

Selective Exposure, Filter Bubbles and Echo Chambers on Facebook

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Abstract

Social Media are becoming an important venue of daily news consumption. However, they may also become a venue of selective exposure. Various factors such as information overload, congeniality bias, homophily, or filtering algorithms may nurture tendency of people to expose themselves to congenial information on Social Media. The Social Network Analysis and Multidimensional Scaling are used to analyze the audience overlap of media outlets on Facebook and address the possible existence of selective exposure on social media. Moreover, the analysis is done in the context of multi-party systems to investigate the structure of selective exposure and possible differences in exposure stemming from the subtleties of political and media system. The research analysis the 64 largest Facebook media outlets in Slovakia and Hungary. Results find evidence for selective exposure on social media, strengthened for readers with a preference for extreme conspiracy or extreme right-wing media. Contrary to the expectation, selective exposure does not follow an ideological division but seems to depend on the nuances of the political system, possibly bringing liberal and conservative readers together. The comparison of Slovakia and Hungary provide no evidence of higher audience fragmentation in more polarized Hungary. This thesis concludes with the discussion of limitations and the possible future research.

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Introduction

Patterns of news consumption have changed over time. While in the past, people have predominantly used newspapers, radio or TV as information sources, nowadays more and more people use the internet and social media to get the news. While there was an overall optimism in the early era of the internet about the growing number of news sources, nowadays the scholars point out potential drawbacks of a large amount of information sources. Although the diversity of sources allows receiving news and opinions from various viewpoints, in this complexity, people tend to expose themselves selectively to politically like-minded sources (Mutz and Young 2011).

However, it is not only the individual's choice, which can nurture selective exposure. In the era of information overload, new systems to sort, aggregate and filter the news are emerging to reduce the costs of users to get new information. Therefore, algorithms such as the one that Facebook uses to decide what to show in one's News Feed and in what order may also have an impact on consumption of news. These algorithms prioritize the pages that user engage the most with and take into the consideration the level of engagement the post received from others, the novelty of the post, and more. This unintentional filtering, which is unknown to circa 60% of Facebook users (Eslami et al. 2015), may lead users to believe that they are not missing any news or that they see the same news as others (Pariser 2011).

The fear of communication scholars is that users' content will be tailored in a way that makes them exposed to like-minded news without knowledge of those users (Mutz and Young 2011). Therefore, users may be trapped in their "filter bubbles" which may feed them with the news that Negroponte calls "The Daily Me" (Thurman 2011). However, these filter bubbles should be researched in relation to people's preferences for certain kind of news, as they emerge as a function of people's tracked behavior on the Internet.

Theories of selective exposure are however older than social media and algorithms. Festinger (1962) theorized that individuals have a preference to select the information that confirms their views and screen out those that contradicts them. Although the debate about the existence of selective exposure started in the 1940s (Lazarsfeld, Berelson, and Gaudet 1948), there is still mixed evidence regarding its existence, strength, and circumstances that magnify or reduce it. Some authors found empirical evidence that people are more likely to expose themselves to politically like-minded media (Lawrence, Sides, and Farrell 2010; Iyengar et al. 2008; Iyengar and Hahn 2009; Stroud 2011). On the other hand, there is evidence that people do not screen out the information that they disagree with (Garrett 2009a). Thus, while individuals may be more likely to select information sources that confirm their beliefs, at the same time they are not deliberately screening out the contradictory views. Moreover, some studies suggest that ideological segregation in online news consumption is low (Gentzkow and Shapiro 2011), and depending on the usefulness of the information, people may seek out information that is countering their views (Valentino et al. 2009). Thus, the preference for selectivity may also depend on mitigating factors.

The disagreement about the existence of selective exposure and factors that influence it also moved to the sphere of online social networks. Some authors argue that people tend to discuss politics within clusters of like-minded others (Conover et al. 2011; Barberá et al. 2015; McPherson, Smith-Lovin, and Cook 2001; Tarbush and Teytelboym 2012). Others claim that social media provide a substantial space for politically cross-cutting exposure (Bakshy, Messing, and Adamic 2015) and that online social networks are not that politically homogenous as it is claimed (Goel, Mason, and Watts 2010). However, while it is assumed that an individual's choice of media and filtering algorithms influence the news people consume on the social networks, there is not much empirical evidence whether interplay of these decisions and algorithms stimulate the selective exposure or not.

Furthermore, studies researching selective exposure focus on the US, where two major parties capitalize main societal cleavages and ideological divisions. Therefore, it is likely that selective exposure follows partisan lines (Coe et al. 2008; Iyengar and Hahn 2009; Stroud 2010). However, there is little research done on the phenomenon of selective exposure in the multi-party systems. Although there may be partisan or ideological bias in media operating in multi-party systems (D.C. Hallin and Mancini 2004; Popescu et al. 2011), it is harder to ascribe the clear partisanship bias in these systems (Goldman and Mutz 2011). Generally, in the multi-party system, the political context is more complex than in the two-party systems, and people's preference in media selection may be affected by this complexity (Meffert and Gschwend 2012). Moreover, it may be that the patterns of exposure may be affected by the nuances of media system (Mancini 2013). For this reason, I do my analysis in Slovakia and Hungary, two countries with the multi-party system that also differ in the number of characteristics that potentially influence the patterns of exposure.

Missing evidence about the existence of selective exposure on social media and lack of literature on selective exposure in multi-party systems provide a space for this research. This thesis aim to fill this gap in evidence and thus my research questions are following:

RQ: Is there selective exposure on social media? If yes, what structure it has in a context of multi-party systems?

I use the social network analysis (SNA) and multidimensional scaling (MDS) to address my research questions. Based on the users' behavior on social media, I created the networks of media outlets, visualizing their distance based on the level of their audience overlap. The social network analysis may reveal whether users engage within a cluster of politically like-minded media during their news consumption. The advantage of these methods is, that they can capture the complexities of news consumption on social media while avoiding the problematic self-reports of exposure (Prior 2013) or artificial environment of experiments. Moreover, it allows

me to see whether characteristics of political and media system influence the patterns of news consumption.

There are numerous reasons why it is relevant to address the issue of selective exposure on social media. First, social media are becoming an important venue of news consumption. According to Pew Research Center (2016) around 45% of adult Facebook users in the U.S. use Facebook to consume news. Second, filtering algorithms operating on social media influences the content of exposure. Since their job is to provide information that users will like and engage with, it is likely that they will provide consonant rather than dissonant political information. Furthermore, this may happen without the knowledge of the users as more than 60% of Facebook users are not aware of the existence of personalized filtering (Eslami et al. 2015). Third, selective exposure may be strengthened by the emergence of smaller, more opinion-focused news outlets on Internet and social media in the recent decade (Prior 2013). While in the era of broadcast media, people were exposed to the same news on every network (Bennett and Iyengar 2008), nowadays people have greater control over the exposure. Thus, their preference for consonant exposure may be eased by the availability of sources, which provide the information they like. Fourth, selective exposure on social media may be enhanced by people's preference to surround themselves with like-minded others (McPherson, Smith-Lovin, and Cook 2001; Tarbush and Teytelboym 2012). Furthermore, this tendency for homogeneity may lead them to create so-called "echo chambers" (Sunstein 2009) where their views are confirmed and reinforced by like-minded others (Jamieson and Cappella 2008). Fifth, filtering out opposing views may have a centrifugal effect on peoples' beliefs and opinions (Pariser 2011), which may produce the polarization of society (Sunstein 2002) and greater dislike of groups with opposite beliefs (Ulbig 2013; Iyengar and Westwood 2014).

In summary, the interplay of individuals preference for consonant information, filtering algorithms that are built to provide information that users are supposed to like, and the rise of

opinion-focused media may foster selective exposure and lead to polarization of society. Thus, the main goal of this thesis is to address whether social media are becoming a new venue of selective exposure or not.

Furthermore, this thesis also aims to expand the theory by researching selective exposure in the context of multi-party systems. Since most of the studies concentrate on the U.S. where selective exposure follows the traditional cleavage between Democrats and Republicans, it is not yet addressed whether the structure of selective exposure is simply not a result of specific political context. Besides that, the complexities of political and media system (Mancini 2013), such as societal cleavages, polarization or level of bias in media may affect the structure of exposure. For these reasons, I study selective exposure in Slovakia and Hungary, two countries with a multi-party system, which also differ in regard to mentioned characteristics.

This thesis is divided into four major sections. The first section introduces the main concepts and theoretical approaches on selective exposure. In particular, it presents different types of selective exposure, explains why it is important for people to expose themselves to diverse views, and outlines empirical evidence for and against the existence of selective exposure. It also discusses the relation between the social media, filtering mechanisms, and the selective exposure. Part of this chapter also reviews the mitigating conditions of selective exposure, its dimensions and possible differences in exposure stemming from the structural characteristics of the political system. Based on the provided theory I lay down my hypotheses.

The second section deals with the methods used to examine the selective exposure on social media. Since the research of selective exposure suffers from the various methodological challenges, such as artificial settings of experiments (Hart et al. 2009) or the over-reporting of exposure in survey data (Prior 2009b), I use the novel approach to investigate the selective exposure. Using the aggregated data of users' behavior from Facebook media pages allows me to analyze whether users engage within the clusters of like-minded media on Facebook. The

engagement provides me the proxy for measuring exposure, as it is assumed that exposure is required for engagement with the post.

The third section is devoted to the analytical part of the work. It presents the results of social network analysis of aggregated users' engagement on Facebook in detail. The observation of the structure of the network allows me to conclude whether people are selectively exposing themselves to politically like-minded media or not. I also use multidimensional scaling to reflect the movements in distances between media outlets when various behaviors such as liking or commenting are analyzed on Facebook. This analysis is done for Slovakia and Hungary, and the resulting differences between the patterns of exposure are discussed.

In the fourth part, I discuss the results and possible limitations of my thesis. In conclusion, I shortly summarize the main argument of my thesis and indicate the potential paths for future research.

1. Theory of Selective Exposure, Homophily, Echo Chambers and Filter Bubbles

1.1. Two ways of defining selective exposure

One of the consequences of increased availability of news sources is that people can easily select the media outlets they prefer. The phenomenon of opting for like-minded information is called *selective exposure*. Sears and Freedman (1967) define selective exposure as a preference for the consonant, as opposed to the dissonant information. The idea of selective exposure is connected to Festinger's (1962) cognitive dissonance theory. According to Festinger (1962), challenging views increase uncertainty and psychological discomfort, while supporting views increase individual's confidence in preexisting attitudes and decisions. Therefore, people tend to expose themselves to information which confirms their views and filter out news that challenges their perspective to avoid the psychological conflict known as *cognitive dissonance* (1962).

The theory of selective exposure was later questioned by Sears and Freedman (1967), who argued that selective exposure, rather than being a result of individual's choice, is stemming from the structure of individual's environment where congenial information predominates. Thus, they coined the term *de facto selective exposure* (Sears and Freedman 1967). However, the later studies revealed that it is indeed individual's choice which drives selective exposure (Frey 1986). At the same time, they concluded that people tend to expose themselves selectively to like-minded information in certain conditions. For instance, people with a high commitment to their attitudes are more likely to expose themselves selectively to like-minded information (Frey 1986). This could be explained by the great discomfort stemming from the knowledge of holding an inaccurate belief on an important issue (Kiesler 1971). Similarly, the quality of uncongenial information may have an effect on individual's selection of information. Since the

high quality of uncongenial information may be a threat to individual beliefs, people tend to avoid them. This does not hold for low quality uncongenial information (Frey 1986; Lowin 1969).

However, seeking out consonant information does not always mean that individuals will screen out all the challenging views. If the exposure to opposing information is considered useful for upcoming decisions (Lowe and Steiner 1968) or it was unfamiliar (Sears and Freedman 1965), individuals did not exercise selective exposure.

1.2. Homophily

One of the factors that influence the type of the news that people are exposed to is the composition of their social environment. The composition of individual's social environment is influenced by the phenomenon of *homophily*. Homophily is the tendency of humans to surround themselves with similar others (Lazarsfeld and Merton 1954). The networks of individuals tend to be homogenous in diverse characteristics, such as demography, socio-economic status, gender, race and political beliefs (McPherson, Smith-Lovin, and Cook 2001). Consequently, the structure of individual's network may influence the reception and the diffusion of information (De Choudhury et al. 2010). In relation to selective exposure on online social networks, individual's tendency to bundle with like-minded others might narrow the political news that one is receiving from his social environment. It may also underrepresent the competing views and lead to the creation of echo chambers.

1.3. Echo Chambers

The definition of the echo chamber is related to its linguistic meaning. The concept refers to a condition where individuals enclose themselves within a chamber of like-minded others, and the presented views and beliefs are echoed by repetition and transmission of the view within this chamber (Jamieson and Cappella 2008). The repetition of this view may reinforce one's

belief system and misguide him/her about the prominence of his/her worldview (Wallsten 2005). This ability to enclose oneself within a chamber of like-minded others had increased after the emergence of the Internet (Sunstein 2009). The Internet and social networks eased the process of connecting with people who share similar interests, religion, or political beliefs by allowing them to create online communities or forums.

Besides that, there is an increasing amount of information sources on the Internet. As Mutz and Young (2011) pointed out, one may expect the curvilinear relationship between the number of available news sources and selective exposure. With a low number of sources, there is almost no possibility of selection. As the number of news sources increases so does the selection possibility. However, if the number of sources is too high, it is not feasible to read all the perspectives. Therefore, one may decide to expose her/himself to like-minded sources (2011). This information overload and attempt for increasing revenues from personalized ads gave rise to another concept related to selective exposure – *filter bubbles*.

1.4. Filter Bubbles

The phrase "filter bubbles" was coined by Eli Pariser (2011), describing the universe of information that is tailored and refined by online services for a specific individual based on her behavior, or the behavior of people who are similar to that individual. Three main factors had influenced the emergence of this information environment. First, information overload made unfeasible for users of Internet to read every new story that emerges or follows every media outlet that is available. Therefore, news systems to aggregate, sort and filter the news emerged to reduce the overwhelming amount of information (Pariser 2011). Second, the cost and the availability of individual's data reduced, making them easier to be collected and to be used. Related to this, the third reason why filter bubbles emerged is a motivation of companies to increase their revenues from tailored content. If the system is effective in targeting and tailoring the content, then the advertising companies gain the competitive advantage on the market

(Pariser 2011). The troubling part is that the motivation of companies is to offer users things they like, not the one that they dislike or they are not interested in.

Thus, when it comes to selective exposure to political news, scholars fear that the personalized systems and algorithms will offer news and opinions that coincide with the beliefs of the targeted individual (Resnick et al. 2013; Pariser 2011). On the other hand, some scholars question the proposition of Pariser (2011) about the existence of selective exposure produced by filtering algorithms. According to Mutz and Young (2011), filtering algorithms are not yet that developed to identify the subtleties of partisanship. Thus the selective exposure produced by filtering algorithms is not likely.

Besides the possible selective exposure stemming from personalized systems, Pariser (2011) recognizes three other troubling characteristics of filter bubbles. First, individuals are alone in their filter bubbles. Since the filter bubble is uniquely tailored for every individual, it may pull individuals apart from each other. Second, filter bubbles are invisible. Many people are not aware of the fact, that their search results or their Facebook News Feed are personalized (Eslami et al. 2015), making them believe that they see the same news as others (Pariser 2011). Moreover, people have a tendency to read or watch “whatever is put right in front of them” (Mutz and Young 2011, 1028). Third, individuals do not choose to enter the filter bubble. While entering the page of a conservative outlet or blog is a choice of an individual, exposure to the certain news is decided by the third person (Pariser 2011).

While it seems theoretically plausible to claim that the era of echo chambers and filter bubbles fostered the selective exposure, the empirical evidence is not so straightforward. However, before I outline the accumulated evidence about the selective exposure, I will discuss the importance of exposure to diverse views.

1.5. Why is it important to expose oneself to the diverse news?

There are several positive effects of exposure to diverse views. First, Mutz and Mondak (2006) argue that exposure to different views is positively related to tolerance towards others. Second, it increases the understanding of arguments used by themselves and by the opposing side (Price, Cappella, and Nir 2002; Mutz and Mondak 2006). Third, according to Moy and Gastin (2006) people who are exposed to diverse views are more opened to political conflict.

Simultaneously, there are some negative effects of selective exposure. According to various authors, selective exposure, the emergence of cyberghettos and fragmentized media environment increased the issue polarization of American society (Stroud 2010; Dilliplane 2011; Arceneaux, Johnson, and Murphy 2012; Mancini 2013). As a consequence, increased polarization may be followed by intolerance or dislike towards out-group(s) (Ulbig 2013; Iyengar and Westwood 2014), support for extremist views or the rise of a hypothetical distance between different groups in society (DiMaggio, Evans, and Bryson 1996: 693). In addition to that, Wojcieszak (2008) argues that homogenous online groups overestimate the public support for their views – a phenomenon called false consensus. If individuals have more precise assessment of how much public support their opinions have, it may lead them to accept the legitimacy of non-desirable outcome rather than being disappointed in the loss of supposed majority. However, there are also some positive effects of selective. Dilliplane (2011) argues that selective exposure has a mobilizing effect on voters and shortens their decision time in elections while exposure to conflicting news has opposite effect.

To summarize, exposure to diverse views may increase people's tolerance, understanding of others and openness to political conflict. On the other hand, selective exposure may increase issue-based polarization, increase the distance among groups of society and embrace the false consensus.

1.6. Does selective exposure exist?

The concept of selective exposure has been widely studied since the 1940s (Lazarsfeld, Berelson, and Gaudet 1948; Sears and Freedman 1967; Frey 1986; Mutz 2006; Hart et al. 2009; Bakshy, Messing, and Adamic 2015). However, the empirical evidence is, at best, mixed. I will first present the results of the studies that provide supportive evidence for selective exposure.

One of the earliest studies that provided evidence for selective exposure was the study of Lazarsfeld, Berelson, and Gaudet (1948), which found that people have a tendency to expose themselves to appeals from parties and candidates they prefer. Later on, it was mostly Dieter Frey (1986) who, besides his empirical studies, reviewed 34 analyses and concluded that selective exposure exists in diverse conditions.

However, since the ways of news consumption has changed and the availability of methodological approaches widened, I will focus on the more recent studies. One of the current proponents of selective exposure is Shanto Iyengar (2008; 2008; 2009), who with his colleagues conducted several empirical analyses to address this phenomenon. In the experimental conditions, they found that Republicans preferred to read about G. Bush rather than Al Gore (Iyengar et al. 2008), or that people are more likely to expose themselves to ideologically congruent media outlets. This effect is strengthened for more politically active partisans (Iyengar and Hahn 2009). Another study that finds support for selective exposure is the meta-analysis of Hart and his colleagues. In their analysis of 91 selective exposure studies, the authors identified that people are almost two times more likely to expose themselves to pro-attitudinal information rather than counterattitudinal information. They also found support for various mitigating factors, such as relevancy of information or usefulness of information for future decisions (Hart et al. 2009). Several studies researching selective exposure in deciding what media to watch or to read support the theory that people tend to expose themselves to media that corresponds to their partisanship (Stroud 2011; Coe et al. 2008; Hollander 2008).

Moving to the sphere of online news consumption, the study of Johnson, Bichard and Zhang (2009) found evidence that blog readers tend to seek dominantly out other blogs that reinforce their opinions in contrast with blogs who challenge them. According to Sunstein (2009), another possible venue for selective exposure is linking of websites. Websites with certain ideological leaning are more likely to link to websites with the same or similar leaning than to pages with different political views (Sunstein 2009).

Nevertheless, some authors question the conclusions of these studies, criticizing the methodological inadequacy or coming with the opposing evidence. In the following, I will review evidence that questions the existence of selective exposure. Furthermore, I will also discuss the mitigating conditions of selective exposure and point out the objections toward some evidence.

One of the main objections to the theory of selective exposure is that people do not screen out information that contradicts their views (Garrett 2009b; Garrett 2009a). While there may be an increased exposure to consonant information, people are only marginally less likely to expose themselves to dissonant information (Garrett 2009a). In addition, Chaffe and his colleagues (2001) argue that people pay the same attention to both, the attitude-consistent and the attitude-counteracting information. However, it can be objected that these studies measured the exposure by self-reports, which are according to Prior (2009b) inflated and should be avoided.

The other set of objections comes from authors who found that under certain conditions, people are seeking information that are contradictory to their views. Several authors found evidence that people are more likely to expose themselves to opposite views if they consider that information useful (Knobloch-Westerwick and Kleinman 2012; Valentino et al. 2009). Another mitigating factor is the quality of the information. People are more likely to expose themselves to the dissonant information if it is low in quality (Hart et al. 2009). Altemeyer

(1998) also found evidence that personal traits, such as open-mindedness, can weaken the selective exposure.

Some authors also doubt the notion that people choose media outlets that are confirming their views. Prior (2013) argues that most voters avoid partisan outlets and cross the ideological lines while consuming news. According to Prior (2013), there is only a small part of strong partisans who exercise selective exposure during the news consumption.

The notion that people choose media outlets that confirm their views is also challenged by Gentzkow and Shapiro (2011). They found that the divergent audiences visit the largest media websites. However, part of their data contradicts their overall argument that there is weak evidence for selective exposure in online media. They point out that the websites of New York Times or Huffington Post attracted on average 25% of conservative users. Similarly, the 75% of readership on the webpage of Fox News are conservatives, and smaller, alternative websites are skewed toward one ideology even more (Gentzkow and Shapiro 2011). It can be argued that this data support the theory of selective exposure, as conservatives are twice as much likely to read Fox News compared to liberals, while the opposite holds for New York Times and Huffington Post.

Thus far, the empirical evidence I presented about the selective exposure was focused on TV, newspapers, blogs, and websites. However, in the recent decade, social media has become the prominent place of news consumption (Gottfried and Shearer 2016). And while factors such as homophily, filtering, and fragmentation of news environment should upsurge the selective exposure, the empirical evidence brings inconsistent results. Furthermore, the novelty of these platforms did not allow many empirical studies to emerge. Thus, in the following I will outline the evidence related to selective exposure and social media.

There are the number of studies that provide evidence of selective exposure on social media. For instance, Conover et al. (2011) revealed that there are two separate clusters of Democrats and Republicans on social network Twitter with only limited number of connections. Similarly, the study of Barberá et al. (2015) found evidence that discussion on Twitter about the political issues follows the ideological lines. Another study conducted by Nikolov et al. (2015) makes evident that users of social media are exposed to a significantly narrower set of information compared to information that comes from their search activity.

As it was mentioned earlier, homogeneity of personal networks may foster selective exposure (Messing and Westwood 2011). If the individual is surrounded by like-minded others, there is a higher chance that the political information she is exposed to on social media will coincide with her views. More importantly, empirical evidence confirms the existence of homophily on online social networks (Tarbush and Teytelboym 2012; De Choudhury et al. 2010).

Moreover, the filtering and algorithms used within social networks such as Facebook may increase the homogeneity of personal networks even more. The study conducted by Nikolov et al. (2015) demonstrates that users of social media are exposed to a significantly narrower set of information compared to information that comes from their search activity. Similarly, the portals that used computer-based algorithms to personalize the content resulted in the higher levels of selective exposure compared to the portals, where exposure was based on the users' customization (Beam 2014). What need to be mentioned is that every system uses different algorithms and therefore the level of selectivity may differ (Beam 2014; Pariser 2011).

However, some authors challenge the existence of selective exposure on social media. For instance, Bakshy et al. (2015) claim that there is a substantive room for cross-ideological exposure on Facebook. The resulting analysis of 10 million U.S. users demonstrated that users are exposed to dissonant information in about 23% of posts (Bakshy, Messing, and Adamic 2015). Furthermore, Goel et al. (2010) confront the selective exposure stemming from the

homogeneity of social networks, indicating that people are exposed to considerable disagreement on Facebook. Nevertheless, both Bakshy et al. and Goel et al. diminish one important factor of selective exposure. Selective exposure does not necessarily mean that people would never read the opposing news source, or they would never encounter the opposing view on Facebook. Instead, it means that people are more likely to expose themselves to consonant rather than the dissonant views. It may be that the information on the opposing source is relevant, unfamiliar, or useful and they would read it (Hart et al. 2009). Thus, if one is twice as likely to expose him/herself to like-minded sources rather than to opposing sources, there is a systematic bias towards congeniality. Therefore, such a limited exposure to oppositional news sources should not be considered as evidence against the selective exposure itself.

Before I proceed to my hypotheses, I will shortly summarize the extensive literature on selective exposure. What may be concluded from the research is that there is still a disagreement whether selective exposure exists or not. It can be suggested that people are more likely to expose themselves to like-minded information, even though some mitigating factors such as usefulness, quality or the relevancy of the information reduce the congeniality bias. Since Internet advanced the media fragmentation, rise of echo chambers and filters bubbles, it is plausible to hypothesize that:

H1: Users on social media will be more likely to expose themselves to media outlets that support their views rather than to media outlets that challenge their views.

This effects may be strengthened for heavy readers or people with the high commitment to their beliefs (Frey 1986; Prior 2013; Stroud 2011; Boutyline and Willer 2016). Frey (1986) argues that exposure to information that counters the strong beliefs increase the discomfort even more. Therefore, it is expected that people holding strong positions will be more likely to exercise selective exposure to avoid this disconfirming views. Therefore, I hypothesize that:

H2: Readers with the high commitment to their beliefs will be more likely to expose themselves selectively to like-minded media.

Numerous studies reviewed argue that people tend to follow partisan and ideological lines while consuming the news (Stroud 2010; Coe et al. 2008; Dilliplane 2011; Iyengar and Hahn 2009). While Republicans and conservatives prefer exposure to Fox News, Democrats and liberals were more likely to expose themselves to either CNN or NPR. (Iyengar and Hahn 2009) Since these studies were conducted in the US, where partisanship correlates with the ideology (Stroud 2007), many of them use ideology and partisanship interchangeably (Garrett 2009a; Stroud 2007; Gentzkow and Shapiro 2011; Iyengar and Hahn 2009). Thus, it is easier to assess the partisan leaning of the media, as the partisanship many time coincides with the ideological leaning. However, in the multi-party system, the ideological leaning of media may mean that the media outlet favors multiple parties with the similar ideology (see Popescu et al. 2011, 120–53; Goldman and Mutz 2011). Therefore, I uniformly use ideological slant of the media outlets and hypothesize that:

H3: There is an ideological dimension in the selective exposure.

There are also structural characteristics of media and political system that may influence the patterns of exposure. According to Goldman and Mutz (2011) if the structure of media system follow the structure of political parties, the exposure to diverse views is less likely. In other words, if media outlets favor specific political parties, people will be less likely to expose themselves to diverse views.

Another structural factor that influences the exposure is the audience fragmentation (Mancini 2013). Audience fragmentation depends on the number of characteristics such as external pluralism, political bias in media or media fragmentation. For instance, political bias may attract

like-minded readership and discourage others from reading this outlet. Thus, it may enhance audience fragmentation and foster selective exposure.

Similarly, the level of internal and external pluralism may be important for measuring the fragmentation of media system. While in systems with high internal pluralism there is a diversity of opinions within one media outlet in media systems with higher external pluralism diverse opinions are provided by fragmented, ideologically slanted media outlets. Thus, balanced coverage may decrease audience fragmentation and reduce the selective exposure.

Equally important, the history of cross-ideological governments may reduce the political polarization. Since polarization is related to the greater dislike of groups with opposing views, the smaller polarization of society should reduce the selective exposure. Therefore, my last hypothesis is as follows:

H4: The media system with the lower polarization of political system, lower political bias in media, and lower media system fragmentation will result in smaller audience fragmentation and vice versa.

2. Research Design

To test my hypotheses, I do social network analysis (SNA) of media outlets based on users' aggregate behavior on Facebook. Since it is not possible to observe individual's exposure on Facebook directly, I use users' engagement (liking and commenting) on Facebook pages of media outlets as an indirect measure of exposure. Based on this interaction of users on pages of media outlets, I can estimate the audience of analyzed media outlets. The comparison of audiences, results in the comprehensive table that calculates the audience overlap of every pair of analyzed media outlets. If there is a high overlap in the audience of two media outlets, the connection between them is created. The resulting network shows which media outlets shares a high portion of the audience and which does not. Based on this, I can observe whether users engage in the cluster of like- minded media outlets or not. In other words, observing the clusters of media outlets allows me to conclude whether users are exposed to the like- minded content on the Facebook or their exposure is balanced. To simplify the understanding of how the audience overlap is calculated on Facebook and how the resulting network would look like, I created the following figure.

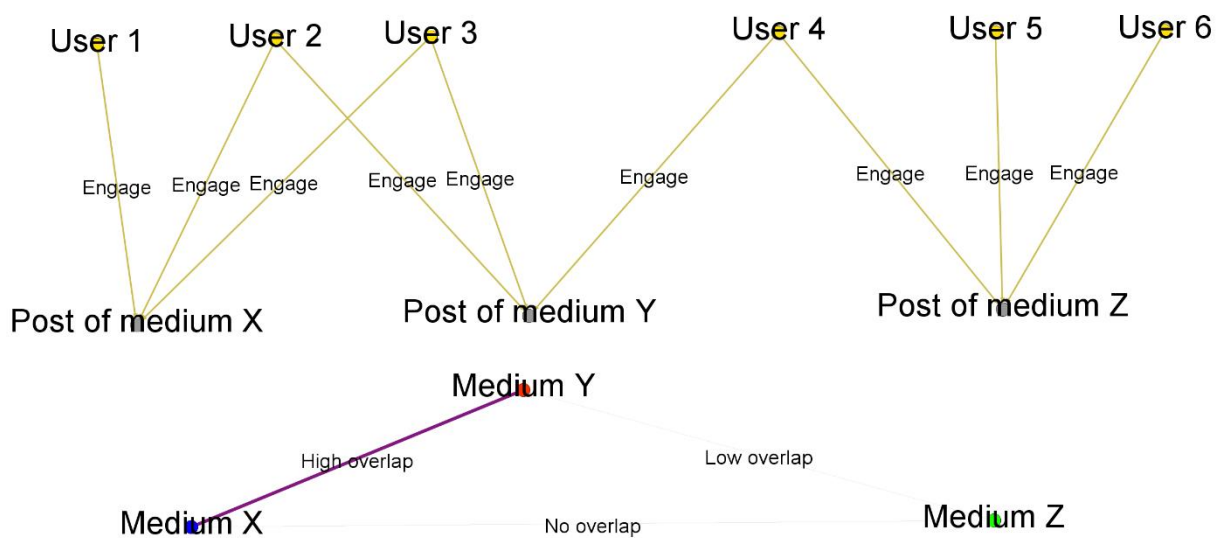


Figure 1: Simplified version of how the audience overlap is calculated. The upper part of the figure shows the how the audience overlap was calculated. The lower part of the figure shows the resulting network of media pages.

In the upcoming sections, I discuss my research design in more detail. First, I start with justification for the selection of countries and media outlets that are analyzed. Second, based on the operationalization of exposure, I justify the measurement of my dependent variable and discuss the possible differences in my results. Third, I provide the details of how I conducted the analysis. Lastly, I discuss how the audience overlap was calculated, what methods I choose to address my hypotheses, as well as, what measures are applied to discuss the networks more in detail.

2.1. Data

2.1.1. Country Selection

As it was mentioned above, most of the studies that have addressed selective exposure focus on the United States. Therefore, one cannot be sure what structure the selective exposure follows in multi-party systems. While in the US, the selective exposure may follow the partisan lines (Dilliplane 2011; Stroud 2010; Iyengar and Hahn 2009) in the context of multi-party system, people can selectively expose themselves based on the issue position (Meffert and Gschwend 2012) or ideology (Trilling, van Klingeren, and Tsfaty 2016).

Furthermore, patterns of exposure may be influenced by the subtleties of the political and media systems. According to Mancini (2013), media fragmentation, the higher external plurality in media, political bias in media and overall polarization can increase the audience fragmentation. It can be speculated that higher audience fragmentation will influence the patterns of exposure in the country. To provide an example, political bias in a medium may attract like-minded readership and discourage others from reading this outlet. Contrary to this, the chance of encountering dissonant information is lower in the media without political bias, and thus, people with diverse beliefs may engage with this medium.

Similarly, the level of internal and external pluralism may be an important factor influencing the exposure. While in systems with high internal pluralism there is a diversity of opinions within one media outlet, in media systems with higher external pluralism, diverse opinions are provided by fragmented, ideologically slanted media outlets. Thus, high level of external pluralism may increase the audience fragmentation and thus foster the selective exposure.

Equally important, the level and the structure of political polarization may influence the patterns of exposure. In countries where the polarization is low, people may be more likely to expose themselves to dissonant information (Trilling, van Klinger, and Tsifti 2016). On the other hand, if the society is highly polarized, the exposure to dissonant information may provide higher discomfort, and thus, people will be more likely to exercise selective exposure.

To determine the structure of exposure in the multi-party system and examine whether the structural characteristics of the system influence the selective exposure, I conduct my analysis in Slovakia and Hungary. There are two reasons why I have decided to choose these countries. First, both Slovakia and Hungary have a multi-party system, and thus, I can address my second research question, about the structure of exposure in a multi-party system. Second, even though Hallin and Mancini (2008) classified Slovakia and Hungary into the same category of media systems, the more in-depth analyses (Vozab, Čuvalo, and Peruško 2013; Popescu et al. 2011) revealed that these countries differ in some characteristics, influencing the patterns of exposure. I discuss these differences in the following part.

According to the typology of Hallin and Mancini (2008), Slovakia and Hungary both belong to The Eastern European/ Post-Communist Media Model. This model is characterized by the history of communism, late democratization, the strong influence of politicians and owners on media, and lower professionalism of journalists. However, the more detailed analysis of media systems in Central and Eastern Europe revealed, that there are notable differences between the countries within this media system model (Popescu et al. 2011; Vozab, Čuvalo, and Peruško

2013; Färdigh 2010). Notably, Slovakia and Hungary differ significantly on several dimensions that are expected to affect the level of selective exposure. While Slovakia is a system with relatively low media fragmentation (Popescu et al. 2011), political parallelism (Vozab, Čuvalo, and Peruško 2013), and political polarization (Palonen 2009; Baylis 2012), Hungary is the opposite. This difference is indicated in Table 1, extracted from the comparative research of media systems in Europe. (Popescu et al. 2011) The dimensions were chosen in the assumption that they may either increase or decrease the fragmentation of the media environment. The numbers that are presented in Table 1 are obtained means. However, it must be mentioned that particularly in the case of Slovakia some dimensions have high variation. This means that there were high differences in the responses. Table 1 also presents the average value in the Eastern Europe to illustrate the difference between Slovakia and Hungary.

Country/ Dimension	Slovakia	Hungary	Eastern European average ¹
Media fragmentation variables			
Same coverage of stories in diverse media outlets 0 (same coverage) – 10 (different coverage)	5,2	3,5	4
Success in providing variety of perspectives in media outlets 0 (not at all) – 10 (very much)	5,8	3,8	4,6
Argument diversity in newspapers 0 (low) – 10 (high)	3,7	3	4
Internet increased the number of actors that influence public opinion 0 (untrue) – 10 (true)	5,8	6,5	6
Independence and political bias variables			
Partisan bias plus policy advocacy in newspapers and TV 0 (low) – 20(high)	9,2	10,7	11,5
Pressure-induced Political Bias - Average of All Indicators 0 (low) – 10 (high)	5,2	5,9	6,5
Journalistic Independence index 0 (low) – 10 (high)	5,2	4,1	4
Freedom of public television from governmental political interference 0 (not at all) – 10 (very much)	1,8	3,3	3,1
Journalistic Professionalism index 0 (low) – 10 (high)	4,1	3,2	4
Owner-induced Political Bias in newspapers and TV 0 (low) – 10 (high)	4,2	6,5	6,2

Table 1: Selected variables measuring the fragmentation, political bias, diversity of arguments and journalistic independence in Slovakia and Hungary. Source: (Popescu et al. 2011)

Table 1 shows that Slovakia has scores lower on a) external pluralism, b) partisan and political bias, c) media fragmentation. At the same time, it has higher a) argument diversity in outlets, b) journalistic independence c) freedom from governmental interference. This indicates that the audience should be less fragmented in Slovakia, and thus, the level of selective exposure should be lower compared to Hungary.

Moreover, there are some other indications that Hungarian media system is more fragmented than the Slovak one. Bajomi-Lázár (2013), claims that change in media law resulted in party colonization of the media in Hungary. The government is effectively controlling the media with advantaging the media, which positively report about the ruling party. As a result, some news

¹ Countries included in this category: Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Macedonia, Moldova, Poland, Romania, Russia, Serbia, Slovakia, Slovenia, Ukraine

sources are departing from the ideological center, leading to the higher media system fragmentation (Bajomi-Lázár 2013).

2.1.2. Media Selection

In each country, there are 32 media outlets with the largest number of page likes on Facebook included in the analysis. Media were chosen based on the list provided by socialbakers.com², the social networks monitoring company. The number of criteria was applied for selection of media. First, the Facebook page must be categorized as “Media”. This means, that if the page is defined as “Community” and shares political news, it is not included in the analysis.³ This usually refers to pages, which share political news but focus on one specific issue such as New World Order or environmental issues. Second, a medium has to report the country in the page address that corresponds to the country of reporting. Third, the outlet has to share at least one post related to politics per week. Fourth, a page has to have an audience of ~5 000 users or more. Fifth, medium has to be active on Facebook. If the page is inactive for more than three months, it was excluded from the analysis⁴.

After the list had been retrieved, I categorized the media based on structural and ideological characteristics. In the next part, I discuss based on what characteristics were media classified. Typically, assessment of media bias in a methodologically rigid way requires quantitative text analysis of news and looking for either similarities within speeches of political figures (Gentzkow and Shapiro 2009), or a number of citations of certain think tanks and policy groups (Groseclose and Milyo 2005), or slant of editorials. (Druckman and Parkin 2005; Ho and Quinn 2008) Regrettably, these data are missing in the analyzed countries, and the quantitative coding would require separate analysis. However, there are other possible assessments of the ideological slant of media outlets. According to Goldman and Mutz (2011), assessing the bias

² “Stats for Top Media Facebook Pages” 2015

³ In case of Hungary, the relatively large outlet vs.hu is not included because of its different category.

⁴ In Slovakia, one outlet was excluded due to the long-lasting inactivity.

in political slant may be based on the partisanship of the owner, editorial endorsement, or simply the general knowledge about the support of certain political views and figures. Thus, the author and three coders from Hungary did the categorization of the media outlets based on the qualitative assessment. The assessment which is based on the general knowledge is also present in some studies focusing on the media outlets in Hungary and Slovakia (Tóth et al. 2012; Open Society Foundations, Kollar, and Czwitkowics 2013; Smoleňová 2015) There was a number of structural and ideological characteristics according to which the media were categorized. I created five categories of media outlets based on the differences in their structural characteristics (mainstream, alternative, broadsheet, tabloid, and regional) and six categories of media outlets based on their ideological slant (socialist, left- liberal, liberal, balanced, conservative, conspiracy).

Firstly, I will discuss the differences between the media outlets based on their structural characteristics. This typology was derived from the concepts in the book *Key concepts in journalism studies* by Franklin et al. (2005).

Mainstream media are defined as traditional mass media, typically radio, newspapers, or TV (Jensen 2008). Their content is professionally produced and distributed; they are publicly accessible and separate the receiver from the producer of the news.

Alternative media are described as a media that produce news and express viewpoints that are marginalized, neglected or suppressed by the mainstream media. These media can have various forms of organization and publication. Typically they have a de-professionalized version of journalism and the readers occasionally produce content.

Broadsheet media have a number of key characteristics. They focus on the hard news, provide analysis and commentary. Their focus has the national or international importance, and the

journalism is driven by the professional ethics. (Lehman-Wilzig and Seletzky 2010) They also provide in-depth and comprehensive coverage of topics and issues.

Tabloid media are defined as media outlets that focus on soft news, sensationalism, exploiting scandals, public spectacles and personal tragedies. Thus, they focus on crime, sport, gossips and lifestyle. Tabloid media often has a printed version and their content is produced and distributed professionally. Usually, they can be differentiated based on their graphic design, where the proportion of headlines and pictures is larger to the text (Limor and Mann 1997).

Regional media are constituted as an equivalent of mainstream media with the difference in the spatial coverage. While mainstream media news has national or international importance, the regional media focus on the coverage of daily news from the specific region or municipality.

The classification of media outlets based on their ideological differences was based on the following characteristics. The coders were qualitatively assessing which political figures and parties are favored in the medium, what political views and policies are advocated in the medium, and the partisanship of the owner.

Table 2 presents the analyzed Facebook pages in Slovakia and Hungary with the number of page likes and categorization of media. As can be seen from the table, the list of selected Facebook pages represents a relative mix of media outlets with different structural and ideological differences. There were five reported mismatches in coding. In these cases, the agreement was achieved after discussion.

Slovakia				Hungary			
Media	# Page Likes	Structural Category	Ideological Category	Media	# Page Likes	Structural Category	Ideological Category
Topky.sk	322007	Tabloid	Balanced	24.hu	377902	Mainstream	Liberal
Nový Čas	329602	Tabloid	Balanced	HVG	368442	Broadsheet	Left-liberal
Televízia Markíza	281718	Tabloid	Balanced	Index.hu	306061	Mainstream	Liberal
Televízia JOJ	247451	Tabloid	Balanced	Blikk	288163	Tabloid	Balanced
Aktuality.sk	133715	Mainstream	Balanced	ORIGO	273256	Mainstream	Balanced
Televízia TA3	111751	Mainstream	Balanced	TV2	259825	Tabloid	Balanced
noviny.sk	101044	Tabloid	Balanced	atv.hu	182053	Mainstream	Liberal
SME	87450	Broadsheet	Liberal	444	149640	Mainstream	Left-liberal
Info.sk	72754	Mainstream	Balanced	168 Óra	122511	Broadsheet	Socialist
Slobodný vysielateľ	71349	Alternative	Conspiracy	RTL Klub official	94716	Mainstream	Liberal
Denník N	61099	Broadsheet	Liberal	NOL.hu	76470	Broadsheet	Left-liberal
Hospodárske noviny	60011	Broadsheet	Balanced	Metropol	66705	Mainstream	Conservative
SME Veda	55315	Mainstream	Liberal	Napilap			
TREND	51999	Broadsheet	Balanced	Delmagyar.hu	61461	Regional	Liberal
PLUSKA.SK	43636	Tabloid	Balanced	Alfahír	59023	Alternative	Conservative
Pravda.sk	37199	Broadsheet	Left-liberal	Hírportál			
Aktuálne.sk	31419	Mainstream	Balanced	24.hu - FN	55395	Mainstream	Balanced
Nezávislé správy	27711	Alternative	Conspiracy	mno.hu	54504	Broadsheet	Conservative
Teraz.sk	26615	Mainstream	Balanced	Borsod Online	41323	Regional	Balanced
GINN	25798	Alternative	Balanced	Szabolcs Online	40024	Regional	Balanced
RTVS	23508	Mainstream	Balanced	kisalfold.hu	35380	Regional	Balanced
.týždeň	22872	Broadsheet	Conservative	Világ gazdaság Online	32350	Broadsheet	Balanced
Zem a Vek	22198	Alternative	Conspiracy	Heti Válasz	30042	Broadsheet	Conservative
Webnoviny	21086	Mainstream	Balanced	Klubrádió	29230	Mainstream	Left-liberal
dolezite.sk	17098	Alternative	Conspiracy	Beol.hu	24262	Regional	Balanced
Pravda a oslobodí	16157	Alternative	Conspiracy	Daily News Hungary	17294	Mainstream	Balanced
Hlavné správy	13027	Alternative	Conservative	The Budapest Beacon	16758	Mainstream	Left-liberal
Konzervatívny výber	12618	Mainstream	Conservative	Népszava Online	16512	Broadsheet	Socialist
Postoj	10032	Mainstream	Conservative	Kitekintő.hu	16416	Broadsheet	Balanced
SME vo svete	9246	Mainstream	Liberal	Hír TV	15903	Mainstream	Conservative
JeToTak.sk	8215	Mainstream	Left-liberal	bama.hu	14252	Regional	Balanced
Chcem byť informovaný	4975	Alternative	Conspiracy	Barikád	11152	Alternative	Conspiracy
				Hetilap			
				Hídfő Net	9259	Alternative	Conspiracy
				Magyar Idők	5766	Alternative	Conservative

Table 2: Table of media outlets that are included in the analysis. 32 pages were selected for both countries.

2.2. Measures

2.2.1. Measurement of Exposure

I chose to measure exposure by tracking the behavior of new consumers. I downloaded the maximum of 300 posts for every media outlet on Facebook during November 2015. From all the posts, I created the list of users that engaged (liked or commented) with one of the posts of analyzed media outlets. I use this engagement as a proxy for exposure, since the direct evidence of what people are exposed to is not available. It would require the access to a large number of users' News Feed to see what they are exposed to on Facebook. However, since these data are not available, I use the engagement as a proxy, since the requirement of the engagement with the post is that individual was exposed to it. This method is not without its limits, but I believe that it faces smaller methodological challenges than experiments and surveys that are commonly used to measure exposure. In the following section, I will explain, why I consider user's engagement as a superior measurement of exposure for analyzing Facebook.

Experiments became a popular method to study selective exposure bias in Internet environment (Iyengar and Hahn 2009; Iyengar et al. 2008; Messing and Westwood 2012). However, there are several drawbacks to this method. First, researchers cannot replicate the exact algorithms used by social networks, because they are private. Hence, they develop their software that may not replicate the reality of social networks, causing the problem with the external validity of the results. Furthermore, algorithms are uniquely personalized either by the input from the users or by Facebook, and it is nearly impossible to predict what the users are exposed to (Pariser 2011). Second, participants are aware of being under study and that may also have an effect on their media consumption habits, how attentive they are and what are their expectations of the research. Third, experiments typically provide only limited number of sources that one can be exposed to. Thus, if the subject faces the limited choice of news outlets his/her news consumption behavior may differ compared to the natural news consumption, where an

immense number of outlets are available to read. For instance, the readers of alternative fringe outlets may find themselves in the decision, in which they do not prefer any of the choices.

Even more problematic than experiments are studies that are trying to research selective exposure by self-reporting surveys (Coe et al. 2008; Johnson, Bichard, and Zhang 2009). The studies where participants are asked how often they watched or read some outlets showed substantive over reporting compared to automatically tracked viewing or reading (Prior 2009b). People are failing to recall exposure; they do not remember the details and often overestimate their actual exposure (Prior 2009a). As a consequence of over reporting people fall into the category of heavy viewers even though they are more likely to be nonselective causal viewers. Therefore, it is not possible to distinguish between the occasional viewers from the heavy viewers and strong partisans. Moreover, Prior (2013) claims that failing to recall exposure leads people to overreport the exposure to like-minded media and underestimate the exposure to the counter-attitudinal media. Thus, this may lead to inflation of selective exposure estimates. Therefore, Prior argues that studies should avoid self-reporting surveys to research selective exposure (Prior 2009a; Prior 2009b; Prior 2013). Thus, I believe that deriving the data directly from user's engagement on the media page may reflect their news consumption behavior better than self-reports or experiments.

However, this measure is not without drawbacks. First, "like" and comment are not direct evidence of exposure. Individual may be exposed to the news post, but do not engage with it. Thus, if a user is exposed to the news post of the media outlet and does not engage with it, she is not included in the analysis. This drawback potentially limits external validity of this study, as people who engage with the posts may differ from regular users of Facebook. At the same time, this drawback should be mitigated by the Facebook algorithms. Facebook prioritizes the posts from the pages and users that individuals interact with. Thus, if she clicks on the post, likes it or comments it, this post will be prioritized above those that she did not interact with.

Second, in my analysis, I separate the engagement on “likes” and “comments” to see whether there are differences in news consumption when different behavior is observed. However, the motivation to “like” or comment may differ, and thus, the conclusion about the exposure depends on the measurement of it. In the following section, I will discuss these potential differences in engagement with the news posts.

2.2.2. Differences in motivation to “Like” or “Comment” on Facebook

To fully address whether selective exposure exists on Facebook or not, one must think about the differences in motivation for people to like or comment something on Facebook. According to Rosen “Like” is an example of “virtual empathy”. “Like” is a way to give positive feedback or to connect with things you care about on Facebook (“The Power of ‘Like’” 2012). However, as Liraz Margalit argues in *Psychology Today*, *“Like has become much more than just a positive reaction toward a post or update; it has evolved into a feedback toward the person her/himself...and... It reaffirms our connection with the group”* (“Our Obsession with ‘Like’—Part 1” 2014). This means that “liking” is a way to assess ourselves, to define who we are, what we agree with. Therefore, in the context of my research, it may be assumed that people would like the post of media outlet to show empathy and positive feedback to an article. At the same time, it is assumed that users would not “like” the post that contradicts their views. Therefore, if the “like” would be the only case of measuring exposure, one may inflate the level of selective exposure as people are more likely to express empathy and positive feedback to things they like.

On the other hand, motivation to comment on something is different from simple “Like”. Motivation to comment may be initiated by corrective action hypothesis, which anticipates that people want to enter a public debate to correct the perceived biases in the public sphere (Rojas 2010). Users may enter a discussion to express both support and critique to the article (Howard 2010), express their opinions and positions (Rowe 2015), or provoke interaction with users with

opposite beliefs (Barberá et al. 2015). This can be done either by starting the discussion or reacting on the post that was posted before. Even though the quality of deliberation may be low (Rowe 2015; Barberá et al. 2015), the exposure to opposing view is present. If this would be the case, the study should observe the differences between the results once a different behavior is observed. However, if only the comments would be considered as the measure of exposure, this can inflate the exposure to the dissonant views as people are more likely to enter a discussion when they perceive the bias or feel the need to express their position. For this reason, I also analyzed the overall engagement, which can provide the best reflection of user's exposure to news as it combines both likes and comments together.

2.3. Model

2.3.1. Audience overlap calculation

In this thesis, I observe the audience overlap to address my hypotheses. Researching audience overlap is a useful method to study selective exposure (Prior 2013). This is because one can observe whether outlets with certain ideological slant share the audience with other like-minded outlets, or they also attract the viewers from outlets with a different ideological slant. To provide an example, if liberal media attracts one set of readers and these readers are not present on conservative media, that means that these readers selectively expose themselves to liberal media. If there would be substantial audience overlap between the liberal and the conservative outlets that would correspond to balanced exposure.

To calculate the audience overlap between the each pair of media, I compared the lists of users that engage on Facebook pages of both outlets. If there is a high number of users that engage simultaneously on both, the audience overlap of these media is high. On the other hand, if there is one set of users that engage on the first page and the other set of users that engage on the second page, there is no audience overlap of these pair of media.

However, media outlets on Facebook differ in the size of their audiences. For this reason, the audience overlap is normalized by the number of registered users on Facebook for the analyzed country. The audience overlap is translated to the distance between the each pair of media outlets. Thus, the larger audience two media share, the smaller is the distance between them.

To calculate this distance, I use a metric called Normalized Facebook Distance. This metric was derived from the metric called Normalized Google Distance by Josef Šlerka, the specialist on analysis of data from social networks.⁵ Normalized Google Distance measure the proximity of terms based on how often they emerge together in one page. (Cilibrasi and Vitanyi 2007) Similarly to Normalized Google Distance, Normalized Facebook Distance compares a pair of media outlets pages based on the number of users that engaged with the both pages during the certain period, relative to the number of Facebook users in the certain country.

The equation for calculating Normalized Facebook Distance is the following:

$$NFD = \frac{\max(\log(x), \log(y)) - \log(x, y)}{\log(M) - \min(\log(x), \log(y))}$$

In this equation, x stands for the number of engaging users on a first Facebook page; y stands for the number of engaging users on a second Facebook page; x,y stands for the number of engaging users that engaged on both pages, M stands for the number of users of Facebook in a particular country. This metric resulted in adjacency matrix showing the relative distance of analyzed Facebook pages. The calculated number represent the distance between the pair of pages. The distance between the pair of pages is lower if the audience overlap between the pages is higher. The sample of resulting distances is presented in the Table 3.

⁵ “Korelace Politických Stran Na Facebooku S Výsledky Voleb Do Evropského Parlamentu” 2015

	Topky.sk	Nový Čas	Televízia Markíza	Televízia JOJ	Aktuality.sk	noviny.sk	SME	Info.sk	Slobodný vysielateľ
Topky.sk	0.0000000	0.4605859	0.5310636	0.5444827	0.5107406	0.5490820	0.7840313	0.5629327	0.6923826
Nový Čas	0.4605859	0.0000000	0.4454738	0.4751644	0.4972158	0.5323134	0.8156612	0.5505749	0.7118190
Televízia Markíza	0.5310636	0.4454738	0.0000000	0.4044204	0.6001568	0.5854145	0.9212729	0.6395103	0.8793993
Televízia JOJ	0.5444827	0.4751644	0.4044204	0.0000000	0.6178841	0.5832897	0.9403366	0.6394078	0.8614763
Aktuality.sk	0.5107406	0.4972158	0.6001568	0.6178841	0.0000000	0.4372148	0.6142606	0.4744271	0.5217311
noviny.sk	0.5490820	0.5323134	0.5854145	0.5832897	0.4372148	0.0000000	0.6955402	0.5115230	0.6059012
SME	0.7840313	0.8156612	0.9212729	0.9403366	0.6142606	0.6955402	0.0000000	0.7166239	0.6945774
Info.sk	0.5629327	0.5505749	0.6395103	0.6394078	0.4744271	0.5115230	0.7166239	0.0000000	0.6099232
Slobodný vysielateľ	0.6923826	0.7118190	0.8793993	0.8614763	0.5217311	0.6059012	0.6945774	0.6099232	0.0000000

Table 3: Sample of resulted matrix representing the distance between the media pages based on the Normalized Facebook Distance. The lower the number is, the closer the media outlets are.

2.3.2. Method of analysis

I use two methods for analyzing the resulting distances, multidimensional scaling and social network analysis. Multidimensional scaling (MDS) is a method to visualize the distances between the individual cases of the dataset (Kruskal and Wish 1978). It attempts to position the objects in relation to each other, based on the provided distances. The closer the objects are, the smaller is the distance between them. This method allows me to observe the level of audience overlap between the pages and see how the media outlets cluster together. If the media outlets with the similar structural characteristic or ideological leaning cluster together, it means that their audience overlap is high, and the users are exposed to the like-minded content. In other words, if people behave in a way that clusters of like-minded media emerge, that means that they are exposing themselves to like-minded content. If the diverse media outlets clusters together, this would mean that users' exposure is balanced. This method also allows observing the dimensions on which the media outlets are divided. Thus, I can address Hypothesis 3 about the structure of exposure. In addition, MDS can reflect the changes in the distances between the media outlets when different behaviors are observed.

I create three separate figures to reflect the different distances between the media outlets. The first figure shows the overlap of users that "liked" a post on analyzed media. The second figure

is based on the overlap of users that commented a post. Since the motivation to “like” and “comment” may be different, it is important to observe this difference from the operationalization to address the existence and the structure of selective exposure on social media fully. The third figure combines these behaviors, reflecting the overall engagement on analyzed media pages.

The second method I use to examine the data is Social Network Analyses (SNA). Based on the data from the distance matrix I created a network that create connections between the media outlets with the strong audience overlap. The connection is created, if the distance between the pages is below 0.55, which indicates the strong audience overlap (Šlerka and Krsová 2015; Socialbakers 2014). The distance between the media outlets on Facebook will be visualized by Force Atlas 2 Layout in Gephi (Jacomy et al. 2014). This layout uses an algorithm to calculate the position of media outlets in relation to other outlets continuously until the whole network stabilize. Media outlets, which share links together, are forced closer to each other while outlets with lesser connections are repulsed from each other. Compared to the MDS this data are dichotomized and thus the distance between the media outlets is only in relation to the number of links it shares with other outlets. Thus, some details are lost because of the dichotomization. However, unlike MDS this method allows me to apply a number of network science measures to investigate the news consumption patterns more in detail. The measures that are used are described in the following paragraphs.

First, I use the *Modularity* measure to detect the clusters in the network of media outlets. The clusters are identified based on the algorithm that detects the similarities between the units, in my case the media outlets (Blondel et al. 2008). Since the clustering of the media outlets reflects the audience overlap, I can conclude whether users are exposing themselves to the cluster of like-minded media or not. Based on the resulting clusters I can also detect how many cross-structural or cross-ideological connections appeared in the network. Furthermore, the

identification of the clusters allows me to compare what is the structure of the exposure in Slovakia and Hungary.

Second, I use the *Density* measure, which represents the ratio of the number of the connection between the media outlets to the number of possible connections of the media outlets if they would be fully interconnected. This value goes from 0 to 1, and the higher is the connectivity between the media outlets, the higher is the density of the networks. The comparison of network densities for Slovakia and Hungary allows me to address my hypothesis about the difference in fragmentation of these two media systems. It is expected, that if the audience fragmentation is higher, the density of the network would be lower. Furthermore, it allows me to see whether there is a significant difference in the audience overlap when the different behaviors are observed.

Third, I use the *Eigenvector centrality* to detect the influential role of the media outlets in the information spread. If the medium is connected to a large number of other media outlets and/or bridges the audiences between the two separate audiences, its role in the information spread is more prominent. On the other hand, if the medium audience is not significantly present in other media outlets, this medium will have a smaller role in the information spread. I use this measure to address my second hypothesis about the readers with the higher commitment to their beliefs. If the extreme outlets only share the audience between each other or there are loosely connected to other like- minded outlets, it allows me to infer that readers of more extreme outlets are more likely to exercise selective exposure.

3. Results

The analytical part of this thesis is divided into the three sections. First, I discuss the case of the Slovakia and test my hypotheses about the existence of the selective exposure on social media, higher congeniality bias of people with the stronger beliefs and the ideological structure of selective exposure. Second, I discuss the case of Hungary and repeat the test of hypotheses in the context of Hungary. Lastly, I will compare the cases on Slovakia and Hungary in order to address the fourth hypothesis about the audience fragmentation.

3.1. Slovakia

Figure 2 shows the network of Facebook media sources in Slovakia. To calculate the distance between the media outlets, 430 822 “likes” were extracted from the period of November 2015. The resulting network consists of 32 nodes and 107 edges. Nodes are the basic network units and in this study, they represent one of the 32 analyzed Facebook media pages. The connections between the network units are called edges. In this study, edges are created if the Normalized Facebook Distance is below 0.55. This suggests a significant audience overlap between the two pages. This affinity was calculated based on the number of overlapping users that liked a post on both pages.

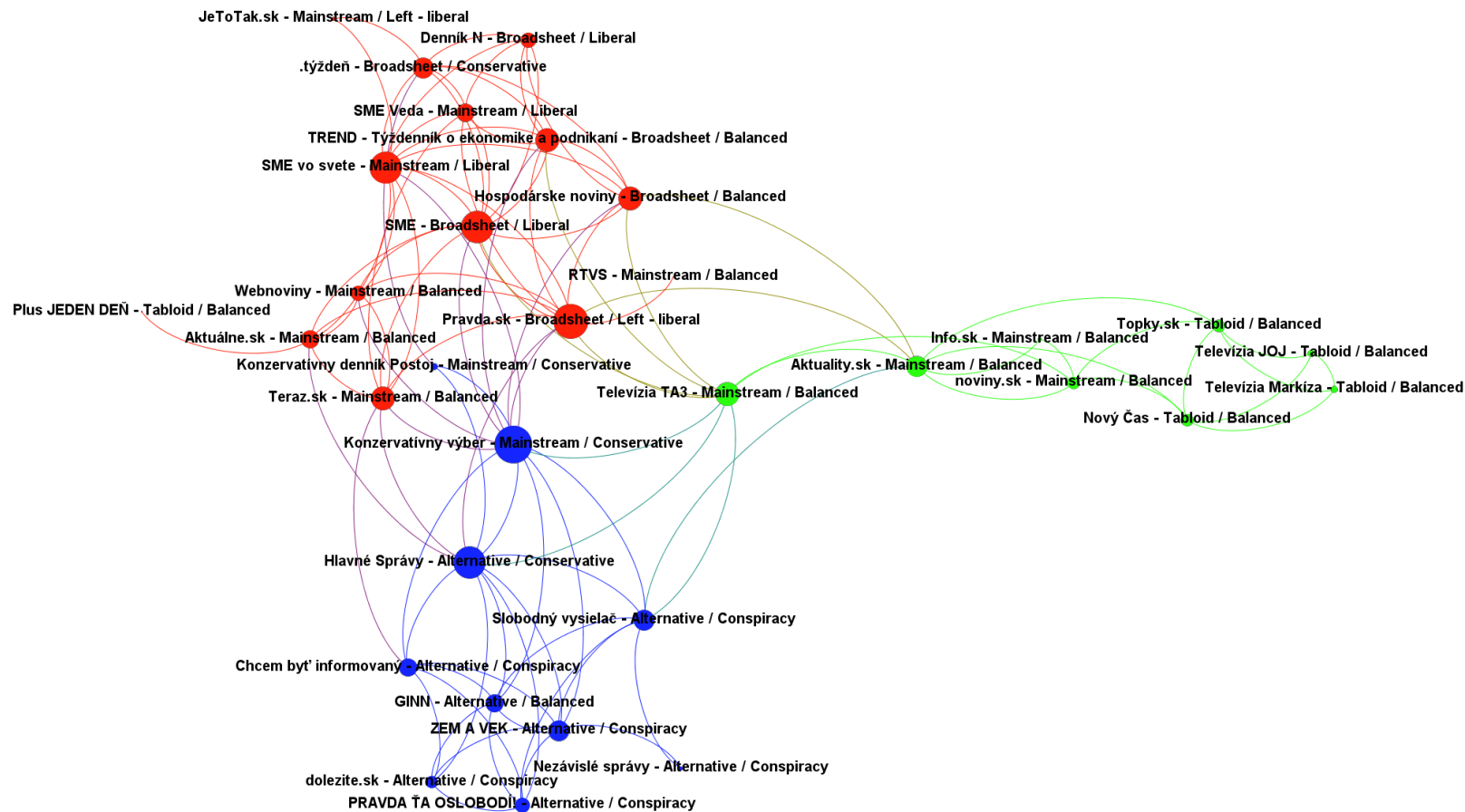


Figure 2: Undirected “like” network of 32 media pages on Facebook in Slovakia. The nodes represent media pages and the edges represent connections between them. The edges are created if Normalized Facebook Distance is below 0.55. Users that “liked” one of the posts on the analyzed media were included in the analysis. There are 32 nodes and 107 edges between them. The average degree is 6.7, which means that on average a medium has significant user overlap with 6.7 other media. The color of the node is based on the measure of modularity, which detects the clustering structure of the network. The size of the node represents the eigenvector centrality, which detects the influence of a medium for information spread. The color of edges represents inter / intra-cluster connections.

The layout algorithm Force Atlas 2, determines the position of the nodes. In general, nodes that share connections are forced closer to each other while at the same time nodes that do not share connections are forced further from each other. To provide an example, *SME*, located in the upper part of the network, is surrounded by the media that it shares connections with. However, since it does not share many connections with the bottom part of the network, it is pushed upper from the center of the network.

Media are separated to the clusters based on the modularity, which uses the algorithms developed by Blondel et al. (2008). This algorithm detects the clustering structure of the network based on the similarities between the media outlets. Modularity works similarly as a hierarchical clustering. It identifies the possible clusters of objects in the network. In general, media outlets are more likely to cluster together if their audience overlap is high. In my networks, the clusters are differentiated by the color.

What can be seen from Figure 2 is that media are divided into the three clusters. The upper-left cluster consists of several media. What these media have in common is that they represent the mainstream hard news media. Interestingly, though, these media belong to very diverse ideological camps. While *Denník N* and *SME* are liberal, *.týždeň* and *Postoj* are conservative, *jeToTak.sk* is very progressive and *TREND* with *Hospodárske noviny* are mostly right-wing pro-market media. In the bottom part of the cluster, there is also daily news side which provides balanced coverage. Therefore, from this cluster is it certain that users are exposed to ideologically diverse news and opinions. This observation fails to support the hypothesis that there is an ideologically based selective exposure.

One of the possible reasons for relative closeness of conservative *.týždeň*, liberal *Denník N*, and progressive *jeToTak.sk* is the fact that Slovakia has a history of cross- ideological governments where liberal and conservative parties formed the coalition against the social democratic and nationalistic bloc of parties. Thus, it may be that this division also translated to the news

consumption patterns, where liberal media and conservative media share the audience. It can be speculated, that if the discomfort in exposure to ideologically diverse information is low (Festinger 1962) individual's congeniality bias would be mitigated. Another possible reason is that in November 2015 the dominant discourse was driven by the refugee crisis and the mandatory quota imposed on Slovakia by the European Union. However, these media found a common ground to discuss why it is important to accept the refugees. While conservative *tyždeň.sk* appeal to Christian values of solidarity related the acceptance of refugees, liberal *Denník N*, and progressive *jeToTak.sk* appealed to values of humanity and importance of compliance with obligations. However, the time series analysis would have to be done to see whether the audience overlap would change with the dominant discourse. Although the selective exposure does not follow traditional conservative/ liberal dimension, the network indicates support for structural selective exposure based on mainstream / alternative media dimension.

The blue cluster in the bottom-left part of the network is represented by alternative, conspiracy, antiestablishment, nationalistic, conservative pro – Russian media. These media claim to provide “*accurate and unbiased information to the public... which are ignored by mainstream media.*” (“Mission of Slobodný Vysielač” 2013) The media in the cluster predominantly focus on hard news. They are strongly anti-Western, use conspiracy theories, half-truths and loaded language in their news stories (Smoleňová 2015). The exceptions to this are *Konzervatívny denník Postoj*, which is a newly emerged mainstream conservative news site. However, as can be seen, this medium is positioned closer to the mainstream cluster rather than to alternative cluster.

The green cluster in the middle-left part of the network is represented by the daily news media, which provide balanced neutral coverage. The media that are on the left side of the cluster focus on the daily news with a smaller portion of opinioned news. These media provide ideologically

unbiased news, where a commentary and analysis section is less developed. These are the cases of *Televízia TA3*, *Aktuality.sk*, *Info.sk* and *noviny.sk*. The portion of the shared content on these pages is covering soft news such as sport, entertainment, culture, or daily news without reference to politics. The right part of the cluster consist of a several tabloid news which report politics in smaller portion or discuss private life and scandals of politicians. From the point of selective exposure, the readership of these media is exposed to news that is not ideologically leaning to a particular side but provides daily coverage with the focus on getting more readership. Along with daily coverage, there are media that provide soft and tabloid news.

Filtering out connections between structurally diverse media outlets reveals that 88 % of edges are within clusters of structurally similar media. In relation to the structure of selective exposure, the data supports the expectation that even though people may be exposed to various news outlets, these are predominantly like-minded. If there were no selective exposure, we would see more connection between the diverse media outlets. The remaining connections indicate the importance of certain media in cross-cutting information spreading.

I used the measure of eigenvector centrality to identify the important bridges of communication. This measure seems to be superior to other centrality measures when it comes to influence in the information spreading role (Banerjee et al. 2013). Thus, it indicates the importance of certain media in cross- cutting information spreading. The nodes that have more prominent role in information spreading are larger in size. When it comes to cross-cutting exposure, mainly *Konzervatívny výber*, *Pravda*, *Televízia TA 3* and *Teraz.sk* have an important role. These media attract the users from politically distinct clusters. Hypothetically, if these media would be missing, the communication and exposure to diverse views would be very limited.

Although Figure 2 supports the expectation of selective exposure on Facebook, one has to be aware that users that were included in the analysis are those that “liked” something on the page of analyzed media. However, pushing the “Like” button requires some action and the

motivation to do so may be different from commenting or simply reading the post. The motivation to “like” something may be a public way of expressing agreement, positive feedback or user’s identity. On the other hand, the motivation to comment a post on Facebook may differ from motivation to “like”. Users can express their disagreement, react on the other discussants, or express their opinion in greater detail. To better understand whether users are more likely to exhibit selective exposure on Facebook or not, one must think about this difference. Therefore, I created the second network in which only users that commented under the post of analyzed media were included. Overall, there were 54 654 users included in the analysis. The following figure represents the “comment” network.

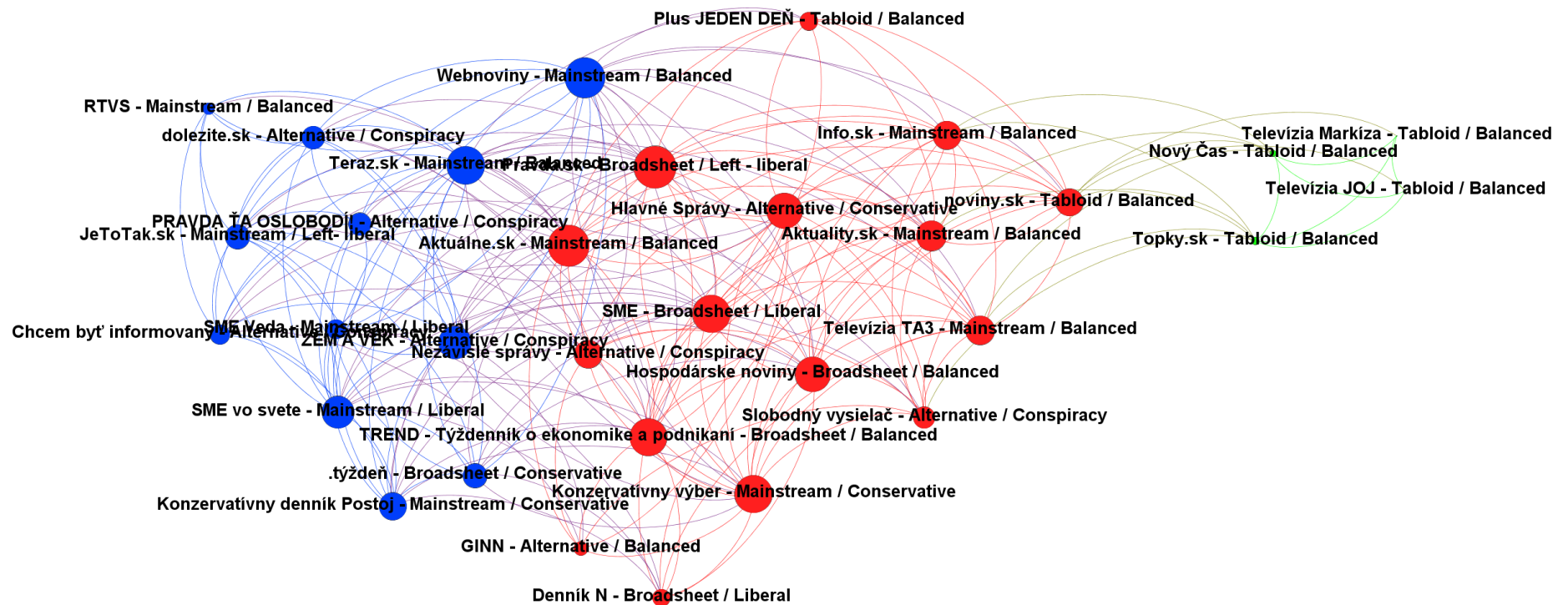


Figure 3: Undirected “comment” network of 32 media pages on Facebook in Slovakia. The nodes represent media pages, and the edges represent connections between them. The edges are created if Normalized Facebook Distance is below 0.55. Users that commented one of the posts on the analyzed media were included in the analysis. There are 32 nodes and 232 edges between them. The average degree is 14.5, which means that on average a medium has significant user overlap with 14.5 other media. The color of the node is based on the measure of modularity, which detects the clustering structure of the network. The size of the node represents the eigenvector centrality, which detects the influence of a medium for information spread. The color of edges represents inter / intra-cluster connections.

Figure 3 shows that the network became more interconnected and that it was significantly redrawn. The number of edges and the density of the network can illustrate the difference in interconnectivity between the first and the second network. Density represents the ratio of the number of the edges to the number of possible edges of the network if the network is fully connected. While the density of the “Like” network is $D_L = 0.22$, the density of the comment network is $D_C = 0.47$. I compared the difference in densities by the chi-square test that resulted that there is a significant change in the density of networks $\chi^2(1, N = 133) = 4.52, p < .05$. In relation to the selective exposure, users are more likely to be exposed to diverse media outlets. Moreover, the resulted clusters consist of politically diverse media outlets. This is also supported by the low modularity $M_C = 0.17$, which fails to identify distinctive communities in the network.

Up till now, networks have indicated the mixed conclusion about the existence of selective exposure on Facebook. While the first network, created based on the “likes” of the posts, supports an expectation about the selective exposure, the “comment” network revealed that users cross political borders when it comes to talking about politics. This demonstrates that people are exposed to the cross-cutting news on Facebook. However, there is an important difference between the two networks. While the “like” network is created from 430 822 likes, the “comment” network is created based on 54 656 discussants. Thus, the smaller portion of users participated in the discussion. Although these discussants are more likely to be exposed to diverse news outlets, this may not hold true for regular readers. To address this prospect, I created “engagement” network which uses both users, that liked or commented one of the posts on the page of a media outlet. Altogether, 456 182 engaging users were extracted for the purpose of the analysis. The following figure shows the “engagement” network.

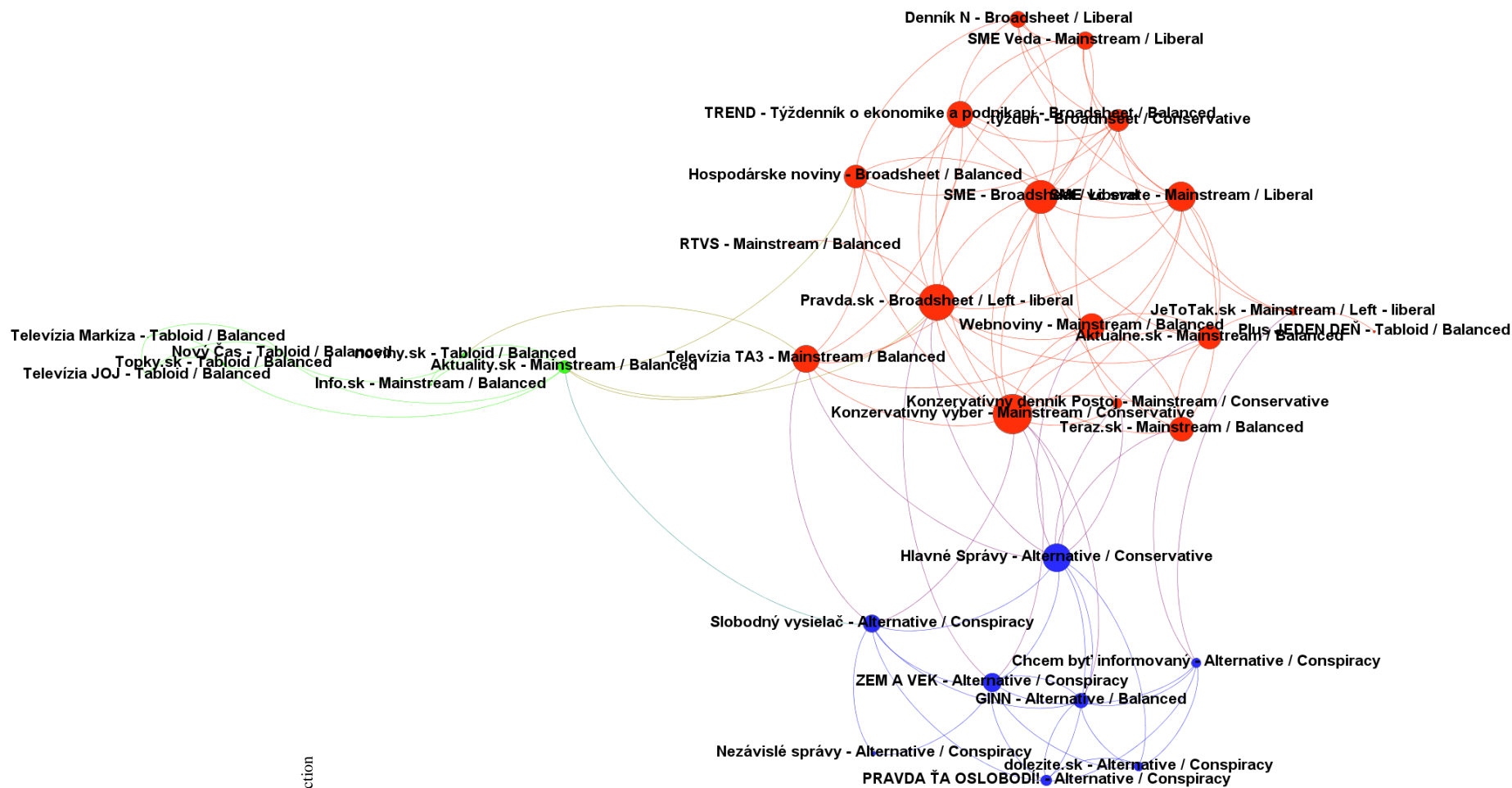


Figure 4: Undirected “engagement” network of 32 media pages on Facebook in Slovakia. The nodes represent media pages, and the edges represent connections between them. The edges are created if Normalized Facebook Distance is below 0.55. Users that either “liked” or commented one of the posts on the analyzed media were included in the analysis. There are 32 nodes and 108 edges between them. The average degree is 6.75, which means that on average a medium has significant user overlap with 6.75 other media. The color of the node is based on the measure of modularity, which detects the clustering structure of the network. The size of the node represents the eigenvector centrality, which detects the influence of a medium for information spread. The color of edges represents inter / intra-cluster connections.

Figure 4 demonstrates that overall engagement of Facebook users is predominantly within a cluster of politically like-minded media. Although a small portion of active discussants is exposed to diverse outlets, the network does not substantively change from the “Like” network. The spatial switch of the green cluster from the right side of the network to the left is due to new connections between the *Televízia TA3* and two balanced mainstream media. These connections also made this mainstream TV with balanced coverage appear in the cluster of mainstream media. The density of the network lowers to $D_E = 0.21$ and clusters of politically like-minded media reappears.

The blue “alternative” cluster remains similar in the structure since most of the edges are between the like-minded media. However, *Konzeratívny výber*, the mainstream conservative media outlet moved to the “mainstream” cluster as some new connections appeared between this medium and some two other media from the red cluster.

I also calculated the ratio of connections that are among the media outlets which differ based on the structural characteristics. There are 15 out of 108 connections between the mainstream + broadsheet outlets and alternative outlets. This results in 14 % of cross- structural connections. These results support the hypothesis about the existence of selective exposure on the social media. At the same time, it goes contrary to the hypothesis about the ideological dimension of the selective exposure.

However, since the data for the social network analysis are dichotomized and may lose some details in the level of audience overlap, I plot the distances of media outlets with Multidimensional scaling. MDS also allows me to observe the difference in the distance between the media depending on the behavior of users. The figures 5-7 reflect these differences.

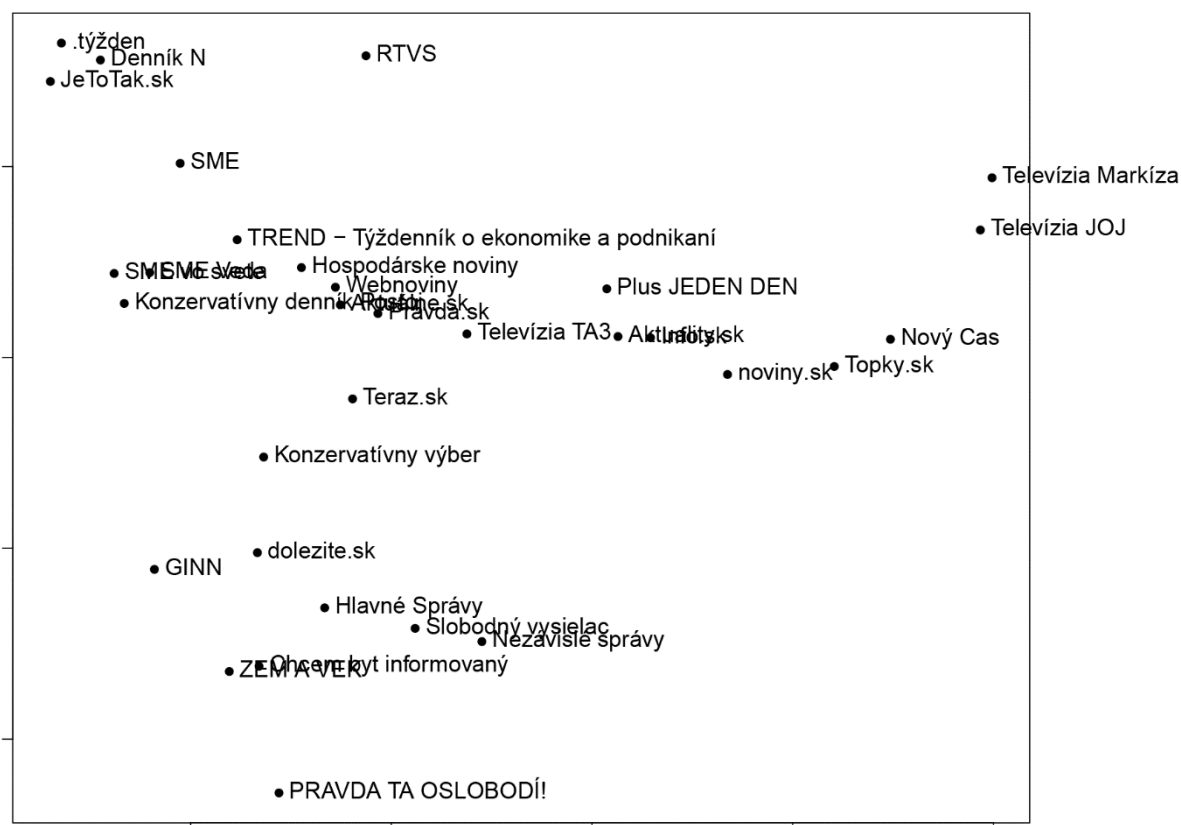


Figure 5: Multidimensional scaling of Slovak media pages on Facebook based on likes. The distances were calculated based on the fan overlap by Normalized Facebook Distance metric. Users that “liked” one of the posts on the analyzed media were included in the analysis. The left-right dimension separates the hard news outlets (left) and the soft news outlets (right). The top-bottom dimension separates the mainstream media outlets (top) and alternative conspiracy outlets (bottom).

Figure 5 illustrates a left-right division between the hard news and soft news readers. While the left dimension is occupied by media outlets that predominantly focus on hard news, the right side is occupied by tabloid and soft news media outlets. Another division that can be seen from the figure is between the ideologically diverse broadsheet and mainstream media outlets in the upper part of the figure and alternative conspiracy media on the bottom part. Therefore, results support the Hypothesis 1 about the existence of selective exposure on social media. However, since the cluster in the top-left side of the figure consists of ideologically diverse media outlets, the results fail to support the Hypothesis 3 about the ideological division in selective exposure. It rather reflects the structural and political division. The upper part consists of established media outlets, both liberal and conservative, whose readership seems to reflect the united

opposition of diverse center-right supports against the socialist government of Robert Fico. On the other hand, alternative media which share conspiracies and anti-Western news are clustered in the bottom part of the figure. As one moves to the center of the top-bottom dimension, the media are becoming less slanted, and their news coverage is relatively balanced.

This division is important as it separates more balanced center from the poles, where ideological slant of the media is clearer. This may be due to the fact that people with the stronger beliefs read these outlets. Since these people are more destabilized by reading the dissonant news, they seek out more congenial outlets and avoid the dissonant ones (Festinger 1962). Since these outlets exhibit politically more biased views, it can be assumed that readers with the stronger beliefs will read these outlets. Thus, these results support theoretical expectation that certain segments of news consumers, such as strong partisans or heavy readers, are the one who are more likely to expose themselves selectively to like-minded media (Prior 2013; Stroud 2011). Although they may represent only small segment of the population (~10 – 15%) is selectively exposing themselves to one-sided news, I would argue that this is not such a small segment when it comes to political participation and activism. (Abramowitz and Saunders 2008; Layman, Carsey, and Horowitz 2006) While general public remains indifferent or even apathetic to political news, the heavy readers and “news junkies” show the signs of attitude polarization (Prior 2013), shape the discussion and at the end of the day politics as well.

I also create the figure of commenting users, to see how the distances between the media outlets change when the users who joined the discussion are analyzed.

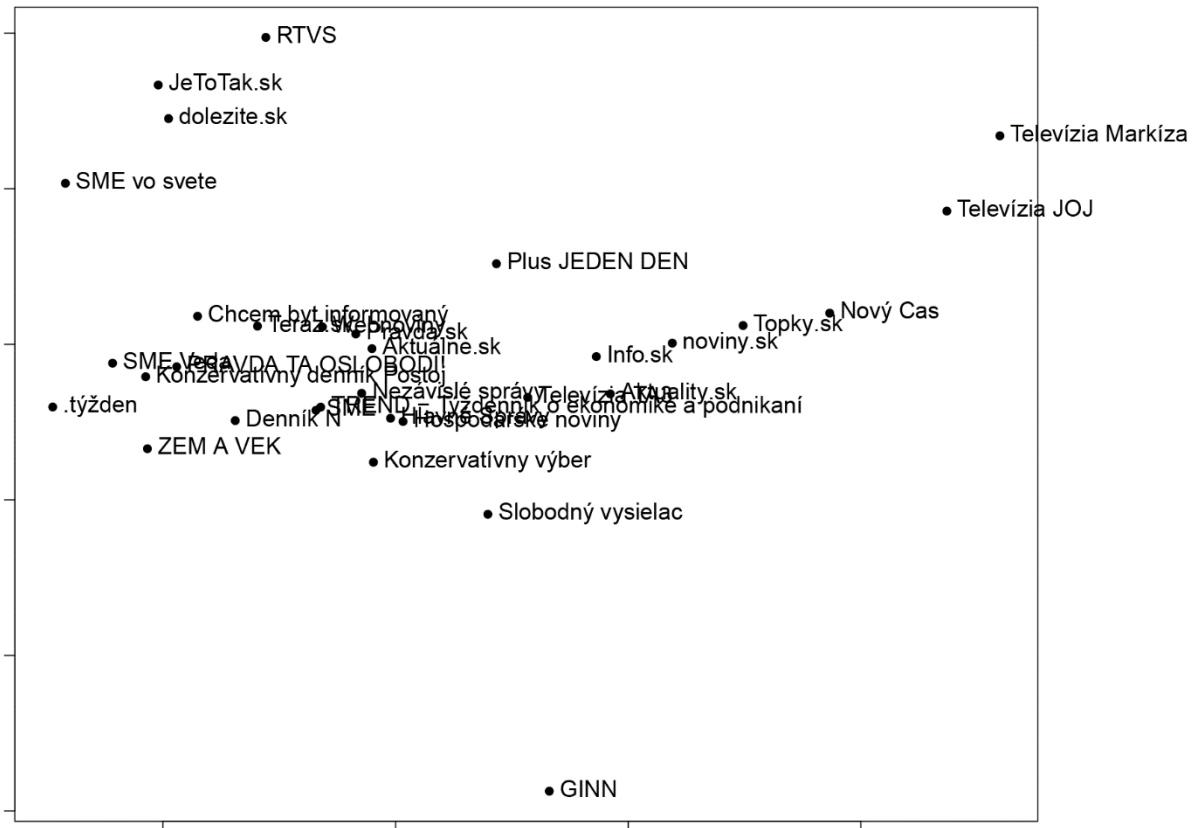


Figure 6: Multidimensional scaling of Slovak media pages on Facebook based on the discussants. The distances were calculated based on the fan overlap by Normalized Facebook Distance metric. Users that commented one of the posts on the analyzed media were included in the analysis. The left-right dimension separates the hard news outlets (left) and the soft news outlets (right). A clear distinction between the media outlets on the top-bottom dimension is missing.

What can be seen from the Figure 7 is that some media that were distant when only “Likes” were analyzed are now bundled together. This figure provides evidence for cross-cutting exposure on Facebook. Most of the media outlets that are bundled together in the center share neither structural nor political characteristics. It can be argued people not discuss in echo chambers while debating politics on Facebook. However, the number of discussants on Facebook is substantively smaller than the amount of those who only “liked” some news post on Facebook. It may be that small group of discussants is crossing the political borders on Facebook while the majority of users engage within the cluster of like-minded media. To address this possibility, I calculate the distance of media pages based on overall engagement.

That means that those who either “liked” or commented something on analyzed media outlets were included in the analysis.

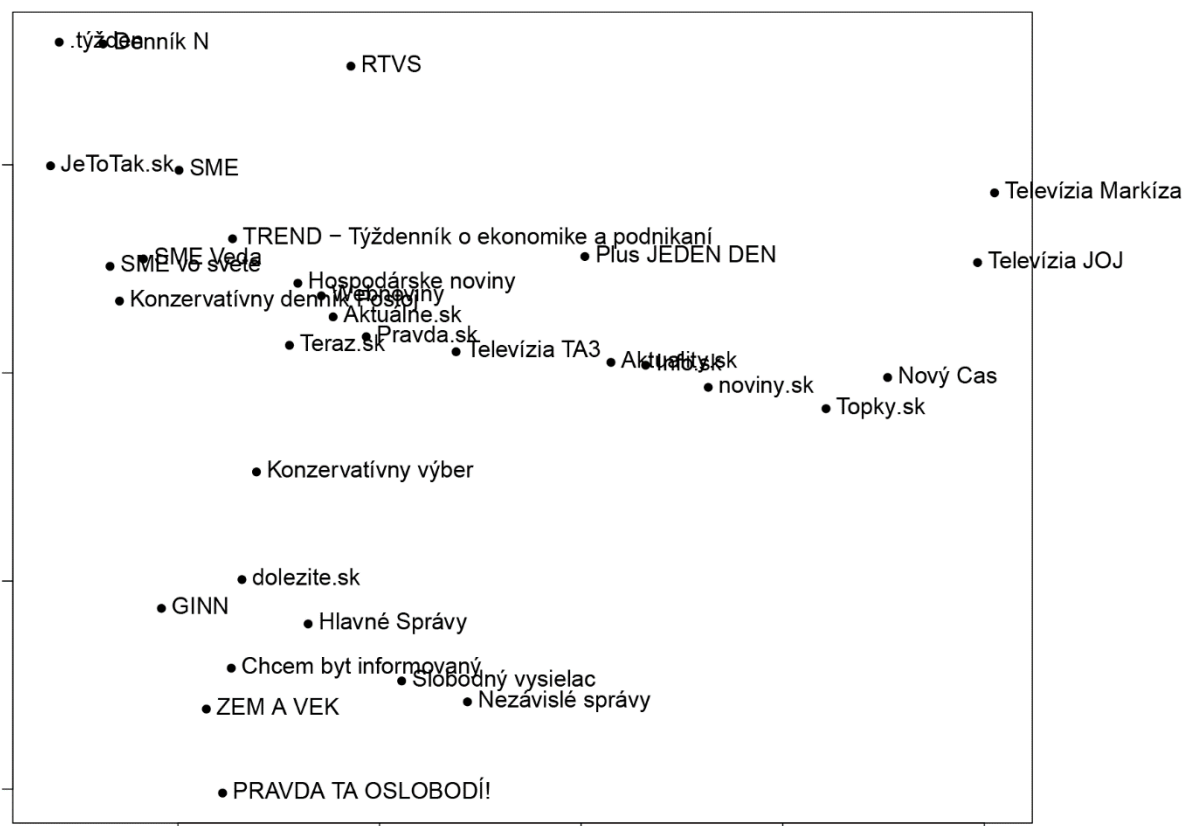


Figure 7: Multidimensional scaling of Slovak media pages on Facebook based on the engagement. The distances were calculated based on the fan overlap by Normalized Facebook Distance metric. Users that either “liked” or commented one of the posts on the analyzed media were included in the analysis. The left-right dimension separates the hard news outlets (left) and the soft news outlets (right). The top-bottom dimension separates the mainstream media outlets (top) and alternative conspiracy outlets (bottom).

Figure 7 reflects the overall engagement of users on media pages. What one can see is that like-minded media become clustered again, reflecting the same divisions as were discussed above in Figure 5. While there is some change in distances between the media outlets, the overall picture remains the same. This implies that people are selectively exposing themselves to like-minded media, and the small number of active discussants does not represent the general behavior of a user in news consumption. Furthermore, there is a structural dimension in the selective exposure in Slovakia.

3.2. Hungary

The following section examines the networks and figures created based on the data collected from Hungarian media outlets on Facebook. Same as in Slovakia, 32 largest media outlets were included in the analysis. First, I calculated the distance between the media outlets on Hungarian Facebook based on users that liked one of the posts from analyzed media. Altogether, 445 721 “likes” are analyzed in the month of November 2015. Layout algorithm Force Atlas 2 was used to determine the position of the media outlets. There are 32 media outlets in the network and 104 connections between them. The connection is created if the NFD is below 0.55. This analysis is represented in the following network.

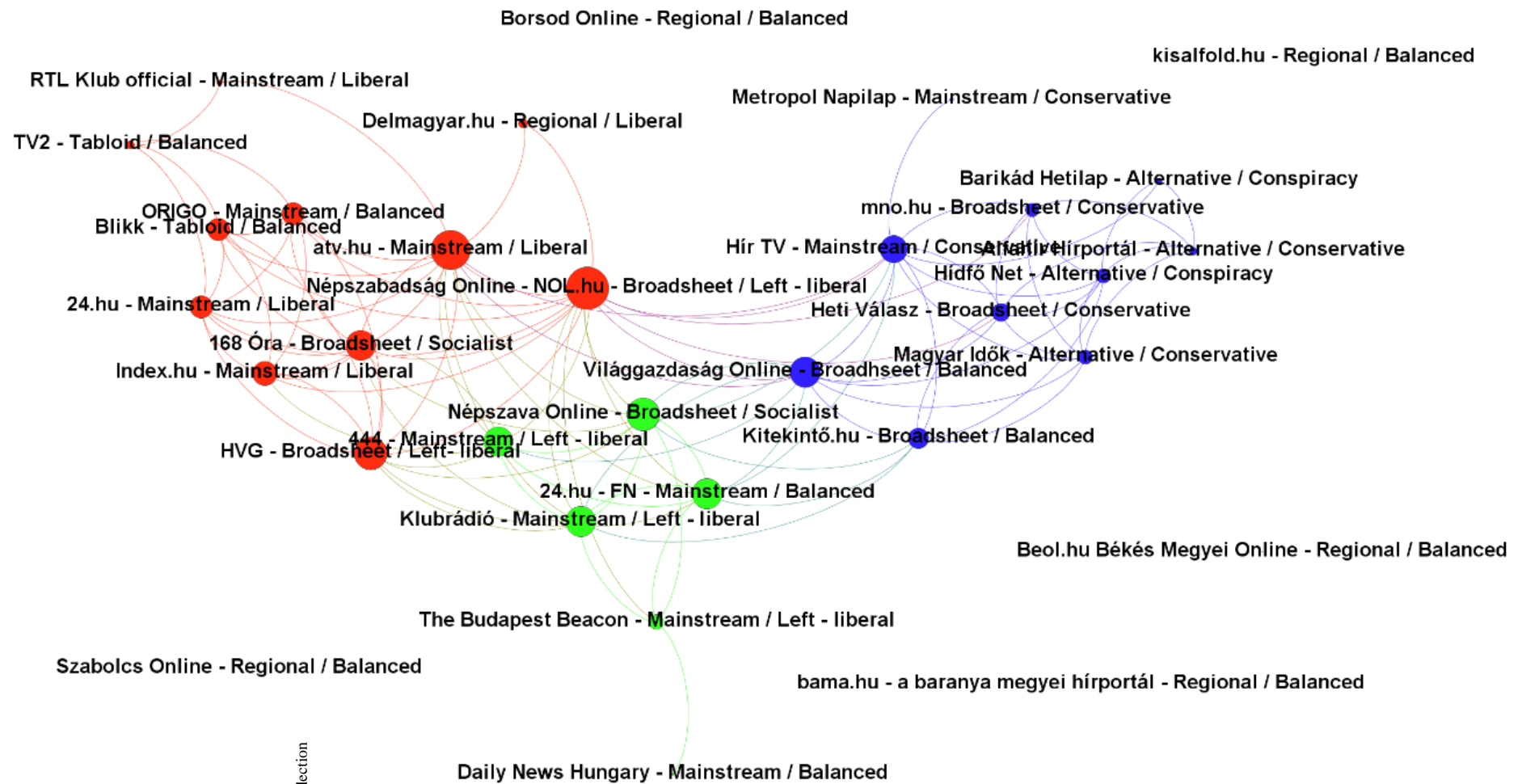


Figure 8: Undirected "like" network of 32 media pages on Facebook in Hungary. The nodes represent media pages, and the edges represent connections between them. The edges are created if Normalized Facebook Distance is below 0.55. There are 32 nodes and 104 edges between them. The average degree is 6.5, which means that on average a medium has significant user overlap with 6.5 other media. The color of the node is based on the measure of modularity, which detects the clustering structure of the network. The size of the node represents the eigenvector centrality, which detects the influence of a medium for information spread. The color of edges represents inter / intra-cluster connections.

As Figure 8 shows, Hungarian media are divided into the three clusters. These clusters were identified based on the modularity. In general, media outlets on the left (red cluster) and in the middle (green cluster) of the network represent the governmental opposition in Hungary. These media are ideologically liberal or left – liberal. There are also two socialist broadsheets in these clusters. On the other hand, media on the right side (blue) are mostly conservative, supportive of either governmental right-wing party Fidesz or more extreme right-wing Jobbik. Thus, it can be argued that users are selectively exposing themselves to ideologically like-minded media. Thus, the observation supports the Hypothesis 1 and Hypothesis 3 about the existence of selective exposure and its ideological structure. At the same time, the structure of the selective exposure follows the political division in the Hungary, the pattern that was already explored in Slovakia.

However, opposite to Slovakia, Hungarian media system is not divided based on the structural lines. The structural division argument holds for “oppositional” media where the alternative media are missing, and only two tabloid outlets are present. However, the right-wing cluster consists of mainstream, broadsheet but also alternative media outlets. It might be said that right-wing readers cluster together due to their shared anti-immigration and anti- EU preference, not concerned with the source or the quality of the information. In the following part, I examine the individual clusters more in detail.

The first cluster, positioned on the left side of the network, is represented mostly by the liberal and left- liberal media outlets. Thus, while there may be diverse opinions presented in these outlets, they are skewed towards the ideological left. Structurally, this cluster consists mostly of the broadsheet and the mainstream media outlets. There are also three tabloid media outlets, *TV2*, *RTL*, and *Blikk*, focusing mostly on soft news. There is one regional media outlet connected to the red cluster, *Delmagyar.hu*, which may be related to its liberal slant. No alternative media outlets are included in this cluster.

The second cluster, positioned in the middle, consists of left- liberal, socialist and balanced media outlets. What these media have in common is that they focus on the hard news. Two media outlets, *The Budapest Beacon* and *Daily News Hungary*, are English news sites, and thus, they are loosely connected to the network. The fact that *The Budapest Beacon* is more connected with other media outlets in the network may be explained by its slant towards left- liberal ideology. Structurally, this cluster consists of mainstream outlets and one broadsheet, which reflect the potential preference of readers for hard, better quality news. In addition, the connections between this cluster and the media outlets in other clusters follow the same structural characteristics, connecting either to mainstream outlets or broadsheets.

The third cluster, positioned on the right side of the networks, consists of right-wing media outlets. In general, the more right one move in the network, the more extreme positions are presented in the media outlets. Notably *Alfahír Hírportál*, *Barikád Hetilap*, and *Hídfő Net*, which present extreme right- wing media, sharing the conspiracies and supporting the pro-Russian agenda. From the structural point of view, this cluster consists of various news outlets. There are mainstream outlets and broadsheets as well as alternative media outlets. In other words, this means that readership of right- wing media outlets is not structurally divided, and the readers of mainstream and broadsheet outlets are willing to read also more alternative and fringe media outlets.

Looking at the connections between the ideologically diverse outlets, one can see that there are not many presents in the network. Only 5% of the connections are between the left leaning media and the right leaning media. Since *Kitekintő.hu* and *Világgazdaság Online* provide neutral coverage of foreign politics and economy, these are not considered as connections between the left leaning and the right leaning media. It can be expected that diverse readers are willing to read these outlets, as the danger of exposure to opposing views is low. The only media outlet that attracts both left- wing and right- wing readers is *NOL.hu*. Its prominent role

is also reflected by the node size, indicating the importance in information transition between the diverse audiences. This puzzling fact that conservative readers are exposing themselves to left- liberal media outlets may be partially explained by the important role of *NOL.hu* in providing original daily news, which is covered by their in- field correspondents. Nevertheless, since *NOL.hu* has left- liberal leaning, it can be objected that readers of *mno.hu*, *Hír TV* or *Heti Válasz* are exposed to the opposing news and opinions. Future research should be conducted to explain this puzzling result.

On the other hand, more extreme right- wing media outlets are completely disconnected from the opposing clusters and thus, it can be concluded that readers that have rigid views read these outlets in order to consume ideologically like- minded media. However, the same behavior is not observed on the left side of the networks, where the most extreme socialist outlet, *Népszava Online*, is connected to the conservative *Hír TV*. Thus, these findings provide only the partial support for Hypothesis 2, about the readers with a higher commitment to their beliefs.

However, as it was already discussed in the case of Slovakia, there is a different motivation to “like” something on the Facebook page of the media outlet and to comment on something. Thus, I created the second network, which reflects the distance of media pages when the users that commented a post are included in the analysis.

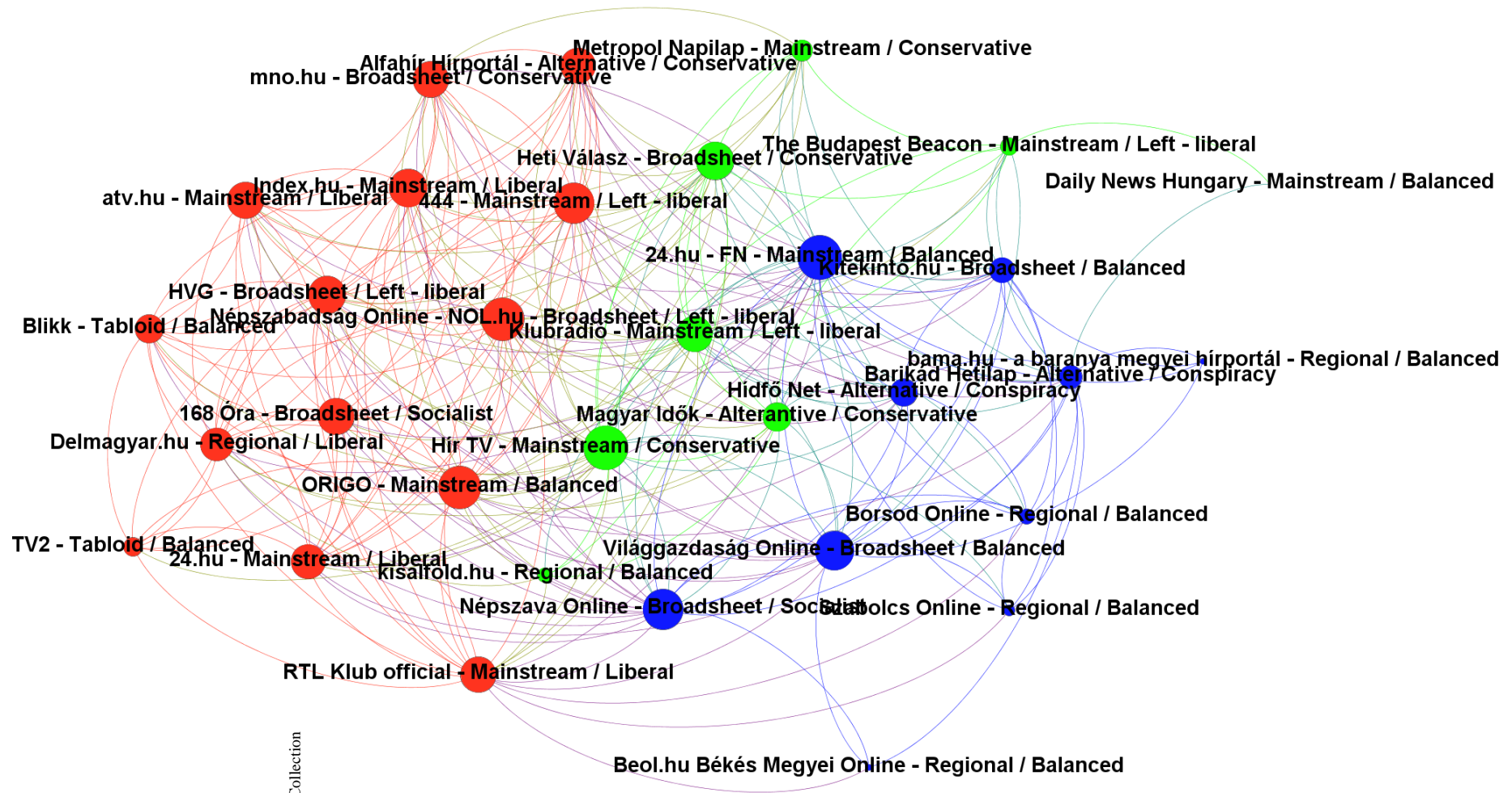


Figure 9: Undirected “comment” network of 32 media pages on Facebook in Hungary. The nodes represent media pages, and the edges represent connections between them. The edges are created if Normalized Facebook Distance is below 0.55. There are 32 nodes and 266 edges between them. The average degree is 16.6, which means that on average a medium has significant user overlap with 16.6 other media. The color of the node is based on the measure of modularity, which detects the clustering structure of the network. The size of the node represents the eigenvector centrality, which detects the influence of a medium for information spread. The color of edges represents inter / intra-cluster connections

Figure 9 reflects the similar pattern that was observed in Slovakia. If only those who commented the post of the media outlets are included in the analysis, one can see that people are exposed to ideologically diverse news. The modularity measure, which divides media outlets to certain clusters, does not reflect any ideological or structural characteristic shared within a cluster. Its value $M_C = 0.12$ reflects that clusters in the network are poorly distinguishable. For comparison, the modularity of “liking” network is $M_L = 0.33$. Similarly, the differences between the “like” and comment network can be reflected on the number of edges and the overall density of the networks. While the “like” network has 32 nodes and 104 edges, the comment network of the same media has 266 edges. These numbers are reflected in the measure of density, which identifies the extent to which the network is interconnected. While the “like” network has a density of $D_L = 0.21$, the comment network has a density of $D_C = 0.54$. The chi-square test indicates that there is a significant change in the density of the networks $\chi^2(1, N = 139) = 7.08$, $p < .05$. Regarding selective exposure, when the comments are analyzed, the media outlets with distinctive ideological or structural characteristics share the same audience. This means that readers of conservative outlets are likely to be exposed to the liberal or socialists outlets as well. However, same as in Slovakia, only small portion of Hungarian users are actively commenting on Facebook pages of media outlets. In Hungary, commenters represent 14.5% of the analyzed sample. Similarly as in Slovakia, the analyzed networks provide mixed evidence about the existence of selective exposure on Facebook. While “like” network indicates that users are “liking” predominantly within a cluster of ideologically like-minded media, the comment network indicates the opposite. However, to address whether the discussants are an important portion of the readership I create the third network, which reflects the overall engagement on Facebook. Thus, users that either “liked” or commented a post during the analyzed period on the pages of selected media outlets were included in the analysis. This behavior is reflected in the following figure.

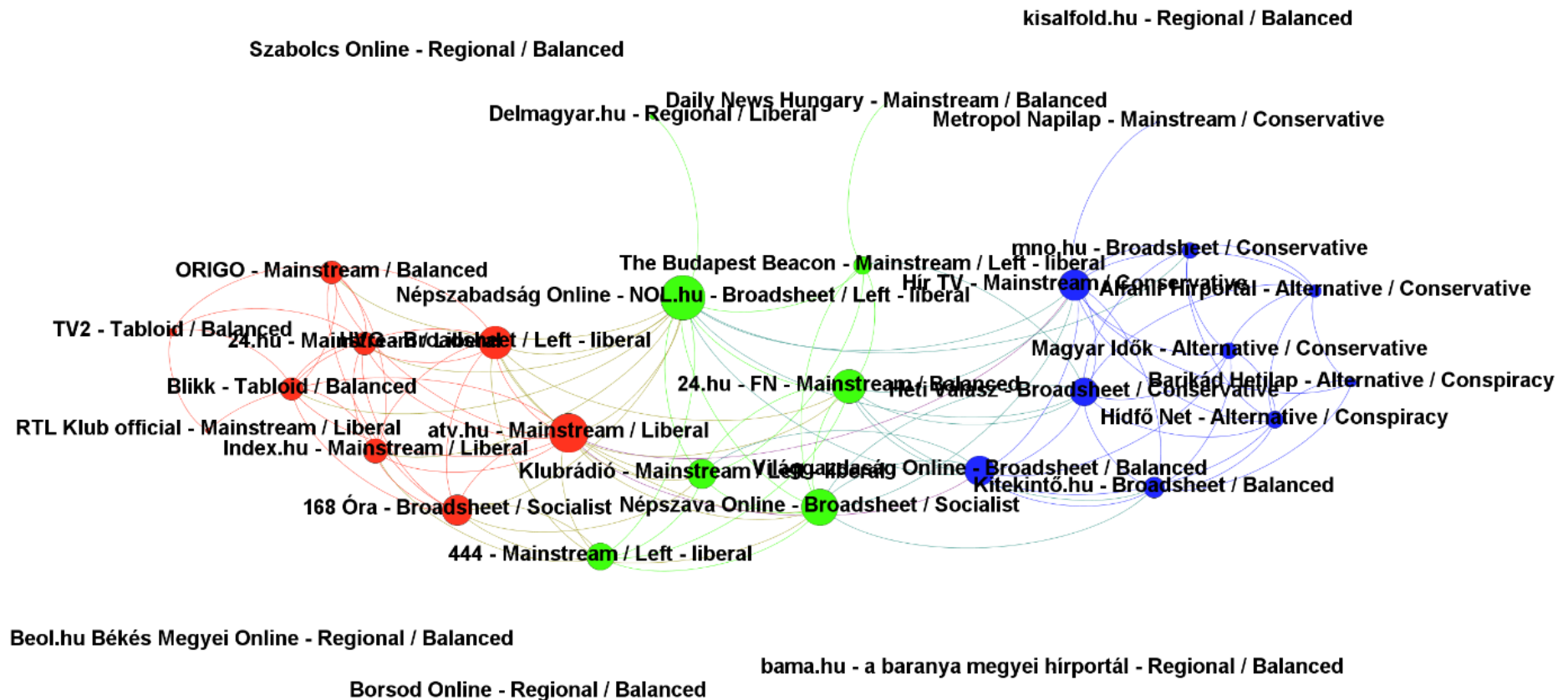


Figure 10: Undirected “engagement” network of 32 media pages on Facebook in Hungary. The nodes represent media pages, and the edges represent connections between them. The edges are created if Normalized Facebook Distance is below 0.55. There are 32 nodes and 106 edges between them. The average degree is 6.6 which means that on average a medium has significant user overlap with 6.6 other media. The color of the node is based on the measure of modularity, which detects the clustering structure of the network. The size of the node represents the eigenvector centrality, which detects the influence of a medium for an information spread. The color of edges represents inter / intra- cluster connections.

As Figure 10 shows, the overall engagement on pages of media outlets reflects the same pattern as the “like” network. Thus, the media is separated into three clusters. While the red and the green cluster in the middle and the left side of the network consist of “oppositional” media that are ideologically like- minded, the right side of the network consists of right- wing media outlets. The difference between the “like” and the engagement network in regard to the density and the modularity is insignificant ($D_L = 0.21$; $D_E = 0.21$, $M_L = 0.33$, $M_E = 0.33$), $\chi^2(1, N = 106) = 0$, $p = 1$. Thus, it can be argued that in general, people are engaging within a cluster of ideologically like- minded media. This means that they prefer to read media outlets that coincide with their political views, while leaving significantly smaller room for exposure to opposing news and opinions. To reflect the differences in the distance between the analyzed media, I used multidimensional scaling. The Figures 11-13 reflects these changes.

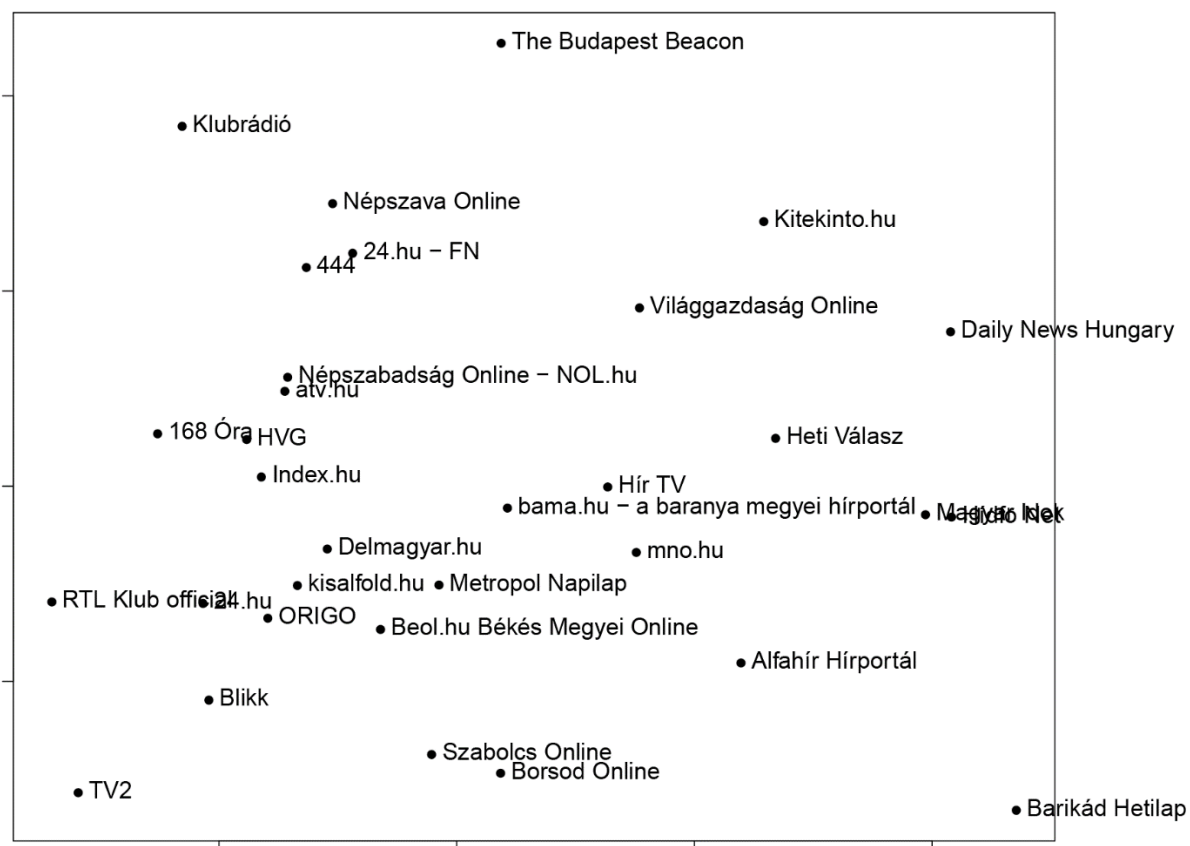


Figure 11: Multidimensional scaling of Hungarian media pages on Facebook based on “likes”. The distances were calculated based on the fan overlap by Normalized Facebook Distance metric. Users that “liked” one of the posts on the analyzed media were included in the analysis. The left- right dimension separates the left-wing outlets (left) and the right- wing outlets (right). No clear distinction can be made on the top- bottom dimension.

First, the users that “like” something on Facebook pages of analyzed media were included in the analysis. Figure 11 demonstrates the left – right dimension that reflects the division between the “oppositional” leftist media and the right wing media. However, there seem to be some deviant cases such as *Kitekintő.hu* or *Daily News Hungary*. These media, although balanced in their coverage, are positioned on the right side of the figure. This can be explained due to their small Facebook activity and low engagement with their post, which increase the distance between the pages in the network and thus drives them to the edge of the figure. Looking at the structural differences of media outlets, there is no distinctive pattern in the network. Similarly,

the top- bottom dimension does not reflect any distinctive characteristics of media outlets. However, the situation is more complex in the analysis based on the users that commented posts of analyzed media.

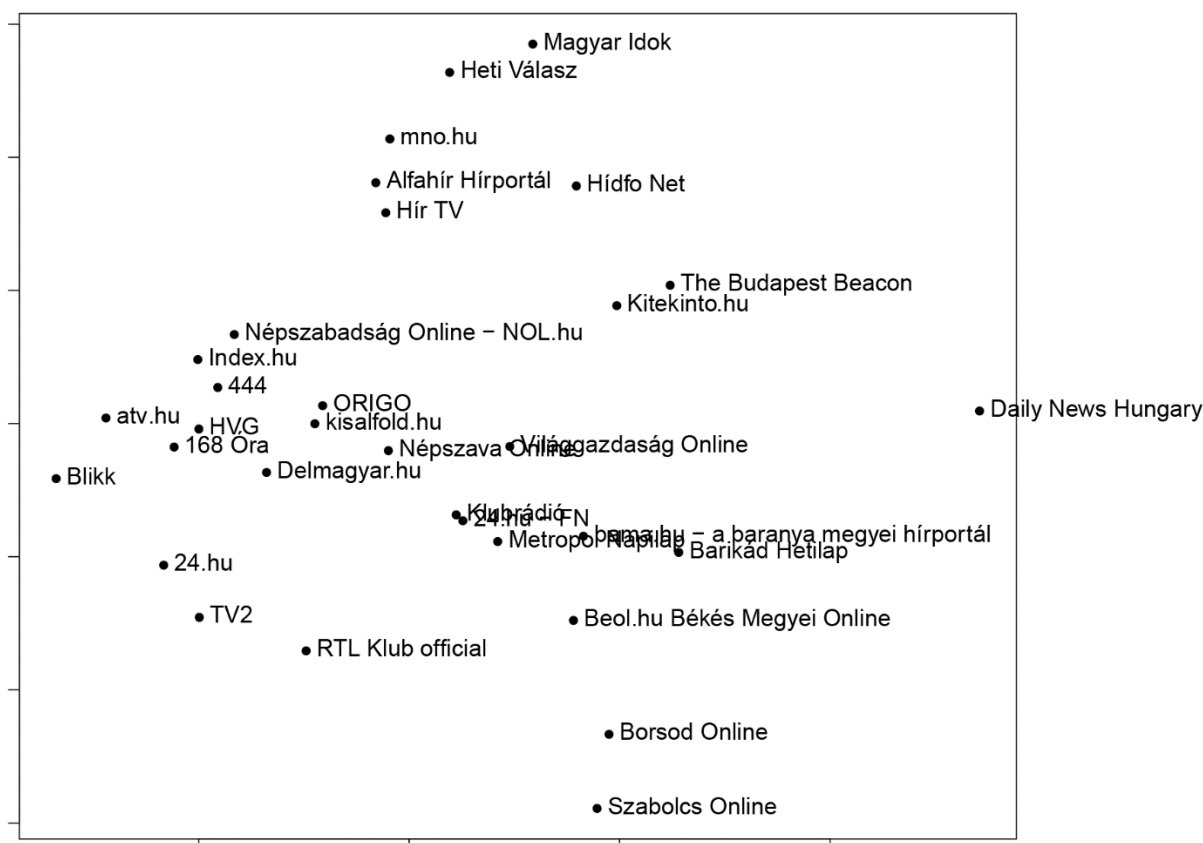


Figure 12: Multidimensional scaling of Hungarian media pages on Facebook based on discussants. The distances were calculated based on the fan overlap by Normalized Facebook Distance metric. Users that commented one of the posts on the analyzed media were included in the analysis.

As can be seen from the Figure 12, the ideological division between the left and right changes. In the first figure oppositional outlets were located on the left side of the network and right-wing media were located on the right. However, in the second figure, right wing media moves to the upper part of the network and the oppositional media cluster around the left – middle part of the figure. The distance between the clusters lowers, but not that substantially as in the case of Slovakia. As Figure 12 shows, ideologically diverse media moves closer to each other, but there are still distinctive clusters of ideologically like- minded outlets. This implies, that

Hungarian readers while commenting stick more to the ideologically like-minded outlets than discussants in Slovakia. However, as social network analysis revealed, the audience overlap between the oppositional media and right-wing media is significant, and thus, one cannot conclude that Hungarian discussants exercise more selective exposure than their Slovak counterparts.

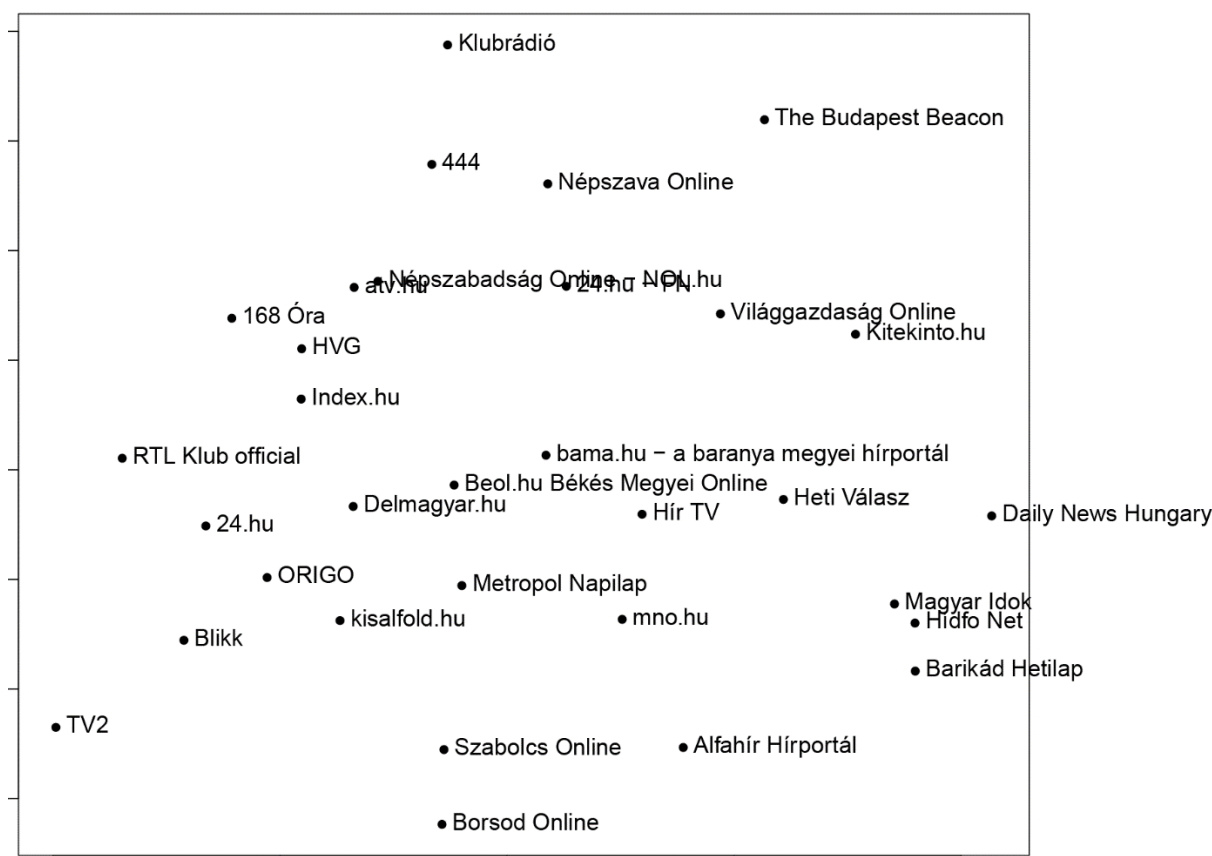


Figure 13: Multidimensional scaling of Hungarian media pages on Facebook based on the engagement. The distances were calculated based on the fan overlap by Normalized Facebook Distance metric. Users that either “liked” or commented one of the posts on the analyzed media were included in the analysis. The left- right dimension separates the left-wing outlets (left) and the right- wing outlets (right). No clear distinction can be made on the top- bottom dimension.

The analysis of the overall engagement, presented in Figure 13, reveals the same pattern as in Slovakia. Once the overall engagement is analyzed, the left- right division reappears. While the media outlets on the left are mostly liberal, left- liberal and socialist, the media outlets on the right are predominantly conservative. Similarly, as in the case of analysis of “likes”, there are

no distinctive differences between the media outlets on the bottom and the outlets on the upper side of the network.

The differences between the Figures 11-13 reflect the changing motivation of users that either like or comment a post on the Facebook. While users predominantly like posts of media outlets that coincide with their beliefs, their behavior changes when they comment. Readers are entering discussions under the posts of opposing media outlets, which indicate that they are exposed to the diverse news. The reason why they do so may be explained by the corrective action hypothesis, suggesting readers' motivation to correct the perceived bias in the news. Nevertheless, as the analysis of overall engagement indicates, the number of discussants that crossed ideological borders is limited, and thus, it can be argued that people predominantly engage within a cluster of ideologically like-minded media outlets.

3.3. Comparing exposure in Slovakia and Hungary

Numerous indicators point out that the Hungarian media system is more polarized and fragmentized than its Slovak counterpart (Bajomi-Lázár 2013; Vozab, Čuvalo, and Peruško 2013; Popescu et al. 2011). It is expected that in the country with higher level of external pluralism and stronger polarization there would be less cross-outlet readership. However, the results of my analysis indicate that this polarization does not translate to the differences in news consumption. While the character of the selective exposure differs in the countries, the data does not support the expectation that Hungarian political system is more fragmentized. Based on the social network analysis of engaging users, I compared the two networks in regard to the number of edges, average degree, density, and modularity. Chi-square test was conducted to compare whether there is a difference in the density of the two networks. This comparison is presented in the Table 4.

Number of media outlets	Number of edges	Average degree	Density	Modularity
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Slovakia	32	108	6.75	0.22	0.37
Hungary	32	106	6.63	0.21	0.34

Table 4: The characteristics of Slovak and Hungarian media outlets networks. The table indicated how many media outlets are in the network, how many connections are between them, and how much connections the average medium has. It also shows the density and the modularity of the networks.

Table 4 demonstrates that there is no significant difference in the fragmentation of Slovak and Hungarian media environment $\chi^2(1, N = 107) = 0.01, p = .90$. If there would be a significant difference in the audience fragmentation, the number of edges, the average degree and the density of the network would be lower in the case of Hungary. However, both networks indicate the same level of audience fragmentation. Thus, the hypothesis 4 was not confirmed.

The only notable difference is that Slovak readers are more likely to expose themselves to diverse ideological outlets, as some conservative outlets are clustered together with the liberal and left- liberal outlets. However, the level of audience fragmentation implies that there are no differences in the level of selective exposure between the Slovak and Hungarian readers. One of the possible explanations is that Facebook can mitigate the audience fragmentation. It can be speculated that if the user like more media outlets on Facebook, Facebook aggregates these media outlets into users News Feed and thus the user can be exposed to a number of sources. However, if the individual is forced to do the selection by herself, she may decide for the media outlet that she prefer.

4. Summary of the Analysis and Discussion

In this section, I summarize the main results of my analysis and discuss its possible limitations. To summarize my results, I use the data from the engagement network. The reason is that the engagement network represents the better proxy for the users' exposure on Facebook than "Like" and comment networks.

First, my analysis shows that both in Slovakia and Hungary ideologically or structurally like-minded media overlapped in their audience substantially more than the media with the diverse characteristics. Thus, this result supports the first hypothesis that people will be more likely to expose themselves to congenial information rather than to discordant information.

The second hypothesis about the stronger selectivity in the exposure of readers with the high commitment to their beliefs was partially confirmed. While the readers of the fringe outlets in Slovakia and readers of extreme right outlets in Hungary are more likely to exercise selective exposure, this does hold for their political counterparts. In Slovakia, readers of the most politically extreme fringe outlets are only present in other like-minded media outlets and have no connection to politically opposing media outlets. In the case of the most extreme outlets in the mainstream cluster, there are some cross-structural and cross-ideological connections.

In the case of Hungary, the audience of the most extreme media outlets on the right is engaging within a cluster of ideologically like-minded media. However, the readers of more extreme "oppositional" media provide only partial evidence for the hypothesis. The most extreme media outlets on the left also engage with the right-wing media. Thus, it can be suggested that not all the readers with the solid beliefs are more likely to expose themselves to consonant media. While it may be true for readers of fringe outlets in Slovakia and readers of extreme right outlets in Hungary, this expectation was not met in the case of their political counterparts.

Third, the analysis suggests that division of selective exposure is more dependent on the political context of the country rather than ideology. In Slovakia, liberal political parties often form a government with the conservative parties and this partnership seems to be also translated into patterns of news consumption. The analysis has shown that liberal or left-liberal outlets, share the audience with conservative outlets.

In Hungary, liberals and socialists are traditional partners in government against the conservatives, and this also translates into patterns of news consumption. The analysis shows that socialist outlets share an audience with liberal or left-liberal outlets, while the readership of the right-wing outlets is clustered with other politically like-minded media. However, since the Hungarian political blocs are ideologically more coherent than in Slovakia, it can be argued that in Hungary the selective exposure is based on ideological division. Nevertheless, these results indicate that rather than hypothesized ideology, there are other factors that drive the selective exposure.

Lastly, I hypothesized that lower polarization of political and media system would result in lesser audience fragmentation. The analysis fails to provide evidence in support of this hypothesis. In Hungary, the audience is fragmented at the same level as in Slovakia, even though the Hungarian system presents the case of higher polarization of the political system, more political bias, and higher media fragmentation.

Although this work may provide evidence for the existence of selective exposure and its structure on social networks, it is not without limits. First, while people on social media may consume like-minded news, they may also visit web pages, read newspapers, or watch TV news that oppose their views. Moreover, they may be exposed to opposing views in their social environment. However, this study is not trying to address the overall fragmentation or homogeneity of social environments, instead it investigates whether social media are another venue of selective exposure.

Second, since the algorithm of Facebook is not public, one cannot be entirely sure what news are recommended for different users other than one's own. Therefore, direct evidence for selective exposure is not possible. Furthermore, the analysis of comments revealed that people also follow sources that oppose their views to discuss and possibly express their disagreement. However, the sample of discussing users is relatively small. In other words, while a few active commenters are exposed to the diverse views the dominant part of the users are exposing themselves to consonant information.

Third, the analysis is limited in its ability to generalize the results to larger populations. Since data are gathered from Facebook, it is not available to examine the socio-demographic characteristics of the sample. It is likely that people actively engaging under media posts on Facebook differ from the general population. Moreover, the motivation to "Like" or "Comment" something already require some action and consequently some users may be exposed to the news, read it but won't engage otherwise. Thus, from the methodological perspective, these users are not included. Nonetheless, this should be mediated with the Facebook algorithms, which prioritize the posts of pages that were clicked on even without pressing "Like" or commenting.

Fourth, one cannot discard the effect of Internet trolls and paid discussants on Facebook. There are several journalistic articles and even the public database of fake Facebook users who praise or attack the particular political party in Slovakia. (Struhárik 2016) One of the sign is that they move from one page to another and engage with the posts. As a consequence, they may contaminate the results, pushing some pages, which have distinct readership closer to each other.

Conclusion

In my thesis, I have studied selective exposure on social media. Online social networks are becoming an important venue of daily news consumption. However, the interplay of factors such as homophily, filtering algorithms or rise of opinion-focused media on social media may foster the selectivity in news consumption. Until now, not much empirical evidence is present about the news consumption behavior on social media and what structure it has in the context of multi-party systems. In this thesis, I used the novel approach of measuring the audience overlap of media outlets on Facebook to address whether the selective exposure is present on social media and if yes, what structure it has. To do so, I derived the methods from network science and statistics to analyze the data in more detail. While this work is not without limitations, the analysis has brought a number of interesting results.

First, this study has found an evidence of selective exposure on social media. Readers, while consuming the news on Facebook, are predominantly engaging within clusters of consonant media outlets. The tendency to prefer consonant information over dissonant information is one way of achieving selective exposure. However, not all of the opposing views can be/ are screened out. While circa 85 – 92 per cent of significant audience overlap is between the consonant media outlets, there are also media outlets with opposing views that show significant audience overlap. Nevertheless, in general, there is an evidence of selective exposure on social media.

Second, this thesis has brought mixed evidence on the issues of selective exposure of readers with the solid beliefs. While the readers of conspiracy media outlets or extreme right-wing media outlets engage only within a cluster of like-minded media, this is not true for their structural or ideological counterparts in the analyzed countries. This thesis shows that a

substantive number of readers of the extreme leftist or liberal media are also exposed to the conservative outlets.

Third, this thesis has questioned the ability of theory about the structure of selective exposure to transfer from the US political context to more complex, multi-party systems in other countries. The analysis has shown that instead of traditional liberal/ conservative structure of selective exposure, which was observed in the US (Coe et al. 2008; Stroud 2010; Iyengar and Hahn 2009), the news consumption in multi-party systems may reflect the nuances of the political system, possibly bringing together readers of liberal and conservative outlets. Thus, it seems that the structure of selective exposure is more dependent on the political context rather than on the ideological differences. This finding can expand the theory about the selective exposure in regard to its structure in countries with different societal/ political cleavages.

Lastly, there was no evidence found that the level of selective exposure is dependent on the fragmentation and polarization of the media system. I tested this proposition in the cases of Slovakia and Hungary, systems that represent two opposing poles in polarization, fragmentation and political parallelism of media systems in the context of Central and Eastern Europe. However, the audience fragmentation was not reflected in the data, showing that both Slovakia and Hungary have a comparative level of audience fragmentation. Since this may be the result that exclusively applies to news consumption in social media, future research should be conducted to clarify this puzzling result.

These results suggest some possible avenues for future research. The analysis of Slovakia revealed that media outlets with different ideological leanings attract similar audiences. The possible explanation of this result is that these media provide virtual agora for supporters of opposition against the government of Robert Fico. However, it would be interesting to see whether these patterns change when the discourse becomes more polarizing on the liberal-

conservative scale, such as discussion of abortions or same-sex marriage. Thus, a possible study could focus on the effect of time and various polarizing event on the dynamics of a network.

In addition to this, the content analysis of comment section on social media can provide interesting insights about the motivation of users to discuss the politics. It can reveal whether comment section functions as an echo chamber, the polarized exchange between the two opposing camps, or possibly serve as a public agora for deliberation.

The reasons why further research should be focused on patterns of news consumption, offline or online, is that it is believed that exposure to diverse opinions has mostly positive effects on society, such as tolerance toward others (Mutz 2006), understanding of arguments of opposing side (Price, Cappella, and Nir 2002), or preventing polarization (Stroud 2010; Mancini 2013).

However, as it was mentioned earlier, not much is known about the selective exposure in a political context different from the US. In general, the political context in the multi-party system may be more complex, and this complexity may affect the media selection of news consumers (Meffert and Gschwend 2012).

At the same time, the shift from the era of mass media to the era of more tailored and personalized media has renewed attention in the selective exposure. However, not many scholars have empirically addressed how the patterns of news consumption are affected by the factors such as homophily or filtering algorithms.

Nevertheless, there are two things that make a selective exposure on social media an important issue to discuss. First, social media are becoming an important venue of news consumption. Second, social media have a great impact on what users are exposed to. The recent accusation of the liberal bias in “Trending Now” function of Facebook (Thielman 2016) should be a warning sign that not only users of social media but also the third person decide what news the user will be exposed to. Hopefully, the debate which this accusation started will emphasize the

importance of balanced exposure and possible paths that can be taken to ensure it on social media.

Bibliography

- Abramowitz, Alan I., and Kyle L. Saunders. 2008. "Is Polarization a Myth?" *The Journal of Politics* 70 (2): 542–55.
- Altemeyer, Bob. 1998. "The Other 'authoritarian Personality.'" *Advances in Experimental Social Psychology* 30: 47–92.
- Arceneaux, Kevin, Martin Johnson, and Chad Murphy. 2012. "Polarized Political Communication, Oppositional Media Hostility, and Selective Exposure." *The Journal of Politics* 74 (1): 174–86.
- Bajomi-Lázár, Péter. 2013. "The Party Colonisation of the Media The Case of Hungary." *East European Politics & Societies* 27 (1): 69–89. doi:10.1177/0888325412465085.
- Bakshy, Eytan, Solomon Messing, and Lada Adamic. 2015. "Exposure to Ideologically Diverse News and Opinion on Facebook." *Science*, May. doi:10.1126/science.aaa1160.
- Banerjee, Abhijit, Arun G Chandrasekhar, Esther Duflo, and Matthew O Jackson. 2013. "The Diffusion of Microfinance." *Science* 341 (6144): 1236498.
- Barberá, Pablo, John T. Jost, Jonathan Nagler, Joshua A. Tucker, and Richard Bonneau. 2015. "Tweeting From Left to Right: Is Online Political Communication More Than an Echo Chamber?" *Psychological Science*, August. doi:10.1177/0956797615594620.
- Baylis, Thomas A. 2012. "Elite Consensus and Political Polarization: Cases from Central Europe." *Historical Social Research* 37 (1): 90–106.
- Beam, Michael A. 2014. "Automating the News How Personalized News Recommender System Design Choices Impact News Reception." *Communication Research* 41 (8): 1019–41.
- Bennett, W Lance, and Shanto Iyengar. 2008. "A New Era of Minimal Effects? The Changing Foundations of Political Communication." *Journal of Communication* 58 (4): 707–31.
- Blondel, Vincent D, Jean-Loup Guillaume, Renaud Lambiotte, and Etienne Lefebvre. 2008. "Fast Unfolding of Communities in Large Networks." *Journal of Statistical Mechanics: Theory and Experiment* 2008 (10): P10008.
- Boutyline, Andrei, and Robb Willer. 2016. "The Social Structure of Political Echo Chambers: Variation in Ideological Homophily in Online Networks." *Political Psychology*, April, n/a-n/a. doi:10.1111/pops.12337.
- Chaffee, Steven H, