

## **YouTube News and Politics Media Diets:**

A User-based Analysis of Filter Bubbles and the Recommendation Algorithm

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## Table of Contents

TABLE OF CONTENTS.....	II
TABLE OF FIGURES.....	IV
TABLE OF TABLES.....	V
ABSTRACT .....	1
1. INTRODUCTION .....	2
2. LITERATURE REVIEW .....	4
2.1 YouTube’s Rise and Relevance to U.S Politics in 2006-2015 .....	4
2.2 Fears of Algorithm-based Radicalization and Polarization in 2015-2019.....	6
2.3 Unknown Impacts of Political YouTube from a User Perspective.....	8
2.4 Contributions of this Thesis .....	10
3. THEORY .....	11
4. DATA AND SETUP .....	12
4.1 <i>YouGov</i> Pulse Tracking and Survey Data .....	12
4.2 Data Preparation to Study YouTube .....	12
4.3 Subsetting Videos Related to News and Politics .....	14
4.4 User Characteristics.....	15
4.5 Limitations of this Thesis.....	17
4.6 Methods .....	18
4.6.1 Descriptive Analysis.....	18
4.6.2 Network Mapping using Gephi .....	18
5. ANALYSIS AND RESULTS .....	19
5.1 Top-Level Trends: YouTube News and Politics Media Diets and User Behavior .....	19
5.1.1 Consumption Frequency per User .....	20
5.1.2 User Behavior: Most Active Periods and Engagement .....	20
5.1.3 Most Popular Content Types .....	21
5.2 The Algorithm: How Do Users Arrive at News and Politics Videos? .....	23
5.3 Understanding Differential Exposure on YouTube .....	24
5.3.1 How Do Media Diets Vary by Ideological Communities? .....	25
(A) Moderate Users .....	26
(B) Liberal and Very Liberal Users.....	27

(C) Conservative and Very Conservative Users .....	28
(D) Comparison of Media Diets by Ideological Communities .....	29
5.3.2 Overlap and Segmentation of Ideological Groups .....	30
(A) Comparing Overlap Coefficients between Ideological Communities .....	31
(B) Ideological Segmentation of the Top Fifty Channels .....	31
(C) Network Mapping Top Channel Co-occurrences per User.....	33
5.4 Understanding Extremist Users.....	35
<b>6. DISCUSSION .....</b>	<b>38</b>
<b>WORKS CITED.....</b>	<b>40</b>
<b>APPENDIX .....</b>	<b>45</b>
A.1 URL Classification of Pulse Dataset .....	45
A.2 Top YouTube API Categories from Full YouTube Dataset .....	45
A.3 Keywords used to Filter Video Titles, Tags and Descriptions .....	46
A.4 Survey Response of YouTube Users' Media Diets.....	48
A.5 Table with Top Predecessor and Successor Locations.....	48
A.6 Channel Type Classification Codebook.....	49
A.7 Users Who Watched More than 60 Alt-Right, Lite or I.D.W. Videos .....	49
A.8 Watch Frequency by News Interest .....	50
A.9 Watch Frequency by Political Ideology.....	50

## Table of Figures

Figure 1: Data Preparation Steps.....	13
Figure 2: Subsetting News and Politics Related Videos .....	14
Figure 3: Overview of Non-political and Political Users.....	19
Figure 4: Top Domains Before and After Watching News and Politics Videos.....	24
Figure 5: Political and Non-Political Video Count Over Time .....	21
Figure 6: Channel Overlap Between Ideological Communities .....	31
Figure 7: Ideological Audiences of Top 50 Political YouTube Channels.....	32
Figure 8: Network Map of the Top 15 Channels per Ideological Community.....	33
Figure 9: All links to and from End Time Prophecy Cluster .....	34
Figure 10: Liberal cluster links to and from PBS NewsHour .....	35
Figure 11: All Links to and from MILO .....	35
Figure 12: All Links to and from TheYankeeMarshal .....	35
Figure 13: Patterns of Top Alt-Users' Watch History Over Time .....	37

## Table of Tables

<b>Table 1: YouTube User Characteristics .....</b>	<b>16</b>
<b>Table 2: Overview of Full Dataset and Political Subset.....</b>	<b>19</b>
<b>Table 3: Political Videos and Channels per User.....</b>	<b>20</b>
<b>Table 4: Frequency Table – Political Videos per User.....</b>	<b>20</b>
<b>Table 5: Top 20 Political YouTube Channels .....</b>	<b>22</b>
<b>Table 6: Top 15 Political Channels by Ideological Community .....</b>	<b>25</b>
<b>Table 7: Videos and Channels Watched per User by Ideological Community .....</b>	<b>30</b>

## Abstract

YouTube is the most important social media platform in the U.S. and has been the subject of numerous accusations of user radicalization, yet no research has attempted to understand YouTube news and politics from the user perspective. In order to provide some first insights into how users consume news and politics content on the platform, this thesis descriptively analyzes 12,242 videos watched by 288 users from their internet browser history data and survey responses. The analysis<sup>1</sup> shows that although news and politics content make up only a small portion of users' overall YouTube diets, more than half of all users watched some political content. Some news and politics users are highly active "junkies" while others are less active, and video counts spiked in the leadup to the 2018 U.S. midterm elections. On the question of YouTube's algorithm, most users arrived at political content from other videos or the homepage, which suggests that YouTube's personalized recommendations play a role in helping users identify political videos. In analyzing the most popular content from different ideological groups, it appears that liberal and moderate audiences consumed more mainstream media, while conservative audiences' media diets were more varied. Late-night comedy clips were most popular amongst liberal audiences, while conservative YouTube personalities were more popular amongst moderate and conservative audiences. However, this research faced numerous limitations including a dataset that does not represent YouTube's demographics as a whole, and the watch histories of some highly active users may have overshadowed the results of less active users. No causal claims can be made as a result.

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<sup>1</sup> Code for this project is available on GitHub: [https://github.com/madelinebrady/Thesis\\_YouTubeNewsandPolitics](https://github.com/madelinebrady/Thesis_YouTubeNewsandPolitics)

## 1. Introduction

YouTube is the most used social media platform by Americans as of 2019 with 73% of U.S. adults responding that they use the platform, which is more than Facebook, Instagram or Twitter (Statista, 2018). There is also considerable evidence that YouTube news and politics is important to users' information consumption behaviors. A recent study by Pew Research found that 38% of YouTube users get their news from the site (Shearer & Matsa, 2018). Several academic authors have also discussed the importance of YouTube to politics since 2006 (Burgess & Green, 2009) as a place to “discuss politics, public policy, and also engage with one another in purposeful interaction (Lachrystal, 2014, p. 141)”. More recent attention to YouTube politics has focused the growth of extremist communities and the platform's potential role in radicalizing users via its recommendation algorithm. Although, the most recent academic literature provides no concrete evidence to suggest that YouTube's algorithm is entirely to blame, and the consumer side of the equation matters.

Despite YouTube's relevance to news and politics, no research has been done from the user perspective. As a result, this thesis will aim to understand **how users consume news and politics content on YouTube** by analyzing a number of questions:

**RQ1:** What do YouTube media diets look like (i.e. consumption frequency, types of content)

**RQ2:** How do users arrive at news and politics content on the site?

**RQ3:** How do media diets vary by ideological communities (i.e. differential exposure), and where do these communities overlap?

**RQ4:** What do media diets of extreme far right users look like?

More information related to these questions will provide consumer-side insights into news and politics information consumption habits. The first question is relevant to understanding the potential scope of political YouTube's impacts on consumers. Questions two and four are foundational to the issue of far-right radicalization and the recommendation algorithm's potential role. Question three is related to understanding if differential exposure to media across ideological groups exists, which has been cited as the most popular mechanism<sup>2</sup> to understanding polarization (Deri, 2019). Investigation into these questions is simply a starting point and further casual research is needed beyond questions of *whether* or *if* to understand *why*. As a result, this thesis aims to help future researchers gain an improved understanding of

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<sup>2</sup> Although Deri explains that no casual evidence proves differential exposure leads to polarization (Deri, 2019).

YouTube news and politics to help develop future theoretical and empirical frameworks of YouTube politics.

First, a literature review (section 2) will discuss YouTube's relevance to news and politics users since 2006, evidence on whether YouTube's recommendation algorithm is radicalizing its users and related literature on the impact of internet media more broadly on users' information consumption habits and opinions. Second, several theoretical assumptions regarding the impact of YouTube media on users will be described in section 3. Third, details regarding the data, data setup process, user demographics and limitations of this thesis are described in section 4. Fourth, the analysis and results (section 5) will present findings on the research questions based on a data analysis of YouTube users' survey responses and internet browser history data. Finally, the discussion section (section 6) will bring together the key findings in conversation with the literature and provide recommendations for future research.



## 2. Literature Review

YouTube was created by former PayPal employees in June 2005 as a simple video sharing and viewing platform (Burgess & Green, 2009, p. 1). In October 2006, the platform was sold to Google for \$1.65 billion in October and by 2008 it was a top site globally (Burgess & Green, 2009, p. 2). YouTube proved to be a relevant platform for U.S. politics as early as 2006. The following section will first discuss **how and why YouTube emerged** as an important tool for political actors and a source of political information for citizens since 2006. Second, it will examine the corresponding **debates and critiques surrounding the Youtube politics' impacts on users** in addition to the concrete academic findings on these issues. The final section will analyze literature related to other internet media and its studied impacts on user's political information consumption, and how this thesis fits into this conversation. Much of the research available on this topic has been conducted in the field of political science or media studies.

### 2.1 YouTube's Rise and Relevance to U.S Politics in 2006-2015

Two key moments define YouTube's emergence into the U.S. political sphere: "gotcha moments" of 2006 and the 2008 presidential election. Beginning in **2006, YouTube emerged as a platform to expose so-called "gotcha moments"** or political gaffes and wrong-doings related to U.S. politics and international human rights abuses. In a high-profile case during the 2006 Virginia senatorial election, incumbent Senator George Allan was caught on video referring to a volunteer from the opposition campaign by a racial slur, which was then posted and distributed widely on YouTube (Lachrystal, 2014, p. 9). During the **2008 presidential election, YouTube became increasingly relevant to U.S. politics** by serving as a platform for the Obama campaign, political influencers and citizens themselves to supply information *to* voters, and on the other hand, a key source of political information *for* voters (May, 2010, p. 503). The Obama campaign uploaded about 2,000 videos which received 14 million hours of views from 50 million users (Lachrystal, 2014, p. 15), which allowed the campaign to reach younger audiences (Powell, 2010, pp. 95-96), personalize the candidate (Burgess & Green, 2009, p. 50), control messaging without journalistic filtering, save thousands of dollars (Lachrystal, 2014, p. 7) and actively engage citizen participation. Additionally, several political influencers including Obama Girl, Will.i.am and Josh Marshall became influential online voices for the first time (May, Who Tube? How YouTube's News and Politics Space Is Going Mainstream, 2010, p. 502). Most importantly, YouTube became a platform for citizens to gather political information and engage in dialogue with other users and the candidates themselves. YouTube took active steps to become relevant in 2008 politics by launching a voter education initiative called You Choose '08 which was a hub bringing together videos of

different candidates and user voices (Lachrystal, 2014, p. 13). YouTube also co-hosted a CNN democratic primary debate in June 2007, where CNN played user uploaded questions for candidates to respond to (Powell, 2010, p. 92). At this moment it was understood that “YouTube caught most campaigns by surprise, and 2008 changed how YouTube was used and perceived during U.S. electoral politics in the following years (Powell, 2010, p. 98).

Since 2008, political campaigns and influencers have remained important to YouTube politics, and while some previously popular types of actors have fallen, new actors have emerged. Following the 2008 election, Albert L. May finds a **rise of mainstream corporate media** actors and a fall of smaller, independent actors in his analysis the top twenty-five news and politics channels during the two-year period after the election (May, 2010). He explains that this occurred because corporate media organizations targeted smaller players for copyright infringement, YouTube actively pursued partnerships with established news organizations and that independent actors may only be most relevant during election cycles. He also finds that mainstream media sources tailored their content toward “lighter, nonpolitical fare” for the audience of YouTube “who want their information unfiltered (May, 2010, p. 508)”. **During non-election cycles, political influencers who had managed to build a large following remained relevant** including The Young Turks and Alex Jones of Info Wars (May, 2010, p. 508). Unlike in 2008, today’s political influencers are not just individual vloggers sharing their videos, but are instead motivated to develop a “devoted fanbase to monetize their videos” (Munger & Phillips, 2019, p. 5). Besides political campaigns, mainstream corporate media and political influencers, YouTube has emerged as an important platform for **activist campaigns**, i.e. WITNESS (Burgess & Green, 2009, p. 121), **think tanks and universities**, i.e. London School of Economics and Political Science (Pineda, Hernández-Santaolalla, Algaba, & Barragán-Romero, 2019), **political late-night comedy critiques**, i.e. Last Week Tonight with John Oliver and Trevor Noah (Rieder, Matamoros-Fernández, & Coromina, 2018, p. 61), **access to governmental information**, i.e. The White House (Lachrystal, 2014, p. 105) and **community building for intersectional communities** (Raun, 2016).

YouTube’s rise has been both celebrated and criticized for its effects on democratic institutions and mainstream journalism. On one hand, authors have described YouTube’s positive effects on U.S. politics through the lens of “possible utopianism” (Krieger, 2016, p. 10), or a focus on how the platform brings **constituencies together**, promotes **citizen engagement** and provides flat-hierarchies for **new, independent voices to be heard**. When analyzing the future of YouTube’s impacts on politics, Lachrystal Ricke argues that,

*YouTube can harness political participation in the production, amalgamation, and exchange of information in a manner not possible through other mediated systems. It has become an essential platform through which the public has chosen to become politically informed and engaged (Lachrystal, 2014, p. 167).*

The basis of these arguments hinges on the overwhelming flood of activity during the 2008 presidential election, the nature of the platform's architecture or statistics showing the relevance of social media platforms to citizen participation more broadly (Lachrystal, 2014, p. 150). On the other hand, Albert May provides an early critique that the rise of "citizen journalism" and "mash-up" videos on YouTube allows users to "bypass conventional journalistic coverage" (May, 2008). He argues that the **origin or validity of a source is not easily identifiable** which threatens citizen's information seeking abilities (May, 2008). Additionally, Moises Naim warns that under the "YouTube Effect", misleading footage can **spread incredibly quickly** and is amplified even further when re-aired via mainstream media channels (Naim, 2009). The same features that have opened the doors for democratic participation and pluralism may also be used to undercut traditional journalistic norms and citizen's belief in democratic institutions.

## 2.2 Fears of Algorithm-based Radicalization and Polarization in 2015-2019

**More recent attention has focused on YouTube's failure to act against radical political content on the site, and the platform's role in distributing this content to users via its recommendation algorithm.** Researchers have identified content related to jihadi terrorist organizations, extreme political positions and conspiracy theorists on YouTube (Ledwich & Zaitsev, 2019, p. 1; Schmitt, Rieger, Rutkowski, & Ernst, 2018; Andre, 2012), which have still managed to "[permeate] the content barrier (Ledwich & Zaitsev, 2019)". In an analysis over-time, researchers Ribeiro et. al. confirmed that inflammatory fringe, far right political channels (i.e. alt-right, alt-lite and intellectual dark web<sup>3</sup>) surged and gained traction for the first time between early 2014 and late 2016 (Ribeiro, Ottoni, Robert, Almeida, & Meira Jr., 2019, p. 3). Similarly, Kevin Munger and Joseph Phillips have found similar results noting peak far-right viewership in 2017 (Munger & Phillips, 2019).

In regards to the distribution of this far right content, **the question of algorithmic-driven radicalization emerged most prominently since the U.S. 2016 presidential election.** Starting in 2016, YouTube switched to a machine learning approach where recommendations were made in a black-box rather than on the basis of concrete metrics as before, i.e. user watch time and time spent on the platform (Cooper, 2019; Covington, Adams, & Sargin, 2016). Around this time period, a number of news stories emerged about users watching videos about presidential

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<sup>3</sup> See appendix 7 for definitions of these terms: Alt-right, alt-lite and intellectual dark web

candidates and being led to videos about conspiracy theories and extreme content (Tufekci, 2018). The Wall Street Journal began investigating YouTube's most recommended videos and patterns of recommendation with an ex-YouTube employee, Guillaume Chaslot, who helped build YouTube's algorithm (Tufekci, 2018; Nicas, 2018). The investigation found that the YouTube algorithm "fed far-right or far-left videos to users who watched relatively mainstream news sources (Nicas, 2018)". As recently as 2020, the New York Times has reported on the case of Caleb Cain, an individual who was in fact radicalized by far-right YouTube content (Roose, 2019). After beginning with self-help videos from an alt-right YouTube personality named Stefan Molyneux, Cain fell down a YouTube rabbit hole of conservative extremism for five years and began experimenting with controversial ideas like the white replacement theory (Roose, 2019; Cain, 2019).

**However, recent academic literature challenges this journalistic narrative and instead suggests that YouTube's algorithm may not be recommending radical content to users in a systematic way without some user input.** Three recent academic papers from 2019 by Mark Ledwich and Anna Zaitsev, Horta Ribeiro et. al. and Kevin Munger and Joseph Philips have used different theoretical and analytical approaches to study this issue. They all find minimal evidence to suggest that YouTube is radicalizing its users by showing them political content that they would not have watched otherwise. Ledwich and Zaitsev approach this question by analyzing the related videos and channels from 800 various political YouTube channels and mapping patterns of recommendations to and from one another. They find that **"the recommendation algorithm directs traffic from all channel groups into the two largest ones and away from more niche categories** (Ledwich & Zaitsev, 2019, p. 7)" like conspiracy theories or white identarian groups. Based on this, they do not find any evidence that YouTube's algorithm prefers extreme right-wing content, but rather that the algorithm disadvantages these channels in favor of center/left mainstream media or partisan left and right independent YouTube creators. They do however find partial evidence suggesting that YouTube's algorithm creates filter bubbles by recommending content similar to users' pre-existing views rather than exposing them to alternate viewpoints. However, they identify recommended channels and videos from a blank slate without effects from a personalization algorithm, which they acknowledge might limit their findings.

Ribiero et. al. attempt to understand if users systematically gravitate towards more extreme content and whether algorithmic recommendations steer users in this direction, although **their results are not conclusive** (Ribeiro, Ottoni, Robert, Almeida, & Meira Jr., 2019). On the first question, they found that a growing percentage of users who commented on extreme far right content (i.e. alt-right) also commented on milder content (i.e. alt-lite and intellectual dark web).

They argue that this user crossover should not be overlooked, although this does not prove a clear “radicalization pipeline”. Ledwich and Zaitsev criticize the basis of this finding for its use of commenter migration patterns because there is no way to discern between real users and trolls (Ledwich & Zaitsev, 2019, p. 2). On the second question, they found evidence that YouTube rarely recommends more extreme alt-right content from milder alt-lite and IDW categories. In terms of video recommendations, they find that mainstream media channels are most commonly recommended. Although they mention that these findings are not conclusive due to their small sample size and omission of the personalization algorithm in their data collection process. Additionally, the strongest evidence is related to recommended channels, which are arguably less relevant than recommended videos. Unlike recommended channels, recommended videos are immediately next to a user’s current video meaning that a user does not need to actively scroll down.

Kevin Munger and Joseph Phillips argue against the idea that YouTube suddenly radicalizes users through a “zombie bite” as suggested by Ribiero et. al., but instead that **the platform matches a supply of far-right content to a demand of pre-existing audiences who are already open to such ideas due to alienation from the mainstream** (Munger & Phillips, 2019). They find that although the most extreme branches of far right content have been in decline since mid-2017, the remaining audience is more engaged than any other political audience group and further mainstream conservatives have entered the YouTube marketplace (Munger & Phillips, 2019, p. 6). In this vein, the “zombie bite” theory naively diverts attention from an even more dangerous threat – that YouTube provides a cheap and easy means for fringe actors to strategically reach vulnerable citizens. This argument paints a considerably larger problem that cannot be simply solved through an “algorithmic tweak”, and they conclude by calling for more empirical and theoretical analysis of YouTube politics (Munger & Phillips, 2019, p. 28).

## 2.3 Unknown Impacts of Political YouTube from a User Perspective

YouTube’s CEO, Susan Wojcicki, recently suggested in a New York Times interview that YouTube politics was “not an initial part of how YouTube worked” and these creators only make up a “small set”<sup>4</sup> (Roose, 2019). However, the previously discussed academic literature shows that YouTube and politics have been closely linked since 2006, and regardless of the size of this community, the platform has arguably impacted how some citizens consume political information and quite possibly informed their political opinions or behavior. This is exhibited by the large body of literature discussing YouTube’s impact on users during President Obama’s 2008 presidential

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<sup>4</sup> Although as discussed by Kevin Roose, this is not confirmable without YouTube’s internal data.

campaign, evidence of the growth of radical media bubbles and qualitative stories like those from Caleb Cain. Nonetheless, **a great deal is still unknown regarding how YouTube politics has concretely impacted users' information consumption habits**, which may be linked to their political opinions and behaviors.

**Several YouTube studies have touched marginally on the question of YouTube media diets and politics from the user perspective.** Merja Mahrt looked into the question of YouTube filter bubbles by analyzing overlapping YouTube media diets with internet browser history data (Mahrt, 2019). Although she found high fragmentation across all categories, this study did not analyze news and politics content exclusively. Another study from 2016 surveyed 100 millennials and found that most respondents did not believe that YouTube impacted their political behavior (Njegomir, 2016). However, this study was limited to self-reported survey data and users' own perceptions of the platform's impacts. Another study found that comments on political YouTube videos are more extreme than those of entertainment videos (Moller, Kuhne, Baumgartner, & Jochen, 2019), which may suggest that political users have extreme opinions. Although, no causality may be claimed as it is unclear if political YouTube users already have strong opinions or if YouTube actually makes these opinions stronger.

The unknowns related to YouTube politics consumption habits are especially apparent in consideration of literature focused on the effects of internet media and social media platforms more broadly. Particularly, **some studies have suggested that social media platforms are affecting users' quality of information consumption and accelerating polarized views.** A recent study by Svenja Schafer found that many Facebook users who consumed political news posts gained perceived knowledge on a topic rather than actual knowledge; however, these users still had a high willingness to discuss the topic in addition to a strong attitude (Schafer, 2019). Furthermore, a number of authors have raised concerns about how selective online media exposure based on users' pre-existing political preferences may be leading to affective polarization online and offline, although further research is needed on *if* and *how* this is occurring (Getzkow & Shapiro, 2011; Sunstein, 2001; Zuiderveen Borgesius, et al., 2016; Pariser, 2011; Deri, 2019). In Sebastian Deri's review of internet polarization, he notes that:

*There are significant and meaningful differences in the political content that partisans of different political orientations consume online, comparable to the degree of segregation in national print newspapers (Deri, 2019, Abstract).*

He refers to this difference in media diets between ideological communities (i.e. echo chambers or filter bubbles) as *differential exposure*. However, Deri notes that although differential exposure is the

most commonly cited mechanism for the existence of affective and topic-specific polarization amongst citizens, there is no concrete causal evidence that it is the driving factor. Furthermore, the cause of differential exposure itself is still unknown. It is unclear whether user's own self-selecting biases or the personalization algorithms from online platforms are to blame (Deri, 2019; Zuiderveen Borgesius, et al., 2016). Neither the impact of news and politics media consumption on citizen knowledge nor opinions have been studied on YouTube. Additionally, **no studies have tried to understand whether differential exposure exists on YouTube** despite strong attention to a potential cause itself, the personalization algorithm.

## 2.4 Contributions of this Thesis

In order to contribute to the existing literature related to YouTube and politics, this thesis will present a missing consumer-based perspective through the use of new data sources. Most studies to date have been limited to survey data or YouTube API data, but this paper will combine both in addition to internet browser history data. Unlike Mahrt's study that similarly used YouTube internet browser history data to study filter bubbles, this thesis will only analyze news and politics related videos. Additionally, rather than focusing exclusively on questions related to YouTube radicalization, this thesis will consider YouTube information consumption more broadly. This is needed in consideration of topics that have been studied on other platforms including affective polarization via differential media exposure and quality of information.

### 3. Theory

This thesis relies on the theoretical assumption that **exposure to news and politics related media has an ability to influence citizens' opinions and behavior** and therefore matters. This notion is based on the 1970's Cultivation Theory by George Gerbner, which theorizes that watching more media predisposes individuals to media messages and therefore the belief that they are real (Gerbner & Gross, 1976; Njegovir, 2016). In this vein, the media world and an individual user are not separate. In the world of politics this matters because information is the basis for citizens to make informed political choices within a democratic society and to hold their government leaders accountable. **In the case of YouTube, media comes in the form of videos.** Munger and Phillips note that this point is seemingly obvious, but has been “insufficiently central” to analyses of YouTube (Munger & Phillips, 2019, p. 5). Similar to other forms of media, YouTube videos related to current events, politics or relevant issues may have the potential to impact citizen's political opinions, or perhaps strengthen or change pre-existing beliefs. As a result, the scope of this paper will be limited only to news and politics related videos and these specific users. Additionally, Munger and Phillips present the only YouTube politics theory to date, which suggests that the platform operates on a supply and demand basis (see section 2.2 for more details) (Munger & Phillips, 2019). This theory indicates that **users' political pre-dispositions matter within YouTube's news and politics information ecosystem exchange**, and YouTube's recommendation algorithm is not the only factor at play. With this in mind, in addition to Deri's discussion of differential exposure, understanding media diets by ideological communities is critical when understanding how YouTube politics works.



## 4. Data and Setup

### 4.1 *YouGov* Pulse Tracking and Survey Data

In order to study the research questions of interest, this paper makes use of *YouGov* pulse tracking and survey datasets collected from August 1, 2018 to March 31, 2019 set up by Professors Simon Munzert (Hertie School), Andrew Guess (Princeton University), Pablo Barberá (University of Southern California) and JungHwan Yang (University of Illinois at Urbana-Champaign). *YouGov* is a market research and data analytics company that was responsible for the implementation of this data collection process. For the pulse dataset, users opted-in on an incentivized basis to have their internet browser history tracked by *YouGov*'s Wakoopa software. Internet browser history was collected 24/7 unless a user paused tracking for a 15-minute window or decided to opt out. This data includes URL paths with a host of other information including time, date, duration, predecessor URL and successor URL. Due to a technical issue with the Wakoopa software, only 28% of all URLs contained full domain level information. In the data preparation phase of this paper, a number of demographic comparisons and check for time gaps were conducted to ensure that this technical issue did not impact the results. The URLs from the pulse tracking data were used in combination with the YouTube Data API v.3 to get further information about each video. In addition to the pulse tracking data, the participants were surveyed by *YouGov* in five waves within this time period with a number of questions related to their political attitudes, media consumption behaviors and knowledge of recent political events. The combination of these two datasets includes self-provided information about internet users and all pages that they visited over the eight-month period.

### 4.2 Data Preparation to Study YouTube

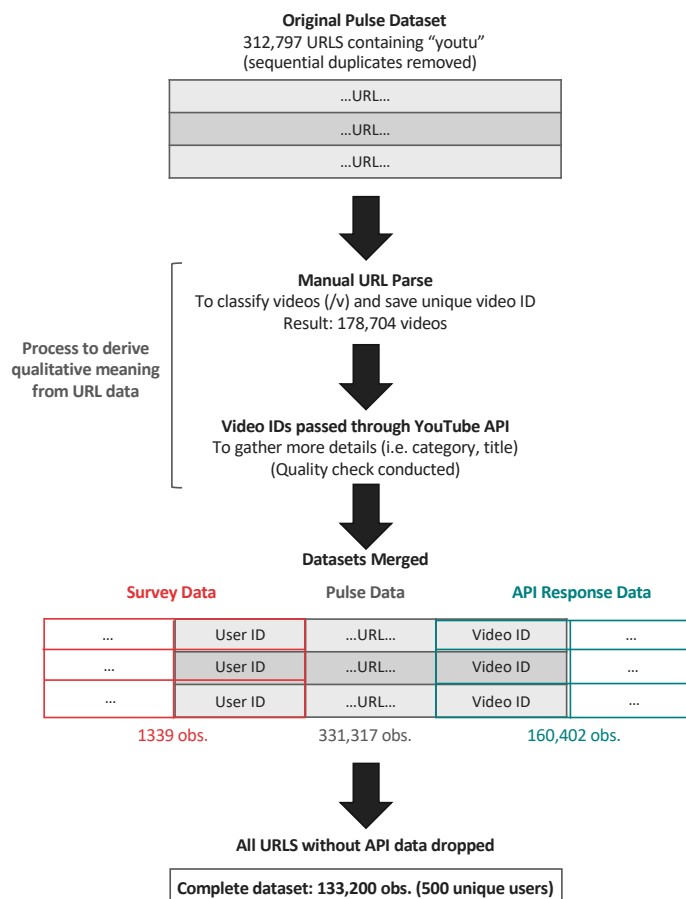
In terms of data preparation to look only at YouTube users and watch histories, the *YouGov* pulse tracking and survey data were limited to URLs containing "youtu" to account for both "youtube.com" and "youtu.be". All URLs containing an error 433 due to the Wakoopa software error were removed. Sequential URL duplicates were removed to avoid double counting potential automated page refreshes. Using the URL Parse Python library<sup>5</sup>, all remaining 312,797 URLs were classified by type based on unique identifying features (i.e. "/v=" for videos). Of the total URLs, 178,704 (57%) were videos and from these videos, the video identification numbers (video ids) were identified and saved (see Appendix 1 for classification counts). The video ids were then fed into the YouTube Data API v.3 in increments of 50, which is the most the API will accept at a

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<sup>5</sup> Python URL Parse Library: <https://docs.python.org/2/library/urlparse.html>

given time. The API returned the following information about each video including video category, video description, video tags, channel name, channel id, view count, number of interactions (i.e. likes, dislikes, favorites and comments) and video duration. A quality check was conducted on the output video ids for missing values and duplicates. Video descriptions were missing for 6,684 videos, which were not dropped because the video tags or title could provide valuable information. The final set included 160,402 unique videos with information from the API, which was then merged with the full list of 331,317 pulse tracking video URLs. With this step, the pulse tracking video URLs were given textual meaning, and as a result, all URLs without API data were dropped. The remaining list of pulse tracking video URLs was then merged with the *YouGov* survey dataset. The final dataset included 500 unique users with 133,200 video URLs. **Figure 1** visualizes this full process.

