Fragmented Social Media:
A Look into Selective Exposure to Political News

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ABSTRACT

The hypothesis of selective exposure assumes that people crave like-minded information and eschew information that conflicts with their beliefs, and that has negative consequences on political life. Yet, despite decades of research, this hypothesis remains theoretically promising but empirically difficult to test. We look into news articles shared on Facebook and examine whether selective exposure exists or not in social media. We find a concrete evidence for a tendency that users predominantly share like-minded news articles and avoid conflicting ones, and partisans are more likely to do that. Building tools to counter partisanship on social media would require the ability to identify partisan users first. We will show that those users cannot be distinguished from the average user as the two subgroups do not show any demographic difference.

Categories and Subject Descriptors

J.4 [**Computer Applications**]: Social and behavioral sciences

Keywords

Facebook, Social media, Online news consumption, Selective exposure, News aggregators

1. INTRODUCTION

The theory of selective exposure holds that people tend to seek out political information confirming their beliefs and avoid challenging information. Selective exposure is thought to be highly problematic as it results in segregated and polarized communities [9]. Fortunately, computer scientists have proposed different news aggregators that encourage politically diverse news consumption and try to mitigate the effect of selective exposure [4, 5]. The problem is that we do not know whether selective exposure actually exists. Evidence in the political science literature is mixed–Stroud found consistent evidence for selective exposure across a variety of media [8], yet, LaCour observes that people are exposed to diverse views in their everyday news consumption [3].

Political scientists have conducted research on selective exposure and have built a strong theoretical foundation. However, they have done so mostly on survey data (which might be inaccurate [6]) and partly on direct measurements of news *exposure*. Studying exposure, however, translates into studying news that people might not have necessarily paid attention to. In this work, we focus on news articles shared in social media, which nicely translates into studying news that people have actually paid attention to. Using data of thirty-seven popular US news sites and 61,977 news articles shared by 12,495 Facebook users, we examine to what extent people share like-minded news. To this end, we show a concrete evidence that selective exposure exists in political news sharing.

2. METHODOLOGY

Facebook news consumption. We gather news consumption information from a random subset of Facebook users who have taken a personality test by installing an application called myPersonality [1] and agreed to share their test results and Facebook profiles: 228,064 Facebook users who shared 4.9M links. The demographic of these users reflects the general Facebook population in USA: their number of social contacts is between 30 and 1000 and whose age is comprised between 18 and 54. This group is composed of 136,838 women (59%) and 91,226 men (41%). 59.6% of users have identified their political affiliations (liberal (69.9%) and conservative (30.1%)). From April to September 2010, we gathered 61,977 articles coming from 37 news sites posted by 12,495 users: 37% of links are successfully classified as political news articles through Alchemy API (discussed shortly); each user has posted 2.85 articles on average; while 60% of users have posted only one article.

Only news articles about politics. To select only the articles about politics, we need to be able to classify articles into categories and select those that fall into politics. To do that, we use the Alchemy API which has been shown that it entails superior classification performance compared to other popular classifiers [7]. Given a URL, Alchemy extracts the associated text and returns featured words, the main topic, and a confidence value for the categorization. The main topic is chosen from twelve pre-listed possible ones. We excluded URLs that are categorized as "None" (e.g., broken link) and URLs that have low confidence values (< 0.5 on Alchemy's scale of $[0, 1]$), and we take the remaining ones that are classified under "Culture/Politics".

Determining media slant. We need to classify news outlets into liberal, conservative, or center. Since the outlets in the Facebook dataset are mainly in US, we consulted the website *http://www.left-right.us* and used *Gentzkow and Shapiro*'s novel classification, which relies on term similarity between political speeches and news articles [2]. Among 37 news sites we focus, fourteen media outlets were classified as right-wing (including Fox News and Politico), six as center (including CNN and NewsWeek), and seventeen as left-wing (including Huffington Post and NPR News).

Measuring partisanship: Net partisan skew. To measure selective exposure, in line with previous work [3], we focus on consumption of news from partisan sources (i.e., those that are classified as either conservative or liberal) and compute the *net partisan skew* as the number of conservative news minus that of liberal news (news counts, being skewed, undergo a logarithm transformation):

$$ln(\#\text{conservative news} + 1) - ln(\#\text{liberal news} + 1) \quad (1)$$

The partisan skew reflects how balance a user's news diet is–for

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[1]http://www.mypersonality.org/wiki

example, it is zero if the user consumes an equal amount of conservative and liberal news and it is $\pm$ 2 if, for every 6.4 ($\approx e^2$) conservative (liberal) articles, the user consumes 1 liberal (conservative) article. We use this metric to be able to compare our result to that of previous work [3].

