parties. Other than these four common issues, the authors showed that the parties' advertising focus diverges, and each party focuses on different issues. A similar study of the 2018 midterms [26] showed that the theme *health care* was mentioned in three of each five advertisements by the democrats. Yet, another study [75], carried out in 2020 with a focus on the presidential race of 2020, showed that Biden's campaign focused primarily on *COVID-19*, *Health care*, *Emergency response*, *Business*, and *Jobs* while Trump's campaign's top 5 concerns were: *Jobs*, *Protests/riots*, *Crime*, *Business*, and *China*.

The results of these papers reveal that while the themes change a bit over time, the issues addressed by the parties were similar and remained constant over the span of 10 years. This can be seen as a strategy adopted by both parties; relevant topics are used to appeal to the voters but they also use their extensive knowledge of the issue, as they have discussed it in length over the years. Indeed, that is further supported by [93], which showed that parties shifted from candidate-focused advertising to issue-focused advertising in the early 2000s. However, parties now use a hybrid approach where the party and Political Action Committees (PACs) associated with the party mainly focus on issue advertising while the candidate spends primarily on boosting their image. This shifted focus is in line with Pfau et al.'s [72] findings on the effects of the party, candidate, and PAC advertising. In addition, Pfau et al.'s results indicate that the impact of political advertising varies by party affiliation. In the case of Republicans, candidate-sponsored ads and party-sponsored ads are the most influential. However, among nonpartisan viewers, candidate-sponsored ads are the most effective, while party-sponsored ads are the least persuasive.

Regarding how the Democratic and Republican parties reach their voters, Fowler et al. [34] highlight the two parties' advertising structures in their work. The study was carried out on data ranging only for half a year, from October 7th, 2019 to May 18th, 2020, and has produced a graph showcasing the advertising structures over the aforementioned time period. The graph can be seen in Figure 1. The graph depicts that many

different pages are used for advertising instead of a single or a few main pages. While some major entities, such as *Donald Trump* and *Mike Bloomberg*, tend to use many smaller pages for advertising alongside their main pages, the smaller entities and candidates had much simpler structures in comparison. It needs to be clarified what purpose these complex structures serve, other than masking the advertiser to the 'average voter'.



**Figure 1:** A two-tiered graph linking every sponsor (green) to all the Facebook pages (pink) on which it sponsored at least one political ad, for both parties, from [34]

Finally, and in terms of spending, the literature also suggests that the amount spent on political advertising keeps growing yearly, especially around the elections and midterms, which hold for both parties [34].

### 3.7 Research gap

Our literature review suggests the need for a comprehensive comparison of all ads between the two major parties. Previous research efforts have primarily focused on a particular event (e.g., the presidential or senate elections) using pre-coded ads or only on the parties' major candidates or primary figures within the parties. In addition, previous papers have focused mainly on TV-based ads instead of Facebook, and there are merely a few recent papers on this topic. The lack of research in this area may be because Facebook's older data needed to be more comprehensive, accurate, and complete. However, researchers have recently been provided with extensive data allowing far more thorough comparisons. The contribution of this thesis is fourfold:

- Provide insights into the actual practices of the two major political parties in the U.S. across all their advertisements that have ever been published on Facebook and Instagram to demystify their practices and contribute to political transparency. Concretely, we perform a network analysis to analyze the advertising structures and entities and the relationships between them to highlight the complex advertising structures and money flow between them.
- Using quantitative data analysis, we also perform time-series analysis highlighting differences in the focus in both parties over time, including spending, impressions, and overall voter's reach along inter-party comparison. Furthermore, we investigate the geographic concentration of ads and spending per state, cover the most commonly mentioned topics per party, and examine the so-called rank difference (mentioned by Kit and Liu [54]), which highlights the issues mentioned by one party but virtually never mentioned by the other. We also compare the extent to which both parties imitate each other. Finally, we present insights into targeted age groups and genders by the two parties.
- Offer a structured but extensive explanation of our methodology so that our study is reproducible in other settings.
- Supply Proof of Concept (PoC) code to generate the same insights in other countries or for other parties.

## 4 Relevance

Many papers focus on the qualitative aspect of political advertising, with the discussion ranging from the ethics, legality, and social implications of OPA. However, as mentioned earlier, this area of research still needs to be explored, and the research is significantly lacking when it comes to quantitatively using data to support findings. In addition, there needs to be more recent insights available on the advertising practices that political parties engage in online. Therefore, exploring the similarities and differences between the two major political parties in the US, examining their advertising strategies, and providing a systematic approach to apply to other countries is crucial to developing a better understanding of political advertising behavior in general, especially when performed based on real-world data. This thesis not only fills a gap in the existing scientific knowledge on political advertising but also has a social impact, as the results will help us comprehend how parties advertise to society. In this way, society, as a whole, can better recognize and understand the phenomena of OPA.

### 4.1 Research Questions

We hope to answer the following research (sub-)questions in this exploratory research:

It is safe to assume the existence of differences across the two political parties under investigation, as each party has a distinctive socio-economical and political landscape, and many differences were already highlighted in previous studies. These differences can lead to adopting different behaviors in OPA. First, however, it needs to be made clear how these behaviors are different across all the historical advertising data, whether both parties respond to each other through advertising or whether the two parties imitate each other. The following question aims at exploring this matter.

**RQ1: To what extent are the behaviors and practices of the Democratic and Republican parties similar, and what are their main similarities and differences?**

The attention of both political parties is dispersed among various subjects, influenced by current events in the nation and the world at large. Neither party exclusively promotes a single issue but rather addresses a



variety of topics across multiple platforms, including those of their prominent figures and official party pages. However, it is unclear what topics are covered by both parties, how they have evolved over time, and if there are recurring themes.

**RQ2: What topics are covered in online political ads by party, and what is each party's main focus?**

## 4.2 Scope

The country in our scope is the US. However, the same methodology (which is extensively described in Methodology) of this research could be followed and applied in different countries, assuming the same or similar advertising data exist for that country. The period examined runs from May 7, 2018, to July 10, 2022, due to data limitations on the part of Facebook to go further back in the past. The comparison concerns only the two major political parties in the US, because even though there are other parties in the political arena in the US, the US is still mainly considered a two-party system ([62]; [83] [82]; [77]). The platform under investigation is Facebook, for the reasons explained in The choice of platform.

## 4.3 The choice of platform

Facebook was chosen as it is the largest social network with more than 2 billion active users [32], which still allows political advertisement (contrary to Twitter, which banned it). Google was out of scope for many reasons. First, Google has taken relatively strict transparency measures [36]. Second, they have also restricted micro-targeting options [38]. Third, Google claims to oblige all advertisers on their platform to comply with national legal requirements. Finally, they periodically release a Political Advertising Transparency Report for many countries with detailed information on verified advertisers' spending on election ads, and a downloadable database of advertising expenditures [37].

While Facebook is the largest source of online advertising spending, it has shown reluctance to set strict rules for transparency and accountability. Facebook then developed the Ad Library, which enables the general public to track all election- and issue-based ads on the platform and find information about political ads on its platform. In early 2019, Facebook made the tool available to political parties in some countries voluntarily. Then, in late June 2019, Facebook changed course and made the Ad Library mandatory for all advertisers in political and social issues.

# 5 Methodology

A series of sub-steps were defined and followed to ensure a well-structured approach in this research. First, we conduct an extensive literature review focused on (online) political advertising, its development, different types, and overall concerns and data regarding the subject. After this information is collected, online data regarding ads by parties in scope is collected. The collected data were pre-processed, then quantitative analysis was performed to answer the research questions. Finally, based on the analysis, several figures and graphs are generated to answer the questions of this research. These steps are explained in greater detail in each subsection in this section.

## 5.1 Literature review

The methodology suggested to perform the literature review by Moher et al. [67] was followed to minimize bias. Moher et al. argue that by applying explicit and systematic methodology while examining all relevant papers and scientific articles, bias can be minimized, thereby producing more reliable results by which

conclusions can be drawn. The discussion of (online) political advertising is a multidisciplinary discussion that can be scrutinized from multiple angles, including but not limited to legal, ethical, political, societal, and many more. To carry out a systematic approach while retaining the scope of this research, Google Scholar was used as the primary source of scholarly articles on the topic of this thesis. A keyword search was the approach taken to find pertinent articles. When reviewing the articles on Google Scholar, however, we frequently referred to other articles through citations. These cited articles were also often studied to gain more knowledge about the topic. By repeating this process numerous times over many articles, we collected the information from multiple sources, even contradictory ones, that were compiled in this thesis.

## 5.2 Data collection and formatting

We consulted several sources to compile a list of all Democratic and Republican Party (presidential) candidates active in the period mentioned in Scope, as Facebook does not provide such a list. We subsequently verified whether the (official) pages associated with these candidates have ever advertised on Facebook. We excluded the ones with no ad history, and the (non-exhaustive) list can be found in Appendix A.

Facebook provides two data sources that can be collected and used to generate the figures and insights in this thesis. On the one hand, we have the generic historical life-long ads ever posted on Facebook, named the *Facebook Ad Library Report* [66], which is high-level and does not contain many details. On the other hand, the specifics of each candidate covered in the scope of this research named *Candidates' data*, which provide much more detail than the *Ad Library*.

While both the data sources are incomplete, they can be both used to extract meaningful insights. For example, *Facebook Ad Library Report* could be used to understand the advertising structures better, and money flows on a high level, as is done in this thesis in Section 6.9. While *Candidates' data* is more focused on the advertising practices that a specific page has employed in the past and can be used to shed light on low-level statistics. Examples of such statistics are topics and keywords mentioned, audience targeted, and trends over time, as in the 6 Section.

### 5.2.1 Facebook Ad Library Report

Facebook does not make a distinction between advertisements relating to (social) issues, elections, or politics, but instead, groups them all into a single category. Making it so that the advertising data is also filled with with advertisements stemming from companies that are not directly political in nature, but are considered social issues, such as, environmental issues, human rights issues, finance and much more. Facebook defines this category as follows:

"Ads about social issues, elections or politics are:

- Made by, on behalf of, or about a candidate for public office, a political figure, a political party, a political action committee or advocates for the outcome of an election to public office; or
- About any election, referendum, or ballot initiative, including "go out and vote" or election campaigns; or
- About **social issues** in any place where the ad is being placed; or
- Regulated as political advertising." [5]

Where **social issues** are defined per country, and in the case of the U.S., those are: *civil and social rights, crime, economy, education, environmental politics, guns, health, immigration, political values and governance, security and foreign policy*.

As a result, when the full advertising history report is downloaded, data regarding all the above is to be found in the report, making it harder to have a more fine-grained distinction between advertisements types and requiring (manual) work to separate political and election-related advertisements from those concerning (social) issues.

The *Facebook Ad Library Report* is structured as follows and an example of this report can be seen in Figure 2

Page ID	Integer value identifying an entity
Page name	Name of the page as displayed on the site
Disclaimer	The disclaimer used that is associated with the spending <sup>1</sup>
Amount spent (USD)	The total estimated amount of money spent by the entity using the aforementioned disclaimer
Number of ads in Library	The total amount of ads published by the entity using the aforementioned disclaimer

1	Page ID,Page name,Disclaimer,Amount spent (USD),Number of ads in Library
2	6756153498,Mike Bloomberg,Mike Bloomberg 2020 Inc,63326588,181198
3	153080620724,Donald J. Trump,TRUMP MAKE AMERICA GREAT AGAIN COMMITTEE,58272160,312233
4	7860876103,Joe Biden,BIDEN VICTORY FUND,55442809,58474

**Figure 2:** A small example of the overview data provided by Facebook

### 5.2.2 Candidates' data

The second overview of data to be retrieved from Facebook, is a detailed (but incomplete) overview of all ads for each row in the previous overview. The detailed overview contains much more data, but is unfortunately often incomplete or missing data. The *Candidates' data* is structured as follows and an example of it can be seen in Figure 3.

<sup>1</sup>if a page was to use multiple disclaimers on the same page, that would results in multiple entries in the overview

ad_archive_id	An Integer value for an ad when it is no longer active, i.e. when it has been archived
page_id	Integer value identifying an entity
page_name	Name of the page as displayed on the site
ad_creation_time	Date time object indicating when the ad was created by the publisher
ad_delivery_start_time	Date time object of when the ad first was published
ad_delivery_stop_time	Date time object of when the ad was last published
byline	A string indicating the name of the entity that paid for the ad
ad_creative_bodies	A list of the text which displays in each unique ad card of the ad <sup>2</sup>
ad_creative_link_titles	A list of titles which appear in the call to action section for each unique ad card of the ad. <sup>3</sup>
ad_creative_link_captions	A list of the captions which appear in the call to action section for each unique ad card of the ad. <sup>4</sup>
ad_creative_link_descriptions	A list of text descriptions which appear in the call to action section for each unique ad card of the ad. <sup>5</sup>
impressions	A string containing the number of times the ad created an impression. In ranges of: <1000, 1K-5K, 5K-10K, 10K-50K, 50K-100K, 100K-200K, 200K-500K, >1M
spend	A string showing amount of money spent running the ad as specified in currency. This is reported in ranges; <100, 100-499, 500-999, 1K-5K, 5K-10K, 10K- 50K, 50K-100K, 100K-200K, 200K-500K, >1M
currency	The currency used to pay for the ad
demographic_distribution	The demographic distribution of people reached by the ad. Provided as age ranges and gender. Age ranges: Can be one of 18-24, 25-34, 35-44, 45-54, 55-64, 65+. Gender: Can be the following strings: "Male", "Female", "Unknown"
delivery_by_region	Regional distribution of people reached by the ad. Provided as a percentage and where regions are at a sub-country level.
publisher_platforms	A list of platforms where the archived ad appeared, such as Facebook or Instagram.
estimated_audience_size	Estimated Audience Size generally estimates how many people meet the targeting and ad placement criteria that advertisers select while creating an ad.
languages	The list of languages contained within the ad.

	A	B	C	D	E	F
1	ad_archive_id,page_id,page_name,ad_creation_time,ad_delivery_start_time,ad_delivery_stop_time,byline,ad_creative_bodies,ad_creative_link_titles,ad_creative_link_captions,ad_creative_link_descriptions,impressions,spend,currency,demographic_distribution,delivery_by_region,publisher_platforms,estimated_audience_size,languages					
2	111169963117334,6756153498,"Mike Bloomberg",2022-05-06,2022-05-06,2022-05-12,"Bloomberg Philanthropies", "As the issue of women's rights moves from the court to Congress, voters will now know exactly who to hold accountable if abortion ceases to be a right for American women.					
3						
4	The ballot, not the bench, is the ultimate arbiter of freedom. <a href="https://bloom.bg/3ie12f5">https://bloom.bg/3ie12f5</a> , "Congress Must Stand Up for Women Before Roe Falls",bloomberg.com,"If abortion ceases to be a right for Americans, voters will know exactly who to hold accountable.", "lower_bound: 250000, upper_bound: 299999", "lower_bound: 4500, upper_bound: 499					
5	5453289894501474,6756153498,"Mike Bloomberg",2022-05-05,2022-05-06,2022-05-06,"Bloomberg Philanthropies", "As the issue of women's rights moves from the court to Congress, voters will now know exactly who to hold accountable if abortion ceases to be a right for American women.					

**Figure 3:** A small example of the detailed overview provided by Facebook

<sup>2</sup>Some ads run with multiple ad versions or carousel cards each with their own unique text.

<sup>3</sup>Some ads run with multiple ad versions or carousel cards each with their own unique title text about the link.

<sup>4</sup>Some ads run with multiple ad versions or carousel cards each with their own unique text that appears in the link.

<sup>5</sup>Some ads run with multiple ad versions or carousel cards each with their own unique text describing the link.

### 5.3 Rank difference calculation

As introduced by [54], the rank difference can have many applications and be applied in many use cases. In essence, it measures the difference in the ranks of two words in a list of words sorted by frequency of occurrence. The rank difference can be used to compare the relative frequencies of two words or the same word in two different text files, or to compare the frequency of a word in the same text file at different points in time.

We follow the method proposed in [54] to compute the rank difference. First, all the words and terms mentioned in each advertisement are combined into a big file, resulting in two files of words and terms, one for each party. These files are then compared to each other to highlight the contrast in word-mention frequency between the two files. Finally, noisy terms (e.g., "the" and "and") are excluded from the results. A result is a number that ranges between 0.0 and -1.0. The closer the result is to 0.0, the lower the rank difference is, and the closer it is to -1.0, the higher the rank difference is. A high rank difference (closer to -1.0) highlights the topics and issues mentioned by one party but practically never mentioned by the other party, which helps to understand the issues that one party focuses on but not the other. In contrast, a low rank difference (closer to 0.0) shows issues mentioned commonly by both parties. We demonstrate this process using an example:

Suppose we have two text files, A and B, and we want to compare the frequency of the word *vote* in these two files. We can do this by calculating the normalized rank difference between *vote* in the two text files. First, we create a list of all the words that appear in both text files, along with their frequencies of occurrence in each file. We then sort this list in descending order based on the frequencies of the words in text file A. The resulting list might look something like this:

Word	Frequency in A	Frequency in B
the	1000	800
and	500	450
to	400	350
a	300	300
of	250	250
vote	200	100
in	150	150
that	100	50
Biden	50	0

**Table 1:** Example terms with their frequency to explain Rank difference

Next, we determine the ranks of the word *vote* in the two text files. The rank of a word is its position in the list, with the most frequent word having a rank of 1, the second most frequent word having a rank of 2, and so forth. In this case, the rank of *vote* in text file A is 6 and the rank of *vote* in text file B is 7. Then, we calculate the rank difference between *vote* in the two text files by subtracting the rank of *vote* in text file B from the rank of *vote* in text file A:

$$\text{Rank difference} = \text{Rank of } \textit{vote} \text{ in A} - \text{Rank of } \textit{vote} \text{ in B} = 6 - 7 = -1$$

To normalize the score and thereby ensure that the rank difference is always between -1.0 and 0.0, we can divide the rank difference by the maximum possible rank difference (which is the difference between the ranks of the most frequent and least frequent words in the list). In this case, the maximum possible rank difference is 8 (since the rank of the most frequent word is 1 and the rank of the least frequent word is 9); thus

we divide the rank difference by 8 to get the normalized rank difference:

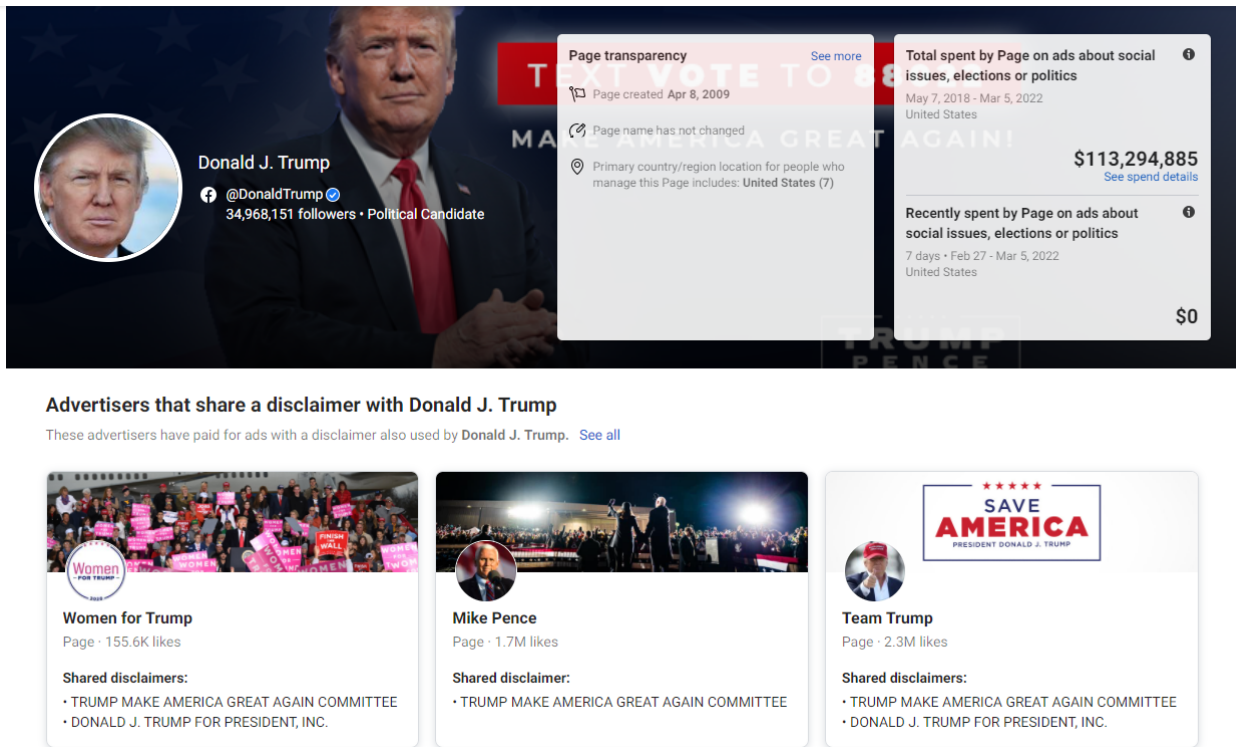
$$\text{Normalized rank difference} = \frac{\text{Rank difference}}{\text{Max possible rank difference}} = \frac{-1}{8} = -0.125$$

A normalized rank difference close to 0.0 indicates that *vote* is more frequent in text file A than in text file B, but nonetheless is frequently mentioned in both files.

While the scores are not necessarily indicative of a topic as they merely highlight specific words, the rank difference can still be considered helpful as it provides an idea of words and, thus, topics mentioned by one party but not by the other. Its value lies in the contrast it reveals between the two parties.

#### 5.4 Graph generation for advertising structure and money flow

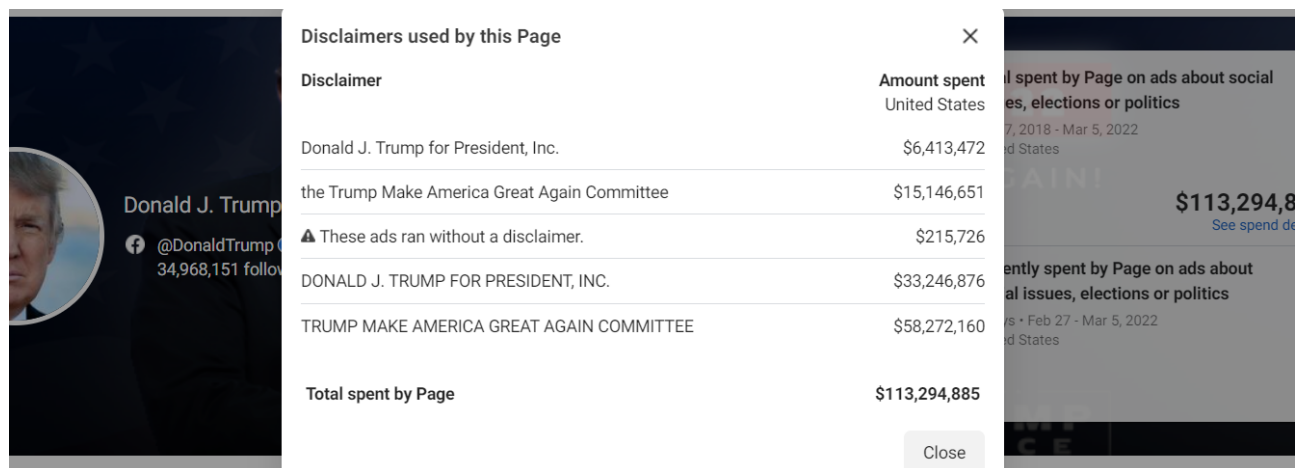
To better understand the two parties' advertising structures and money flow, we generate a graph that plots the entities involved in advertising for both parties. The process of generating the entities to determine the OPA structure for both parties is explained using an example. First, terminology needs to be defined. For example, only a **Page**, such as that of the former president of the U.S., *Donald Trump*, can advertise on Facebook.