**Figure 1: Data Preparation Steps**



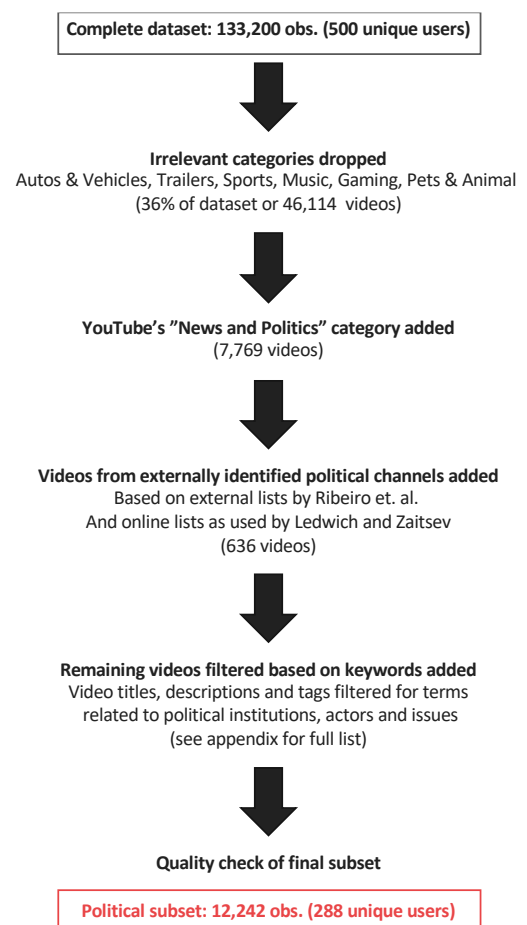
### 4.3 Subsetting Videos Related to News and Politics

Based on an initial data exploration, YouTube's classification scheme was not sufficient to capture all news and politics related videos. As a result, a number of steps<sup>6</sup> were taken to limit the full YouTube dataset to only news and politics related videos (see Figure 2). To start, videos in irrelevant categories based on the YouTube classification scheme were removed: Autos & Vehicles, Trailers, Sports, Music, Gaming, Pets & Animals (see Appendix 2 for breakdown of all categories). As a result, 34.6% of videos (46,114) were dropped for a remainder of 87,086 videos related to News & Politics, Film & Animation, Science & Technology, Travel & Events, Movies, Shows, Entertainment, Education, People & Blogs, Comedy, Howto & Style, Nonprofits & Activism.

Based on the remaining videos, a list of YouTube videos related to news and politics was created. First, this includes all videos classified as News and Politics via the YouTube API (7,769 videos). This classification scheme is labeled by the channel owner, and some channels appeared to use one default category while others use a mix (Wilson, 2019). Second, 636 videos published by known political YouTube channels cited in lists by recent literature (Ribeiro, Ottoni, Robert, Almeida, & Meira Jr., 2019, pp. 16-18; Ledwich & Zaitsev, 2019) and online lists created by FeedSpot (Feedspot, 2020), Social Blade (Social Blade, 2020) and Social Bakers (Social Bakers, 2020) were added (similarly to authors Ledwich and Zaitsev). Based on these first two steps, 8,405 videos related to news and politics were identified. Finally, the remaining videos' titles, descriptions and tags were filtered based on a set of keywords (see Appendix 3) related to political institutions, actors and issue areas including the following:

- The president, executive branch leaders and departments
- Supreme court justices and judicial branch
- Legislative branch: All U.S. senators and U.S. House of Representatives leadership

**Figure 2: Subsetting News and Politics Related Videos**



<sup>6</sup> Full process and keywords used for descriptions, titles and tags is available on GitHub: [https://github.com/madelinebrady/Thesis\\_YouTubeNewsandPolitics](https://github.com/madelinebrady/Thesis_YouTubeNewsandPolitics)

- Top issue areas identified qualitatively using Isidewith (Isidewith, 2020) with terms related to both sides of the debate (i.e. anti-gun, pro-gun)
- Top political influencers across several mediums (including online, cable news and radio)
- Google trends related to politics and top news stories for the given time frame (Pauley, 2018)
- General list of political terms (i.e. politics, government, election, midterms)

Keyword matches were added for a total of 12,242 videos related to news and politics or 9% of the total videos with API return data with 288 unique users. Filtering related videos doubled the dataset.

During final keyword filtering step, several measures were taken to ensure and check that the final subset of data included videos relevant to politics and news. Filtering was done in small incremental batches to ensure that keywords were used in the correct context (i.e. Doug Jones the politician not the actor), and every video was checked. This process was done from specific terms to more general terms to ensure words with precise close meaning were added first. For example, any video mentioning Alexandria Ocasio Cortez is highly likely to be about politics while “economy” or “midterms” may have looser associations. Additionally, some relevant words could not be used because they would return unrelated results. For example, “vote” could be related to an election or survey on which beauty product is the best. This was accounted for by instead selecting related terms precisely related to a political context (i.e. election). Issue terms were chosen carefully to ensure a relevant political or activist context. For example, “gay marriage” returned results related to couples or celebrities, so a term like “LGBTQ+ activist” derived stronger political associations. Additionally, for all batches of keywords, video title results were kept but, in some instances, video description and tags results were not kept because they returned out of context results. Sometimes fewer and more specific terms were used to filter descriptions and tags, while more general terms could be used for titles. Finally, a quality check on random samples and tests filtering for random, unrelated terms (i.e. Avatars) was conducted on the final dataset. A full list of the keywords may be found in the annex.

#### 4.4 User Characteristics

**Table 1** shows the user demographics of the full dataset of all YouTube users and the news and politics subset of users. It appears that the mean age of around 50 years old for both groups is higher than expected given the platform’s known presence among younger age demographics (Statista, 2019). The overall dataset appears to be representative of YouTube’s overall gender demographics (Chi, 2019) with a slightly higher percentage of women in the full dataset. Interestingly, the news and politics dataset appear to have slightly more men than women

in comparison to the overall users. The remaining demographics are not confirmable via external data, so it is unclear if the full YouTube dataset is truly representative of YouTube. The full dataset is predominantly white with few minority groups, which is not representative of the U.S. and perceivably not the case of YouTube either. In terms of ideological leaning, moderates are the largest group represented, and the datasets are skewed towards liberal users with fewer conservatives represented. Both groups appear to be very interested in the news, and rather than print, these news consumers get their news from the internet, TV and some radio (see Appendix 4). The dataset is also well educated with most users receiving some level of college education.

**Table 1: YouTube User Characteristics<sup>7</sup>**

	Full Dataset Users	News and Politics Users
<b>Age</b> (mean)	54 years old (1964)	53 years old (1965)
<b>Gender</b> (%)		
<i>Male</i>	49%	53%
<i>Female</i>	51%	47%
<b>Race</b> (%)		
<i>White</i>	82%	81%
<i>Black</i>	7%	7%
<i>Hispanic</i>	5%	6%
<i>Asian</i>	2%	1%
<i>Mixed</i>	3%	2%
<i>Other</i>	1%	1%
<b>Education</b> (%)		
<i>No High School</i>	1%	2%
<i>High School</i>	14%	14%
<i>Some College</i>	22%	23%
<i>2-year College</i>	15%	15%
<i>4-year College</i>	27%	25%
<i>Post-grad</i>	21%	22%
<b>Political Ideology</b> (%)		
<i>Very Liberal</i>	21%	22%
<i>Liberal</i>	21%	23%
<i>Moderate</i>	28%	26%
<i>Conservative</i>	16%	15%
<i>Very conservative</i>	13%	14%
<i>Not sure</i>	0%	1%
<b>News Interest</b> (%)		
<i>Most of the time</i>	64%	68%
<i>Some of the time</i>	25%	23%

<sup>7</sup> Due to rounding not all categories add up to 100%

<i>Only now and then</i>	7%	7%
<i>Hardly at all</i>	2%	2%
	n = 500 users	n = 288 users

## 4.5 Limitations of this Thesis

Due to several limitations of this study, no assumptions of generalizability or causality can be made. First, the overall user demographics are older, more interested in news, more educated and whiter than one would expect for an average U.S. population. It does not appear likely that these user demographics represent YouTube, although there are no external statistics available to confirm this. As a result, the user demographics may be limited to the types of people who are incentivized to respond to the YouGov survey. No post-stratification methods were used in this thesis to offset potential concerns. Second, the classification of news and politics videos may have failed to capture all related videos due to a biased keyword selection. Because YouTube’s ‘news and politics’ category is determined by channel owners themselves, including all videos may have allowed for non- news and politics related videos to enter the dataset. Although several steps were taken to prevent this, a manual coding of all videos or channels by several individuals may help limit bias in the future. Third, several highly active users account for more video observations in the dataset than less active users. For this reason, these users’ watch activity may overshadow less frequent users. To account for this throughout the thesis, the unique number of users represented is mentioned in analyses. Fourth, there is also no way to confirm that participants of the pulse tracking data experiment were also the owners of some lesser known YouTube accounts when evaluating the most popular channels within the dataset. Finally, due to the large variety of channels and videos, each individual video was not classified, and as a result top-level trends may only be observed (i.e. most popular channels).

## 4.6 Methods

### 4.6.1 Descriptive Analysis

This paper employs descriptive analysis techniques to provide a first look at news and politics YouTube consumption from the user perspective. The top channels and various data subsets are analyzed and described to understand overall patterns and trends.

### 4.6.2 Network Mapping using Gephi

In order to map networks of channels and co-occurrences between individual users, the network analysis tool Gephi was used. First, all unique channels were supplied as nodes and all unique combinations of channel co-occurrences per user were supplied as edges (or connections between the nodes). Gephi's ForceAtlas2 algorithm then applied to was applied to the data to build the network and a number of statistics were run and visualized. The betweenness centrality or network diameter statistic indicates the node's centrality or shortest path within the network, and this is visualized via the node's size (Brandes, 2001). Next, a community detection algorithm was run to identify different classes within the network and visualized through color (Blondel, Jean-Loup, Lambiotte, & Lefebvre, 2008). Otherwise all default settings for the ForceAtlas2 were used.

## 5. Analysis and Results

The analysis and results from this thesis attempt to provide a first descriptive look at how YouTube users use the platform for political information consumption based on the four previously outlined research questions. The first section will look at YouTube news and politics diets overall in terms of how frequently users watch news and politics videos and peak watch periods. The second section will analyze classified predecessor and successor URLs from the news and politics dataset to paint a picture of how users find news and politics videos. This has potential implications on the role of YouTube’s algorithm in recommending content to users. The third section will analyze the most popular channels watched by each ideological community. To get a better understanding of differential exposure on the platform, it will include a comparison of differences and overlaps between these groups. The final section will analyze four users who watched more than sixty videos from known far right channels. Although no generalizable conclusions can be made from such a small group, patterns in these users’ behaviors and YouTube diets may shed some light on the type of users that are interested in extreme content.

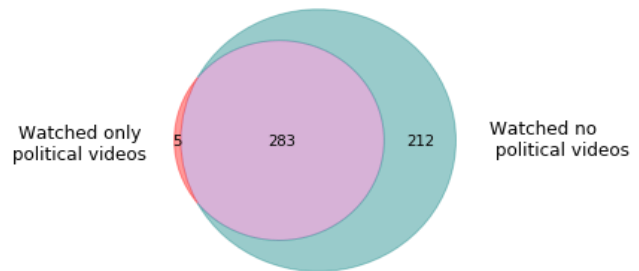
### 5.1 Top-Level Trends: YouTube News and Politics Media Diets and User Behavior

**Despite the small percentage of political videos within the dataset, a large group of users came into contact with some political content.** In the full dataset of 133,320 YouTube videos, 9% were related to news and politics<sup>8</sup>. It appears that most users watched YouTube content related to music, entertainment and people & blogs rather than politics. Of the overall 500 unique users in the full dataset, 288 users or **58% viewed one or more political videos** (See **Table 2** and **Figure 3**). Five users viewed only political videos<sup>9</sup> while 212 users (42%) did not view any political videos at all. Political users (68%) did not appear to be any more interested in news

Table 2: Overview of Full Dataset and Political Subset

	Total Videos	Unique Users	Unique Channels	High News Interest
<b>Full Dataset</b>	133,320	500	36,568	322
<b>Political Dataset</b>	12,241	288	2,505	196

Figure 3: Overview of Non-political and Political Users



<sup>8</sup> For more details regarding the dataset and political subset, see data and setup section

<sup>9</sup> Of the five users who watched only political content, they individually watched very few political videos ranging from one to eleven videos.



than non-political users (62%) despite their watch history. This suggests that the overall dataset was already quite interested in news, and only some users use YouTube as a further source of information. Both groups responded that they receive most of their news from the internet, TV and some radio (see Table 1 for additional information). The subset of 288 political users and 12,241 videos, referred to as the political dataset, will be analyzed in the following sections.

### 5.1.1 Consumption Frequency per User

Although most political users said they were interested in political news, within this group **some users were clearly more interested in politics and news content on YouTube than others** (see **Tables 3 and 4**). On average, political users watched 42.5 political videos or about five videos per month within the period of study. However, **the top eleven political users watched around half of the total political videos within the dataset**, which shows that some users are YouTube politics junkies. These top eleven users watched more than 299 videos each or between one and two videos per day on average. The most active user watched a total of 902 videos or three to four political videos per day on average in the 212-day period. These top political users are generally quite active on YouTube and watching political videos only makes up a portion of their time spent watching videos on the platform or 28% on average. At minimum, political videos made up 9% of an individual's total video consumption and at most, 60%. On the other hand, some users rarely watched political videos with the bottom fifth of political users watching only one political video. The mean number of videos watched per user is notably higher than the median of 6.4 videos, which shows that the distribution of videos and channels is skewed by the most active users.

Table 3: Political Videos and Channels per User

	Mean	Max	75%	50%	25%	Min
Videos per User	42.5	902	26	6.4	2.8	1
Channels per User	15	443	14	5	2	1

Table 4: Frequency Table – Political Videos per User

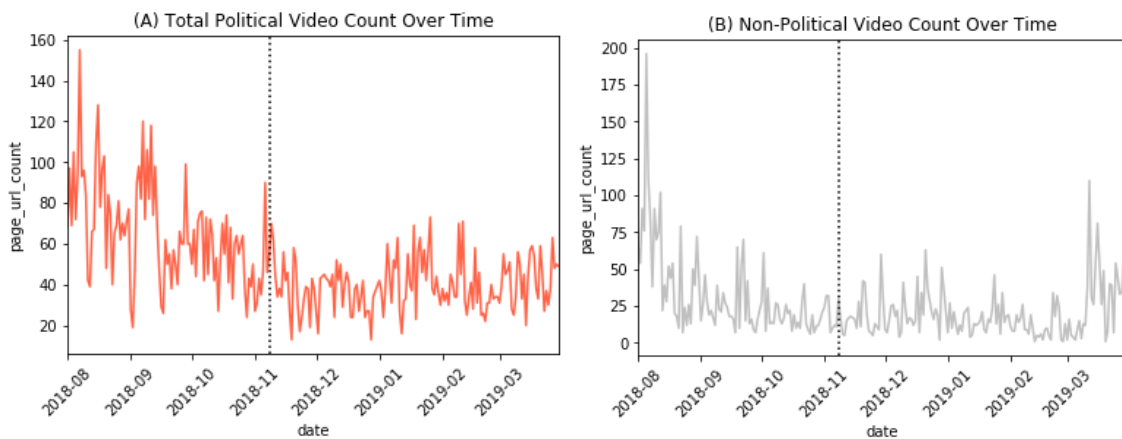
Number of political videos per user	Frequency
1-9	164
10-19	41
20-29	16
30-38	14
40-49	7
50-59	6
60-69	3
70-79	5
80-89	3
90-99	3
100-199	8
200-299	8
300-399	5
> 400	5

### 5.1.2 User Behavior: Most Active Periods and Engagement

When analyzing the total political video counts over time, it appears that **users were more active prior to the U.S. midterm elections on November 8, 2018** (see Figure 5). During the

days leading up to the election, there was a peak in the total political video view counts on November 6. This trend is not seen in the over-time plot of non-political videos, which suggests that the overall increase seen prior to mid-November may correspond to this political event. Increased political viewership during an election cycle aligns with findings by Albert May (May, 2010). This high-level trend may indicate that political users watched YouTube as a means of political information. Although it remains unclear if users were more interested in political videos during this time or if channels were simply publishing more political content. In line with Munger and Phillips’ supply and demand theory, perhaps both are true.

**Figure 4: Political and Non-Political Video Count Over Time**



Additionally, to understand if political users are more engaged than non-political users, similarly to Moller et. al., the average per-user video completion rate (VCR) between these two groups may be compared. VCR is calculated by dividing the time a user spent watching a video by the total length of that specific video. This metric is more valuable than total watch time because it accounts for the fact that some videos may be longer or shorter. However, only 10% of data was available (1,308 videos) due to zero values from the pulse dataset and YouTube API. From this limited set of data, no differences between these two groups was identified with a VCR of around 20% for both groups. Given the limited amount of data, no conclusions can be made.

### 5.1.3 Most Popular Content Types

Understanding the top news and politics channels from this dataset will contribute to findings by Ledwich and Zaitsev on the overall news and politics information ecosystem on YouTube. The top twenty channels account for more than a third of the total videos in the dataset and almost half of political users viewed a video from at least one of these channels. **Table 5** lists the top

twenty channels by count along with the channel type and video categories from the YouTube API. The channel type has been determined through further qualitative analysis of the channel in addition to the use of pre-existing lists created by third parties (see Appendix 6 for further details). These different channel types are represented by the varying row colors including mainstream media, late-night comedy, YouTube shows and other. Additionally, the official YouTube video categorization<sup>10</sup> is displayed to demonstrate that categories from YouTube's API fail to include all news and politics related videos.

**Table 5: Top 20 Political YouTube Channels<sup>11</sup>**

Channel Type:   = Mainstream news   = Late-night comedy   = YouTube Show   = Election Analysis

Rank	Channel Title	Channel Type*	YouTube Category**	Rank	Channel Title	Channel Type*	YouTube Category**
1	PBS NewsHour	Mainstream news	People & Blogs, News & Politics	11	NBC News	Mainstream news	News & Politics
2	The Late Show with Stephen Colbert	Late-night comedy	Entertainment, People & Blogs	12	The Majority Report w/ Sam Seder	YouTube show	News & Politics
3	CNN	Mainstream news	People & Blogs, Entertainment, News & Politics	13	David Pakman Show	YouTube show	News & Politics
4	MSNBC	Mainstream news	News & Politics	14	Last Week Tonight	Late-night comedy	Film & Animation, Entertainment
5	The Young Turks	YouTube show	Entertainment, News & Politics	15	Big Think	Media	Education
6	The Daily Show with Trevor Noah	Late-night comedy	Comedy	16	ABC News	Mainstream news	News & Politics
7	Real Time with Bill Maher	Late-night comedy	Film & Animation, Entertainment	17	Vox	Mainstream news	News & Politics
8	Fox News	Mainstream news	News & Politics	18	The YankeeMarshal	YouTube show	Entertainment
9	Saturday Night Live	Late-night comedy	Entertainment	19	Democracy Now!	Mainstream news	News & Politics
10	Paul Joseph Watson	YouTube show	News & Politics	20	Let's Talk Elections	Election analysis	News & Politics

\*see annex for classification details \*\*per the channel owner's selection available via YouTube API

<sup>10</sup> Determined by channel owner on a per video basis (although channels can set defaults), not YouTube.

<sup>11</sup> Includes 4,027 of 12,241 total videos (33%) and 136 of 288 (47%) unique users watched at least one video from one of these channels

**Media and late-night comedy dominate** in terms of the most popular types of content identified in the top twenty channels, similarly to findings by Ledwich and Zaitsev. The top mainstream news outlets represent a range of the ideological spectrum including PBS NewsHour, CNN, MSNBC, Fox News, NBC News, Big Think, ABC News, Vox and Democracy Now. All of these channels are officially classified as news and politics on YouTube. In regards to political late-night comedy shows, The Late Show with Stephen Colbert is the second most watched channel followed by The Daily Show with Trevor Noah as sixth, Real Time with Bill Maher as seventh, Saturday Night Live as ninth and LastWeekTonight as fourteenth. **Despite the fact that these late-night comedy shows discuss politics, they are not classified as news and politics by YouTube** but rather entertainment, people & blogs or film & animation.

**The most popular YouTube shows include a mix of partisan liberal and conservative personalities.** On the partisan liberal side, The Young Turks (Ledwich & Zaitsev, 2019), Sam Seder (Seder, 2013) and David Pakman Show (David Packman Show, 2020) provide “progressive” political news with interviews, commentary and some comedy that are exclusively critical of Republicans. On the partisan conservative side, Paul Joseph Watson is a British YouTube personality who considers himself a part of the Global New Right and was previously associated with Alex Jones’ InfoWars (Lupu, 2019). On his channel, he provides controversial commentary on culture, news and politics in an effort to “combat the leftist mainstream meteor” (Lupu, 2019). TheYankeeMarshal promises a “gun channel with educated and useful firearms information coupled with insightful unbiased political commentary and real-world common sense” (TheYankeeMarshal, 2013). Most of these YouTube shows have been classified on YouTube as news & politics, although some also include entertainment and education. Unlike other YouTube shows, Let’s Talk Elections provides minimal commentary but rather a quantitative analysis on various U.S. elections.

## 5.2 The Algorithm: How Do Users Arrive at News and Politics Videos?

An analysis of the predecessor and successor domain level URLs<sup>12</sup> show that **most users arrive at political videos from somewhere else on YouTube and stay on YouTube afterwards (see Figure 4).** More specifically, most users arrive at political content from YouTube videos, the homepage and by searching. **As most users arrive from videos or the homepage (60%), this suggests that YouTube’s personalized recommendations may play a large role in how users find political content to watch.** When a user arrives from a video, this suggests

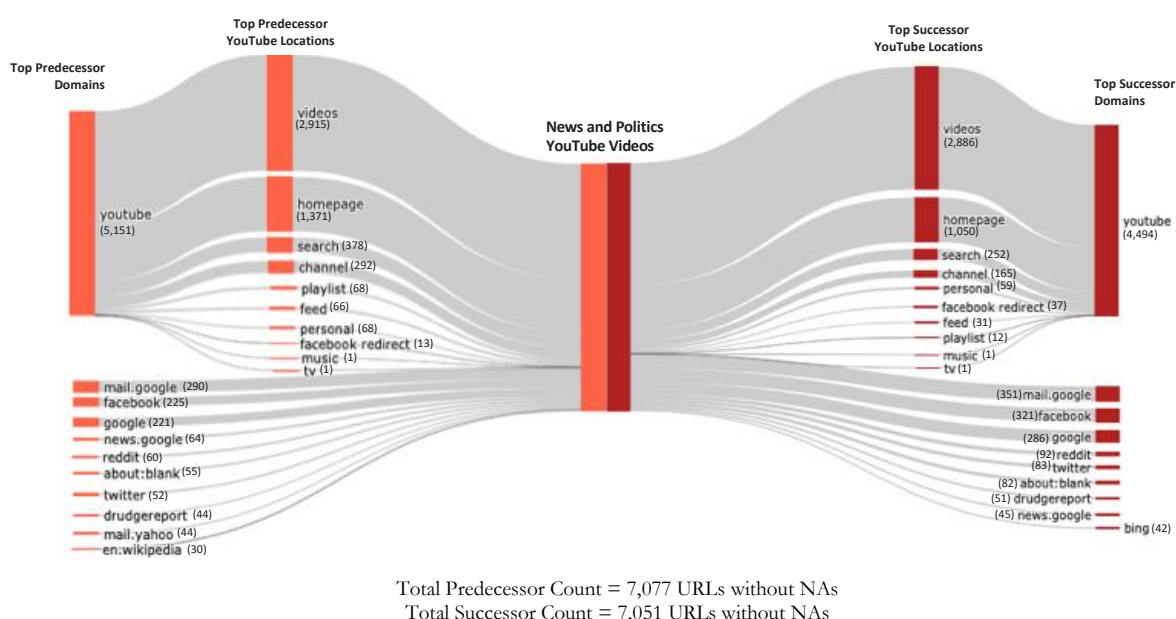
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<sup>12</sup> Data for all 12,242 political videos was not available due to a tracking error and NAs were dropped. 5,144 N/A predecessor domains removed or 42% of total and 5,190 N/A successor domains removed or 42% of total.

that they simply clicked on a related video or channel in the sidebar or continued watching via the auto-play function. If they arrived from the homepage, they clicked on a video from the selection of personally curated options. The top external domains that users arrived from include Google Mail, Facebook and Google in addition to a number of other email providers, social media websites, a new browser (i.e. about:blank), news sites or Wikipedia. This shows that users also watch YouTube videos that have been shared by friends via email or social media. Only 5% of users directly searched YouTube or Google to find political content, which suggests that most users were recommended content based on YouTube's algorithm.

Users' paths after watching political videos is similar to their arrival. After viewing political videos, most political users stay on YouTube, to watch another video or back to the homepage. In terms of non-YouTube domains, users go to Google mail, Facebook or Google. Going to Google after watching a video may suggest that users are searching for related information, or simply carrying on with a completely unrelated task. Additionally, **Facebook, Reddit then Twitter are the most popular social media platforms with user cross-over to and from political YouTube.** Although there were only a few counts within this analysis, this might be important to consider when thinking about information flows across social media platforms. The top ten predecessor domains make up 87% of total URLs and the top successor domains make up 83% of total URLs. This suggests little variation in how users arrive at political YouTube videos. It's important to note that most of these top domains are also the top websites that exist on the internet so no direct claims can be made. Nonetheless, this analysis of predecessor and successor links shows the power of YouTube's recommendation algorithm when it comes finding political content. Appendix 5 includes a full table with the results.

Figure 5: Top Domains Before and After Watching News and Politics Videos



## 5.3 Understanding Differential Exposure on YouTube

### 5.3.1 How Do Media Diets Vary by Ideological Communities?

The following section will deep dive into the media diets of very liberal, liberal, moderate, conservative and very conservative users by analyzing and comparing the top fifteen channels watched by each group (**Table 6**). The same techniques as the previous section were used to categorize channel types and further details are available in Appendix 6. **When comparing different ideological demographics, is there diversity between media diets or do they watch the same types of content?** Understanding differential exposure on YouTube may have implications regarding increased polarization. Channels in Table 6 make up 42% of the total dataset and represent channels watched by 50% of users at least once. Just because a certain channel is watched by one group, this does not indicate that channel's ideological slant.

**Table 6: Top 15 Political Channels<sup>13</sup> by Ideological Community**

Channel Type: ■ = Mainstream news ■ = Late-night comedy ■ = YouTube show ■ = End Time Prophecy ■ = Re-posted news clips

■ = Online campaign ■ = Election analysis ■ = Non-political news

Rank	Very Liberal	Liberal	Moderate	Conservative	Very Conservative
1	PBS NewsHour	The Late Show with Stephen Colbert	Big Think	Fox News	J.D. Farag
2	The Late Show with Stephen Colbert	Real Time with Bill Maher	TheYankeeMarshal	Paul Joseph Watson*	Philip DeFranco
3	The Daily Show with Trevor Noah	CNN	Reed Timmer	The Next News Network**	Jan Markell
4	The Young Turks	MSNBC	Paul Joseph Watson**	Real Coffee with Scott Adams	Mark Dice**
5	MSNBC	The Young Turks	New Rockstars	#WalkAway Campaign	Real Life with Jack Hibbs
6	The Majority Report w/ Sam Seder	The Daily Show with Trevor Noah	CNN	The Echo Chamber	Prophecy Update Videos
7	CNN	Saturday Night Live	An0maly - News Analysis & Hip-hop	CBC News	Jimmy Kimmel Live
8	David Pakman Show	NBC News	Fox News	Let's Talk Elections	CBS News
9	Washington Week (PBS)	PBS NewsHour	DW News	CNN	The Next News Network**
10	Democracy Now!	LastWeekTonight	VisualPolitik EN	Truth Machine	ABC News

<sup>13</sup> Includes 5,106 of 12,241 (42%) total videos and 143 of 288 (50%) total unique users viewed at least one video from one of these channels.

11	Vox	David Pakman Show	Saturday Night Live	MILO**	PragerU***
12	NBC News	Late Night with Seth Meyers	Philip DeFranco	CTV News	Paul Joseph Watson*
13	Redacted Tonight	CBS Sunday Morning	PBS NewsHour	ABC News	StevenCrowder*
14	Saturday Night Live	Vox	Wall Street Journal	Golden State Times	#WalkAway Campaign
15	LastWeekTonight	CBC News: The National	MSNBC	Body Language Ghost	Rebel News**
35 /62 users (35%)		36/67 users (54%)	36/75 users (48%)	19/42 users (45%)	17/39 users (44%)
1715/3193 videos (54%)		1855/3640 videos (51%)	740 /2388 videos (31%)	552/2158 videos (26%)	244/799 videos (30.5%)

\* Identified by Horta Ribiero et. al. as “Alt-lite”

\*\* Identified by Ledwich Zaitsev as “Conspiracy”

\*\*\* Identified by Horta Ribiero et. al. as “Intellectual Dark Web” and by Ledwich Zaitsev as “Religious Conservative”

#### (A) Moderate Users

A closer look at the top fifteen channels watched by seventy-five moderate users shows that **moderates opt for educational and softer news media, watch less late-night comedy in comparison to liberal users and watch conservative-leaning YouTube shows.** Videos published by these top channels make up 31% of the total videos watched by all moderates. 48% of moderate users viewed at least one video from one of these channels. The most popular news media channels include Big Think, CNN, Fox News, DW News, VisualPolitik EN, PBS NewsHour, Wall Street Journal and MSNBC. Not only did moderates watch top mainstream news outlets like CNN and Fox, but they watched Big Think and VisualPolitik EN, which are exclusively available online and take an educational approach to current issues and news. Additionally, moderates watched little late-night comedy content in comparison to liberal and very liberal users. The only show that made it into the top fifteen channels includes Saturday Night Live, which makes fun of Republicans in the Trump era, but has historically satirized both parties (Wild, 2019).

In terms of YouTube shows, moderates watched soft and political news recaps from Philip DeFranco and conservative personalities like TheYankeeMarshal (pro-second amendment commentary), Paul Joseph Watson (New Right activist) and An0maly – News Analysis & Hip-hop. Philip DeFranco discusses not only political news, but focuses heavily on popular news related to celebrities and viral stories. He claims to be “fiscally conservative and socially liberal” (Philly D, 2015) and to cover both sides “even if he massively disagrees (The Rubin Report, 2017)”, but he has received criticisms from both sides in user comments (Reddit r/DeFranco, 2018). An0maly is a self-proclaimed non-partisan, news analyst; however, he has promoted known conspiracy theorist Alex Jones’s theories and products (An0maly, Alex Jones On Q Anon: Claims He Will Reveal Founders On Tuesday! Reaction & Thoughts., 2020), promotes the idea that mainstream media are liars (An0maly, Maddow, The WHO & What In The World Is Going On?,

2020), denies climate change science (An0maly, An0maly On Television Dropping Facts On Climate Protests! Laura Ingraham Angle 9/23/19, 2019) and frequently favors Trump to “non-establishment” Republicans and Democrats (An0maly, Best Of Trump! Top Comebacks To Reporters At Task Force Q&A., 2020). Two channels, Reed Timmer and New Rockstars have been classified as news and politics by the channel authors, although they are about weather and superhero movie related news.

*(B) Liberal and Very Liberal Users*

**Liberal and very liberal users predominately watch mainstream media channels and late-night comedy in addition to some partisan liberal YouTube shows.** For self-identified liberals, videos watched by the top fifteen channels make up about 51% of total videos watched by this group. 54% of liberal users watched at least one video from one of these channels. The top mainstream news media channels include CNN, MSNBC, NBC News, PBS NewsHour, CBS Sunday Morning, Vox and CBC News: The National. All<sup>14</sup> of these sites have been rated by All Sides as liberal or very-liberal with the exception of PBS NewsHour, which has been rated as center (AllSides, 2020). Six of the top channels include late-night comedy shows – The Late Show with Stephen Colbert, Real Time with Bill Maher, The Daily Show with Trevor Noah, Saturday Night Live, LastWeekTonight and Late Night with Seth Meyers. In terms of YouTube shows, liberals watched The Young Turks and David Pakman Show.

For very liberal users, videos by the top publishers make up about 54% of the total videos watched and 35% of very liberal users watched a video from one of these channels. In terms of mainstream media, the top channels include PBS NewsHour, MSNBC, CNN, Washington Week (PBS), Democracy Now!, Vox and NBC News. Interestingly, although these users consider themselves more liberal, the top mainstream news media site for very liberal users is the centrist outlet PBS NewsHour, while the top outlet for liberal users is CNN. The same late-night comedy shows make it to the top fifteen with the exception of Real Time with Bill Maher and Late Night with Seth Meyers. It appears that very liberal users watch slightly more partisan-left YouTube shows than late-night comedy and liberals do. These shows include The Young Turks, The Majority Report w/ Sam Seder, David Pakman Show and Redacted Tonight.

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<sup>14</sup> CBC News: The National is a Canadian outlet that has not yet been rated by All Sides. Some studies have found the outlet is liberally biased, but not all sources agree (Tattrie, 2019).



### *(C) Conservative and Very Conservative Users*

In comparison to moderate and liberal users, the top fifteen **channels watched by conservatives include fewer mainstream media channels, no late-night comedy shows and a variety of different types of content including shows, re-posted news clips and an online anti-liberal activist campaigns.** These channels make up 26% of the total videos watched by the group and 45% of users watched videos from one of these channels, which suggests that they watch a wider spread of content than liberal and moderate users. The most watched channels by conservatives are Fox News followed by Paul Joseph Watson, an alt-lite personality<sup>15</sup> (Ribeiro, Ottoni, Robert, Almeida, & Meira Jr., 2019), and The Next News Network, a channel that regularly promotes a variety of conspiracy theories (Ledwich & Zaitsev, 2019). Conservatives watched less mainstream media than moderate or liberal users with the top channels including Fox News, CBC News, CTV News and ABC news. Conservative users also watched a number of partisan conservative YouTube shows including Paul Joseph Watson, The Next News Network, Truth Machine and MILO, some of which have been called alt-lite and conspiracy channels (Ledwich & Zaitsev, 2019; Ribeiro, Ottoni, Robert, Almeida, & Meira Jr., 2019) and promote pro-Trump content. Three of the top channels include re-posted news clips which have been given accusatory titles claiming to expose or mock the mainstream media, Democratic politicians or so-called “social justice warriors”<sup>16</sup>. Some example titles from these channels include, “Chris Mathews Gets Schooled by Tea Partier (The Echo Chamber, 2010)” or “SHIFF LEAKED IT: Trump EXPOSES Democrats at HEATED Press Conference in India (Times, 2020)”. By using such titles, selecting a limited portion of a news segment and adding some audio commentary, these videos prime the user for what problem they should see while watching the video. Additionally, #WalkAway campaign appears to be a highly popular channel, which is an online movement of ex-liberals sharing their issues with the progressive movement and why they left. In other channels, the election analysis channel called Let’s Talk Elections was also popular in addition to Real Coffee with Scott Adams. Scott Adams, the Dilbert comic creator, claims he is “further left” than Bernie Sanders, but defends Trump’s “powers of persuasion” in his most recent book and frequently posts YouTube video-blogs discussing politics, some of which have been retweeted by Kanye West (Brunswick Review, 2018).

Top channels watched by very conservative users include few mainstream media or late-night comedy shows, but instead include **channels related to the end time theory, political conspiracies and Alt-lite.** Videos published by the top 15 channels makes up 30% of the total

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<sup>15</sup> See appendix 7 for definitions of alt-right, lite and intellectual dark web

<sup>16</sup> This term is used by alt-lite media to characterize “morally-righteous” progressives who defend social issues.

videos watched by very conservative users, and 44% of users watched a video from one of these channels. In terms of mainstream media, very conservative users watched even less than conservatives, with CBS News as the eighth and ABC news as the tenth most watched channel. The top channels for this ideological group (J.D. Farag, Jan Markell, Real Life with Jack Hibbs and Prophecy Update Videos) promote the end time prophecy (Prophecy Update Videos, 2020) and a number of unconfirmed political theories. These channels claim to “help Christians see current events through the lens of the Bible” (Markell, 2020); however, they are promoting a theory that the sins of modern life promoted by progressive Democrats (i.e. LGBTQ+ rights) will lead to the end of the world. As a result, they blame progressive values, the Democratic Party, mainstream media and Pope Francis who they see as a liberal conspiracy for an impending apocalypse (Hibbs, 2020). These personalities appear to be a part of an online community together (Markell, What You Believe About the Rapture and Why it Matters – Pastor Jack Hibbs, 2020; Markell, Pope Francis: An Apocalyptic Player? – Gary Kah, Pastor J.D. Farag, and Pastor Tom Hughes, 2020). Additionally, The Next News Network is the ninth most popular channel, which has been cited by Ledwich and Zaitsev as a channel that regularly promotes a variety of conspiracy theories, or “an event or circumstance that is the result of a secret plot that is not widely accepted to be true (even though sometimes it is) (Ledwich & Zaitsev, 2019)”. The Guardian (Lewis, 2018) and Washington Post (Timberg, 2016) note that this channel picked up attention during the 2016 election for publishing intentionally false stories particularly against the Clinton campaign. Additionally, the top YouTube shows include Philip DeFranco, Mark Dice, PragerU, Paul Joseph Watson, Steven Crowder and Rebel News. While Philip DeFranco provides a mix of political news updates and celebrity news, all of the other shows provide partisan-right coverage (Philly D, 2015). Very conservative users also watched videos by the online #WalkAway Campaign and Jimmy Kimmel Live. As a late-night comedian, Jimmy Kimmel oftentimes criticizes Trump, but perhaps with less frequency than other shows like The Daily Show with Trevor Noah.

#### *(D) Comparison of Media Diets by Ideological Communities*

When comparing the top channels watched by different ideological groups, it is apparent that these groups have different news and politics YouTube diets. Although all groups watch some level of mainstream media, these channels are more popular amongst moderate, liberal and very liberal users. Additionally, **all groups turn to YouTube for some additional layer of political or social commentary and entertainment, beyond the basic reporting of events and facts.** Liberal and very liberal users watch quite a bit of late-night comedy shows, which do not provide event-based reports, but instead filter news through entertainment and satirical commentary

critical of conservative politics. Liberals also watch progressive YouTube shows that provide a layer of opinions on top of current events in a similar way to late-night comedy shows. On the other side, conservative and very conservative audiences opt for non-mainstream information sources including shows, personalities and user uploaded content (i.e. news clips and #WalkAway Campaign). **Conservative YouTube diets appear to be less centralized around a few key players and therefore more diverse.** This is exhibited by the fact that the top fifteen channels only account for 25% of the total videos watched by conservatives, which less than all other groups. For liberals on the other hand, the top fifteen channels absorb a majority of all videos watched by both very liberal (54%) and liberal (51%) groups. This suggests that their news and politics diets are less diverse and these groups stick to the mainstream voices within their own ideological community. This dynamic is also exhibited when looking at the average channels per user in the dataset as exhibited in **Table 7**. Conservatives watched videos by twenty-three different channels on average, while liberals, the second largest group, watched 15 different channels per user.

**Table 7: Videos and Channels Watched per User by Ideological Community**

	Unique Users	Unique Channels	Total Videos	Videos per user						Channels per user					
				Avg.	Max	75%	50%	25%	Min	Avg.	Max	75%	50%	25%	Min
<b>Very Liberal</b>	62	679	3,193	51.5	722	29	7.5	3	1	14	238	16	6	2	1
<b>Liberal</b>	67	697	3,640	54	889	35	7	2.5	1	15	137	17	4	2	1
<b>Moderate</b>	75	695	2,388	32	302	20.5	6	2	1	12.5	149	9.5	3	1	1
<b>Conservative</b>	42	809	2,158	51	902	23.5	5.5	1	1	23	443	11	5	1	1
<b>Very Conservative</b>	39	357	799	20	131	21	6	4	1	11	73	15.5	5	2	1

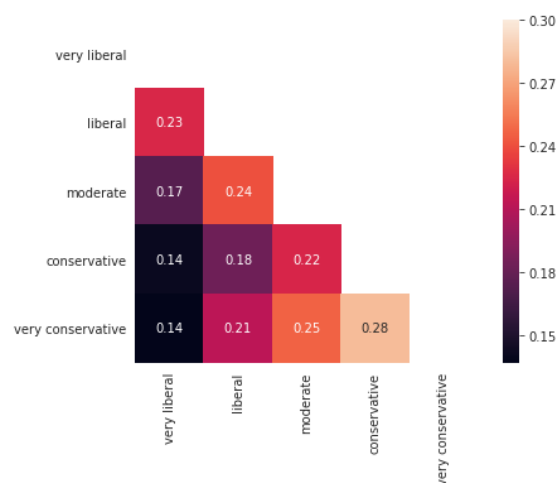
### 5.3.2 Overlap and Segmentation of Ideological Groups

**How segmented are these different ideological groups on YouTube, and over what types of content do they overlap?** This section will first attempt to measure overlap between ideological groups using the overlap coefficient. Second, it will descriptively evaluate the audience segmentation of the top fifty channels and network map top channel co-occurrences within users' YouTube media diets. These descriptive analyses may provide a first idea of whether users of different ideological backgrounds exist in siloed bubbles or whether they venture to the other side of the political ecosystem that may not align with their political views.

#### (A) Comparing Overlap Coefficients between Ideological Communities

In order to understand the overlap between media diets of ideological communities, the overlap coefficient<sup>17</sup>  $(X, Y) = \frac{|X \cap Y|}{\min(|X|, |Y|)}$  was used to compare sets of channels watched between each community (**Figure 6**). Full overlap between two sets is indicated by a score of 1 while no overlap is indicated by a score of 0. This metric has been used by several authors to measure the intersection in news consumption habits and is preferred over the Jaccard Similarity measure due to its usefulness in comparing groups of different sizes (Ribeiro, Ottoni, Robert, Almeida, & Meira Jr., 2019, p. 6; Guess, 2008; Deri, 2019). As two unique sets of channels are compared, the calculation does not take the frequency of channels into account, but rather how many channels overlap. The results show that **channels watched by conservative and very conservative users overlapped the most** – even more than very liberal and liberal users. The least amount of channel overlap occurred between very liberal and both conservative and very conservative groups. It makes sense that users that identify on opposite sides of the spectrum are the least similar; however, it is interesting that there are no differences between very conservative and conservative groups in overlapping with very liberal channels. Moderate channels overlapped most closely with very conservative and liberal audiences, which again suggests that some survey respondents have different conceptions of their ideological leaning.

Figure 6: Channel Overlap Between Ideological Communities



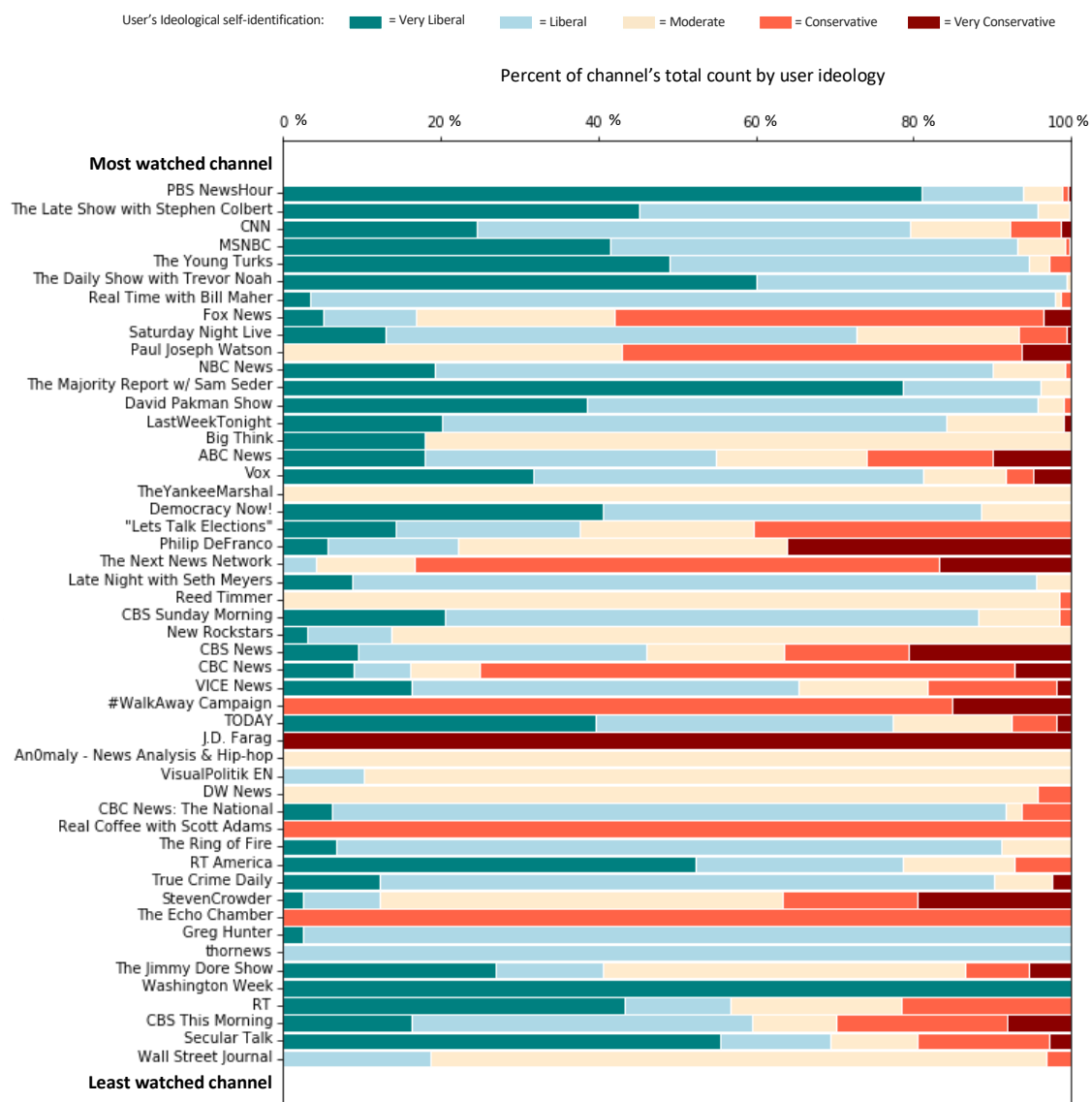
#### (B) Ideological Segmentation of the Top Fifty Channels

When analyzing the top fifty channels broken down by their ideological audiences, **most audiences are dominated by one side of the ideological spectrum or the other**. Figure 7

<sup>17</sup> The py\_stringmatching overlap coefficient [module](#) was used to make this calculation.

visualizes this audience segmentation by showing the percent ideological breakdown per channel with the most watched channels at the top. Some mainstream media channels appear to be balanced like CBS News, ABC News and RT. The Wall Street Journal, DW News, VisualPolitik EN and Big Think have a large portion of moderate users, while Fox News and CBC News are mostly watched by conservative and very conservative users. All other news channels appear to be dominated by liberal and very liberal audiences. This is also the case for late-night comedy shows, although Saturday Night Live has a small percentage of moderate and conservative viewers. The only somewhat mixed audiences for YouTube shows are The Jimmy Dore Show or Let's Talk Elections. **For most of the top channels, moderates are part of the same audiences that also have strong conservative viewership and fewer liberals** (i.e. Fox News, Paul Joseph Watson and Steven Crowder). This also occurs the other way around as exhibited by the viewership of Big Think, VisualPolitik EN and the Wall Street Journal but in fewer cases. This again suggests that within the self-identified moderates, some may be more liberal or conservative leaning despite their self-identification.

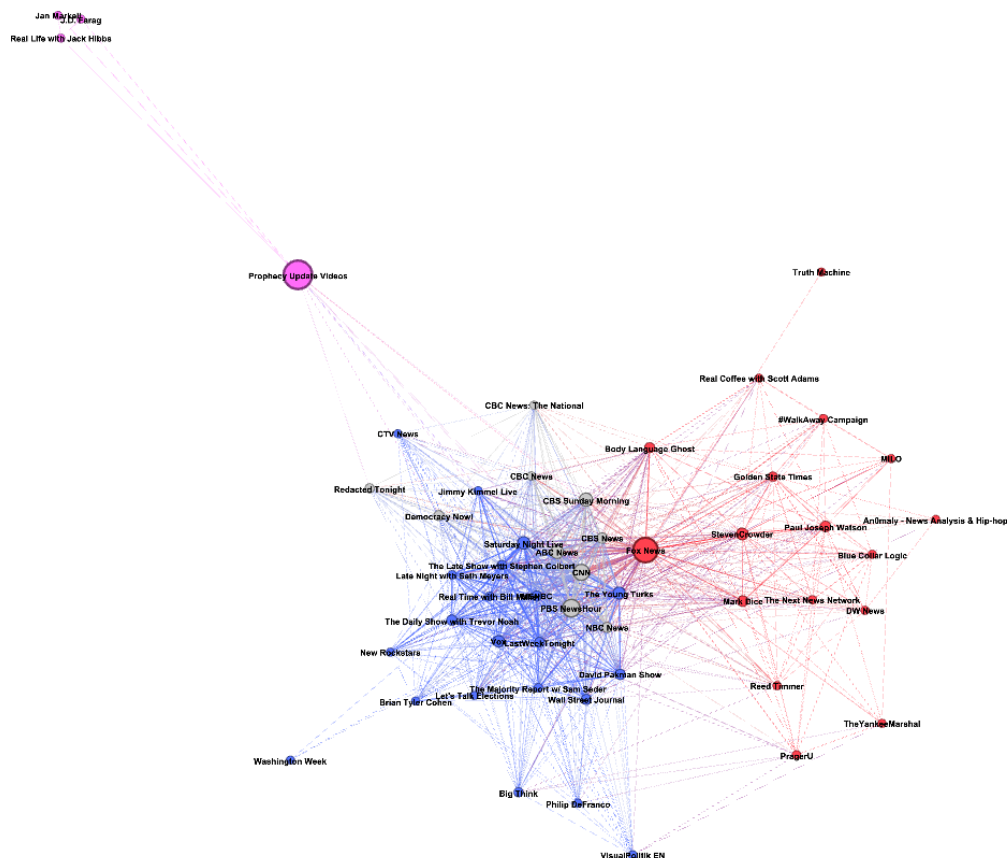
Figure 7: Ideological Audiences of Top 50 Political YouTube Channels



### (C) Network Mapping Top Channel Co-occurrences per User

Network mapping the top channels shows the **segmentation of liberal, conservative and conspiracy communities with the most overlap over some mainstream media outlets**. Figure 8 shows the top 15 channels from each ideological group<sup>18</sup> mapped as nodes (see methods section 4.7.2 for more details). These nodes are connected by undirected edges which represent the co-occurrence of two channels within one user's media diet. For example, if a user viewed both Fox News and CNN, an edge was created to connect these two channels together. As a result, a thicker edge line and closeness within the network signifies more cases of co-occurrence between those two channels. The size of the channel nodes is determined by how central that channel is within the network based on the shortest path, or the betweenness centrality. The larger the node, the more central that channel is. **Fox News appears to be the most central channel followed by PBS NewsHour and CNN**. Additionally, a clustering algorithm was applied and the four resulting clusters are visualized in blue,

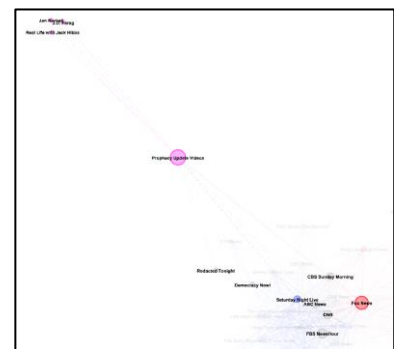
Figure 8: Network Map of the Top 15 Channels per Ideological Community



<sup>18</sup> When all channels were mapped, the results were not interpretable.

red, grey and magenta. The blue cluster includes channels watched frequently by liberal and very liberal users including liberal-leaning YouTube shows, late-night comedy and some mainstream media channels. The red cluster includes channels watched by conservative and very conservative users including Fox News, conservative YouTube shows, channels that re-post news clips and the #WalkAway Campaign. **The grey cluster appears to show the key channels that link together the blue and red clusters** including PBS Newshour, CNN, ABC News, CBS Sunday Morning, NBC News, CBS News, CBC News (The National), Democracy Now and the YouTube talk show called Redacted Tonight. The pink cluster is a distant island of channels promoting the End Time conspiracy, which are connected to themselves and linked back to the larger network via a channel called Prophecy Update Videos. Rather than being linked to alt-right channels, Prophecy Update Videos is only linked to Fox News within the red cluster and otherwise linked to centrist mainstream media and some progressive media (See Figure 9).

**Figure 9: All links to and from End Time Prophecy Cluster**



**All progressive YouTube shows link back up to mainstream media, while this is not the case for all conservative YouTube shows.** The cluster of blue nodes is dense and closely connected within itself, and every blue node has a connection to PBS NewsHour in addition to several other mainstream news media outlets (see Figure 10). There is little overlap between progressive YouTube channels on the exterior of the blue cluster (i.e. Redacted Tonight, Brian Tyler Cohen, The Majority Report w/ Sam Seder, The Daily Show with Trevor Noah) to conservative channels on the exterior of the red cluster (i.e. MILO). However, there does appear to be some, although fewer, links between popular progressive YouTube channels like The Young Turks and David Packman Show with channels like MILO or Paul Joseph Watson. This may be explained by users from one side checking out a few videos from the other side. This shows that the liberal bubble is quite connected within itself with fewer users coming into contact or seeking out extreme conservative content. Additionally, although Let's Talk Elections was a top channel for self-identified conservatives, it appears that this channel is watched within the blue bubble of liberal channels. This suggests again that some respondents may not have the same perception of their political ideological identification. Perhaps some conservatives stay within the confines of blue and grey mainstream media territory while only some experience the land of alt-lite and conspiracy channels. When taking a closer look at the red cluster, all channels link up with Fox News. Channels closer to the center of the network (i.e. Steven Crowder, Mark Dice, The Next News Network) connect back to several other mainstream media channels in addition to a number



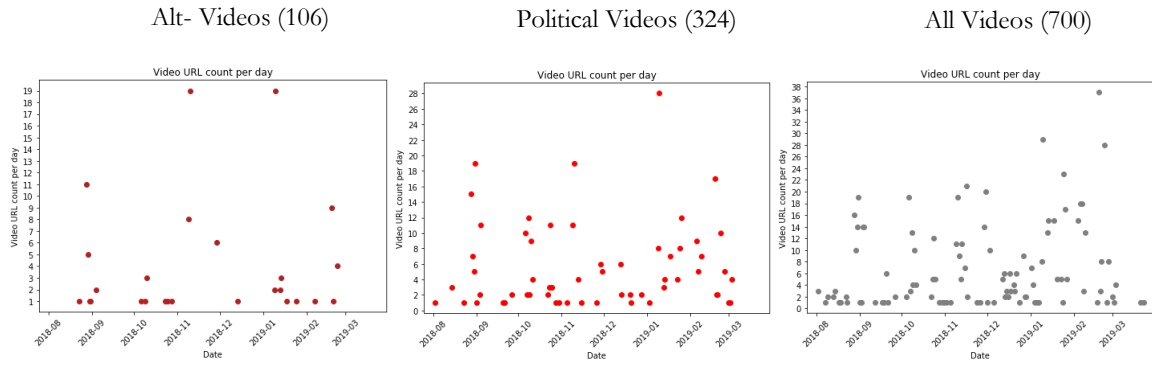


**These individuals were some of the most active users within the political dataset, including the top overall political user.** Two were the top conservative users, and the others were the top and fifth most active moderate political users. All of these individuals were white males between the ages of 55 and 80 years old. All of these users said they were interested in news “most of the time” with the exception one users who responded “some of the time”. The most active two Alt- users watched around 100 videos from these identified channels, or about one video on average every other day in the 212-day period of study. Despite their YouTube watch history, none of these users self-identified as very conservative. Rather, two of these individuals considered themselves conservative while the others identified as moderate. Most of these users arrived to a majority of these videos and continued from somewhere on YouTube, while the user with the most varied media diet most frequently arrived from and continued to his Google Mail account. This suggests that this user was receiving email links to directly watch this YouTube content. A look at these users over time suggests two different types of watch habits. All of the users appear to watch this type of content more sporadically with some **days of large binges which appear to correspond to days where they already are watching quite a bit of political content (see Figure 13).** The most active user watched up to 19 alt- videos in one day while the other three users’ average alt- binge was about six videos.

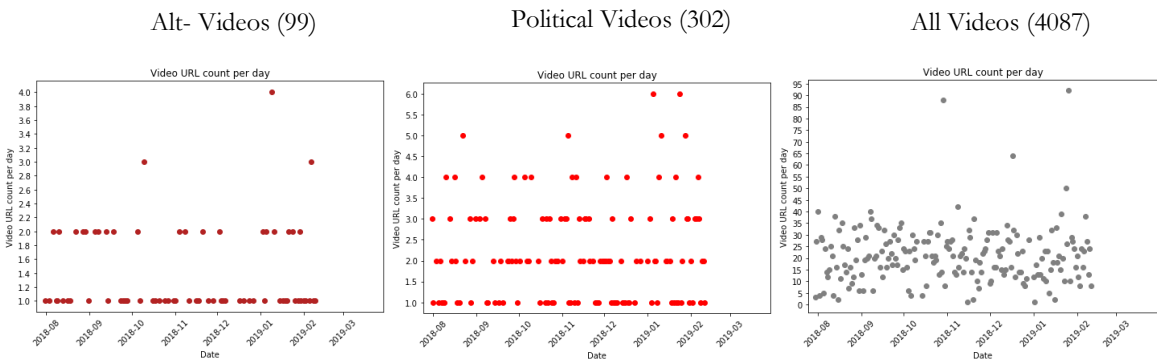
**Political content made up varying degrees of these users’ overall YouTube diets, and these users watched little mainstream media with the exception of Fox for some.** For two users, news and politics related videos were the largest category of videos of their overall YouTube diet with news and politics videos taking up more than 40% of their total watched videos. Both of these users watched few mainstream news media channels, with one watching exclusively Fox News quite frequently and the other watching neither Fox nor any other mainstream news channels more than a few times. While for another user, news and politics was just a small percentage (7%) part of their entire media diet with cars and travel dominating. This user’s top news and politics channels included a number of Alt-lite personalities, but they appeared to also watch content from mainstream news outlets like DW News and the Wall Street Journal. The fourth user fell somewhere in the middle with news and politics videos making up 25% of their media diet. This user’s mainstream news media diet consisted mostly of Fox News with a few local news channels, ABC News and USA Today. Additionally, none of these users watched so-called BreadTube channels, or channels promoting a counter-movement to the rise of alt-right content on YouTube (Roose, 2019; RationalWiki, 2020).

Figure 13: Patterns of Top Alt-Users' Watch History Over Time

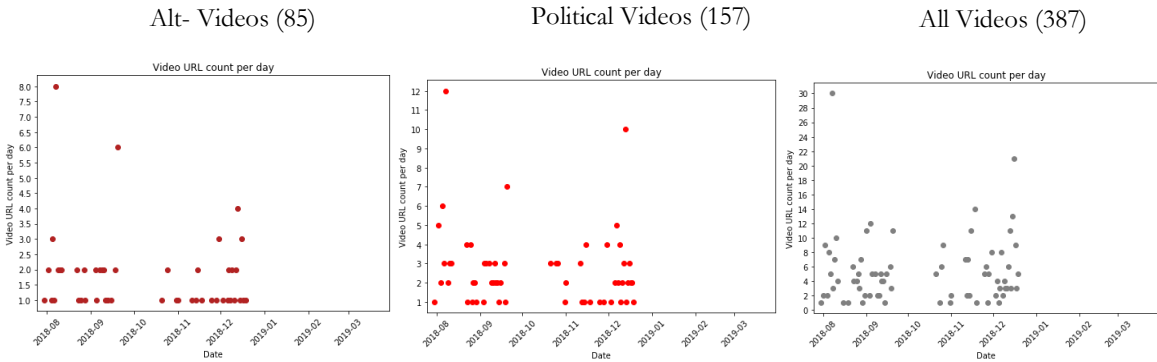
(A) Top Alt-User (7<sup>th</sup> in pol dataset)



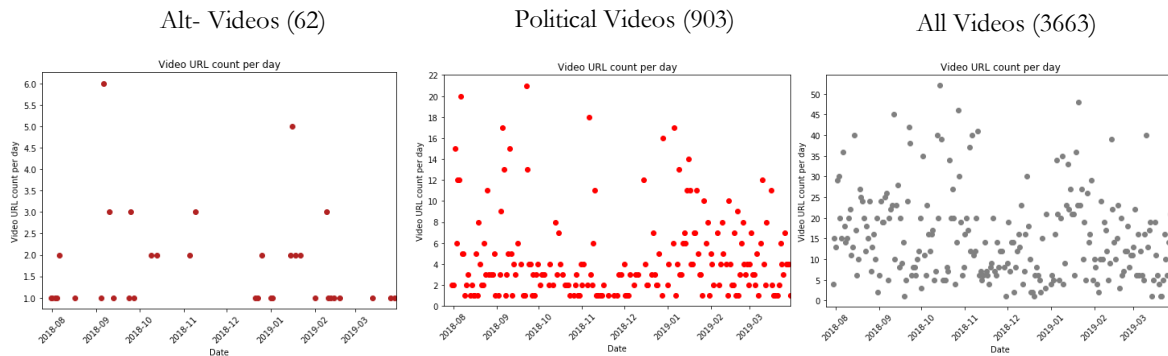
(B) Second Top Alt-User (10<sup>th</sup> most active in dataset)



(C) Third Alt-user (20<sup>th</sup> overall)



(D) Fourth Alt-user (most active overall)



## 6. Discussion

This thesis provided a first descriptive overview of how individuals use YouTube for news and politics information consumption, although further research is needed to expand on causal implications of these findings. The analysis shows that although news and politics content may not be the most popular category on YouTube, over half of users came into contact with one or more news and politics related videos. Consistent with the literature, the lead up to an election period may be the most important time for YouTube politics. Also, like the findings of Ledwich and Zaitsev, the most popular types of news and politics content include mainstream media, late-night comedy and partisan YouTube shows. This suggests that many users turn to YouTube for further political commentary and entertainment on top of conventional news reporting. YouTube is unique to other social media platforms in its cultivation of political personalities and partisan show hosts. With this in mind, **although most studies have focused on smaller, alternative media bubbles, a better understanding the most popular content is also needed.** More specifically, how does popular YouTube political commentary (i.e. late-night comedy YouTube clips, partisan YouTube shows or re-posted news clips) impact the quality of users' information consumption and fit into users' overall online and offline media diets?

Based on the analysis of different ideological communities, media diets across the different groups appear to be quite different. A deep dive into different ideological groups showed that the most popular types of content vary by political ideology. Conservatives have the most varied media diets, and watch significantly fewer mainstream media channels than other ideological groups. The most extreme far right users watched little to no mainstream media on YouTube with the exception of Fox News. Further casual evidence is needed to understand **why environments of differential media exposure exist on YouTube.** Are extreme users tuning into YouTube or is YouTube itself is playing a role in making users more extreme?

Given that most users find political content via YouTube videos and the homepage, the role of YouTube's personalization algorithm cannot be overlooked for news and politics consumption more broadly. This is especially critical given the analysis showing that the audiences of the top news and politics channels within the dataset were quite siloed and media diets between different ideological groups appeared to be quite different. Although the literature suggests that YouTube has made changes to prevent users from watching radical, niche political content – what are the impacts more broadly on news and politics users? More research is needed to understand **how and if YouTube's algorithm is cultivating siloed information ecosystems** where users do not watch content that does not agree with their views or intensifies their views. More evidence is needed to understand the responsibility of the user versus the algorithm in determining user's news

and politics consumption choices. Additionally, it would be interesting to understand how YouTube's own understanding of news and politics content on their site configures into their algorithmic recommendations. In analyzing the top twenty political channels, almost half of the channels did not label videos as news and politics.

Additionally, some news and politics users were quite active and appeared to go on binges, while others only watched several videos. Some of the most active political users also watched the most radical far right content in the dataset. These two points suggest that more research is needed to understand the **impacts of high frequency YouTube use on political knowledge and opinion formation**. Although this thesis was limited to the number of videos watched by each user, future researchers can dive deeper into political engagement (i.e. video completion rate) and patterns of binges.

It appears that survey respondents have different conceptions of their own political ideological leanings, especially the most extreme users. For example, none of the users who watched the most extreme content identified as very-conservative but rather moderate and conservative. This shows that the ideological spectrum is not two-dimensional, despite the U.S.' two party-system. **This might also suggest that users who typically would not identify as very extreme turn to YouTube because they are alienated from mainstream news.** This aligns with Munger and Phillips' theory that these users turn to YouTube for alternate voices. Nonetheless, this research showed that using self-reported survey data may pose some potential issues when analyzing differential media exposure between groups because group identities may not be perfectly accurate.

This thesis was restricted to only the most popular channels; however, it would be worthwhile for future researchers to categorize all videos within a news and politics dataset to get a better picture of YouTube's news and politics information ecosystem. In conclusion, more research is needed on how YouTube news and politics is impacting users' political opinions and behavior, and why differential media exposure appears to exist on the platform. Future research using similar data should take the findings from this thesis a step further to understand if political YouTube is increasing affective polarization and topic specific polarization.

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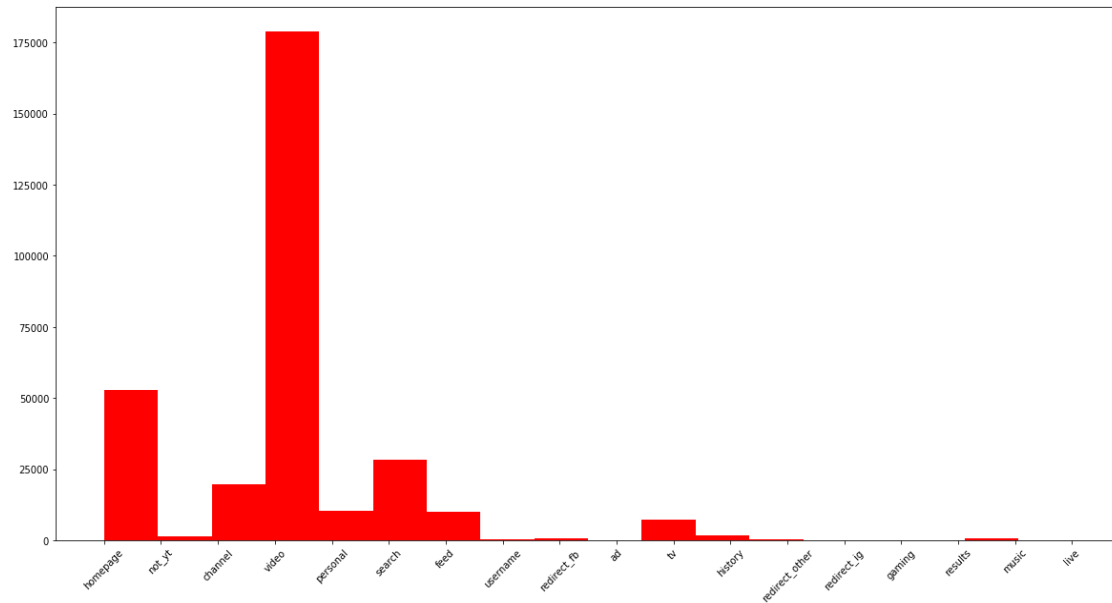
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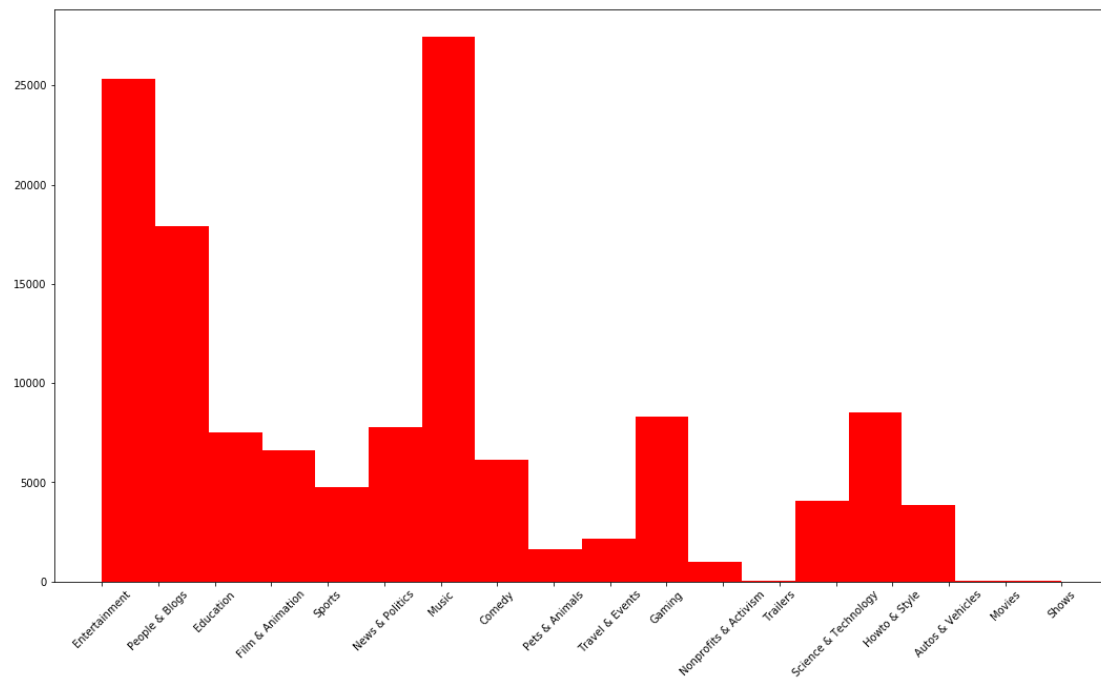
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## Appendix

### A.1 URL Classification of Pulse Dataset



### A.2 Top YouTube API Categories from Full YouTube Dataset



### A.3 Keywords used to Filter Video Titles, Tags and Descriptions

Category	Keywords (Not Case Sensitive)
Trump	['Trump', 'President of the United States', 'Commander in Chief', 'Mike Pence', 'vice president pence', 'white house', 'Vice President of the United States', 'US President', 'Jared Kushner', 'Steve Bannon', 'America First'] Case = True: ['MAGA', 'POTUS']
Obama	['Obama', 'Barack', 'Biden']
Supreme Court	['SCOTUS', 'Supreme Court of the United States', 'Anthony Scalia', 'Ruth Bader Ginsburg', 'Brett Kavanaugh', 'Blasey Ford', 'Neil Gorsuch', 'Justice John Roberts', 'Clarence Thomas', 'Samuel Alito', 'Elena Kagan', 'Sonia Sotomayor', 'Stephen Breyer', 'Anthony Kennedy', 'constitution']
Trump Cabinet	['Jeff Sessions', 'Matthew Whitaker', 'Sean Spicer', 'Sarah Huckabee Sanders', 'Rex Tillerson', 'Mike Pompeo', 'Steve Mnuchin', 'Jim Mattis', 'Patrick Shanahan', 'Ryan Zinke', 'David Bernhardt', 'Sonny Perdue', 'Wilbur Ross', 'Alex Acosta', 'Alex Azar', 'Ben Carson', 'Elaine Chao', 'Rick Perry', 'Betsy DeVos', 'David Shulkin', 'Robert Wilkie', 'Ronny Jackson', 'John Kelly', 'Kirstjen Nielsen', 'Mick Mulvaney', 'Steve Bannon', 'Reince Priebus', 'Michael Cohen', 'Rudy Giuliani', 'paul manafort', 'michael flynn', 'roger stone']
Political Parties	['democrat', 'republican', 'Democratic National Committee', 'Republican National Committee']
House Leadership	['Kevin McCarthy', 'Steve Scalise', 'Liz Cheney', 'Mark Walker', 'Jason Smith', 'Gary Palmer', 'Tom Emmer', 'Drew Ferguson', 'Steny Hoyer', 'Jim Clyburn', 'Ben Ray Lujan', 'Hakeem Jeffries', 'Katherine Clark', 'David Cicilline', 'Cheri Bustos', 'Cedric Richmond', 'Ilhan Omar', 'Ayanna Pressley', 'Rashida Tlaib', 'Ocasio-Cortez', 'Pelosi', 'Beto O'Rourke', 'house of representatives', 'congress', 'congressional district']
U.S. Senators	['Lamar Alexander', 'Tammy Baldwin', 'John Barrasso', 'Marsha Blackburn', 'Richard Blumenthal', 'Roy Blunt', 'Cory Booker', 'John Boozman', 'Mike Braun', 'Sherrod Brown', 'Richard Burr', 'Maria Cantwell', 'Shelley Moore Capito', 'Benjamin Cardin', 'Thomas Carper', 'Robert Casey', 'Bill Cassidy', 'Susan Collins', 'Christopher Coons', 'John Cornyn', 'Catherine Cortez Masto', 'Tom Cotton', 'Kevin Cramer', 'Mike Crapo', 'Ted Cruz', 'Steve Daines', 'Tammy Duckworth', 'Richard Durbin', 'Michael Enzi', 'Joni Ernst', 'Dianne Feinstein', 'Deb Fischer', 'Cory Gardner', 'Kirsten Gillibrand', 'Lindsey Graham', 'Chuck Grassley', 'Kamala Harris', 'Margaret Wood Hassan', 'Josh Hawley', 'Martin Heinrich', 'Mazie Hirono', 'John Hoeven', 'Cindy Hyde-Smith', 'James Inhofe', 'Ron Johnson', 'Tim Kaine', 'John Kennedy', 'Angus King', 'Amy Klobuchar', 'James Lankford', 'Patrick Leahy', 'Mike Lee', 'Kelly Loeffler', 'Joe Manchin', 'Edward Markey', 'Mitch McConnell', 'Martha McSally', 'Robert Menendez', 'Jeff Merkley', 'Jerry Moran', 'Lisa Murkowski', 'Christopher Murphy', 'Patty Murray', 'Rand Paul', 'David Perdue', 'Gary Peters', 'Rob Portman', 'Jack Reed', 'James Risch', 'Pat Roberts', 'Mitt Romney', 'Jacky Rosen', 'Mike Rounds', 'Marco Rubio', 'Bernard Sanders', 'Bernie Sanders', 'Ben Sasse', 'Brian Schatz', 'Charles Schumer', 'Chuck Shumer', 'Rick Scott', 'Tim Scott', 'Jeanne Shaheen', 'Richard Shelby', 'Kyrsten Sinema', 'Tina Smith', 'Debbie Stabenow', 'Dan Sullivan', 'Jon Tester', 'John Thune', 'Thom Tillis', 'Patrick Toomey', 'Tom Udall', 'Chris Van Hollen', 'Mark Warner', 'Elizabeth Warren', 'Sheldon Whitehouse', 'Roger Wicker', 'Ron Wyden', 'Todd Young', 'John McCain', 'Chris Murphy', 'Michael Bennet', 'Doug Jones']
U.S. Agencies (Also filtered channel title)	['U.S. Dept. of Veterans Affairs', 'TSA', 'IRSvideos', 'U.S. Environmental Protection Agency', 'USDA', 'U.S. Department of Commerce', 'Department of Defense', 'U.S. Department of Education', 'U.S. Department of Energy', 'U.S. Department of Health and Human Services', 'U.S. Department of Homeland Security', 'United States Department of Housing and Urban Development', 'US Department of the Interior', 'The Justice Department', 'USDDepartmentofLabor', 'U.S. Department of State', 'US Department of Transportation', 'U.S. Dept. of Veterans Affairs']
Top Lobbying Groups in 2018 according to <a href="#">Open Secrets</a> (no matches)	['U.S. Chamber of Commerce', 'National Association of REALTORS', 'American Hospital Association', 'Blue Cross Blue Shield Association', 'American Medical Association (AMA)', 'Business Roundtable', 'NAMvideo', 'NCTA The Internet & Television Association', 'NRA', 'AIPEC', 'Koch Industries', 'CTIA Everything Wireless', 'AARP', 'Biotechnology Innovation Organization', 'AmericanChemistry']
Social Movements and Issues (based on <a href="#">ISideWith</a> )	<u>Racial Justice / White Nationalism</u> (based on <a href="#">ACLU</a> ) ['black lives matter', 'all lives matter', 'racial justice', 'affirmative action', 'prison reform', 'ShieldWall Network', 'white nationalism', 'racial inequities', 'intersectionality', 'racial inequit', 'neo-nazi', 'civil liberties', 'racial profiling', 'american indian rights', 'race and criminal justice', 'white supremacy', 'white supremacist', 'white privilege', 'NAACP'] <u>Climate / Climate Denial</u> (based on German <a href="#">study</a> ) ['climate change', 'green new deal', 'greta thunberg', 'fridays for future', 'global warming', 'dakota access pipeline', 'fracking', 'climate crisis', 'clean energy', 'paris climate', 'climate conspiracy', 'flat earth', 'paris climate', 'anti-vax', 'anti-vaccination', 'stop vaccinating', 'inconvenient truth', 'climate science', 'climate skeptic', 'green new deal', 'sierra club', 'corporate responsibility', 'carbon emission', 'chemtrails', 'climate hacking', 'climate manipulation', 'climate engineering', 'climate modification', 'geoengineering'] <u>Women's Rights / Men's Rights</u> ['feminism', 'women's rights', 'planned parenthood', 'abortion', 'roe v wade', 'roe v. wade', 'proud boys', 'mens rights', 'pro-life', 'pro-choice', 'pro life', 'pro choice', 'equal pay for women', 'rights for women', 'womens rights', 'feminist'] <u>Gun Rights / Control</u> ['gun control', 'second amendment', 'molon labe', 'gun rights', 'right to bear arms', 'national rifle association'] <u>Immigration</u> ['refugee crisis', 'immigration reform', 'border wall', 'immigrant detainment', 'border security', 'immigration ban', 'muslim ban', 'sanctuary cities', 'immigration and customs enforcement', 'ACLU', 'American Civil Liberties Union', 'child separation', 'migrant crisis', 'migrant caravan'] <u>Social Issues</u>