3. RESULT

We will test following hypothesis: ***[H1]*** *News consumption in social media is not balanced but suffers from partisan sharing.*

To measure the extent to which selective exposure exists, we analyze news consumption for articles coming from partisan news outlets–that is, from outlets that can be labeled as either conservative or liberal. We compute net partisan skew using expression (1): a positive score represents users sharing news from conservative outlets, while a negative one indicates sharing from liberal outlets. Figure 1(a) displays the distribution of net partisan skew in the form of kernel density estimates for users who posted at least 4 articles[2]. The curve shows two peaks, reflecting liberal views (left peak) and conservative views (smaller right peak), respectively. The majority of our Facebook users are liberal.

Based on self-reported political affiliations on Facebook, we separate liberal users (N=149) from conservative ones (N=84) and compute their partisan skew (Figure 1(b)). We find that all of them consume a considerable number of like-minded news and systematically avoid cross-cutting news. Liberal users read more liberal news outlets and are centered around a net partisan skew of -1.8, while conservative users read more conservative news (centered around 1.4).

Then, since it has been shown that partisan sharing to political news ends up influencing news consumption on matters that are not strictly related to politics, we analyze consumption of not only political news but of any type of news. We find that, when sharing news about, say, technology, people tend to still select outlets that match their political beliefs, and liberals tend to do much more so than conservatives.

Next, we will try to predict their levels of partisanship. To build tools that counter partisan sharing, one would need to identify partisan users first. With rich demographic data for our Facebook users, we attempt to do that. More specifically, we consider. The following predictors:

- Three Facebook variables: number of Facebook friends, number of postings, and number of likes received from their social contacts.
- Three personal attributes: sex, age, and size of the city he lives in.
- Five personality traits: for our users, we have data from the five-factor model of personality, or the big five, which is the most comprehensive, reliable and useful set of personality concepts [1]. An individual is associated with five scores that correspond to the five main personality traits and that form the acronym of OCEAN. Imaginative, spontaneous, and adventurous individuals are high in $Openness$. Individuals who are ambitious, resourceful and persistent individuals are high in $Conscientiousness$. Individuals who are sociable and tend to seek excitement are high in $Extraversion$. Those high in $Agreeableness$ are trusting, altruistic, tender-minded, and are motivated to maintain positive relationships with others. Finally, emotionally liable and impulsive individuals are high in $Neuroticism$.

All predictors undergo a logarithmic transformation, when nec-

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[2]From our data analysis, we learn that the minimum number of articles upon which the net partisan skew can be computed is 4–below that, the resulting net skew cannot be computed with sufficient confidence.
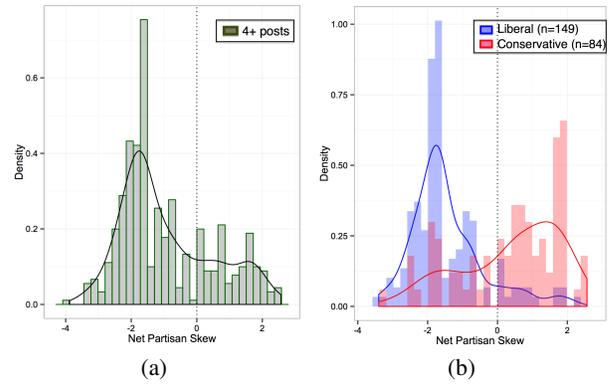

(a)   (b)

Figure 1: Net Partisan Skew of political news

essary (e.g., when they are skewed) and are then correlate with net partisan skew. We find that conservatives (high in net partisan skew) tend to be older ($r = 0.24$), have less likes from friends ($r = -0.13$), live in smaller town than liberals ($r = -0.15$), are more emotionally stable and less spontaneous than liberals ($r_{Openness} = -0.20$, $r_{Conscientiousness} = -0.15$, and $r_{Neuroticism} = -0.21$). All coefficient are statistically significant. Next, we study how these predictors are correlated with partisanship. To this end, we correlate them with the absolute value of net partisan skew - the higher his absolute value, the more partisan a user. Out of the eleven predictors, none of them was correlated for conservatives, while only sex was correlated for liberals ($r = 0.30$), suggesting that liberal men than to be more partisan than liberal women. To sum up, it turns out that predicting political leaning (where most existing research in computer science has gone into) is far easier than predicting partisanship, which appears to be quite challenging. As a result, it might be very difficult to create tools that effectively counter partisan sharing without being able to identify partisan users.

4. CONCLUSION

This is the first study to unobtrusively measure selective exposure in the context of online news consumption. We have shown that selective exposure still exists, especially among those who are partisans, which can amplify the collective prejudices over time. Consequently, in the near future, as the current structure of online media consolidates, we might be left with a political discourse driven by echo chambers. It is important, then, to create alternative media that brings together left, right, and center.

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