**Figure 4:** Example of a Facebook page

Each page, such as the one shown in 4, has **Disclaimers** associated with it, as can be seen in Figure 5. In this case, there are four disclaimers and a non-disclaimer (i.e., the failure to add a disclaimer to an ad)<sup>6</sup>. Each ad must have a Disclaimer.

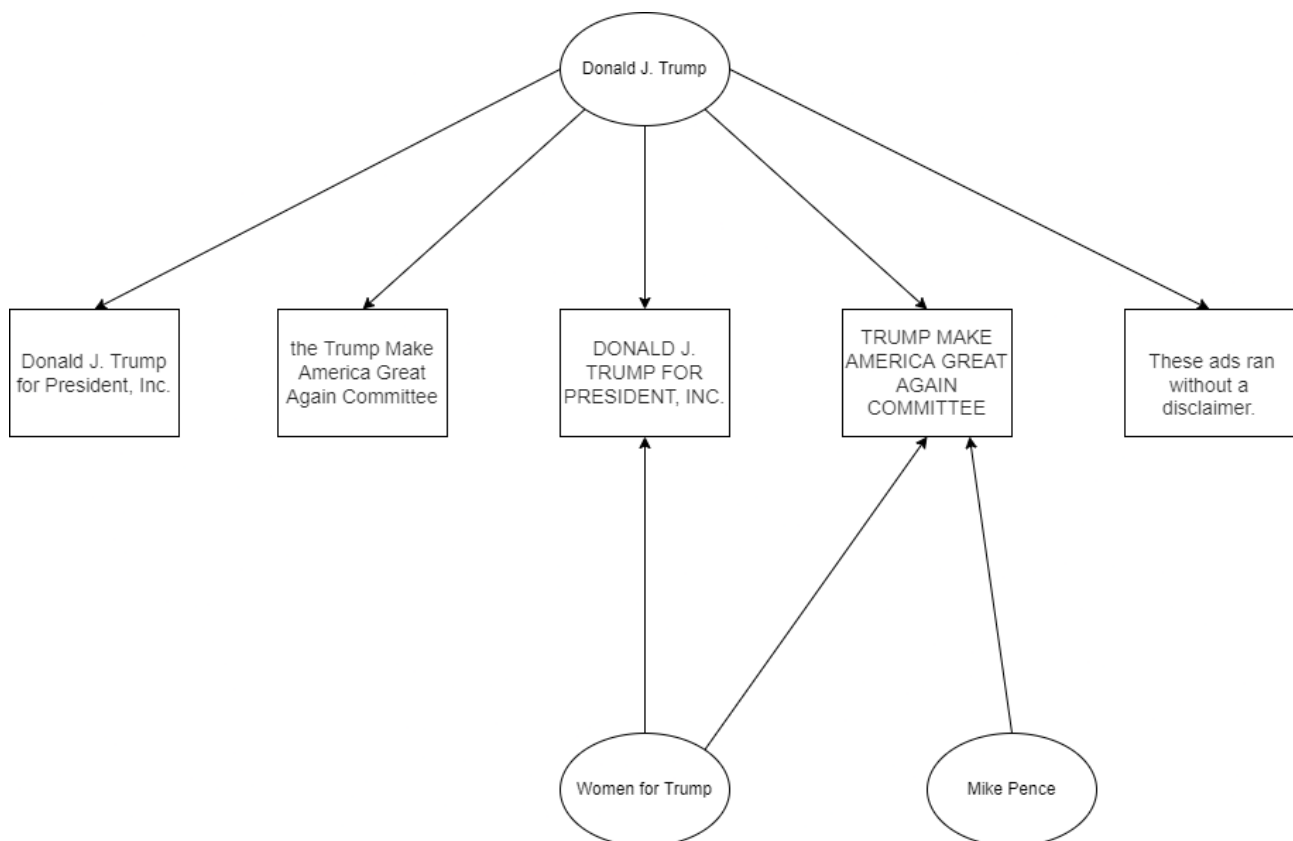
<sup>6</sup>Non-disclaimed ads or ads with disapproved disclaimers are usually removed; however, Facebook does not mention how quickly or thoroughly that process is performed



**Figure 5:** Example of disclaimers associated with a page

Other pages can partially or fully share the list of disclaimers (consisting of four in this example), as can be seen in figure 4, where some of the disclaimers are shared by other pages and are displayed in a bullet-point style list, resulting in the structure which can be seen in Figure 6 for a single page. Note that capitalization or any other change in the disclaimer results in a different disclaimer. Therefore, *Donald J. Trump for President, Inc.* and *DONALD J. TRUMP FOR PRESIDENT, INC.* are two different disclaimers, although the only difference is the capitalization.

Each of the connected pages (i.e. *Women for Trump* and *Mike Pence*) to the original page, *Donald Trump's*, in the illustrative example below, are named *level 1 pages*. These *level 1 pages* also might have their own disclaimers, which are not shared by the original page.



**Figure 6:** An example of a structure between Pages and Disclaimers, where pages are oval-shaped, and disclaimers are rectangle shape

To gain a complete overview of all pages and their interconnections, we compiled a list of each party's

official pages and their major (advertising) candidates. Then, for each of these candidates, we retrieved their disclaimers. Then, for each of these disclaimers, we retrieved all the pages that have advertised under this disclaimer<sup>7</sup> until all official and verified pages and their associated disclaimers are examined and included in the graph. This approach was largely automatable, with the exception of compiling a list of all official party pages and their major (advertising) candidates. The graph generation process can be found in Appendix B Section B.2.

The graph generation process was also approached from a different aspect. A considerable portion of the money spent on political advertising stems from non-official non-verified pages, so-called political organizations, non-profit organizations, and (super) Political Action Committees (PAC). This process is further elaborated on in section 5.5.

## 5.5 Unofficial organizations and committees

Upon examining the data, it became apparent that a significant portion of the money invested in OPA towards the two parties is being done by non-official entities that are not (directly) connected to the political parties. Moreover, the structure of these non-official entities is tightly linked to the US case and the legal framework in the US regarding OPA. As a result, this process section is not directly generalizable or applicable to other countries. However, we elaborate in this subsection on the types of entities and how they were dealt with in the context of this thesis to increase reproducibility. There are multiple types of advocacy groups in the US that may engage in OPA. These are:

- **Political Action Committee (PAC):** Is a group "organized for the purpose of raising and spending money to defeat and elect candidates." There are two sub-types of PACs: [23]
  - \* **Separate segregated funds (SSF):** "SSFs are political committees established and administered by corporations, labor unions, membership organizations or trade associations. These committees can only solicit contributions from individuals associated with connected or sponsoring organization" [24]
  - \* **Non-connected committees:** These committees "are not sponsored by or connected to any of the aforementioned entities and are free to solicit contributions from the general public." [24]
- **Super PAC:** These are committees that "may receive unlimited contributions from individuals, corporations, labor unions and other PACs for the purpose of financing independent expenditures and other independent political activity." [24] These committees can then spend unlimited sums to overtly advocate for or against political candidates. [23]
- **Leadership PAC:** "Is a political committee that is directly or indirectly established, financed, maintained or controlled by a candidate or an individual holding federal office, but is not an authorized committee of the candidate or officeholder and is not affiliated with an authorized committee of a candidate or officeholder." [24]
- **Hybrid PACs (Carey Committees):** "A Carey committee is a hybrid PAC that is not affiliated with a candidate and has the ability to operate both as a traditional PAC, contributing funds to a candidate's committee, and as a super PAC, which makes independent expenditures." [89]
- **Social welfare groups / 501(c)(4) groups:** "Civic leagues or organizations not organized for profit but operated exclusively for the promotion of social welfare, or local associations of employees, the

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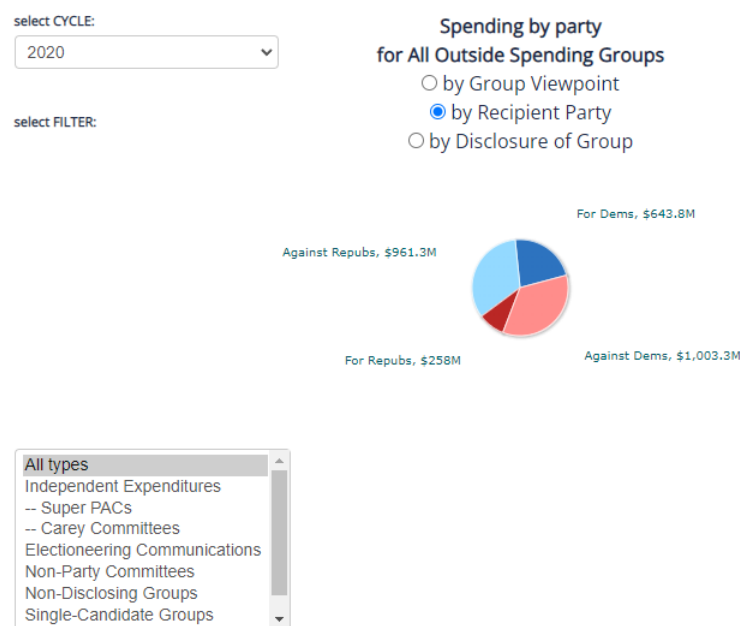
<sup>7</sup>Note that if a non-official page has advertised using additional disclaimers, with only one of these disclaimers associated with the official party or one of its candidates. Then only data regarding that one disclaimer is fetched to ensure that we only cover what is spent on political advertising that happens to be associated with or paid by the party.



membership of which is limited to the employees of a designated person or persons in a particular municipality, and the net earnings of which are devoted exclusively to charitable, educational, or recreational purposes." [23]

- **501(c)(3) groups:** Are charitable, religious, and educational organizations that are nonprofit with a dedicated mission. The political activity of organizations are required to be nonpartisan in nature. [4]
- **527 Group:** "These groups are typically parties, candidates, committees or associations organized for the purpose of influencing an issue, policy, appointment or election, be it federal, state or local. Such organizations can raise unlimited funds from individuals, corporations or labor unions" [89]

These types are essential to stress as they spend significantly more than the parties. More than \$2.8 billion was spent by these entities in the election cycle of 2020, as can be seen in Figure 7 [89]<sup>8</sup>. As described above, the nature and type of an entity determine what it can and can not do, to a certain degree, which is why their spending is represented in terms of "For Party" and "Against Party". However, this representation merely implies whether they have advertised for the party (i.e., positively towards the party's issues and candidates) or advertised against it (i.e., negatively towards the party's issues and candidates). Unfortunately, Facebook does not label these different types of groups. Instead, all these entities are labeled as political organizations with no further nuances to their nature, making it harder to gain insights into all the different parties involved in OPA for a political party and challenging to automate the process. In addition, this lack of transparency results in the reliance on external sources to determine which entities are associated with or advertise solely For or Against a particular party.



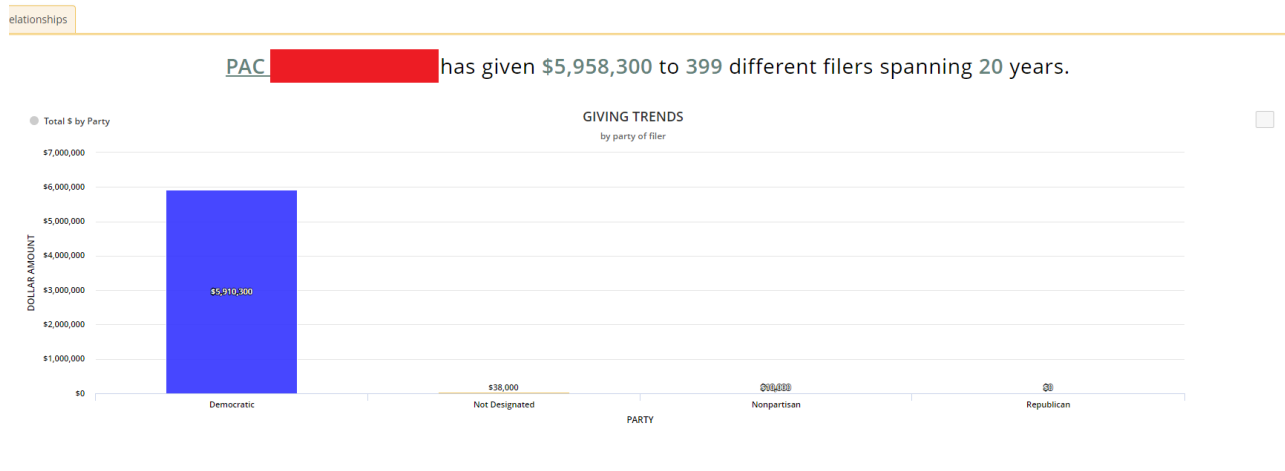
**Figure 7:** The spending towards OPA by non-official entities as described in 5.5

Both the organizations, FollowTheMoney and OpenSecrets<sup>9</sup>, were utilized to determine advocacy groups' (unofficial) leaning. The role of these organizations was crucial for this research as they helped highlight which advocacy groups were associated with or advertising solely For or Against which party. In addition,















<sup>8</sup>Note that this amount is not only on Facebook or online, but also includes amounts spent on TV. However, a PAC was included in our analysis only if it had spent on OPA and only for that amount spent on OPA.

<sup>9</sup>Both organizations are research groups that track spending in American politics and are non-partisan, independent, and non-profit. Both organizations have subsidiaries in different countries, which can be consulted to uncover the different advocacy groups' leanings.

they showed the contribution history of each advocacy group and based on that, the advocacy group's leaning was determined. This leaning was only labeled as "Democratic" or "Republican". For example, the PAC in Figures 8 and 9 has almost exclusively spent money towards the democratic party and their candidates; therefore, it is marked as Democratic in the data.



**Figure 8:** An example of a PAC's spending history, not only on Facebook but also on TV.

												<div>123456next</div>					
Candidate		Election Status	Status of Candidate	Specific Party	General Party	Election Jurisdiction	Election Year	Election Type	Office Sought	Incumbency Status	# of Records	Total \$					
	<a href="#">BARBER, RON</a>	WON-GENERAL	WON	DEMOCRATIC	DEMOCRATIC	AZ	2012	STANDARD	US HOUSE DISTRICT AZ 002	INCUMBENT	4	\$20,000					
	<a href="#">OWENS, WILLIAM L (BILL)</a>	WON-GENERAL	WON	DEMOCRATIC	DEMOCRATIC	NY	2009	SPECIAL	US HOUSE DISTRICT NY 023	OPEN	5	\$20,000					
	<a href="#">MURPHY, MATTHEW SCOTT (SCOTT)</a>	WON-GENERAL	WON	DEMOCRATIC	DEMOCRATIC	NY	2009	SPECIAL	US HOUSE DISTRICT NY 020	OPEN	4	\$20,000					
	<a href="#">OHALLERAN, TOM</a>	WON-GENERAL	WON	DEMOCRATIC	DEMOCRATIC	AZ	2020	STANDARD	US HOUSE DISTRICT AZ 001	INCUMBENT	4	\$20,000					
	<a href="#">CISNEROS, GIL</a>	LOST-GENERAL	LOST	DEMOCRATIC	DEMOCRATIC	CA	2020	STANDARD	US HOUSE DISTRICT CA 039	INCUMBENT	4	\$20,000					
	<a href="#">LEVIN, MIKE</a>	WON-GENERAL	WON	DEMOCRATIC	DEMOCRATIC	CA	2020	STANDARD	US HOUSE DISTRICT CA 049	INCUMBENT	4	\$20,000					
	<a href="#">PORTER, KATHERINE (KATIE)</a>	WON-GENERAL	WON	DEMOCRATIC	DEMOCRATIC	CA	2020	STANDARD	US HOUSE DISTRICT CA 045	INCUMBENT	4	\$20,000					
	<a href="#">DELGADO, ANTONIO</a>	WON-GENERAL	WON	DEMOCRATIC	DEMOCRATIC	NY	2020	STANDARD	US HOUSE DISTRICT NY 019	INCUMBENT	4	\$20,000					
	<a href="#">CARTWRIGHT, MATTHEW ALTON</a>	WON-GENERAL	WON	DEMOCRATIC	DEMOCRATIC	PA	2020	STANDARD	US HOUSE DISTRICT PA 008	INCUMBENT	4	\$20,000					
	<a href="#">WILD, SUSAN ELLIS</a>	WON-GENERAL	WON	DEMOCRATIC	DEMOCRATIC	PA	2020	STANDARD	US HOUSE DISTRICT PA 007	INCUMBENT	4	\$20,000					
	<a href="#">SCHRIER, KIMBERLY (KIM)</a>	WON-GENERAL	WON	DEMOCRATIC	DEMOCRATIC	WA	2020	STANDARD	US HOUSE DISTRICT WA 008	INCUMBENT	4	\$20,000					
	<a href="#">CROW, JASON</a>	WON-GENERAL	WON	DEMOCRATIC	DEMOCRATIC	CO	2020	STANDARD	US HOUSE DISTRICT CO 006	INCUMBENT	4	\$20,000					
	<a href="#">AXNE, CINTHIA (CINDY)</a>	WON-GENERAL	WON	DEMOCRATIC	DEMOCRATIC	IA	2020	STANDARD	US HOUSE DISTRICT IA 003	INCUMBENT	4	\$20,000					
	<a href="#">UNDERWOOD, LAUREN A</a>	WON-GENERAL	WON	DEMOCRATIC	DEMOCRATIC	IL	2020	STANDARD	US HOUSE DISTRICT IL 014	INCUMBENT	4	\$20,000					

**Figure 9:** Candidates supported by the PAC, not only on Facebook but also on TV

However, in our analysis, non-official entities that did not clearly align with either political party were excluded. This is a limitation as if a page had spent an equal amount of funds on both the Democratic party and the Republican party, these figures could be added to the data for both parties for the sake of completeness. Our research found that non-official entities with a balanced allocation of funds typically provided support based on their viewpoints rather than parties. Therefore, they were not identified with any party and only supported a party on a case-by-case basis. Another limitation of our analysis is that the data provided by FollowTheMoney and OpenSecrets is incomplete, which may be due to the fact that not all parties are required to disclose their income streams or simply due to a lack of available data.

## 6 Results

In this result section, we first present the quantitative data analysis of the official parties' practices only, then continue to present the advertising structures and money flow of both the official parties and unofficial entities, as described in Section 5.5. This means that the results section covers only the official parties' practices, except for Sections 6.9.2 and 6.9.4 as they cover the unofficial entities. Afterward, we summarize the results and answer the research questions in Section 6.10. To support our analysis, multiple figures were generated to highlight the results. All these figures were generated using visualization packages in Python and Gephi<sup>10</sup>, an open-source visualization platform.

### 6.1 Overall statistics, data incompleteness and lack of transparency

In order to fully comprehend our results, it is essential to provide context and key statistics regarding the data collected from Facebook and Instagram (detailed in Section 5.2). Throughout the entire advertising history of both parties, from March 2018 to June 2022, there were a total of 1,491,883 ads created by both parties on the aforementioned platforms. However, it was observed that the Democratic party created significantly more ads than the Republican party, with 1,188,773 ads. In contrast, the Republican party only published 303,110 ads, indicating that the Democratic party created approximately four times the amount of ads compared to the Republican party.

Additionally, it is essential to note that while Facebook does provide some data, it is limited and, in some instances, only an estimate. The reason for this needs to be clarified, as the information on the exact amount spent is known to the advertisers. The data columns of *impressions*, *spend*, and *estimated audience size* are therefore estimates, as Facebook only provides data as a range. For example, the spend column is a range, with most data entries being in the range of 0-99, indicating that any amount between \$0 and \$99 was spent on a particular ad. For such cases, an average of \$49.5 was used. This estimation implies that whenever data is discussed regarding *impressions*, *spend*, and *estimated audience size*, it is merely an estimate, and actual numbers may be higher or lower. In some cases, the data is left blank, indicating that Facebook did not specify a range. In those cases, the percentage of the total data entered was indicated, and thus the amount of data used in making the estimate (e.g., Figure 24 is only filled in 67% of the cases). In such cases, we refrained from estimating the remaining unfilled data as their values could be anything, and we chose accuracy over completeness.

Using this method, it was estimated that the Democratic party had spent approximately \$372M (\$371.73M) over four years on advertisements on Facebook and Instagram. In comparison, the Republican party had spent approximately \$80M (\$80.13M), which is approximately 4.5 times less than the Democrats. It should be noted that this difference in spending is consistent with the disparity in the number of advertisements created by the two parties. In total, both parties spent approximately \$450M throughout the research period. For context, spending on political advertisements on television (including broadcast, local cable, national cable, and satellite TV) during the study period is estimated to be in the tens of billions of dollars [25].

### 6.2 Most mentioned topics and rank difference

This subsection presents the top 5 topics mentioned by both parties. We then show both the lowest and the highest rank difference between the two parties, as introduced by Kit and Liu [54] and elaborated upon in Section 5.3.

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<sup>10</sup><https://gephi.org/>

### 6.2.1 Top 5 topics for both parties

Both parties utilize social media to incentivize their audience to vote, donate or mention the other party. This usage is a noticeable difference from traditional media, as past research, such as that mentioned in Section 3.6, does not display these topics. However, previous research was focused on TV, and when conducted on online platforms, it focused on specific campaign and election events, which has traditionally been a more appropriate medium to mention social and community issues than Facebook and is still considered the main focus of many political parties.

Top 5 topics mentions by the Democrats	Top 5 topics mentions by the Republicans
Campaign and voting, 778k mentions	Campaign and voting, 336k mentions
Trump, 623k mentions	Trump, 146k mentions
Donations, 369k mentions	Donations, 34k mentions
Health care, 107k mentions	Joe Biden, 28k mentions
Jobs, 86k mentions	Jobs, 20k mentions

The table above shows that the Democrats mainly focused on mentioning the Republicans, trying to mobilize voters or asking for donations, and focused on the topics of *Health care* and *Jobs*. The Republicans covered the same topics, but mentioned their own candidate much more often than the other party's candidate.

### 6.2.2 Highest rank difference<sup>11</sup>

Term	Rank difference	Frequency Democrats	Frequency Republicans
Wealthy	-0.990	29,951	0
Flights	-0.987	23,246	0
Student (loans)	-0.983	15,972	0
Fossil (fuel)	-0.980	12,989	0
Reproductive (rights)	-0.978	11,771	0

**Table 2:** Top 5 topics mentioned by the Democrats but are not or rarely mentioned by the Republicans

Table 2 lists the topics mentioned by Democrats but not or hardly mentioned by Republicans. The column *Frequency Democrats* indicates the frequency of a topic mentioned by the Democrats but not the Republicans. We see that the Democrats focused on issues relating to *Wealth*, *Flights*, *Student loans*, *Fossil energy*, and *Reproductive rights*.

Term	Rank difference	Frequency Democrats	Frequency Republicans
Liberals	-0.937	3	5,049
Deceptions	-0.935	0	2,419
Leftist	-0.919	0	1,811
Farleft	-0.915	0	1,680
Radicalleft	-0.903	0	414

**Table 3:** Top 5 topics mentioned by the Republicans but are not or rarely mentioned by the Democrats

Table 3 lists the topics mentioned by Republicans but not or hardly mentioned by Democrats. The column *Frequency Republicans* indicates the frequency of a topic mentioned by the Republicans but not the Democrats. We see that the Republicans focused on issues relating to *Liberals* and *'Leftist'*. However,

<sup>11</sup>Note that the names of candidates (i.e., Trump, Biden, Bloomberg ) were excluded from this overview.

one must note the relatively big difference in the frequency of mentions between the Republicans, with the highest being 5,049, and the Democrats, with the lowest being 11,771. This relatively big difference is due to the Republicans having 4.5x fewer ads posted than the Democrats, as mentioned in Section 6.1.

### 6.2.3 Lowest rank difference<sup>12</sup>

Term	Rank difference	Frequency Democrats	Frequency Republicans
President(-ial elections)	-0.00001	267k	136k
Florida (voting laws change and swing state)	-0.0002	14k	9k
Birthday (Donations as birthday gift)	-0.0004	36k	22k
Immigrants	-0.0005	4k	4k
Judge (criticism of Judges)	-0.001	1k	1.3k

**Table 4:** Top 5 topics mentioned common by both the Democrats and Republicans

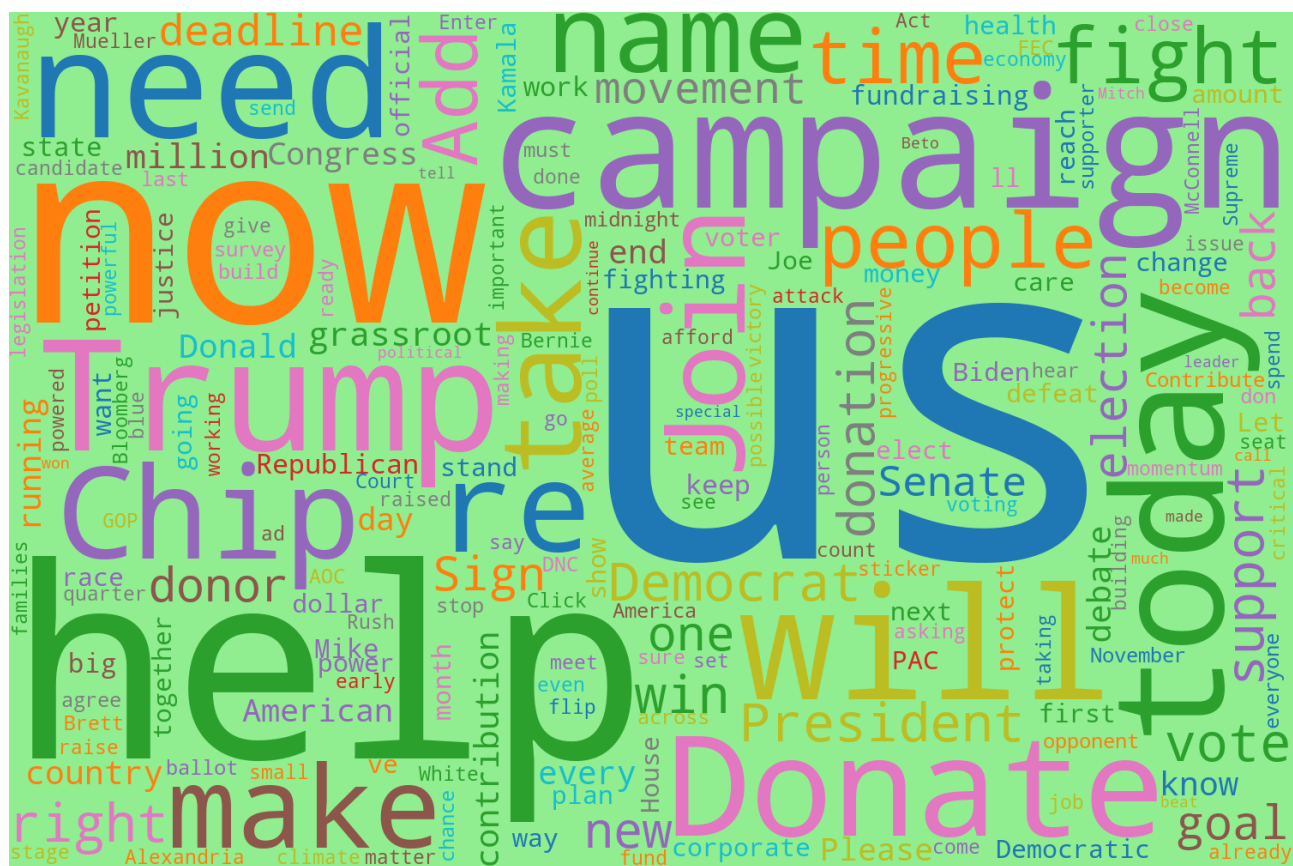
Table 4 depicts the common topics between both parties, with both parties mentioning *Elections and Donations*, which is in line with the top 5 topics mentioned by both parties, as described in Section 6.2.1.

## 6.3 Wordcloud

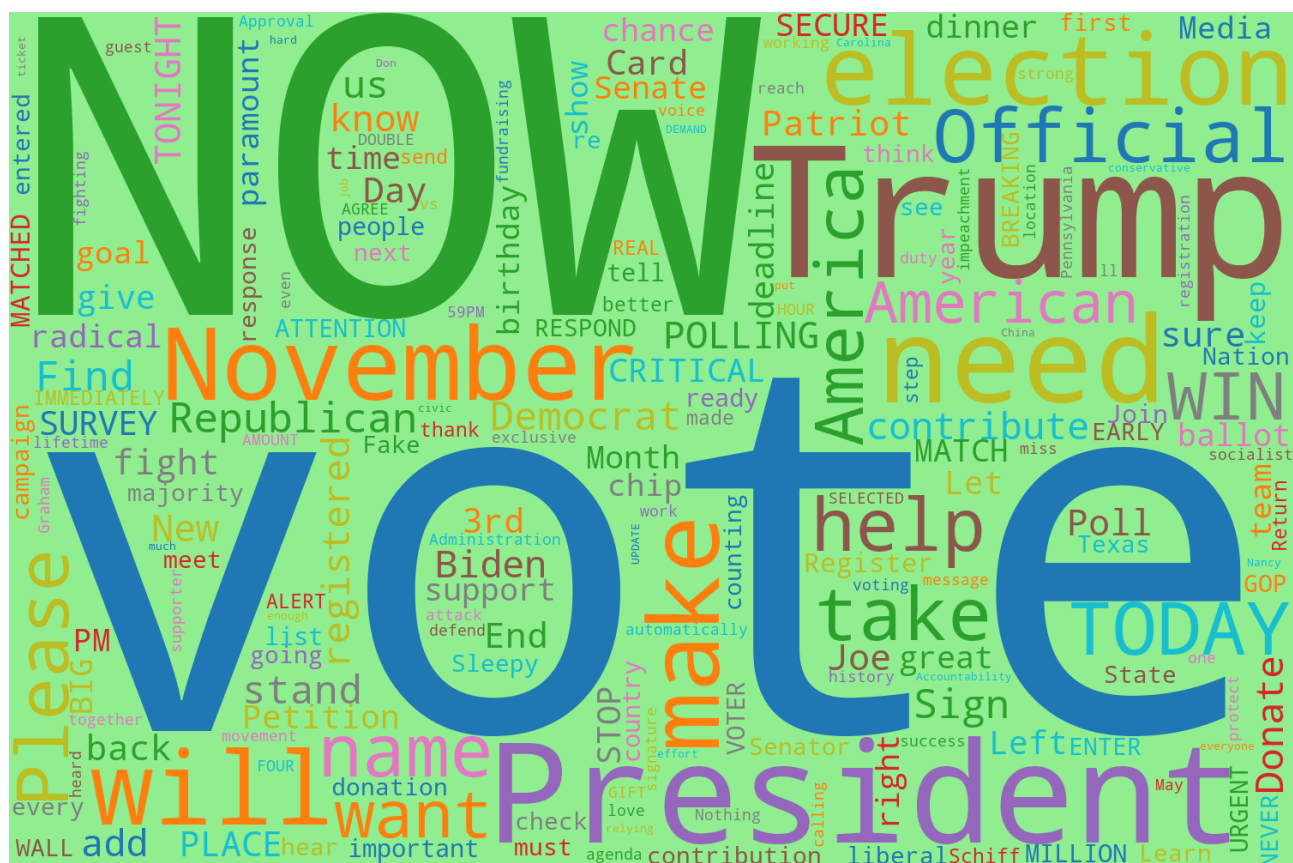
Figures 10 and 11 show the most frequently mentioned words of the Democratic and Republican parties, respectively, during the study period. For the Democrats, one notices donation requests and calls for action, such as *need*, *chip [in]*, *help*, *donate*, but also mentions of *Trump* and the Republican party. As for the Republican party, their word cloud is rather similar as it mostly also calls for action. There is little difference between the two word clouds.

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<sup>12</sup>Note that the names of candidates (i.e., Trump, Biden, Bloomberg ) were excluded from this overview.



**Figure 10:** Word cloud of all Democratic party ads in the research time frame, the bigger the word, the more often it was mentioned.



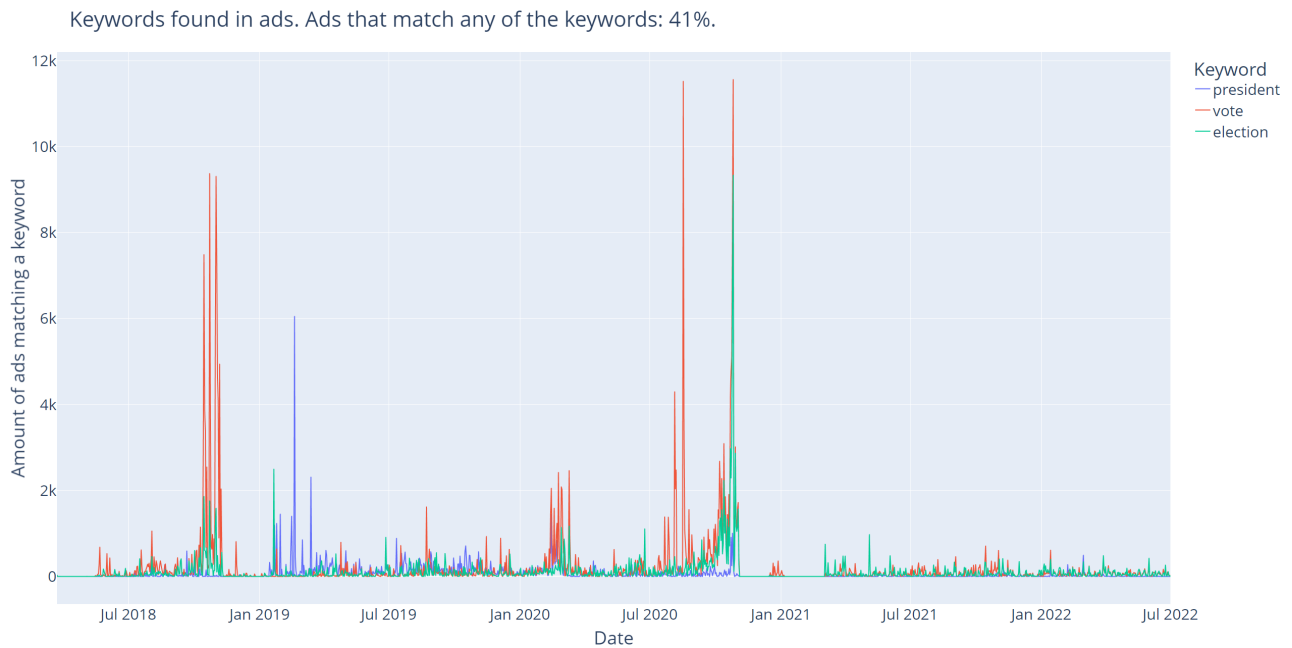
**Figure 11:** Word cloud of all Republican party ads in the research time frame, the bigger the word, the more often it was mentioned





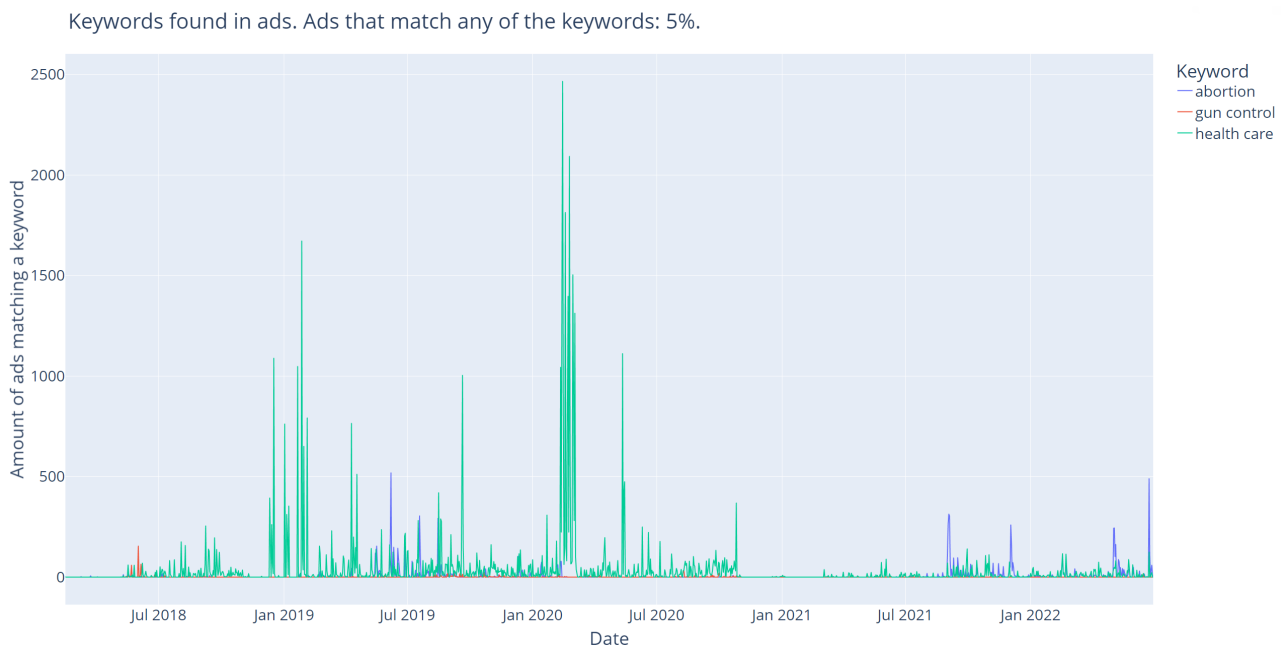






**Figure 14:** Overall mentions of the keywords *president*, *vote*, *election* over the advertising history of both parties

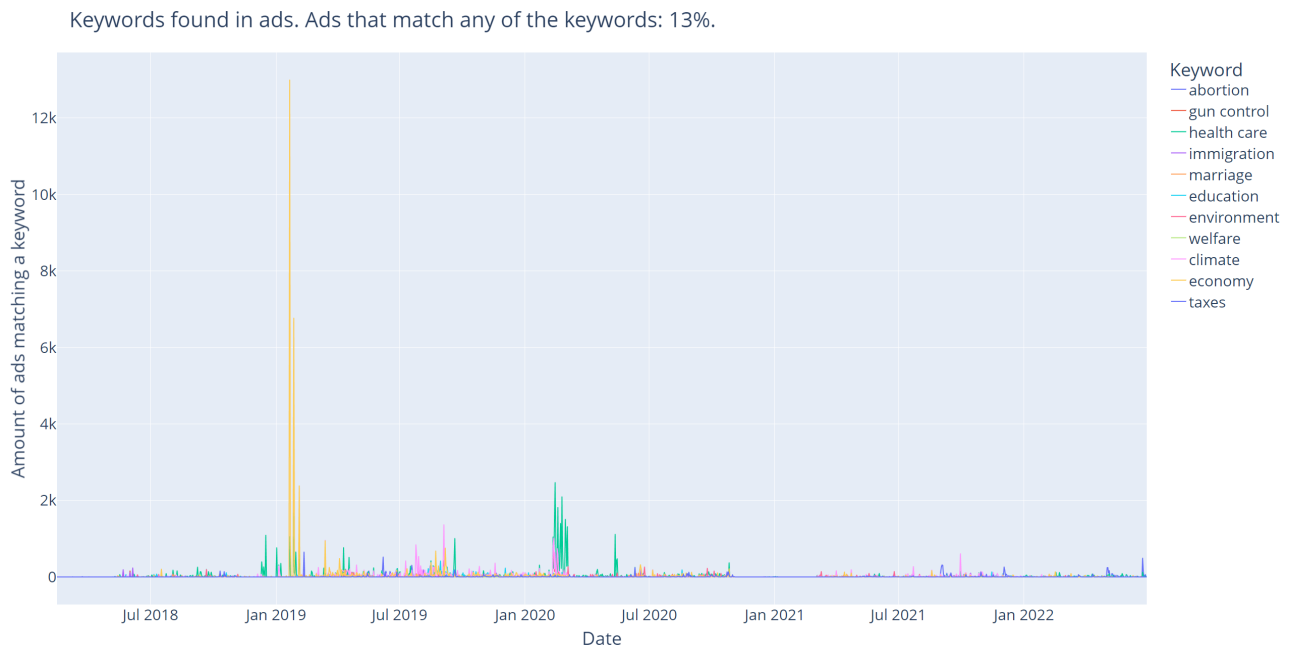
Compared to elections and campaign-related keywords, other prominent topics in the U.S., such as *abortion*, *gun control*, and *health care*, as shown in Figure 15, we notice a big difference in the frequency of advertising and the date of the spikes. While *health care* appears to be the central theme between these three topics, we see a surge in advertisements mentioning *abortion* in 2022. However, these three topics were only mentioned in 5% of the ads.



**Figure 15:** Overall mentions of the keywords *abortion*, *gun control*, *health care* over the advertising history of both parties

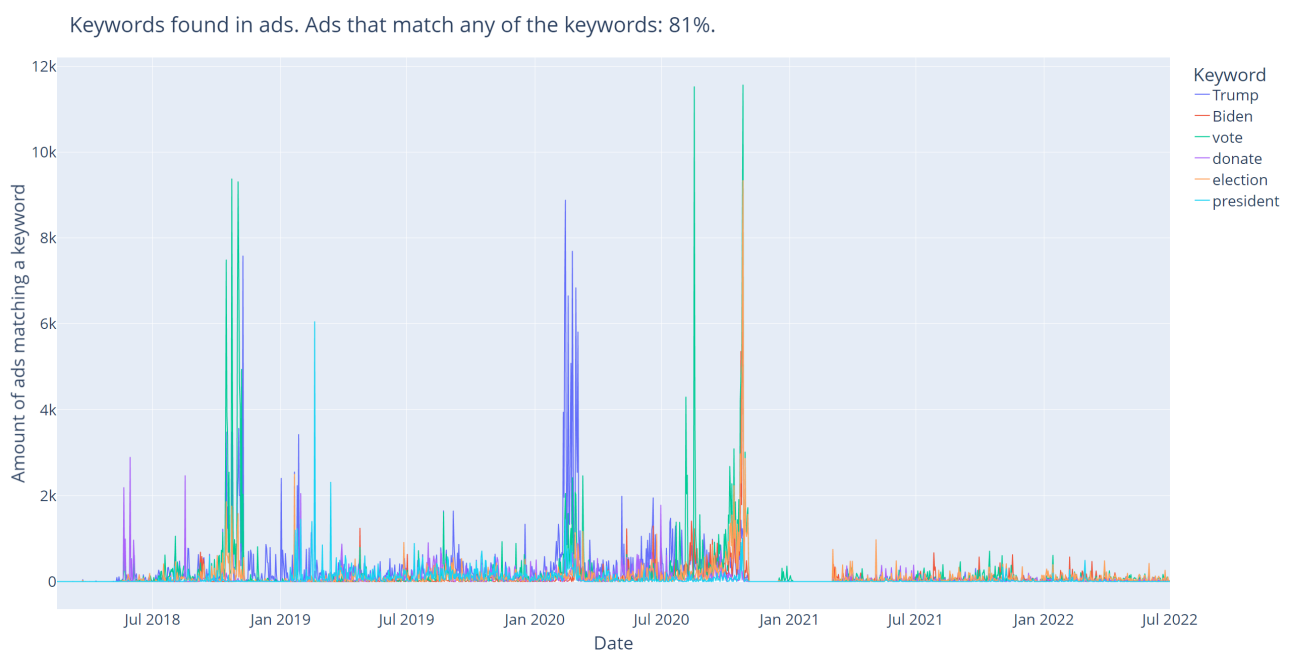
Indeed, when we include more relevant topics in the U.S. and globally to the list, such as *immigration*, *marriage*, *education*, *environment*, *welfare*, *climate*, *economy*, *taxes*, the percentage of ads mentioning them remains relatively low, namely 13%, as to be seen in Figure 16. This low percentage, combined with top topics mentioned by both parties in subsection 6.2.1 implies that both parties are more likely to advertise on Facebook and Instagram to mobilize voters rather than cover national issues. When examining periods with

many mentions of a specific issue (such as the peak in February 2019 in 16), we observed that although a specific issue was mentioned, in this case *gun control*, it was mostly used to refer to policies that the party supports on that issue, or to ask for support to pass legislation on the issue, or an opportunity to target the other party.



**Figure 16:** Overall mentions of the keywords *abortion*, *gun control*, *health care*, *immigration*, *marriage*, *education*, *environment*, *welfare*, *climate*, *economy*, *taxes* over the advertising history of both parties

Since Figure 14 features 41% of both parties' ads already with only three keywords, we used both parties' known topics and frequently mentioned words to arrive at a minimum set of keywords that were mentioned in 81% of the ads. These keywords continue to focus primarily on campaigns, votes, and donations, combined with the name of the leading candidates for the 2020 election, as shown in Figure 17.

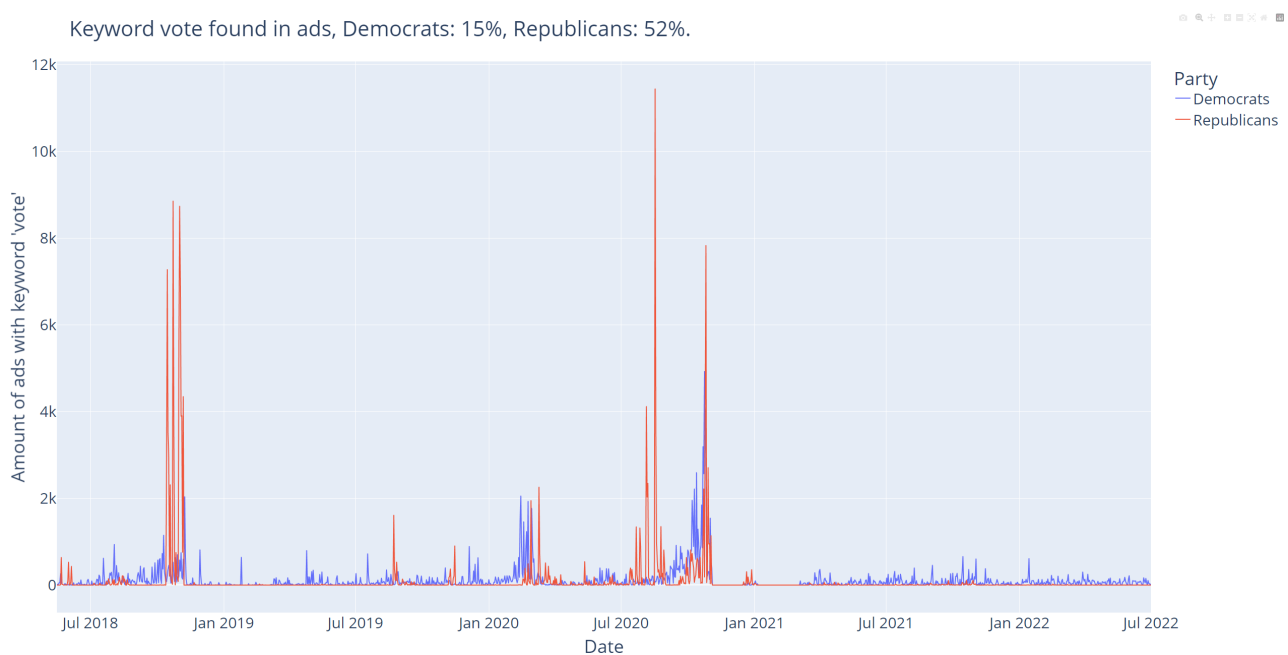


**Figure 17:** Overall mentions of the keywords *Trump*, *Biden*, *vote*, *donate*, *election*, *president* over the advertising history of both parties

## 6.5 Keywords differences between the two parties

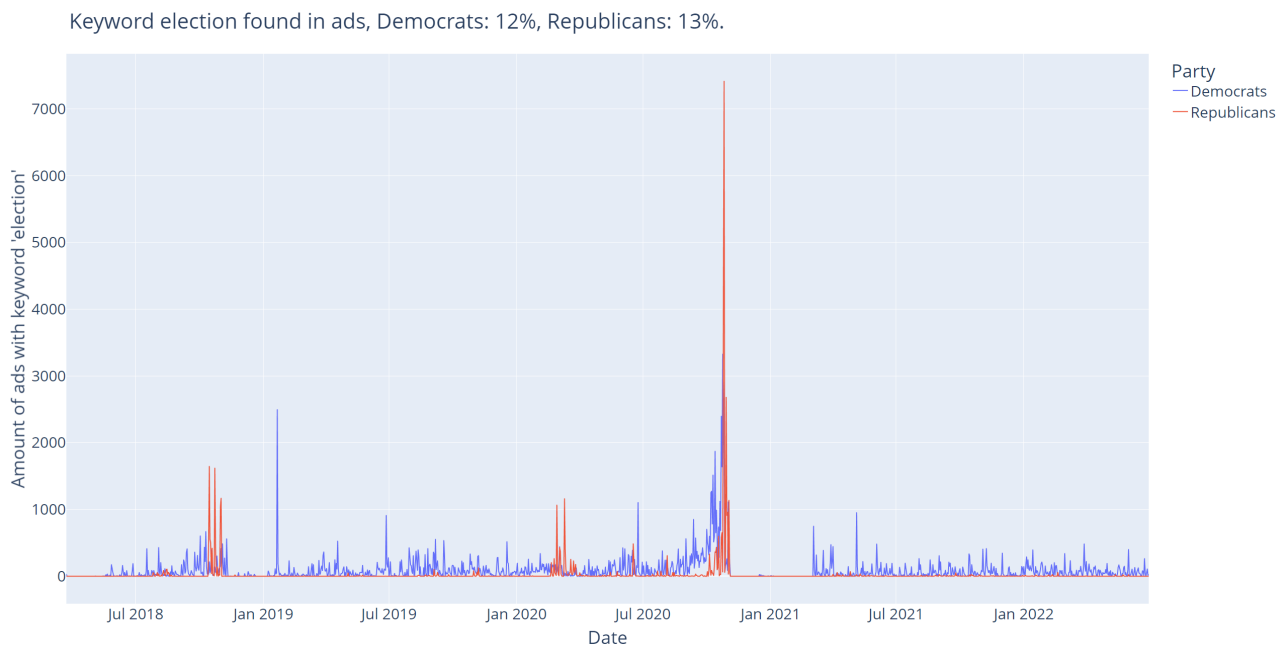
In order to better understand the differences between the two parties and the advertising practices of each party, it is essential to compare their advertising behavior with their coverage of particular topics over time. It is also important to compare on a party-by-party basis to determine whether the mentions shown in the previous subsection are heavily biased by one party, for example. Therefore, in this subsection, we compare their practices regarding important topics and keywords, highlighting their use of specific keywords over time, among the percentages of their advertisements in which this word was mentioned. We use both the word cloud and the top-mentioned topics as input for this subsection.

When it comes to the keyword *vote*, Figure 18 shows the use of it by each party over time. Surprisingly, the Republican party has used it in over 50% of their advertisements, while the Democrats in only 15% of their ads. Also, in this case, we see massive spikes around the midterm elections of 2018 and the presidential elections in 2020.



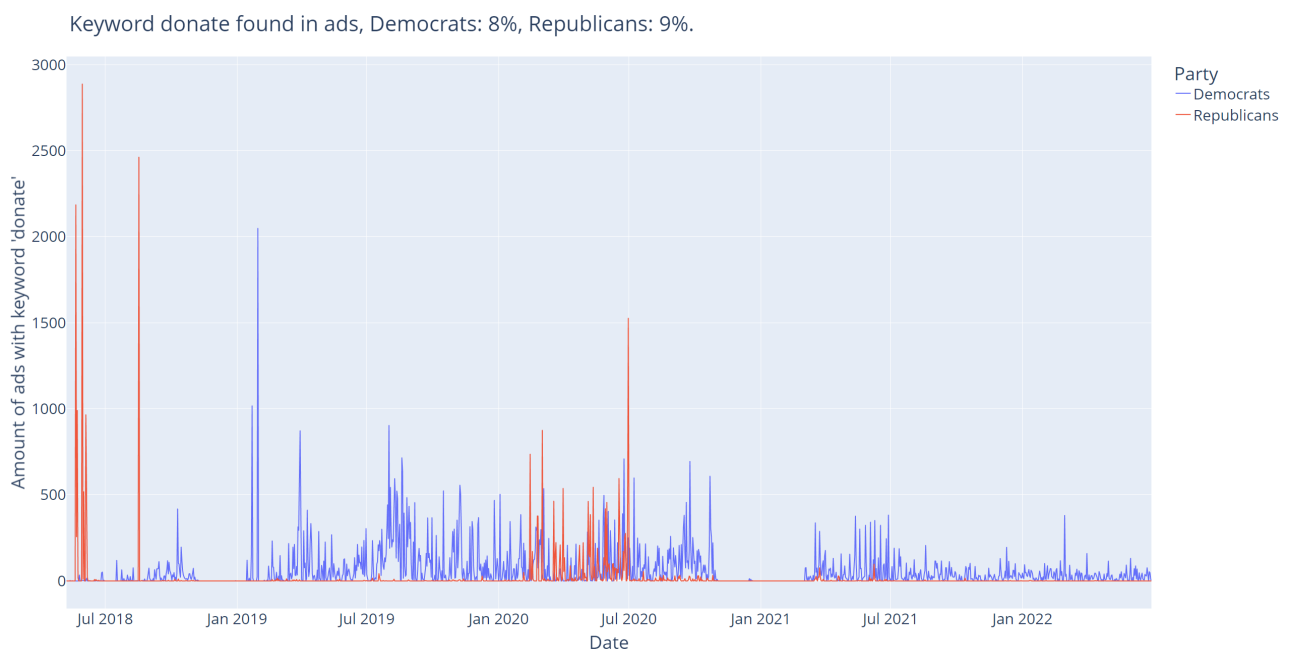
**Figure 18:** Overall mentions of the keyword *vote* per party over their advertising history, as a percentage of their total ads

Similarly, Figure 19 shows the use of the keyword *election* for both parties over time. Again, both parties have used it in approximately 12% of their ads, and together with the keyword *vote*, they are the top-mentioned keywords by both parties, alongside the leading candidates from both parties. These two figures support our earlier findings which suggest that both parties primarily used social media for voter mobilization and seeking donations and overall support for their party.



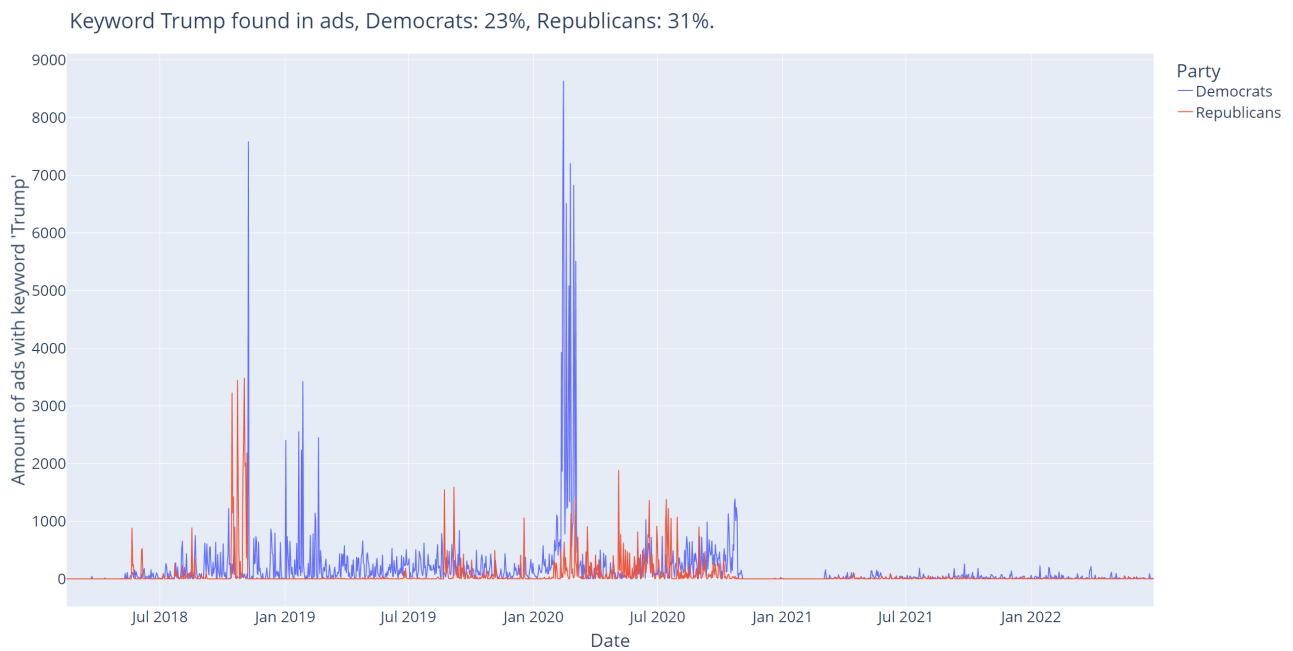
**Figure 19:** Overall mentions of the keyword *election* per party over their advertising history, as a percentage of their total ads

Seeking (financial) contributions by both sides took place mostly before the 2020 elections, and is done almost exclusively by Democrats thereafter.



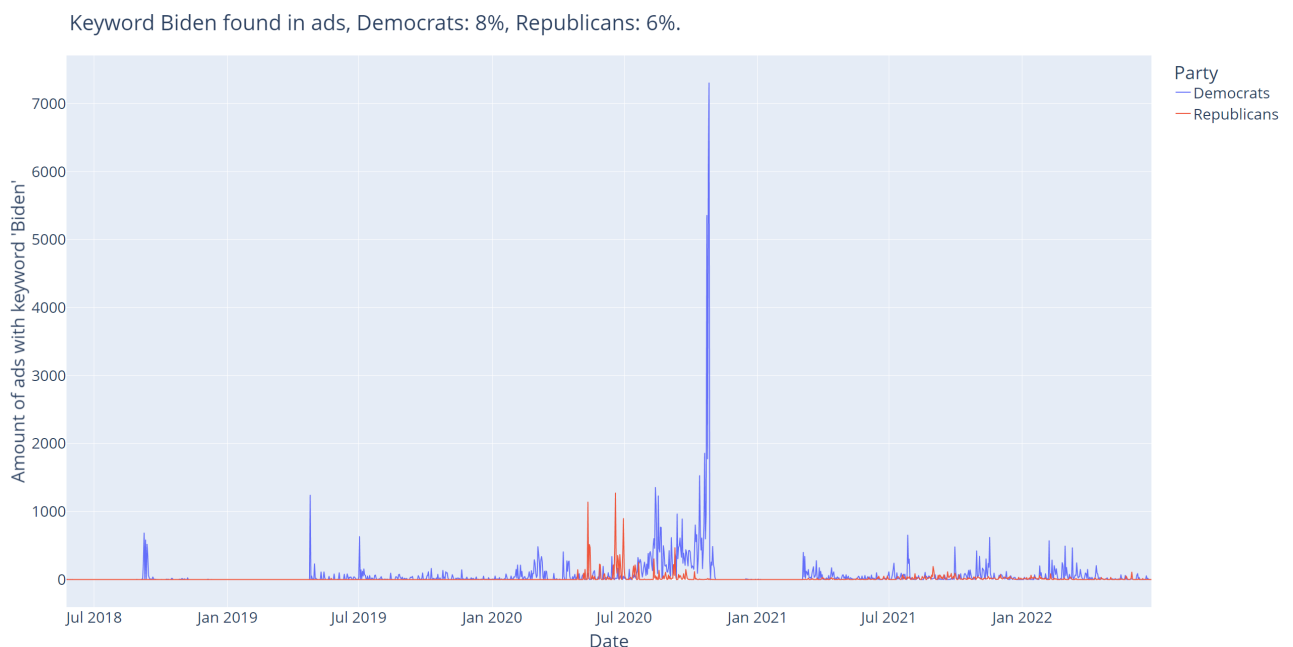
**Figure 20:** Overall mentions of the keyword *donate* per party over their advertising history, as a percentage of their total ads

The major candidates of both parties are also mentioned relatively frequently in the party's own ads and by the other party. For example, Figure 21 shows how often the word *Trump* is mentioned over time and its total mention as a percentage of the total number of ads. The Republicans mentioned Trump in 31% of their ads, while that percentage for the Democrats was 23%. However, since we know that the Democrats had four times as many ads, in absolute numbers, the Democrats seem to have mentioned Trump more often. Interestingly, the peaks of **Trump's** mentions by neither party were near the 2020 election. The Republicans peaked around the 2018 midterm elections, while the Democrats' mentions focused on early 2020.



**Figure 21:** Overall mentions of the keyword *Trump* per party over their advertising history, as a percentage of their total ads

A similar story is to be observed for *Biden* with the candidate's party mentioning them more often than the other party. In contrast to *Trump*, however, the Democrats have mainly and almost exclusively mentioned their primary candidates around the 2020 presidential election. These mentions could be both negative or positive. We expect each party to be positive regarding their candidate and critical of the other party's candidate, but further analysis would be needed to confirm this.

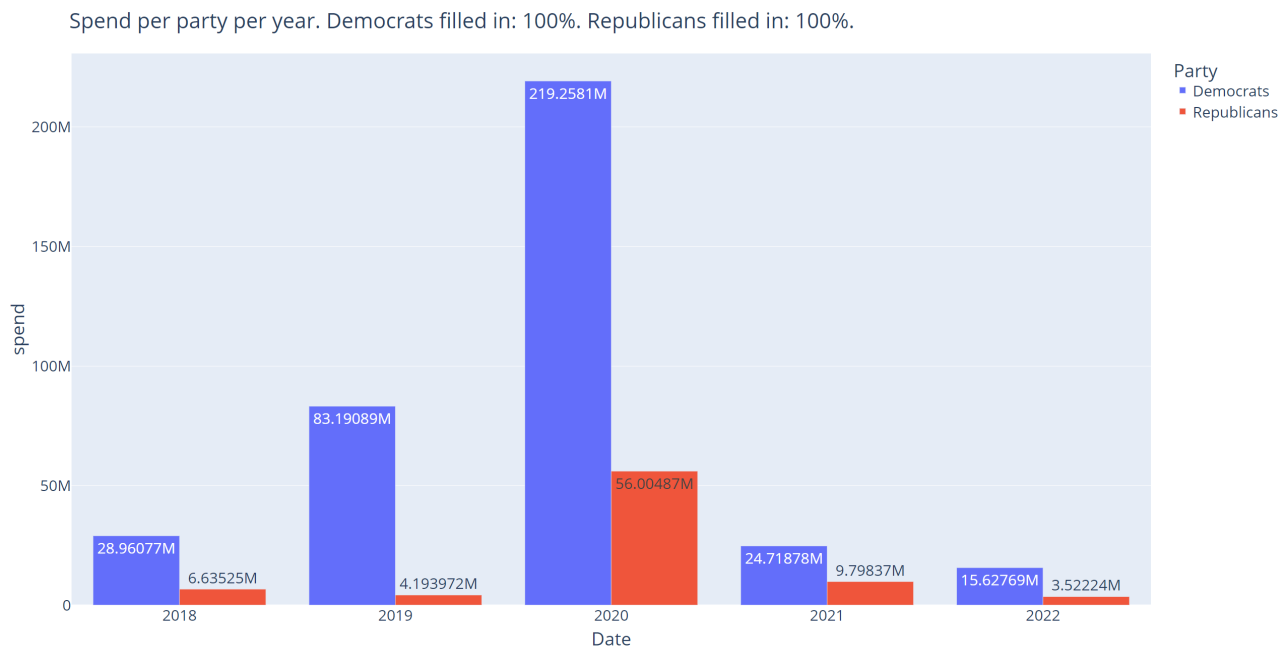


**Figure 22:** Overall mentions of the keyword *Biden* per party over their advertising history, as a percentage of their total ads

This section provides insight into the strategies employed by both parties on social media platforms, specifically Facebook and Instagram, which primarily aim to encourage action rather than to persuade individuals or alter their perspectives on a specific issue. It is worth noting, however, that the major candidates are frequently mentioned in the ads, which may indicate that the parties are targeting each other's candidates.

## 6.6 Trends in spending

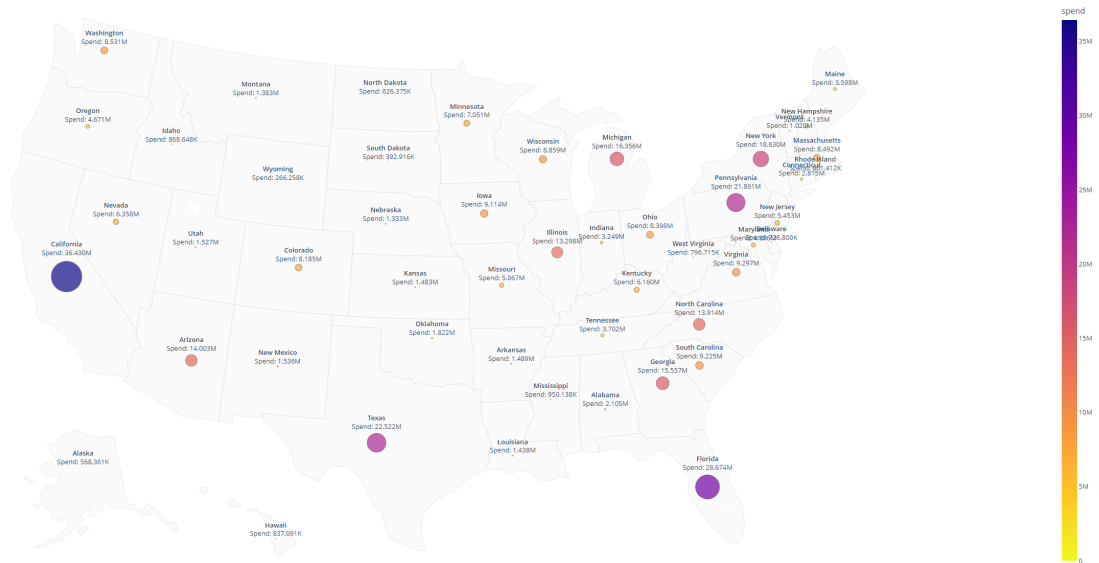
Figure 23 displays the spend per party over the years, with the data for 2018 and 2022 being incomplete, due to limitations by Facebook and the timing of this research, respectively. We see a clear peak in spending in the presidential election year, namely 2020, by both parties. However, spending in the midterm year, namely 2018, is lower than that of 2019. This noticeable difference is possibly due to most spending being in the first few months of the year, as Facebook only made data available that goes back to May 7, 2018, which implies that spending from approximately the first half year is not included in the figure below. While the overall spending by Democrats is higher than that of the Republicans, they seem to spread their spending over the years. For instance, the Democrats spending in 2020 is merely two and a half times that of 2019, which is, in turn, three times higher than that of 2018, while the Republican's spend in 2020 is approximately 14 times higher than that of 2019. This suggests a slight difference in strategy when it comes to spending on OPA, as Republicans' spending was much more concentrated on the presidential election year compared to the Democrat's.



**Figure 23:** Spend in millions, per party per year. Note that the data for 2018 and 2022 are not complete, and that the spend is an estimate and not an exact number, as mentioned in 6.1

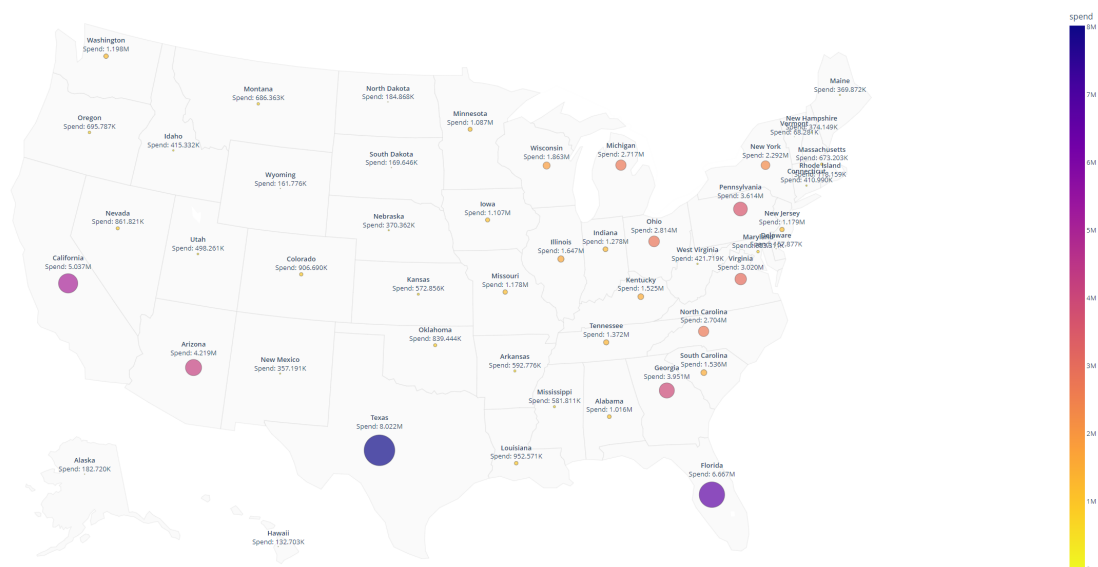
Moreover, little data is available (in 67% of cases for Democrats and 56% for Republicans) on where each ad was placed. Nevertheless, this data can be used to estimate spending by state. Both parties focus their spending on 5 out of 50 states, as shown in Figures 24 and 25, representing about 35% of total spending. These states are California, Texas, Florida, Pennsylvania, and New York. After normalizing the spending by state to the total spending by party, the spending by state is surprisingly similar, except that Texas is an outlier for the Republicans because they do a large portion of their spending there, and the same is true for California for the Democrats.

Distribution spend of ads of Democrats. Ads with spend data: 67%. Total spend: 350.534M



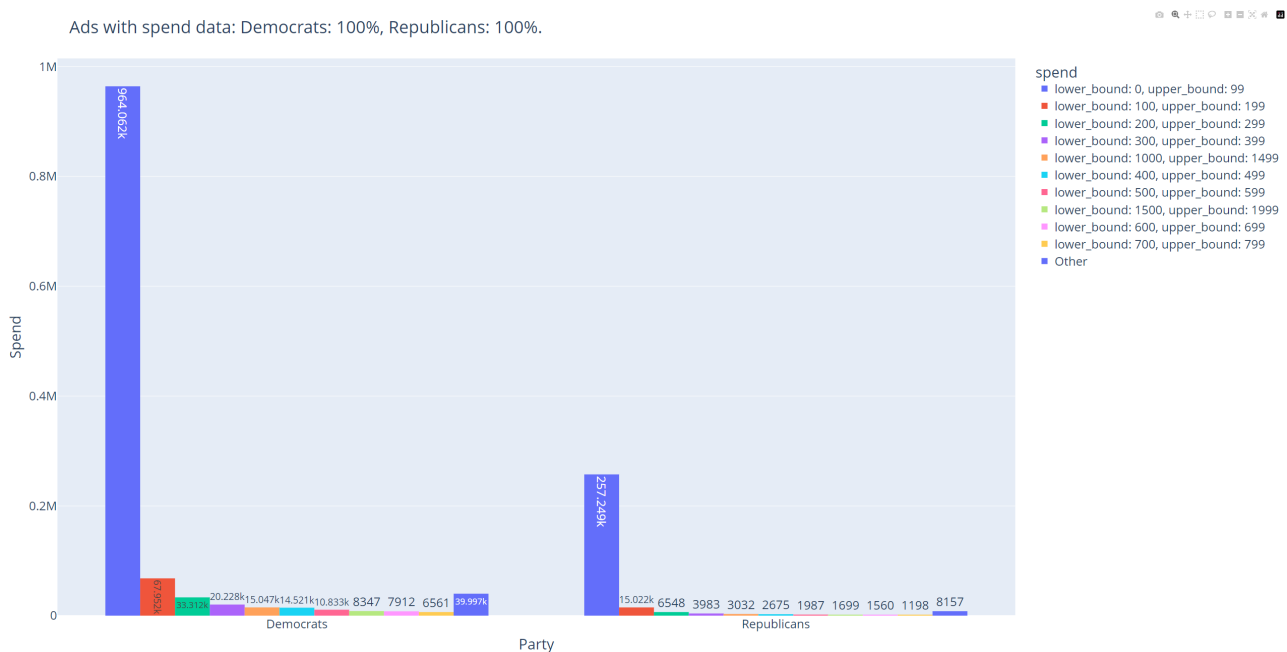
**Figure 24:** A spend geomap of the Democratic party highlighting the states in which the most money was spent on advertising

Distribution spend of ads of Republicans. Ads with spend data: 56%. Total spend: 73.483M



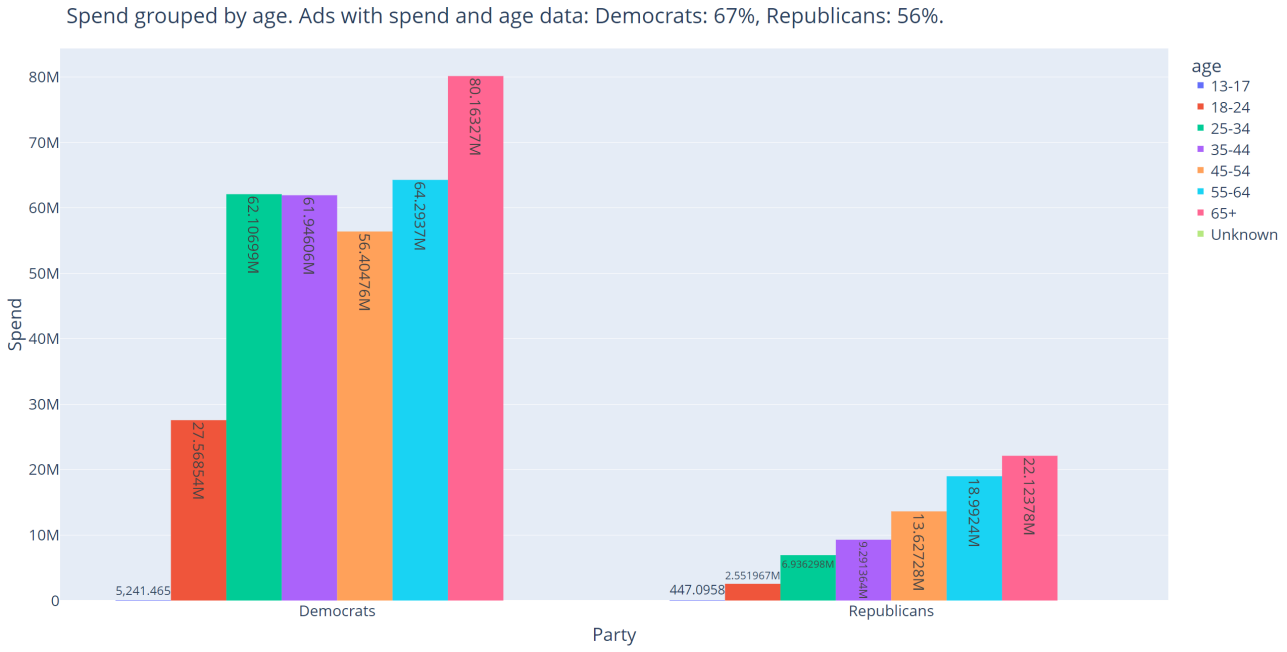
**Figure 25:** A spend geomap of the Republican party highlighting the states in which the most money was spent on advertising

We also examine the amount of money spent on each ad campaign and the distribution of these amounts. Both parties spend less \$100 on most of their ad campaigns, as seen in 26. Such distribution may suggest that they spend most of their money lightly across many ad campaigns instead of spending heavily on a few ad campaigns. However, does not exclude the possibility that these campaigns are different runs of the same campaign at different times, resulting in considerable amounts being spent on a few campaigns. When looking further into the data, one can notice a normal distribution pattern with a positive skewness (i.e., right-skewed) in the amounts of money spent per campaign.



**Figure 26:** Total spend amounts per party, highlighting how much parties spend on ads. Note that the spend is an estimate and not an exact number, as mentioned in Section 6.1

Finally, limited data (in 67% of the cases for the Democrats and 56% for the Republicans) is also available on which age groups the parties targeted the most by which party, as can be seen in 27. We notice increased spending as voters get older, which is more noticeable in the Republican's case than in the Democrat's spending patterns. It is unclear why parties seem to spend more on older voters (except that, logically, almost nothing is spent on the age group 13-17 as this group cannot vote). We theorize that this is due to the aging US electorate and because the share of people belonging to the 65+ age group who are registered to vote is the highest (almost 80%) compared to the other age groups [80].



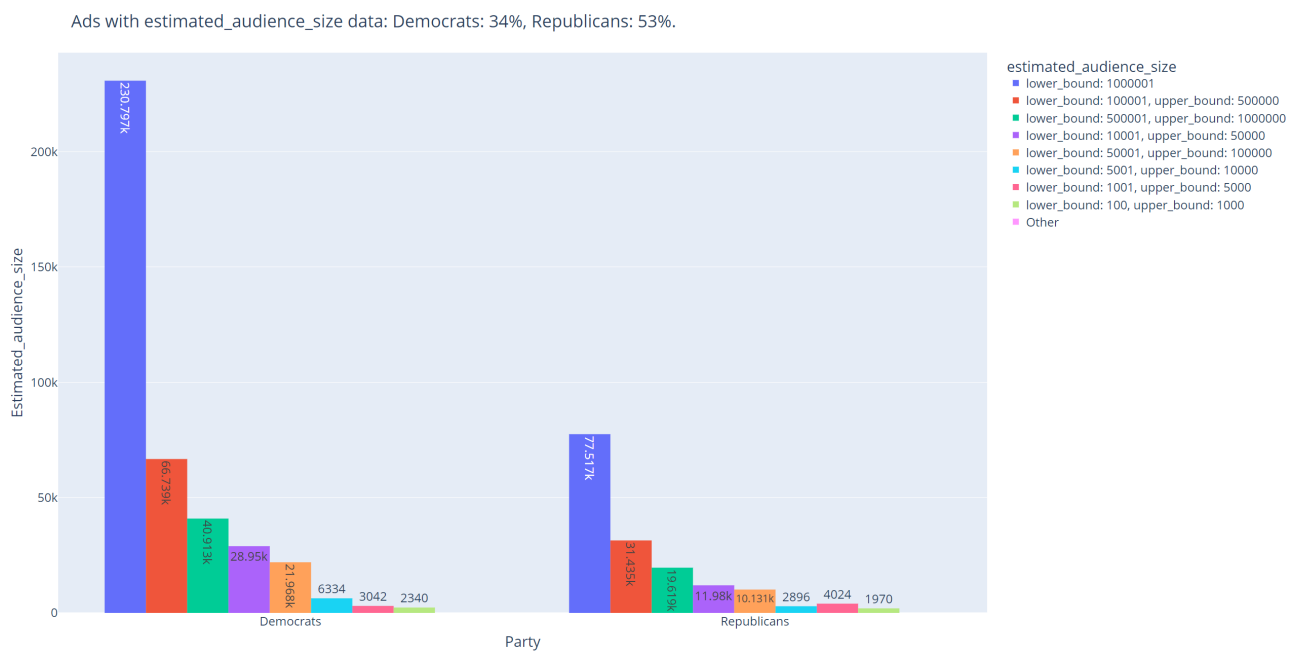
**Figure 27:** Total spend per age group per party, highlighting how much parties spend on ads on different age groups. Note that the spend is an estimate and not an exact number, as mentioned in Section 6.1



## 6.7 Impressions and estimated audience size

*Estimated audience size* is a metric that estimates how many people meet the targeting and ad placement criteria that advertisers select while creating an ad [1]. *Impressions*, on the other hand, is the number of times an ad entered a person's screen (and thus most likely seen) [2]. The latter is crucial to understanding and estimating how many people are reached by ads paid for by both parties. In both metrics, there is little to no difference between the two parties.

Figure 28 shows that, in general, most ad criteria set by both parties are generic, as in most cases, the estimated audience size is above a million. Unfortunately, Facebook does not show how many people exactly, as this could be 2 million or 100 million. Next to this, the data's availability is limited. In only one-third of the ads published by Democrats, this metric is available, with only half the ads published by Republicans. It is unclear why there is a discrepancy in the data's availability. However, we notice that a non-negligible amount of ads (purple bar plot) is set to criteria that only target 10,000 to 50,000 people. One might assume this to be a form of micro-targeting, given the small number of individuals. However, due to data unavailability, it is challenging to ascertain what ads were served to this group, whether the same campaign was run on a larger scale, and whether this is a local variation of it in a particular state or whether it was indeed a form of micro-targeting.



**Figure 28:** Estimated audience size of by both parties

As for people who saw the ads (Figure 29), we see that the majority of ads were only seen by a few thousand people, with most of them only being seen by hundreds of people. This figure correlates with the spending on ads, as the more a party spends, the more widespread its campaign will be.

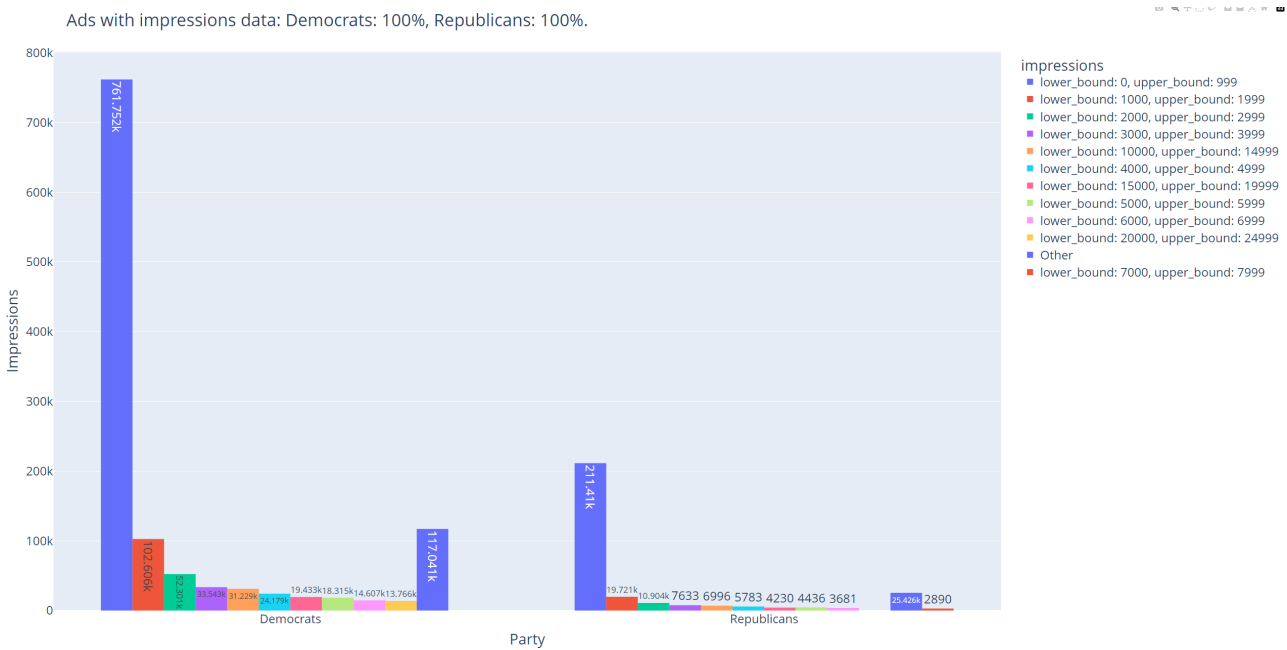


Figure 29: impressions reached by ads placed by both parties

6.7.1 Gender

While the data completeness when it comes to impressions, spending, and estimated audience size per gender is very limited, it still does paint an idea of whether or not parties do advertise to a specific gender more than others. Facebook has genders classified into three categories, *female*, *male*, and *unknown*. It should be noted that the figures shown in Figure 30 represent the total number of people reached by all ads, therefore it is not possible to determine which campaigns specifically targeted a certain gender. This is due to the fact that ads are not grouped into campaigns in the data provided by Facebook and are instead available on an ad-by-ad basis. Facebook also does not provide which campaign existed of which ads. However, the graph does show that when the data is normalized, the *unknown* category is double the size in the case of Democrats compared to Republicans, implying that the filters set by the Democratic advertisers include more people identifying as *other* compared to Republicans. Furthermore, the Democrats' filters are much more leaning towards *males* compared to *females*, which is not the case for Republicans.

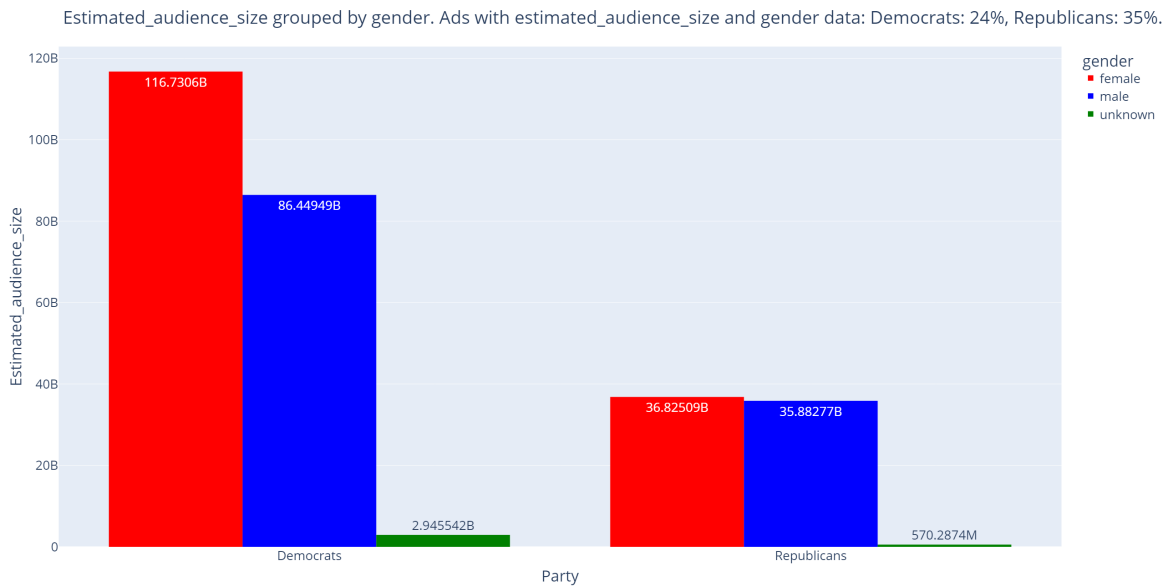
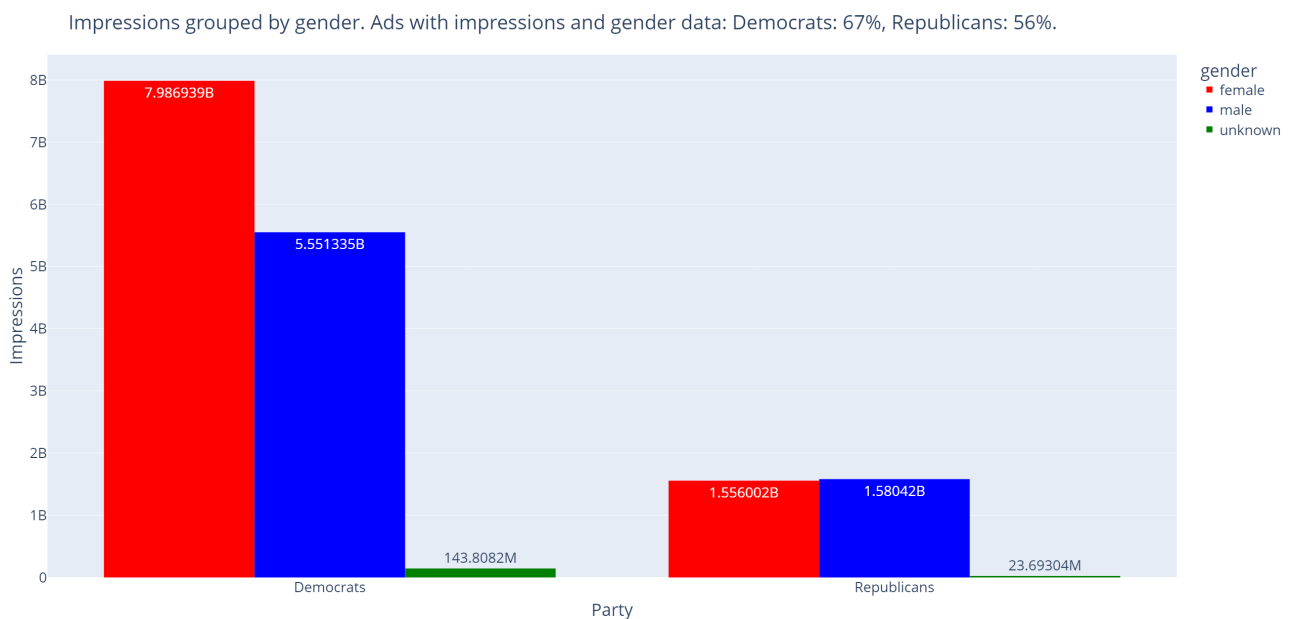


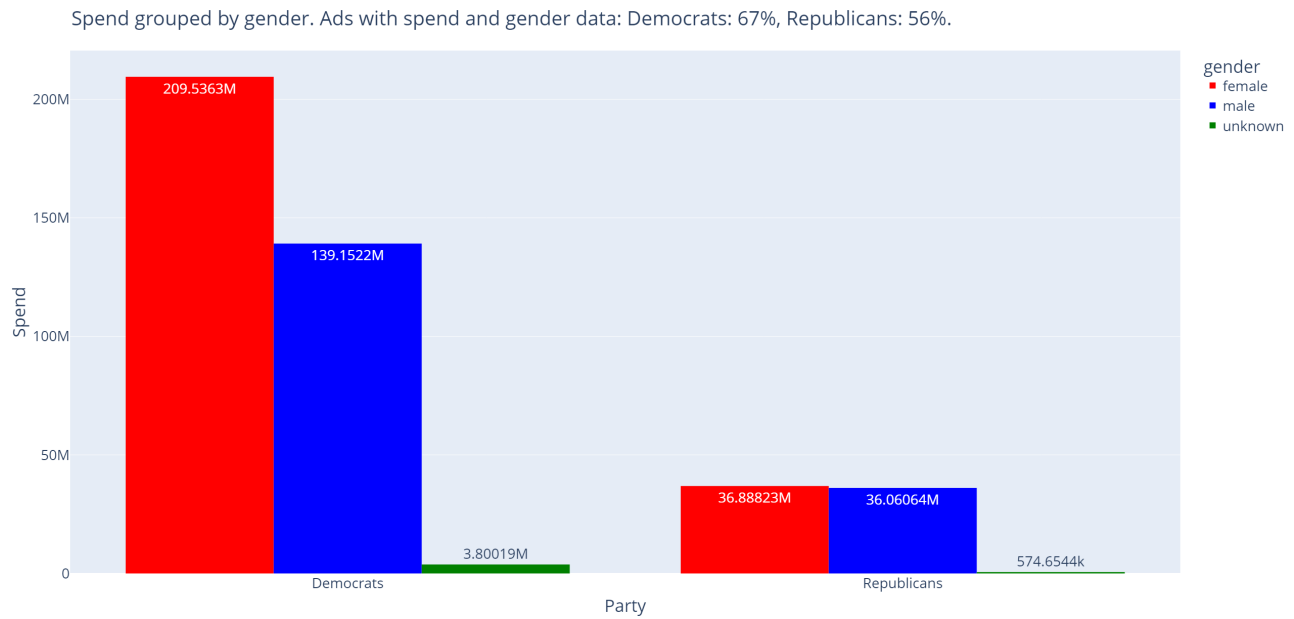
Figure 30: Estimated audience size per gender category

Looking closer at the actual impressions reached by gender, as shown in Figure 31, the data overlaps clearly with the estimated audience size and thus does not imply any abnormalities. The figure does, however, show that 13.6 billion (note that the data is incomplete and this is an estimate and not an accurate number, see Section 6.1) people were reached by Democratic ads. The Republicans' ads reached 3 billion people. This difference in number is also aligned with the multiplier of spending, as the Democrats spent approximately 4.5x more on advertising on Facebook platforms than the Republicans, as explained in Section 6.1. To put these numbers into perspective, the amount of American Facebook users is estimated to be 240 Million in 2022 [70], with approximately 200 Million using Facebook at least monthly [22] [46]. Such disparity in number of people reached and active monthly users imply that each month, the average user is exposed to 80 ads. While there are no official statistics on this matter, our numbers are much lower than the estimate of 36 ads a day [45].