	<p>["healthcare reform", "medicare", "obamacare", "universal healthcare", "single payer healthcare", "medicaid", "paid sick leave", "housing is a human right", "social security", "pension reform", "minimum wage", "worker rights", "labor rights"]</p> <p><u>Digital rights</u></p> <p>["cambridge analytica", "net neutrality", "internet shutdown", "internet rights"] #no results with internet rights and data privacy returns unrelated results</p> <p><u>Trade</u> (no results)</p> <p>["trade war", "NAFTA", "china tariffs", "world trade organization"]</p> <p><u>Election reform</u></p> <p>["electoral college", "gerrymandering", "voter fraud", "rigged election"]</p> <p><u>Political Finance</u></p> <p>["Political Action Committee", "lobbying", "political finance", "lobbyists", "campaign finance"] #Pacs returns unrelated results</p> <p><u>Russia "scandal"</u> (no results)</p> <p>'impeachment', 'mueller report', 'steve dossier', 'russian witch hunt', 'steve bannon', 'paul manafort', 'mike flynn', 'michael cohen', 'stormy daniels', 'Roger Stone', 'maria butina', 'election meddling'</p> <p><u>U.S. foreign relations</u></p> <p>["North Atlantic Treaty Organization", "war against terror", "military spending", "afghanistan war", "US conflict", "U.S. conflict", "war in syria", "war in iraq", "Libyan crisis", "syrian civil war", "guantanamo", "syrian conflict", "nuclear arms race", "terror organization", "ISIS militant", "# israeli palstinian conflict", "israel lobby", "free palestine", "AIPAC", "pro-palastine", "anti-israel", "israeli settlements", "arab terrorists", "jihad", "sharia law", "refugee", "one state solution", "two state solution", "middle east affairs", "anti-semitism", "anti-muslim", "# international relations", "foreign relations", "international relations", "united nations", "international organisation", "human rights", "iran nuclear deal", "denuclearization"] # "ISIS" is also in crisis, US Military too general</p> <p><u>LGBTQ+</u></p> <p>["LGBT rights", "LGBT activists", "LGBTQ+ rights", "LGBTQ+ activists", "homophobia", "homophobe", "anti-LGBT", "anti-gay", "LGBT documentary", "Stonewall Riots", "gender issues", "trans rights", "transphobia", "United States v Windsor", "Defense of Marriage Act"]</p> <p><u>First Amendment Rights</u></p> <p>["first amendment", "free speech", "freedom of the press", "government censorship", "protest", "Khashoggi", "independent media", "free press", "police brutality"]</p> <p><u>Other</u></p> <p>["religious right", "farm subsidies", "genetically modified food", "student loans", "VA privatization", "federal deficit", "national debt", "government shutdown", "corporate subsidies", "legalize marijuana", "opioid crisis", "decriminalize marijuana"]</p>
General political terms	<p><u>Ideology</u></p> <p>["liberals", "conservative", "radical left", "alt-right", "libtard", "alt-left", "far right movement", "progresive movement", "moderate voters", "libral snowflake"]</p> <p><u>Media</u></p> <p>["fake news", "alternative media", "mainstream media", "left wing media", "left-wing media", "right-wing media", "right wing media", "media bias", "bias in media", "political bias", "fringe media"]</p> <p><u>Government and politics</u></p> <p>["government"] ["politics", "political"] ["capitol hill", "state of the union", "senate", "senator", "economy", "federal reserve", "regulation", "the fed", "democracy", "democratic system"]</p> <p><u>Elections</u></p> <p>["election", "midterms", "battleground states"]</p>
Non-Youtube Political Influencers (according to list by <a href="#">Business Insider</a> )	<p>['Rachel Maddow', 'The Young Turks', 'Waleed Shahid', 'Stacey Abrams', 'Charlamagne Tha God', 'Sean Hannity', 'Rush Limbaugh', 'James Comey', 'John Boehner', 'Michelle Malkin', 'andrew Breitbart', 'Ann Coulter', 'Drudge Report', 'Michelle Bachmann', 'John Conyers', 'Daily Kos', 'Mother Jones', 'Ezra Klein', 'Alex Jones', 'Infowars']</p>
Late-night comedy that are always about news and politics (Filtered by channel title)	<p>'Real Time with Bill Maher', 'LastWeekTonight']</p>

Note: Some variation between titles, tags and descriptions with full details available on GitHub: [https://github.com/madelinebrady/Thesis\\_YouTubeNewsandPolitics](https://github.com/madelinebrady/Thesis_YouTubeNewsandPolitics)

## A.4 Survey Response of YouTube Users' Media Diets

	All YouTube Users	News and Politics Users
<b>Television (%)</b>		
<i>Daily</i>	49%	46%
<i>Weekly</i>	24%	24%
<i>Less than weekly</i>	19%	21%
<i>Never</i>	8%	9%
<b>Print (%)</b>		
<i>Daily</i>	18%	17%
<i>Weekly</i>	21%	20%
<i>Less than weekly</i>	36%	37%
<i>Never</i>	25%	26%
<b>Radio (%)</b>		
<i>Daily</i>	26%	29%
<i>Weekly</i>	24%	22%
<i>Less than weekly</i>	29%	29%
<i>Never</i>	21%	19%
<b>Internet (%)</b>		
<i>Daily</i>	72%	75%
<i>Weekly</i>	18%	17%
<i>Less than weekly</i>	7%	5%
<i>Never</i>	3%	2%
<b>Personal Discussions (%)</b>		
<i>Daily</i>	29%	29%
<i>Weekly</i>	43%	43%
<i>Less than weekly</i>	24%	24%
<i>Never</i>	3%	2%
<i>Not sure</i>	2%	2%
	n = 500 users	n = 288 users

## A.5 Table with Top Predecessor and Successor Locations

Top Predecessor Locations	Count	Top Successor Locations	Count
<b>YouTube</b>	<b>5,151</b>	<b>YouTube</b>	<b>4,494</b>
Videos	2,915	Videos	2,886
Homepage	1,371	Homepage	1,050
Search	378	Search	252
Channel	292	Channel	165
Playlist	68	Personal	59
Feed	66	Facebook Redirect	37
Personal	46	Feed	31
Facebook Redirect	13	Playlist	12
Music	1	Music	1
TV	1	TV	1
<b>Google Mail</b>	<b>290</b>	<b>Google Mail</b>	<b>351</b>
<b>Facebook</b>	<b>225</b>	<b>Facebook</b>	<b>321</b>
<b>Google</b>	<b>221</b>	<b>Google</b>	<b>286</b>
<b>Google News</b>	<b>64</b>	<b>Reddit</b>	<b>92</b>
<b>Reddit</b>	<b>60</b>	<b>Twitter</b>	<b>83</b>
<b>About:blank (New browser)</b>	<b>55</b>	<b>About:Blank</b>	<b>82</b>
<b>Twitter</b>	<b>52</b>	<b>Drudge Report</b>	<b>51</b>
<b>Drudge Report</b>	<b>44</b>	<b>Google News</b>	<b>45</b>
<b>Yahoo Mail</b>	<b>44</b>	<b>Bing</b>	<b>42</b>
<b>Wikipedia</b>	<b>30</b>		
Total Count = 7,097 without NAs Top make up 87% of total		Total Count = 7,051 without NAs Top make up 83% of total	

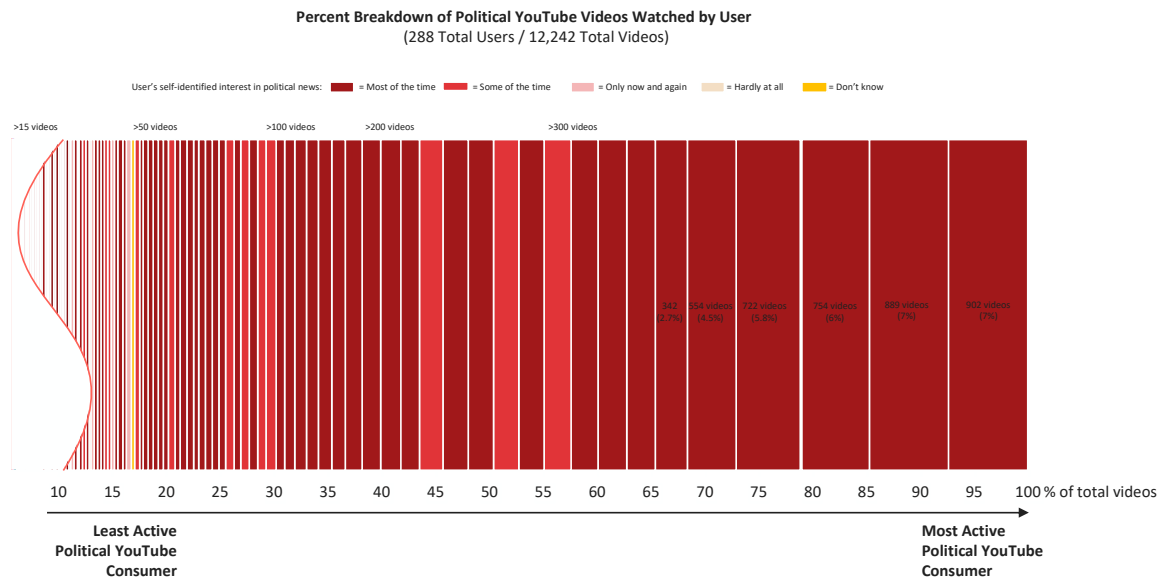
## A.6 Channel Type Classification Codebook

Video Category	Description	Examples
<b>Mainstream news</b>	YouTube channels of news organizations and are officially verified by YouTube. They report on new information related to current events, politics and the world. They have also been classified as such by <a href="#">ad fontes media</a> , <a href="#">mediabiasfactcheck.com</a> and in Horta Ribiero et. al. These channels provide news content with some opinion content; however, opinions represent a number of different individuals.	PBS NewsHour, CNN, MSNBC, Fox News, NBC News, Big Think, ABC News, Vox, Democracy Now!, DW News, CBS Sunday Morning, CBC News, CBC News: The National, Washington Week (PBS)
<b>Late-night comedy</b>	Channels from late-night television comedy show.	The Late Show with Stephen Colbert, The Daily Show with Trevor Noah, Real Time with Bill Maher, Saturday Night Live, Last Week Tonight
<b>YouTube show</b>	Includes channels that are produced for YouTube that mix political news with entertainment, commentary or satire. This includes talk shows and political personalities.	TheYoungTurks, The Majority Report w/ Sam Seder, David Pakman Show, Redacted Tonight, Paul Joseph Watson, The YankeeMarshal
<b>End Time prophecy</b>	Channels that discuss politics and news in the context of Christianity. This includes channels promoting the End Times prophecy.	J.D. Farag, Jan Markell, Real Life With Jack Hibbs, Prophecy Update Videos
<b>Re-posted news clips</b>	Channels that re-post mainstream media clips (i.e. MSNBC, Fox News) with critical titles and/or some audio commentary.	The Echo Chamber, Golden State Times, Body Language Ghost
<b>Online campaign</b>	Activist campaign calling for other users to post their stories and experiences online.	#WalkAwayCampaign
<b>Election analysis</b>	Quantitative election coverage and prediction analysis	Let's Talk Elections
<b>Non-political News</b>	News related to non-political topics.	Reed Timmer, New Rockstars

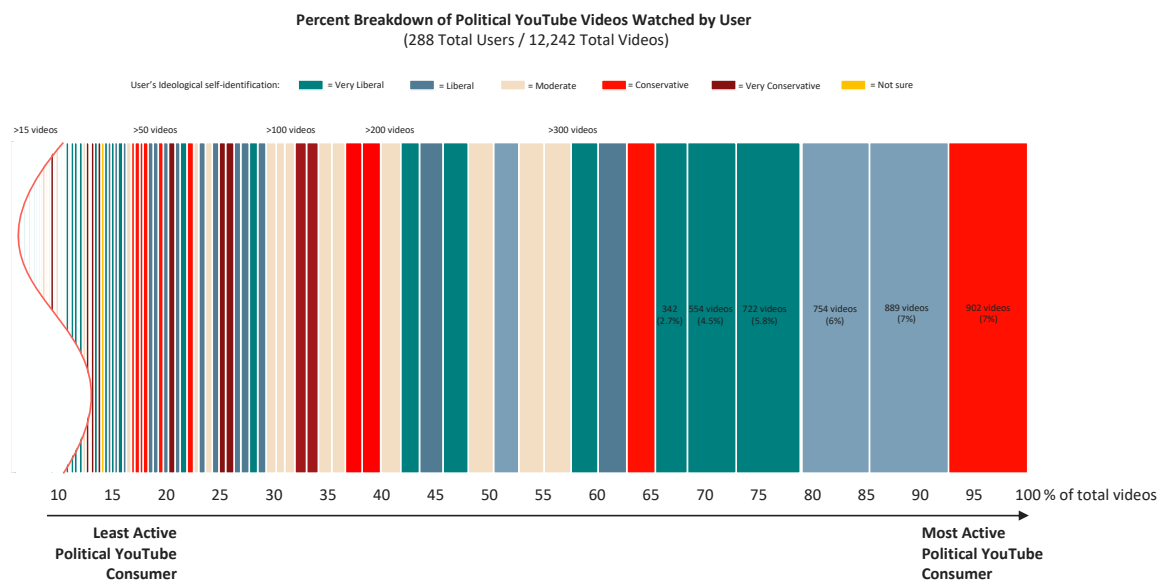
## A.7 Users Who Watched More than 60 Alt-Right, Lite or I.D.W. Videos

Category	Definition	Number of videos	Number of unique users	List of channels
<b>Alt-Right</b>	"Loose segment of the white supremacist movement consisting of individuals who embrace racist, anti-Semitic, and white supremacist ideology" (Ribeiro, Ottoni, Robert, Almeida, & Meira Jr., 2019; Anti Defamation League, 2020)	6	1	'Mark Collett', 'Black Pigeon Speaks'
<b>Alt-Lite</b>	Right-wing activists who do not necessarily embrace white supremacy ideology or racial nationalism (Ribeiro, Ottoni, Robert, Almeida, & Meira Jr., 2019).	285	4	'John Ward', 'Zach Hing', 'No Bullshit', 'The Fallen State', 'SJW CRINGE MACHINE', 'Bearing', 'Styxhexenhammer666', 'Gavin McInnes', 'Oppressed Media', 'Leo Stratton', 'BlazeTV', 'StevenCrowder', 'AIU-Resurrection', 'Undoomed', 'Computing Forever', 'Stefan Molyneux', 'SJWCentral', 'Liberty Hangout', 'Domination Station', 'Paul Joseph Watson', 'The Iconoclast', 'News2Share', 'Dr. Steve Turley', 'Lauren Chen', 'MILO'
<b>Intellectual Dark Web (IDW)</b>	Horta Ribiero et. al. refer to a definition coined by Eric Weinstein popularized by his New York times opinion piece stating, "iconoclastic thinkers, academic renegades and media personalities [...] touching on controversial issues such as abortion, biological differences between men and women, identity politics, religion, immigration, etc" (Ribeiro, Ottoni, Robert, Almeida, & Meira Jr., 2019; Weiss, 2018)	61	4	'PowerfulJRE', 'DronetekPolitics', 'The Free Speech Club', 'Washington Watch', 'Davie Addison', 'The Rubin Report', 'The Daily Wire', 'Matt Christiansen', 'Informative', 'ReasonTV'

## A.8 Watch Frequency by News Interest



## A.9 Watch Frequency by Political Ideology



### Statement of Authorship

I hereby confirm and certify that this master thesis is my own work. All ideas and language of others are acknowledged in the text. All references and verbatim extracts are properly quoted and all other sources of information are specifically and clearly designated.

DATE: 25 May, 2020

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