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Why individuals seek diverse opinions (or why they don't)

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ABSTRACT

Fact checking has been hard enough to do in traditional settings, but, as news consumption is moving on the Internet and sources multiply, it is almost unmanageable. To solve this problem, researchers have created applications that expose people to diverse opinions and, as a result, expose them to balanced information. The wisdom of this solution is, however, placed in doubt by this paper. Survey responses of 60 individuals in the UK and South Korea and in-depth structured interviews of 10 respondents suggest that exposure to diverse opinions would not always work. That is partly because not all individuals equally value opinion diversity, and mainly because the same individual benefits from it only at times. We find that whether one looks for diverse opinions largely depends on three factors–one's prior convictions, emotional state, and social context.

INTRODUCTION

An outrage industry is easy to find on television, radio, and the Internet. Fox News is a news organization in US that often misrepresents things in an effort to appeal to conservative viewers. In 2004, Britain's media regulator Ofcom censured the channel for failing to show "respect for the truth" [5]. More recently, a poll on health-care reform clearly shows Fox viewers are much more misinformed than the remaining TV viewers [14]. One product of the outrage industry is a series of false, or at least misleading, opinions being spread.

To fix this problem, researchers and practitioners alike have been proposing technological solutions that expose people to diverse opinions and balanced information. The two sites *Politifact.com* and *FactCheck.org* are the most popular examples of sites that gather politicians' public statements and dig out their potential lies. Munson and Resnick ran several experimental studies in which they exposed individuals to a variety of political opinion items and found that participants did not equally value exposure to opinion diversity [10]. A question left unexplored is whether exposing individuals to diverse opinions is an effective solution to the spreading of misleading rumors or, as The Economist has recently claimed: "with the web increasingly divided into like-minded echo chambers, it's not clear whether such a flood of factuality would inform people better–or just reinforce their convictions about what a lying bunch the other lot are" [6].

To answer that question, we try to understand why (or why not) people currently seek diverse opinions on news media outlets and, in so doing, we make the following contributions:

- We distribute an online survey and learn how 60 Facebook and Twitter users in the UK and South Korea read news in those platforms.
- To interpret those responses, we then build a reasoning framework upon the vast literature of opinion spreading. We find that different people seek diverse opinions to very different extents, and that each individual tends to change the way he/she seeks diverse opinions. This change mainly depends on the seeker's: 1) prior beliefs; 2) emotional state; and 3) social context.
- We supplement survey results with structure interviews of 10 individuals, whose comments offer new insights on how social media sites have changed the ways people find news. We find, for example, that some participants try to go beyond their echo chambers by using the Twitter search tool.
- We finally add a quantitative analysis of 2.9M Twitter users. We find that a user's emotional context relates to his political diversity (i.e., users who use more emotion words tend to seek diverse opinions), and that like-minded users associate with each other based on their political diversity.

RELATED WORK

Munson and Resnick run experimental studies, which suggest that online users can be clustered into three distinct subgroups: diversity-seeking, support-seeking, and challenge-averse [10]. Challenge-averse users seek out affirming opinions but reject and avoid challenging ideas, support-seeking users are primarily interested in opinions that are similar to their own, and diversity-seeking users are interested in considering opinions that challenge their own.

SEEKING OPINIONS: A SEEKER CENTRIC VIEW

From the literature on opinion spreading, we find that three main factors are associated with the process of pro-actively seeking opinions. That is, whether one seeks diverse opinions depends on one's: 1) prior beliefs; 2) emotional state; and 3) social context.

Factor 1: The seeker's prior beliefs

Individuals often agree with opinions that fit with, and support, what they already know. In 2008, US liberals were prepared to believe that Governor Sarah Palin thought that Africa was a country rather than a continent, while US conservatives

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were rejecting the same rumor as baseless [11]. The same situation was interpreted in radically different ways according to existing beliefs. After developing strong beliefs, people approach whatever they hear later with those beliefs. This is often called *biased assimilation*: people process information in a way that fits with their own preconditions. Biased assimilation is partly produced by people's desire to reduce *cognitive dissonance* [7], i.e., people tend to deny claims that contradict their beliefs.

Cognitive dissonance occurs under two conditions: 1) strong prior beliefs; and 2) skewed trust. When those two conditions do not hold, that is, when people's beliefs are weak and when they trust both sides of an argument, people will seek diverse opinions and potentially learn from what they read and hear. Liberals were prepared to accept Palin's confusion about Africa because: 1) the confusion fitted what they already thought about the Governor (prior belief); 2) the news was reported by the liberal New York Times (trusted source).

Expectation 1: We expect that individuals tend to seek diverse opinions on issues they are not sure about, and they do so by consulting trustworthy sources.

Factor 2: The seeker's emotional state

Because of cognitive dissonance, people deny claims that contradict their beliefs. This is especially true if those claims contradict their *deepest* beliefs–people do not give up their beliefs especially when they are strongly and emotionally committed to them [8].

Expectation 2: We expect that people would seek diverse opinions on issues that people deeply care about and issues that survive "emotional selection" (i.e., issues that are able to tap emotions common across individuals, like disgust, anger, and outrage [8]).

Factor 3: The seeker's social context

The decision to seek diverse opinions is also affected by social context–it is well-known that we are less driven by independent thought than we would like to believe, and more by peer influence [4]. Indeed, opinions spread through two different but overlapping processes:

1) Social Cascade. A necessary condition for the circulation of opinions is that "susceptible individuals must be in touch with one another" [1]. During World War II, "the rumor that all men over thirty-five years of age were to be discharged travelled like lightning–but almost exclusively among men over that age" [1]. That is because whenever a critical mass of people hold the same opinion, a social cascade starts: people form their opinions by increasingly relying on others and decreasingly checking the facts.

2) Group Polarization. Not checking facts results in *conformity* cascades. In a conformity cascade, people do not question their group's judgment but go along with the group to maintain the good opinion of others or to avoid social sanctions [3]. The result is that people's beliefs are a product of social networks working as echo chambers, and those who live in diverse echo chambers end up with radically different beliefs on the same issue. Widespread acceptance of falsehoods (e.g., racial segregation and discrimination on the basis of sex) is inevitable in echo chambers.

Expectation 3: We expect that individuals who seek diverse opinions are those who are not embedded in echo chambers but span a variety of social contexts in which people hold different and possibly opposing views.

WHY PEOPLE (DON'T) SEEK DIVERSE OPINIONS

Based on the literature, we have put forward three main expectations of how people would seek diverse opinions. Now the question is whether such expectations still hold today.

To get a preliminary understanding of how people consume news everyday, how, when and where they seek or get exposed to diverse opinions, and whether such an exposure has any impact on changing their minds, we distributed an online survey on the two social media sites Facebook and Twitter in November 2011[1]. We gathered responses from sixty individuals (forty five males and fifteen females). We then supplemented survey responses with structured interviews of ten out of the sixty individuals (6 males and 4 females). Next, we report percentage results from the survey, and quotes from the structured interviews.

The age range of our participants is from 18 to 49 years old. Twenty seven live in Europe, and thirty three in South Korea. 80% are graduates or postgraduates of different majors, and all of them are very active users of social media sites. Being active online users, our participants read, on average, 17.46 news articles on the Internet every day, mainly through online newspaper sites and social media sites.

Our respondents value exposure to diverse opinions yet feel it is cumbersome to look for different points of view. 63% of them have been exposed to diverse opinions without looking for it. The sources of exposure have not been major news sites but largely Facebook and Twitter. For 74% of our respondents who have been exposed to views different to their own, no change of opinion resulted from the exposure. We thus asked participants with which of the three political diversity preference definitions they would identify themselves [10]. It turned out that 43% felt to be diversity-seeking, 35% support-seeking, and 22% challenge-averse.

Factor 1: The seeker's prior beliefs

We found that the main factor that determines whether one looks for diverse opinions or not is the strength of one's prior belief. Weak beliefs about an issue generally call for reading a variety of articles, especially if readers deeply care about the issue (reflecting factor 2, which is discussed next).

By contrast, strong beliefs are often associated not only with avoiding different views but also with keeping prior convictions untouched. The challenge-averse participant 7 said:

> *"If I'm opinionated about something, no article would change my mind."*

It is interesting that some participants are not prepared to change their minds after reading articles they find reputable. These participants belong not only to the challenge-averse category but also belong to the support-seeking category. For example, participant 3 mentioned:

> *"For issues about which I have strong opinions, I don't care about different points of view."*

[1]Our survey questions are available at **http://bit.ly/survey-news-consumption**

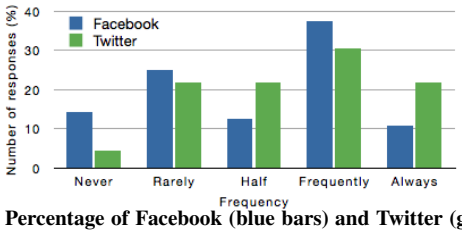


Figure 1. Percentage of Facebook (blue bars) and Twitter (green bars) users who have read news articles with views different to their own: never, rarely, half (of the time), frequently, and always.

However, when our participants changed their minds, they did so because they received news from trusted sources. 31.6% of Facebook users and 65.2% of Twitter users have changed their minds after coming across news articles with views different their own, mainly news coming from friends and from trusted news outlets (e.g., BBC news). Yet, this does not happen regularly, as participant 4 said:

> *"I read articles containing diverse opinions, and these articles often came from friends; but, to be honest, it has not happened very often."*

Factor 2: The seeker's emotional state

Our participants tended to pro-actively look for news about issues they deeply cared about. Our European respondents repeatedly mentioned 2011 issues they strongly related to– UK riots, Greece's financial situation, and the "Occupy Wall Street" movement against social and economic inequality. The most recurrent issue among our Korean respondents was, instead, FTA (Free Trade Agreement) with US.

It has also been mentioned that, initially, the "Occupy Wall Street" movement was not widely covered by traditional media outlets, and social media offered an alternative way of finding news about it, as participant 4 reported:

> *"When Occupy Wall Street was happening, only few mainstream media articles were covering it, so I looked for and found plenty of blog posts and tweets about it."*

Factor 3: The seeker's social context

Whether an issue is popular or not, our respondents did seek diverse opinions about it only if the issue was repeatedly mentioned by more than one of their online friends. For example, participant 8:

> *"News coming from my friends tend to be far more interesting than those coming from popular news sites."*

As nice as it might sound, reading news preferentially from friends might well result into people sorting themselves into echo chambers. However, in reality, that is not what our respondents felt their use of Facebook and Twitter translated into. Only a few respondents felt their Facebook accounts were echo chambers, and those included participants 6 and 4:

> *"I have few friends who posts lots of news links on Facebook, but they're usually about stuff I already read."*
>
> *"Usually my friends tend not to differ in their opinions."*

However, many respondents looked for news on social media sites for the very fact that these sites tend to broaden their views. 7 out of 12 challenge-averse individuals were prepared to loose their reticence and read articles with views different from their own, but only if the articles came from their friends. Participant 3 voiced:

> *"If an article with views different than my own has been posted by friends online, then it is a very different story. I'd read it. It is not just about the article itself, but it's about being aware of what your friends like."*

Similar comments were echoed, to a greater degree, by Twitter users who strongly felt they got diverse opinions on the site (Figure 1). However, they also acknowledged that they carefully picked who they followed depending on the amount of diversity they desired.

Few respondents mentioned they have used Twitter's search tool to go beyond their usual 'news diet'. Participant 4 said:

> *"When I became interested in the 'London Occupy' movement, the first thing I did was to search for it on Twitter. Just to understand what the public made of it."*

Summary The need for diverse opinions varies across individuals and, for the same individual, it is not static but is constantly changing, mainly depending on the issue at hand (emotional issues attract more attention) and on prior beliefs. The stronger the belief, the less likely a change of mind and, as a result, the less likely to look for alternative points of view. Yet, our respondents have changed their minds after serendipitously receiving news articles from trustworthy sources (e.g., traditional outlets, Facebook contacts).

POLITICAL DIVERSITY IN SOCIAL MEDIA

To add further quantitative evidence, we take 320M tweets of 2.9M users and study how their political diversity relates to their emotional and social contexts.

Methodology

The Twitter dataset We used the Twitter dataset from previous work [2]. We chose nine popular USA-based news outlets whose political leanings are determined by consulting a number of public data including [9] and web resources such as *www.left-right.us*[2]. These news outlets cover the entire USA political spectrum and have high penetration rates. Among all users who follow each news outlet, we selected users who posted at least ten tweets in the last three months of the data collection period and who follow at least two of news outlets. This results in a set of 419,446 active news readers on Twitter. For each user, we extracted tweets, media outlets followed, and social network.

Political Diversity Score Our method measures a user's preference for seeking political diversity based on which media outlets the user mentions and on the political leanings of those outlets. We assume that diversity-seeking users would mention politically diverse news outlets in their tweets. We estimate a political diversity of a user's media mentions by using Shannon diversity: $H' = -\sum_{i=1}^{S}(p_i \log p_i)$, where S is the number of possible political leanings (left and right in our case) and p_i is the relative proportion of the user's mentions on the left (p_1) and on the right (p_2). The resulting distribution for our users is power-law: 81% of users have low diversity, while few users are very diverse. With the Shannon

[2]Fox News, Chicago Tribune, U.S. News & World Report, and Washington Times, are classified as right-wing and the remaining five news outlets are classified as left-wing, namely Huffington Post, NPR, Washington Post, ABC news, and NYTimes.

Index for each user at hand, we are now ready to test whether political diversity relates to emotions and social context.

Political diversity and emotions

We found that individuals are more likely to pay more attention to issues that are emotional and, hence, they do seek diverse opinions about those issues. Therefore, we would expect that users who seek diverse opinions (who have higher political diversity) express more emotions in their tweets. So our first hypothesis is:

Hypothesis 1 - Users who express more emotions are more likely to seek diverse opinions.

To test this, we need to classify the sentiment of tweets first. We measure the sentiment of user's tweets using a dictionary called Linguistic Inquiry Word Count. LIWC is a dictionary of 2,300 English words that reflect people's emotional perceptions. After removing stop-words from tweets, we count, for each user, the number of words that are positive and those that are negative in the user's tweets. Then we aggregate both counts to produce the *"emotion score"* for user i: $e_i = \frac{|P_i|+|N_i|}{|T_i|}$, which is the proportion of words in the user's tweets that are positive ($|P_i|/|T_i|$) or negative ($|N_i|/|T_i|$) over the total number of tweets $|T_i|$. The distribution of emotion words is normal.

We then plot each user's political diversity against the user's emotion score (Figure 2(a)) and find that political diversity is more common among users who tend to be emotional in their tweets (i.e., who have emotion score above 0.3), with correlation coefficients of $r = .15$.

Political diversity and social context

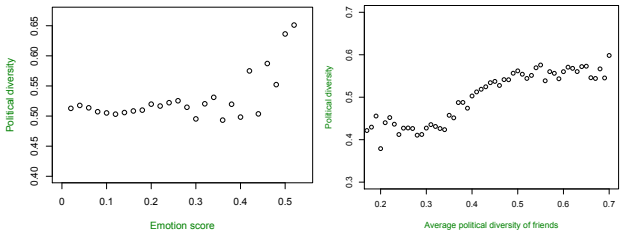
We found that Twitter friends only partly contribute to increase a user's political diversity. So we would expect to have similar risers associating with each other. To test this, we formulate our next hypothesis as:

Hypothesis 2 - Users who seek diverse opinions have friends who do likewise.

We plot a user's political diversity versus the average political diversity of his friends (Figure 2(b)). We find users with high political diversity tend to be followed by like-minded users, with correlation coefficients of $r = .28$.

IMPLICATIONS

It is tempting to believe that exposing people to balanced information can reduce the risks that cascades and polarization will lead people to accept falsehoods. In reality, we have seen that showing diverse opinions to individuals might not have any impact on changing one's mind. That is in line with previous studies that have shown that exposure to balance information does not change people's mind but, by contrast, increases commitment to original perceptions [12]. The first experimental work in this area was carried out in 1975. People were asked to read several studies arguing in favor of and against the deterrent effects of the death penalty for violent crimes. One would expect that supporters and opponents would move toward a "middle argument". Instead "after reading the opposing studies, both sides reported that their beliefs had shifted toward a stronger commitment to what they thought before they had done so." [13]. The same effect has been observed in subsequent studies [11]. Our work suggests that, to expose people to diverse opinions, researchers and



(a) (b)

Figure 2. A political diversity of a user against *(a)* a emotion score of his tweets and *(b)* a political diversity of user's friends.

practitioners should build news aggregating tools with very specific features. These tools should:

- Cover issues people deeply care about and about which they have weak beliefs (e.g., initially, the emotional topic of the UK riots was not widely covered by media outlets).
- Aggregate news from sources individuals personally find reputable (e.g., BBC News or trustworthy friends).
- Encourage people to get out of their social echo chambers (by, e.g., having user interfaces that emphasize search tools over news streams).

CONCLUSION

Technological solutions that aim to make the news more reliable by exposing people to diverse opinions have proved ineffectual. That is not to say that exposing people to diverse opinions is worthless, but merely that, as this paper has detailed, it could work only in specific situations. Polarized news reporting might be inevitable, but news aggregation that is user-tailored could surely attract fresh consumers of news.

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