**Figure 31:** impressions grouped by gender for both parties

Finally, we investigated the spend per gender, which also overlaps largely with the estimated audience size, implying no abnormalities, as can be seen in Figure 32.



**Figure 32:** Spend grouped by gender for both parties

When further investigating the male vs female targeting by advertisers, we used the (incomplete) data available in the demographic distribution (people reached by the ad, as explained in Section 5.2), to determine the gender ratio of an advertisement and whether a certain gender was targeted by one of the parties more than the others. For example, on Facebook in the US, there are more females than males on the platform, with females accounting for approximately 54% of the total users in the country [79]. Table 5 shows the percentages of advertisements reached by at least a certain percentage of a gender<sup>13</sup>, and is to be interrupted as follows.

	Dem 50%	Rep 50%	Dem 80%	Rep 80%	Dem 95%	Rep 95%
Male	27.14%	48.25%	3.46%	1.15%	2.50%	0.13%
Female	69.77%	49.24%	7.39%	1.41%	3.69%	0.46%

**Table 5:** Table showing the percentages of ads served to at least a certain percentage of Facebook users identifying with the *Male* and *Female* genders

For the Democrats, our data has revealed that 69.77% of their ads had an audience of at least 50.0% female. In contrast, 7.39% of the ads had an audience of at least 80.0% female, and finally, 3.69% of their ads had an audience of at least 95.0% female. To give perspective to these percentages, the Democratic party had launched approximately 1.2 million ads during the time range of this research.

These percentages imply that the majority of their ads (approximately 70%), had at least a ratio of 50% females while more than 7% had been served to at least 80% females. On the other hand, only 27% of their ads had a ratio of at least 50% males. Our data suggest that male Facebook users in the US were much more targeted than females. However, One thing to note about this statistic is that unclear whether these were served to a specific gender because of the filters set by the advertiser or Facebook targeting these specific users, combined with the fact that the data is largely incomplete (approximately only available in 50% in the records), which makes it challenging to draw any meaningful conclusions regarding any micro-targeting.

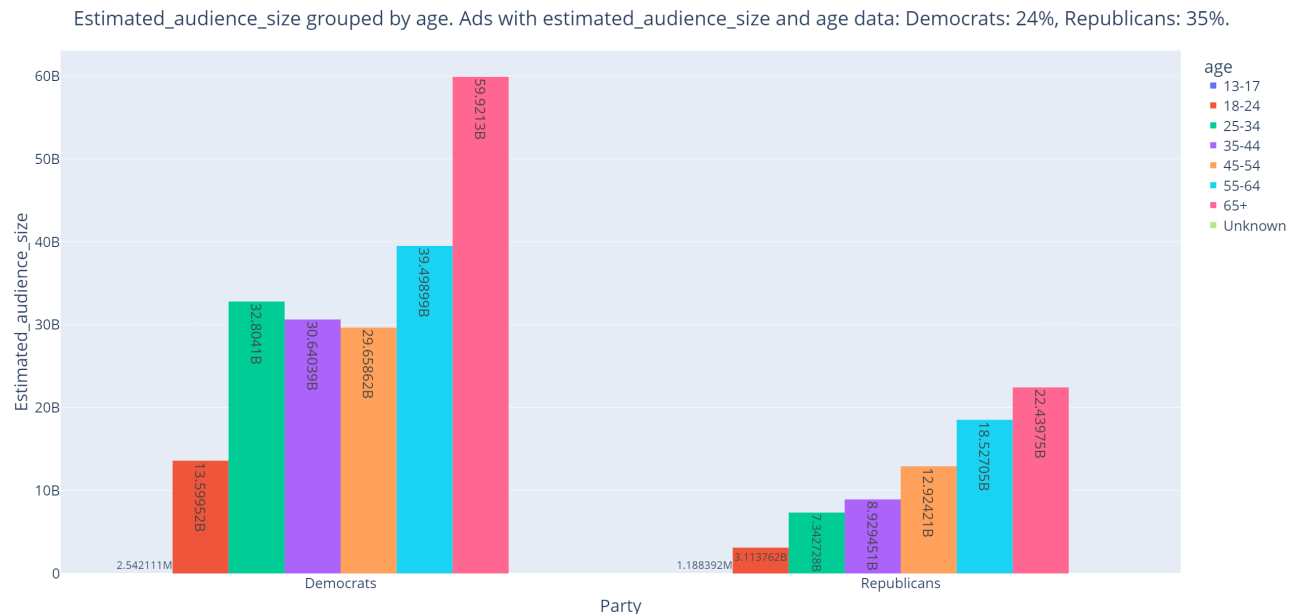
As for the Republicans, 49.24% of the ads had an audience of at least 50.0% female, while 1.41% of their ads had an audience of at least 80.0% female, and finally, 0.46% of their ads had an audience that consists of at least 95.0% female. To give perspective to these percentages, the Republican party had launched

<sup>13</sup>Such statistics are not available on the gender classification *Unknown*

approximately 300,000 ads during the time range of this research. Therefore, these numbers overall are more in line with the overall representation of these two genders on the platform, compared to the numbers of the Democrats, and suggest that the republican party had an equal split in the genders their ads reached.

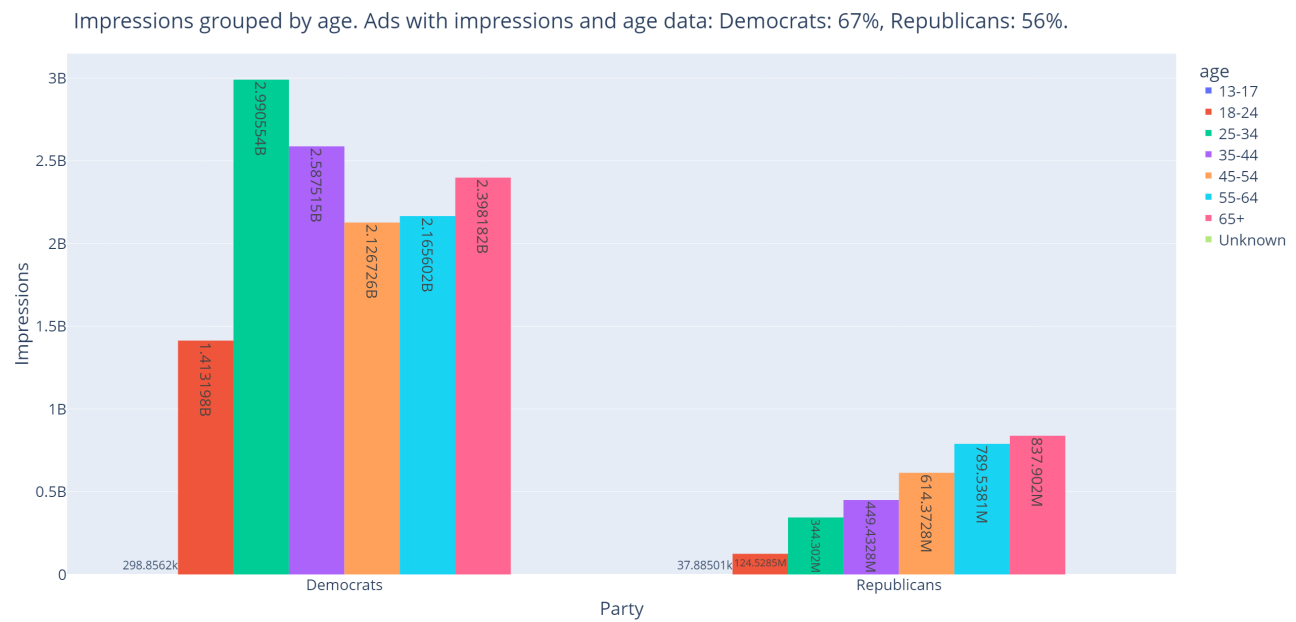
### 6.7.2 Age

The statistics on gender in the previous subsection 6.7.1 were also performed on Age groups. Figure 33 shows that the estimated audience size is generally larger with older age groups.

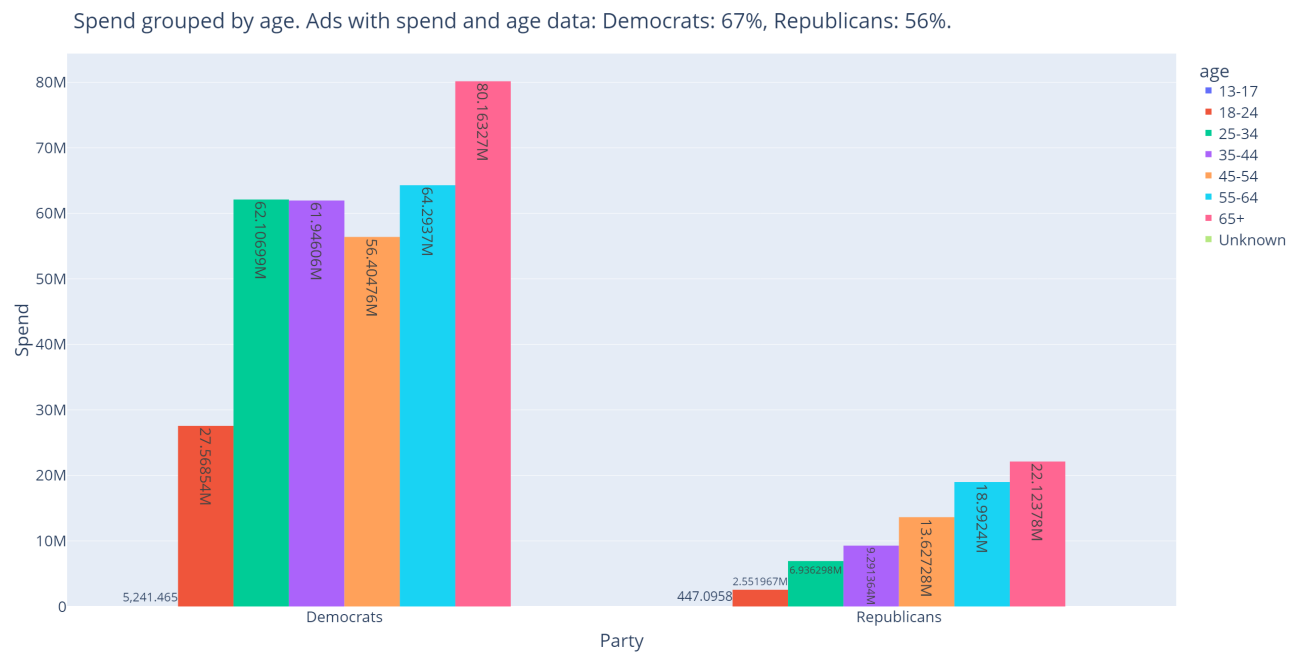


**Figure 33:** Estimated audience size grouped by age

However, Figure 34 indicates that the ads displayed on people's screens do not correlate with the number of people meeting the advertising criteria, in case of the Democrats. The Democrats' most reached age group is people between 25-34 years old, with the second largest being 35-44. These numbers are somewhat different from those of the Republicans, as their most reached age groups were 55+. While this may have been a clear strategy by the Democratic party to target young people and by the Republicans to target somewhat senior citizens, it may also have been Facebook's ad-matching algorithm. We suspect that it is the latter given that Figure 35 illustrates that the spend does not correlate with the impressions but rather with the estimated audience size. This remains conjecture, however, as there are also ways to manipulate the data to show spending differently from impressions.



**Figure 34:** impressions grouped by age for both parties



**Figure 35:** Spend grouped by age for both parties

## 6.8 Audience-related attributes

### 6.8.1 Publisher platforms

Most ad campaigns by the Democratic party were launched on Instagram and Facebook together, as seen in Figure 36. However, approximately 40% of the ads were exclusively published on Facebook, whereas less than 5% were published on Instagram exclusively. As for Republicans, 60% of their ads were exclusive to Facebook, while the rest was on both Facebook and Instagram. Only a minimal amount was solely advertised on Instagram. The focus of Republicans on Facebook could be due to the age group distribution; as we have highlighted earlier that Republicans spend more on targeting senior citizens compared to Democrats, and these are believed to be more prominently active on Facebook. The percentage of people aged 55+ on Facebook to be 22.2%, while on Instagram, it is 11.3% [20] [78].

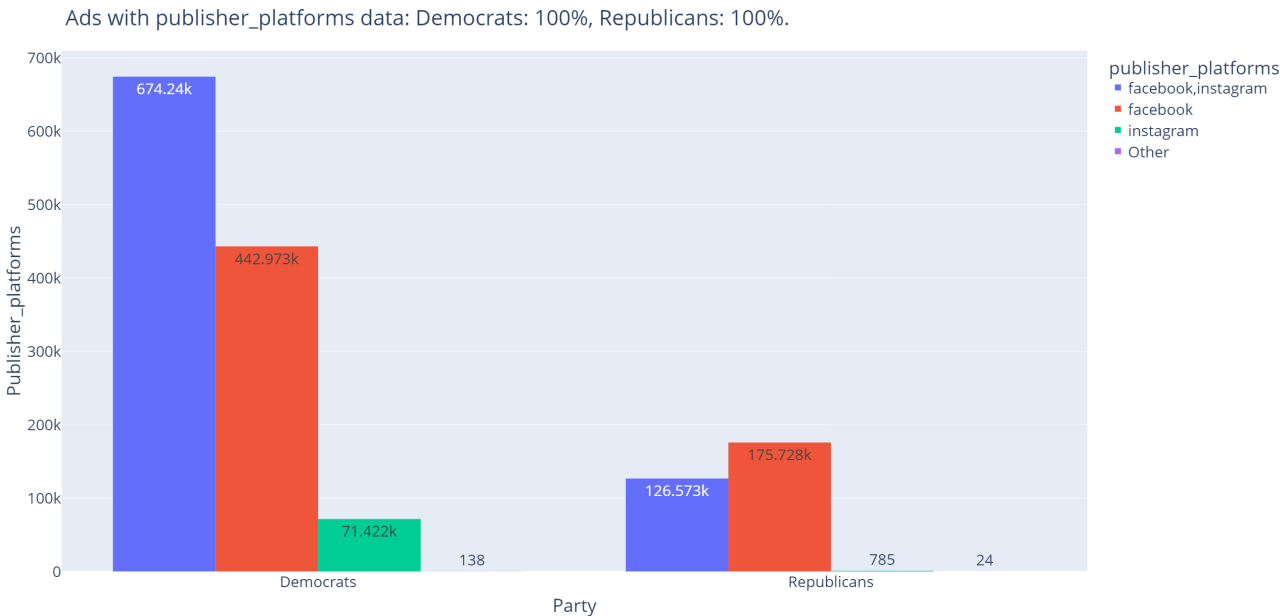


Figure 36: Publisher platforms for ads published by both parties

6.8.2 Advertising languages

As anticipated, +99% of the ads placed by both parties were in English. However, the Democratic party advertised in more languages than the Republicans. Democrats advertised in Spanish, Chinese, Vietnamese, Bengali, and Korean, while Republicans only advertised in Spanish and Vietnamese. Language statistics can be seen in Figures 37 and 38.

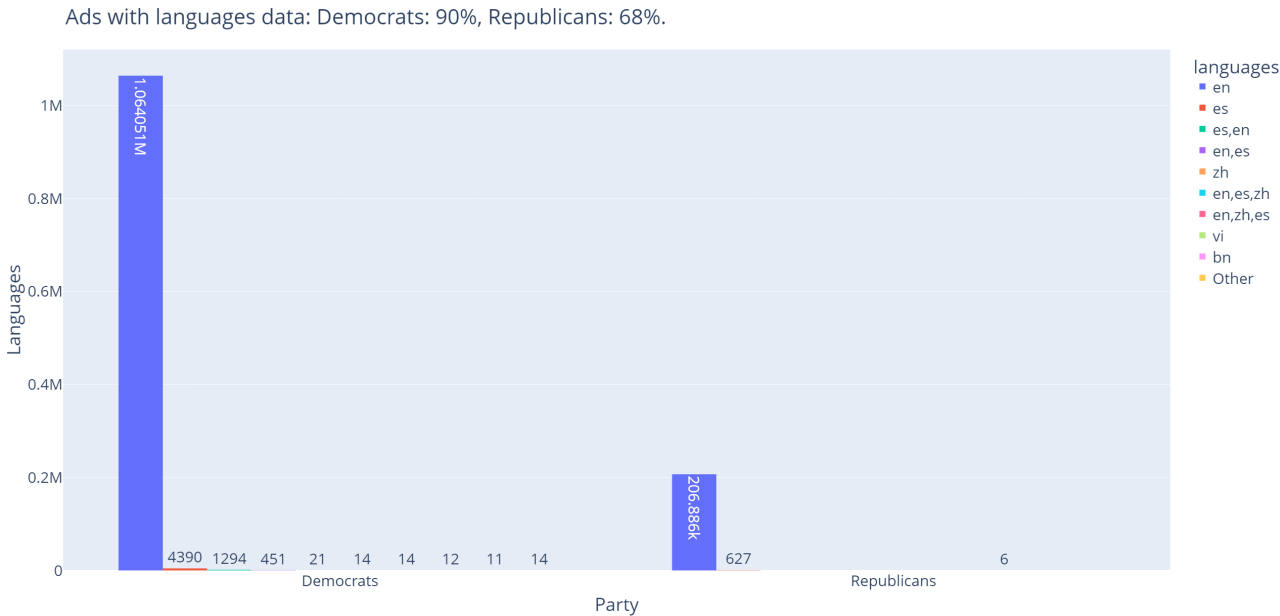
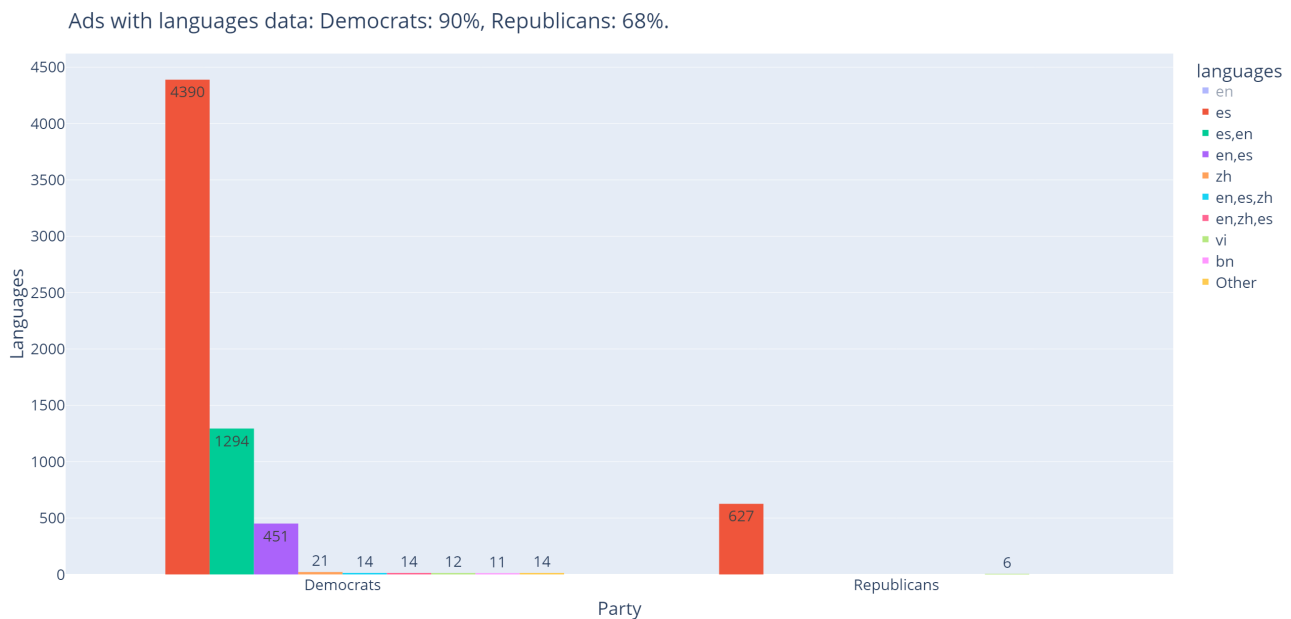


Figure 37: An overview of the languages used in advertisements by both parties



**Figure 38:** An overview of the languages used in advertisements by both parties, excluding English

## 6.9 Advertising structures and money flows

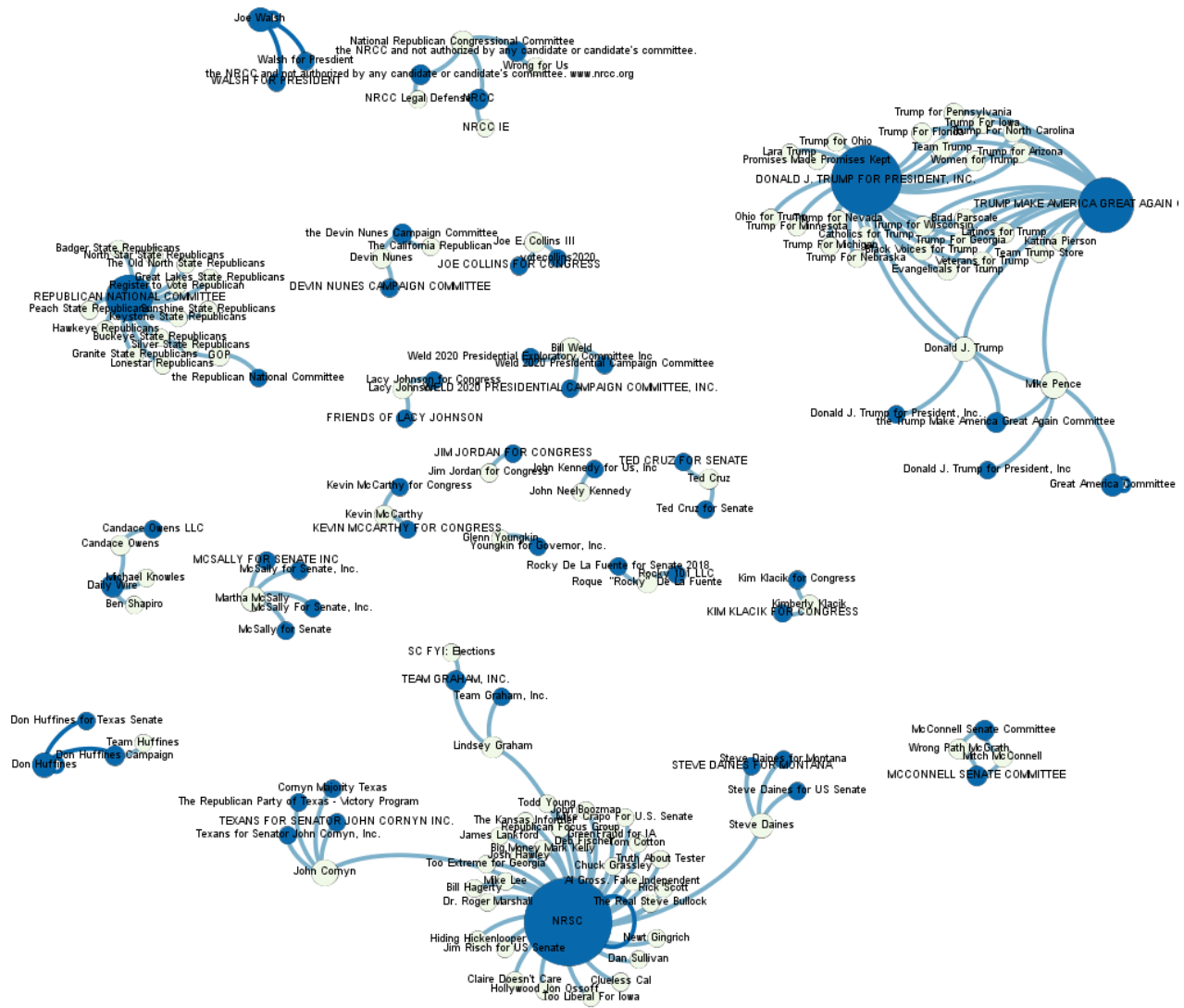
Having understood how advertising behavior differs between the two parties and the main differences and similarities, we now concentrate on visualizing the advertising structures, and money flows between all official and unofficial pages of both parties. In the visualizations below, the nodes colored in blue are the disclaimers used and the white nodes are the pages, as explained in subsection 5.4.

### 6.9.1 Official republican pages

As can be observed in Figure 39, there are three main clusters of entities advertising for the republican parties, with the one using *NRSC* (which stands for National Republican Senatorial Committee) being the biggest one. As for the second largest cluster, the one with *Donald Trump*, we see multiple disclaimers used by a group of local pages to support the primary candidate locally. We hypothesize that these pages are either run by a local campaign office in each of the states or that these pages are deliberately local-sounding so that the targeted voters of each of these states can feel as if there is a more significant following and community for the party's main candidate in their area. A different pattern can be observed for Senators, as a single page usually uses multiple disclaimers. To the best of our knowledge, there is no clear advantage or disadvantage to using different yet similar-looking disclaimers. Finally, there is also a set of Republican candidates who only have used the *NRSC* disclaimer and did not create their own.

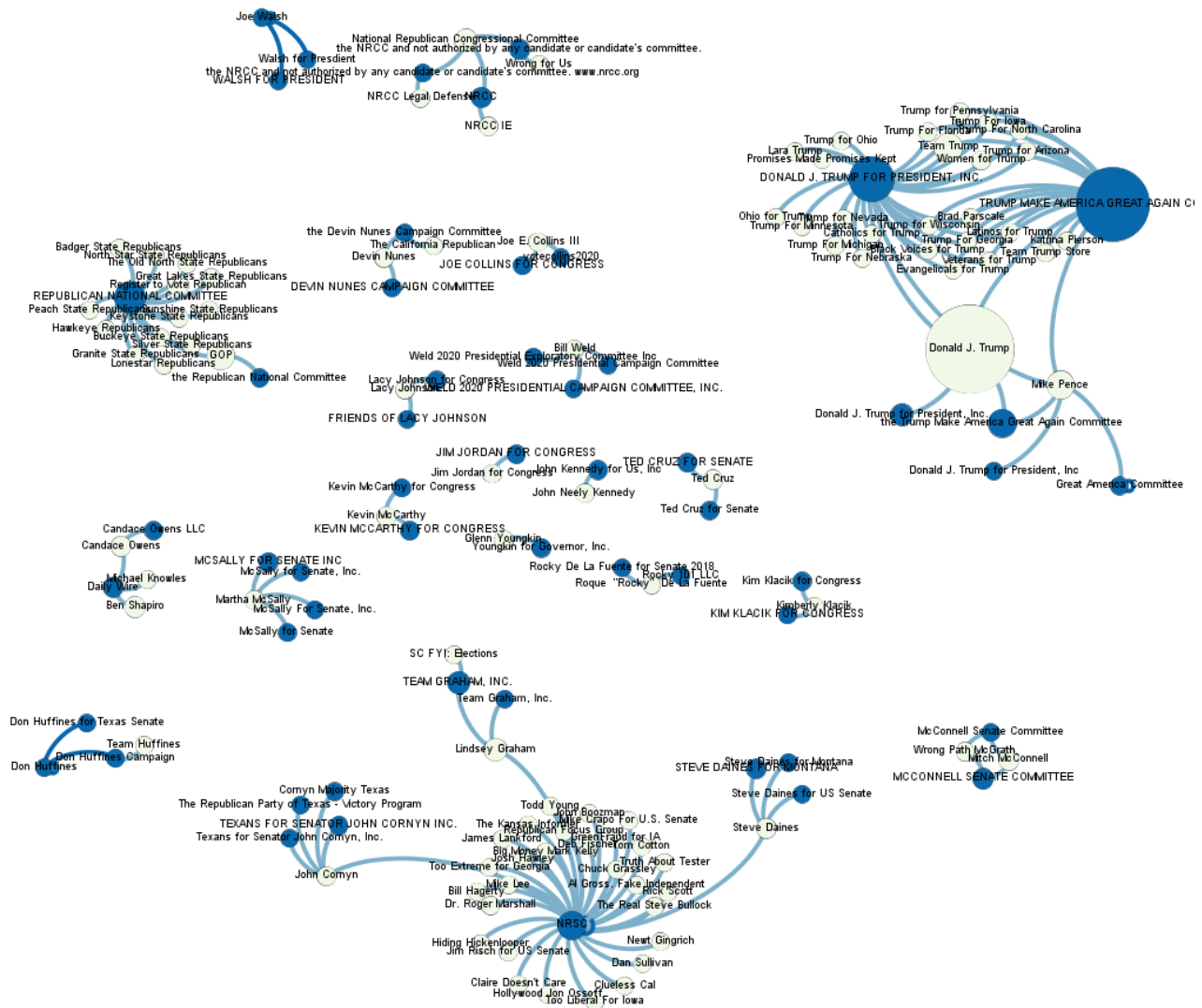
In short, most Republican congressional candidates adhere to fairly simple ad structures in which one disclaimer is shared by a handful of pages, while the party's official page and their main candidate use somewhat complex structures using local pages.





**Figure 39:** The graph highlighting the shared disclaimers by different **official republican** pages on Facebook. The larger the node is, the more entities are associated with it.

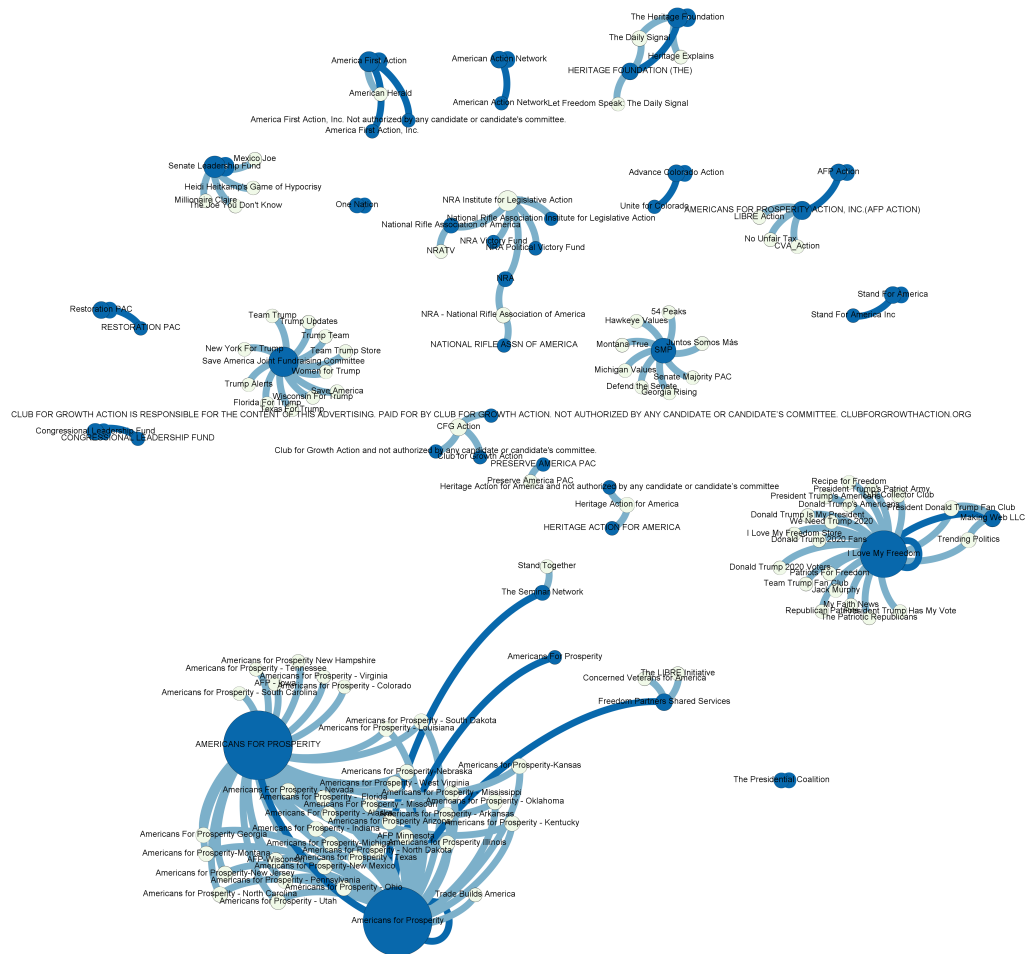
As for the spending, figure 40 highlights the spending of the official pages of the republican party, as well as the spending on each disclaimer. One can observe that the pages and disclaimers associated with *Donald Trump* had spent more money than all the other official republican pages combined. These insights suggest that the Republican party is particularly focused on their primary candidate in terms of spending.



**Figure 40:** The graph highlighting the spending by different **official republican** pages on Facebook. The larger the node is, the more money is spent by the page/using the disclaimer.

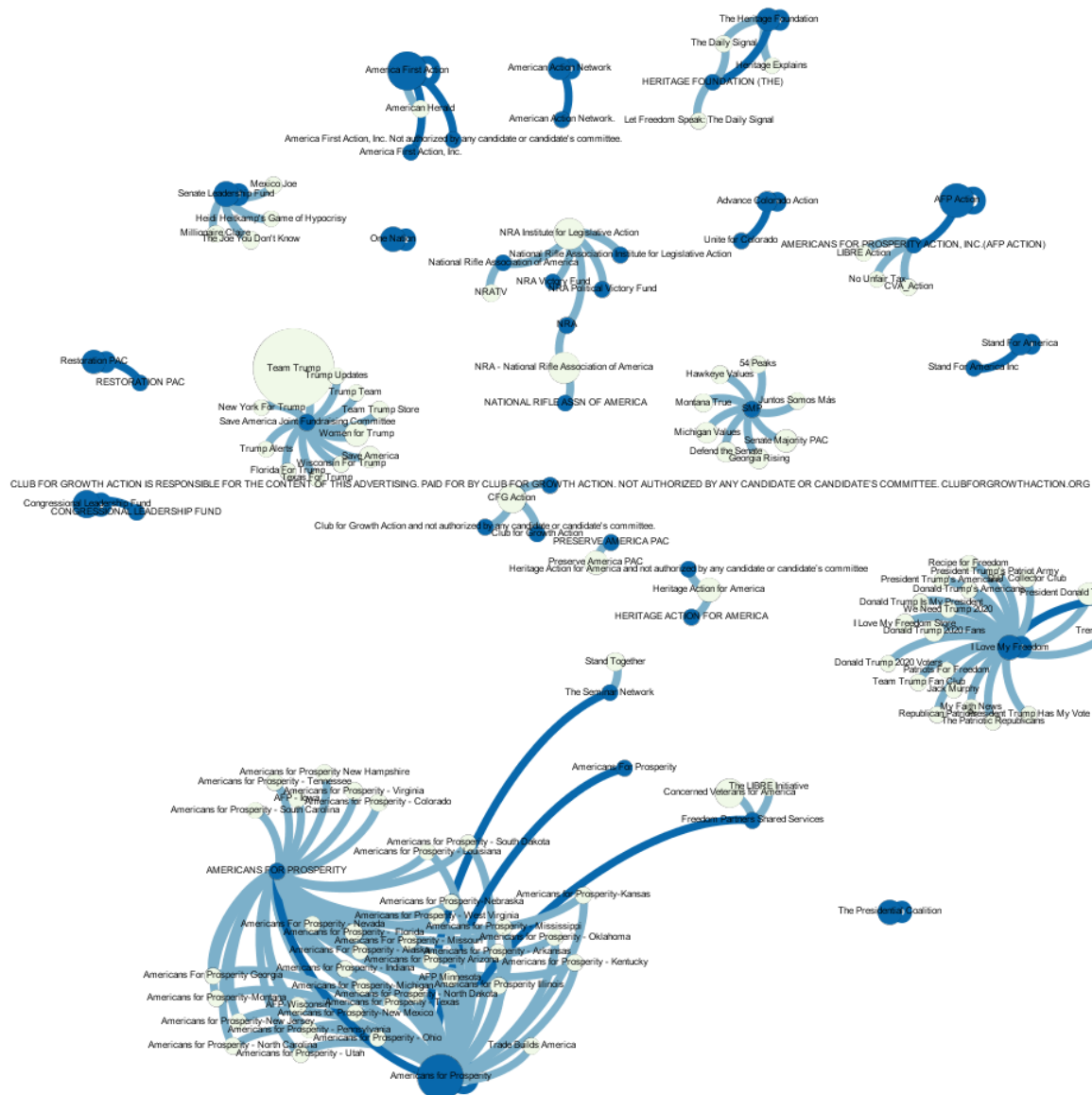
### 6.9.2 Unofficial republican pages

Although these pages are not officially affiliated with the Republican Party, they have (almost) exclusively supported the party's positions or contributed to campaigns via the party's official representatives. Most of these organizations and committees in Figure 41 had a limited number of pages advertising for them. However, the *Americans for Prosperity* organization is the largest, with many local alias pages across the country. On the other hand, in the other large cluster in the figure, the *I Love My Freedom* disclaimer appears to stem from fan pages. The number of pages coordinating using the same disclaimer may require further investigation.



**Figure 41:** The graph highlighting the shared disclaimers by different **unofficial republican** pages on Facebook. The larger the node is, the more entities are associated with it.

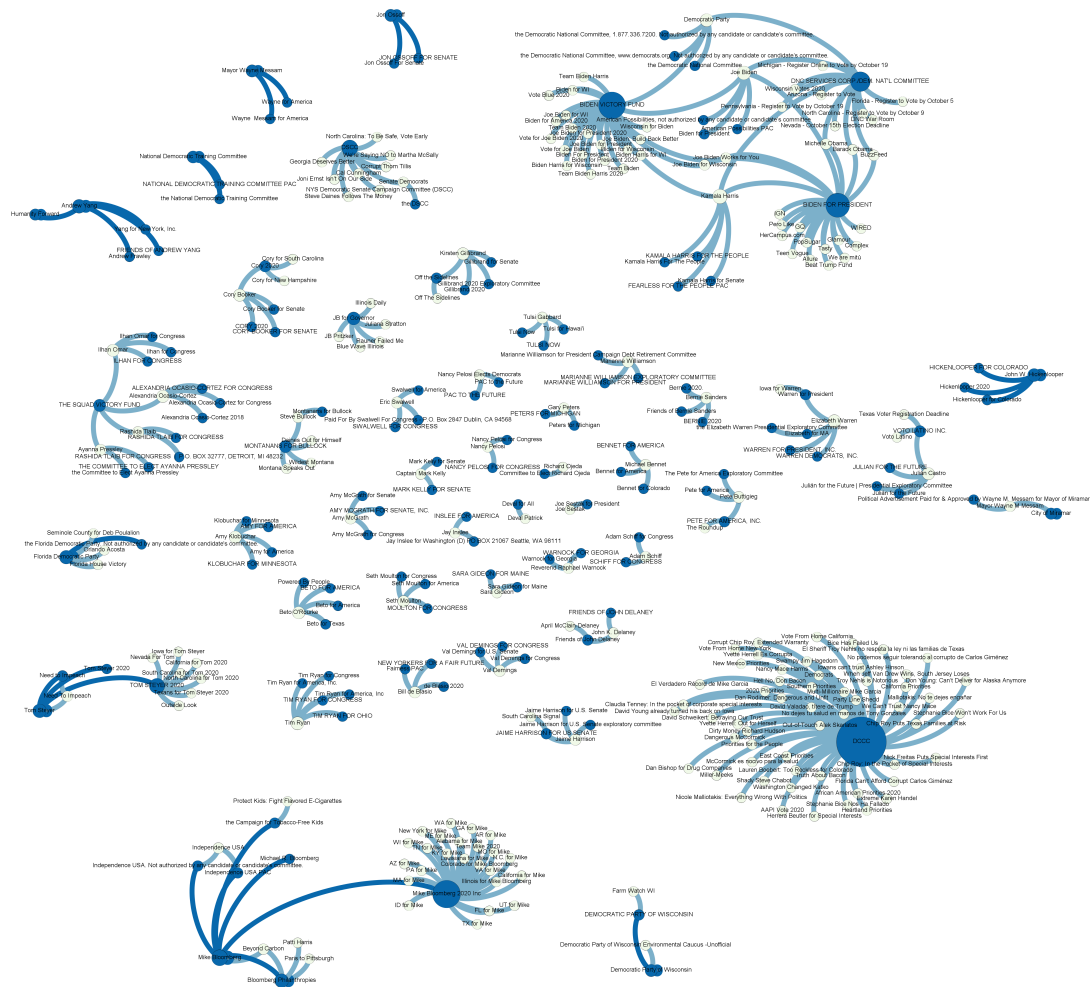
Similar to the official republican pages, Figure 42 highlights that most of the money is spent on *Trump*-related pages.



**Figure 42:** The graph highlighting the spending by different **unofficial republican** pages on Facebook. The larger the node is, the more money is spent by the page/using the disclaimer.

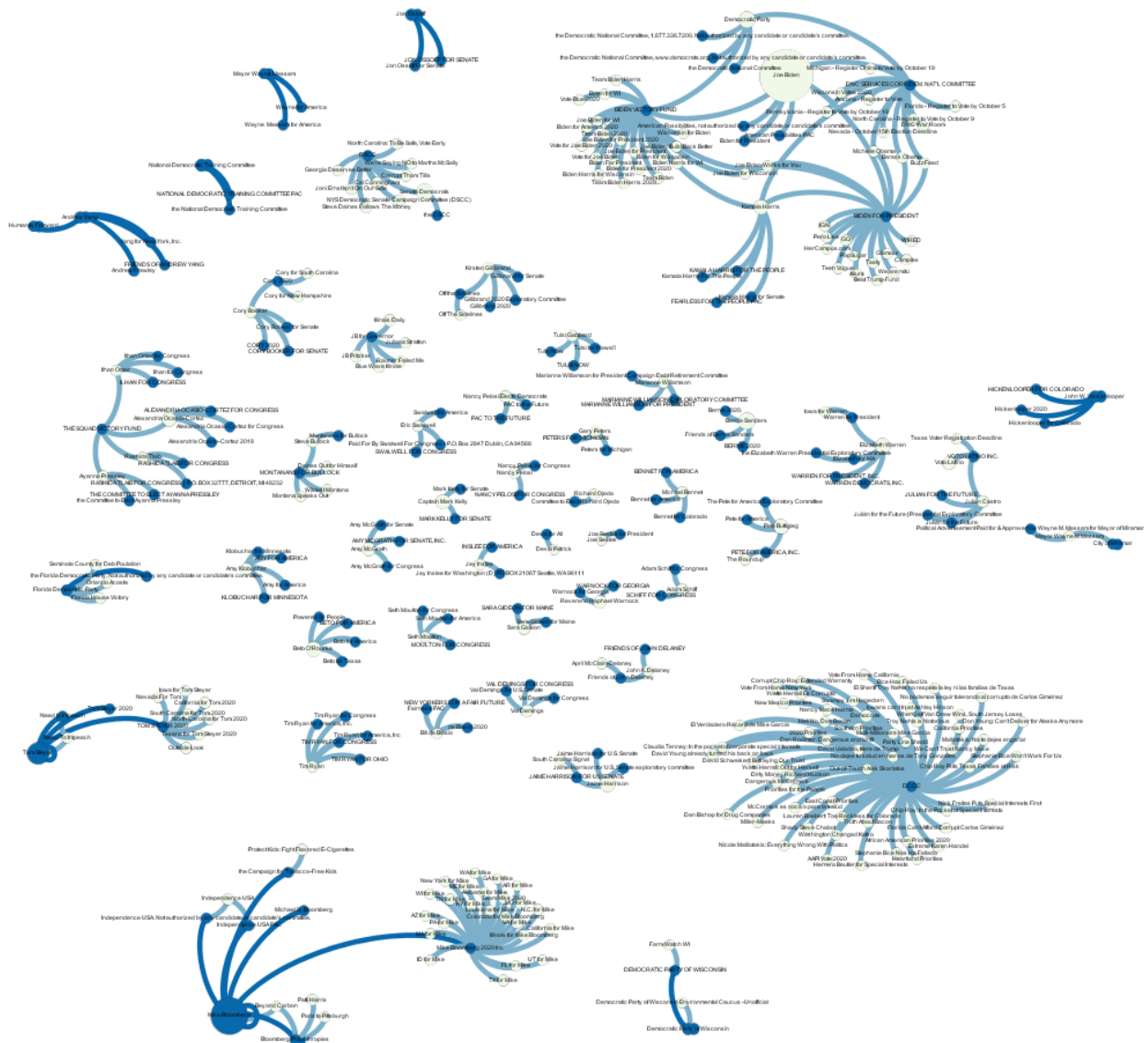
### 6.9.3 Official democratic pages

Figure 43 shows the advertising structure of official Democratic pages, which is a similar pattern to that of the republicans. While many (more minor) candidates use the official party's disclaimer, namely *DDCC* (Democratic Congressional Campaign Committee), we observe many big pages supporting the campaign of *Joe Biden*, with many local pages as well. Interestingly, *Mike Bloomberg's* campaign is also filled with local pages, which is only similar to pages of the primary candidates of each party, *Donald Trump* and *Joe Biden*. This may suggest that *Bloomberg* had a different strategy and coordination than the rest of the democratic party, which is much more in line with the practices of the main party's candidates.



**Figure 43:** The graph highlighting the shared disclaimers by different **official democratic** pages on Facebook. The larger the node is, the more entities are associated with it.

In terms of spending, figure 44 shows that most of the money in the democratic party was spent using the official Joe Biden page, with Bloomberg's campaign not far behind.

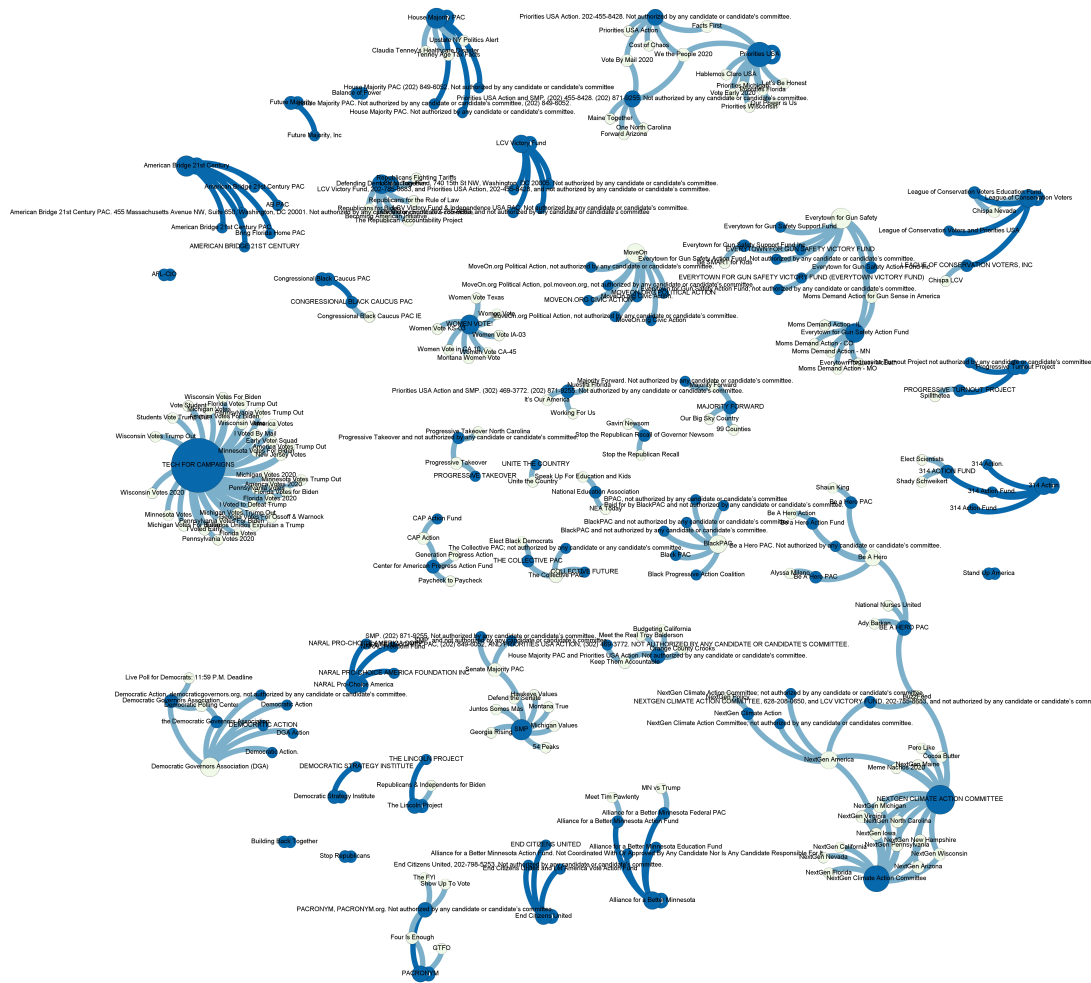


**Figure 44:** The graph highlighting the spending by different **official democratic** pages on Facebook. The larger the node is, the more money is spent by the page/using the disclaimer.

#### 6.9.4 Unofficial democratic pages

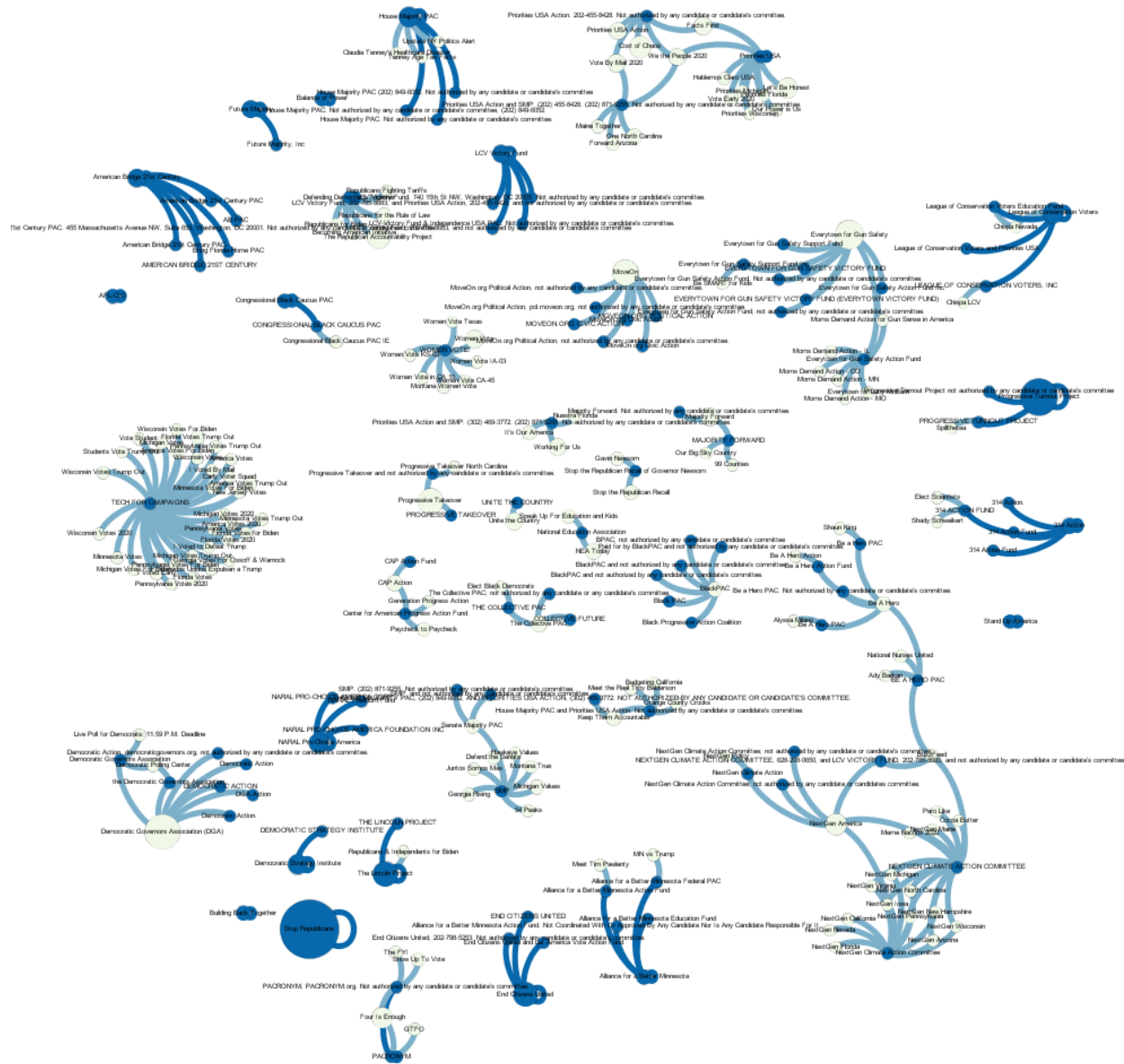
In Figure 45 we notice the same scattered structures as in other cases, with the exception of the *TECH FOR CAMPAIGNS* PAC, and *NextGen Climate Action* Super PAC. Overall, the structures are similar to the unofficial pages of the Republican party.





**Figure 45:** The graph highlighting the shared disclaimers by different **unofficial democratic** pages on Facebook. The larger the node is, the more entities are associated with it.

Spending shows that the page *Stop Republicans* has spent the most money on OPA against the republican party. Although it is a page using its disclaimer with no other complex structures, alongside a few other pages to support the democrats, as can be seen in Figure 46.



**Figure 46:** The graph highlighting the spending by different **unofficial democratic** pages on Facebook. The larger the node is, the more money is spent by the page/using the disclaimer.

## 6.10 Results summary

In summary, we analyzed all the ads placed by party candidates and representatives, as well as official pages associated with the party, on Facebook and Instagram, spanning over four years. Our findings suggest that the Democratic party is estimated to have spent four and a half times more than the Republican party in terms of money on OPA and therefore had 1.2M ads compared to the 300k ads by the Republicans. Republicans focused their spending on the election year, while the Democrats spread their spending more equally over the years. Both parties spend 35% of their total budget in 5 states, which are both states known to have historically supported their party or swing states. Compared to TV, spending on Facebook and Instagram is a small portion of the party's overall expenditure, as billions are usually spent yearly on TV ads. In contrast, in almost four years, the total spend of both parties is estimated to be at most \$500M. While the data incompleteness was a limitation, it was still possible to highlight the most mentioned topics advertised about by both parties. Both parties primarily use Facebook and Instagram for voter mobilization, donations seeking, and overall



support for their party and candidate. Although current developments in the U.S are sometimes mentioned, this happens much less frequently than previously anticipated. Moreover, while there are no clear preferences for one party to target a specific gender or age group, the Democrats had reached more male voters than the Republicans, and the Republicans focused more on senior citizens (i.e., +55 years old).

Similarly, we report little difference regarding the advertising structures of the official pages of both parties, except for the fact that in the case of the Republican party, no entity other than *Donald Trump* seems to have spent a significant amount of money on advertising, as is the case for *Mike Bloomberg* along *Joe Biden*. Many lesser-known candidates from both parties use their party's standard disclaimer, while the more well-known candidates spread their ads across multiple pages. However, these scattered ads have relatively simple structures compared to the structures of the major candidates of both parties, such as *Joe Biden* and *Donald Trump*. The primary candidates of each party tend to have a few main pages on which spending is concentrated but also many local pages they use to advertise. The spending behavior is proportional to the candidate's importance and role within the party, with the major candidates spending the most on advertising. Unofficial organizations and committees also exhibit similar behavior, with a few of each party showcasing complex advertising and spending structures.

We conclude by answering our research questions, RQ1 and RQ2. As for RQ1, although the specifics may differ somewhat in terms of the structures and other details in both parties, the general structures are very similar and do not differ significantly between both parties. In addition, both parties appear to follow similar strategies regarding advertising on Facebook and Instagram. For RQ2, current developments in the U.S. and important themes in the country do get covered by both parties; however, the main focus, by far, of both parties is voter mobilization and donation seeking.

## 7 Limitations and future work

This research was constrained by multiple limitations, with the most prevailing being:

- Only pages that have spent at least 1 Million USD Dollars were included in our analysis; therefore, pages that have spent less are not visible in our work. Consequently, if complex advertising structures with limited total spending appear in the data, they have been overlooked in our analysis. In a future study, we suggest including all pages in a similar analysis, and our reproduction steps B.1 combined with our PoC code B.2, can help achieve a complete analysis.
- Our research focused primarily on ad text and included text related to image and video-based ads. Future work could use image and text analysis to more finely and accurately distinguish between the types of ads carried by a page, but also include the content of image- and video-based ads in the analysis.
- The results of the second part of the research largely depend on the accuracy of the data found on FollowTheMoney and OpenSecrets. To our knowledge, no other organizations provided similar data while being perceived as more trustworthy than the organizations above. Future research could utilize other sources to compare the data, and in case of disturbances, investigate those to have a more reliable data source.
- Due to the exploratory nature of this thesis, the research questions and their answers may appear inconclusive and the analysis somewhat superficial, which is mainly due to the lack of a standardized approach to this research, which has changed along the way, as a normal part of exploratory research.

We hope that future research will address this problem by building upon and enhancing our steps listed in B.1.

- The incompleteness of the data and lack of transparency placed a significant burden on the first part of our research. Facebook failed to provide a large proportion of records and information about these records, and they provide broad ranges for important and critical data columns instead of concrete values. Combined with the fact that data collection was time-consuming due to limitations on the number of ads a verified researcher account could download per day.

## 8 Discussion

The insights this type of research provides on online advertising practices in the US can contribute to more transparent and fairer practices in several ways. First, for individual voters, understanding the nature and prevalence of certain practices can help them make more informed decisions about the advertisements they encounter online. This is especially important in the digital age, where the sheer volume of advertisements and the speed at which they are delivered can make it difficult for individuals to differentiate between reliable sources of information and misleading or biased content. By increasing transparency and understanding of online advertising practices, individuals can be empowered to make more informed choices about the advertisements they encounter and the sources of information they consume.

Second, this type of research can aid in creating more effective regulations and policies to protect consumers from misleading or manipulative advertising. By providing a deeper understanding of online advertising in the US, such research can inform the development of new regulations and policies tailored to address the unique challenges and opportunities presented by the digital advertising landscape.

Furthermore, by shedding light on the inner workings of online political advertising, such research can help controlling bodies to better detect and prevent potential abuses of the system. For example, the Interactive Advertising Bureau has established guidelines for ethical and transparent digital advertising practices [84]. By identifying areas where current practices deviate from these or similar guidelines, this research can help identify potential areas for improvement and provide recommendations for ensuring that online advertising is conducted fairly and transparently.

Overall, this research aims to provide a deeper understanding of the current state of online advertising in the US and identify areas where improvements can be made to benefit all stakeholders. By increasing transparency and fairness in online advertising, this research aims to contribute to a more informed and empowered citizenry, as well as a more accountable and trustworthy digital advertising industry. However, the process of gaining insights into online advertising practices can be cumbersome, time-consuming, it is context-dependent (i.e., what is applicable and works for Facebook, does not work for other platforms), and involves a lot of manual work. Therefore, the author recommend making it a collective effort and utilizing tools such as scrapers, crawlers, and scripts (where allowed) to extract information automatically. We also provide guidance and concrete steps on how to replicate this research (in other countries) , which is to be found in Section B.1.

## 9 Conclusion

Online political advertisement attracts advertisers due to the wealth of data collected on users, making it possible to target a specific set of users. However, as a new medium of advertisement, it is associated with numerous privacy and transparency concerns. Existing research on the matter is mainly qualitative, and little is known regarding online political parties' advertising practices.

In this work, we compared the democratic and republican advertising structures and practices on Facebook, the largest advertising platform. We found little difference in how they structure their advertising entities, with leading candidates and representatives creating complex structures with many local pages. In contrast, the lesser-known candidates keep their structures simple. Furthermore, political organizations and committees that are linked, associated with, or favor one of the parties, exhibit similar patterns to the party they are associated with.

Regarding spending on advertisements, they both have a similar approach of focusing on the major candidates within their party. Their spending on Facebook and Instagram is a small portion of their total spending on ads. OPA's spending is negligible compared to TV advertising, suggesting that TV remains the main focus of both parties. Additionally, 35% of the spending is focused on five states, both swing states, and states known to support one party. Concerning content, both parties spend mostly on voter mobilization and seeking (monetary) support. Finally, while there were some differences in genders and age groups targeted, that difference was not significant.

## Appendices

### A Official pages from both parties

Candidate/Page	PageID on Facebook
Donald J. Trump	153080620724
Mike Pence	6726182861
GOP	123192635089
Bill Weld	1742663025978076
Rocky De La Fuente	763491940427547
Joe Walsh	325935647511804
Ted Cruz	69983322463
Mitch McConnell	259130650776119
Lindsey Graham	165987503528599
Steve Daines	176789922364429
Candace Owens	1593518174052711
John Neely Kennedy	160513344045084
Martha McSally	278490715553293
Kevin McCarthy	159964696102
Glenn Youngkin	101605354952785
Lacy Johnson	168051710543266
Joe E. Collins III	1061240530648502
John Cornyn	355316521236121
Jim Jordan for Congress	7814597100
Don Huffines	345653475580468
Kimberly Klacik	1635441679872518
National Republican Congressional Committee	46093654473
Devin Nunes	834645469890446

**Table 6:** Republican party's prominent candidates and official pages.

Candidate/Page	PageID on Facebook
Joe Biden	7860876103
Bernie Sanders	124955570892789
Tulsi Gabbard	174866249236469
Elizabeth Warren	38471053686
Mike Bloomberg	6756153498
Barack Obama	6815841748
Amy Klobuchar	7606381190
Pete Buttigieg	1039701332716228
Tom Steyer	416707608450706
Deval Patrick	6290032613
Andrew Yang	562149327457702
Michael Bennet	57495285387
John Delaney	227809447291840
Cory Booker	36872302227
Marianne Williamson	207697880579
Julián Castro	97458155742
Kamala Harris	24413227922
Steve Bullock	105732744375701
Joe Sestak	6985950786
Wayne Messam	100157833650312 , 102255626515926
Beto O'Rourke	223055747744143
Tim Ryan	197908256931216
Bill de Blasio	175360322557925
Kirsten Gillibrand	6820348410
Seth Moulton	269499756522301
Jay Inslee	6227578465
John Hickenlooper	97493741436
Eric Swalwell	281835005264380
Richard Ojeda	1375193652713915
Alexandria Ocasio-Cortez	1316372698453411
Ayanna Pressley	79820371749
Ilhan Omar	780941275347834
Rashida Tlaib	134597023235240
Michelle Obama	22092775577
Democratic Party	12301006942
Amy McGrath	111393882812494
Jaime Harrison	328072970642479
Captain Mark Kelly	163148530407080
Reverend Raphael Warnock	109111900634787
Sara Gideon	2330577043935831
Val Demings	134498556891640
JB Pritzker	783753138471485
Jon Ossoff	1336293769761923
Gary Peters	6713653788
Adam Schiff	109092142462587
Nancy Pelosi	1711465445765878
Marcus Flowers For Congress	102391291904684
Katie Porter	428821014132730
Terry McAuliffe	82778945149

**Table 7:** Democratic party's prominent candidates and official pages, first part.

Candidate/Page	PageID on Facebook
Stacey Abrams	214821605377109
Claire McCaskill	8284449706
Theresa Greenfield	683872625157265
Heidi Heitkamp	302589433094744
Cal Cunningham	111428049989
Andrew Cuomo	124558988400
John Fetterman	1632814840319802
Charles Booker	305380096638473
Senate Democrats	20787991568
National Democratic Training Committee	830121337093232
Democrats	23790541544
Democratic Party of Wisconsin	95483488591
Nancy Pelosi Elects Democrats	101617224555221
Florida Democratic Party	7833534974

**Table 8:** Democratic party's prominent candidates and official pages, second part.

## B Graphs

### B.1 Steps to conduct this research (in different countries)

1. Compile a list of prominent figures within a party and a list of official pages associated with the parties. This list will be used as a starting point to gather related pages and their disclaimers. One could use Wikipedia pages to automate this process, as the more complete such a list is, the less manual work one needs to perform to categorize individual pages. This list need not be complete, but the more complete it is, the better since such a list will also be used later to gain insights about advertising behavior. An example of the tables used as a starting point in this thesis can be found in A.
2. Obtain a list of all advertisers on the platform, their disclaimers, and their spending. On Facebook, this can be obtained from the Ad Library Report [66], which also includes Instagram data.
3. Retrieve the disclaimers of all the official party pages and their candidates' official pages, then retrieve all the pages that have ever used these disclaimers. Remove these rows from the list to reduce the total amount of entries. This can be done using our PoC code, which can be found at B.2.
4. After filtering out the official pages and their disclaimers, one could consider filtering the data for pages containing *LLC* and *Inc.* in their disclaimers, which should remove a non-negligible number of entries. This is because Facebook does not exclude private entities and companies who also have advertised for non-political issues from the list, instead, they put all advertisers of all types in one overview, and *LLC* and *Inc.* were almost exclusively used by companies.
5. At this stage, we have a list of candidates, representatives, and pages belonging to a particular party. The candidate data is to be downloaded from their Facebook page after creating a verified researcher's account. However, Facebook allows a maximum of three pages to be downloaded per day per account. Then, the data of all these different pages can be appended to each other, per party, to form one data source for each party. Our code B.2 could be used to generate all the figures shown in this thesis with a few clicks of a button, and can be used as an inspiration to generate more insightful figures.
6. To create ad structures and money flows, one should use Ballotpedia<sup>14</sup>, Wikipedia, or another source to

<sup>14</sup>[https://ballotpedia.org/Main\\_Page](https://ballotpedia.org/Main_Page)

determine the advertiser behind the page. After the advertiser is determined, they can be categorized into the type of committee they are (e.g. PAC, Super PAC, 501(c)(3) group ... etc.) and either linked to the official structure of the party or an unofficial link to the party using OpenSecrets and FollowTheMoney (or other similar organizations), depending on the type of group it is.

Note that visiting the advertiser's website <sup>15</sup> might need to be deployed is sometimes necessary as no or minimal data on the page could be found online, and Facebook provides very limited data on the advertising entity.

7. Duplicate entries of the same page can be removed after the page leaning has been determined, based on the page ID. This is because a page is entered multiple times based on the disclaimers it uses, and we have observed that many big spenders are entered multiple times in the data. For example, suppose a page associated with a PAC that supports one of the parties has four entries because the page uses four different disclaimers after finding the page and retrieving its disclaimers. In that case, all these four entries can be removed, reducing the manual work as this prevents the need to investigate and label the same page multiple times.
8. Once the lists are complete, a visualization platform can be used to generate the graphs highlighting the advertising structures in the data, such as Gephi.

## **B.2 Code to extract entities information**

The automation of information extraction has been conducted using a python script that can be found here [3].

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<sup>15</sup>assuming it still exists, otherwise, the Internet Archive <https://archive.org/> might need to be deployed

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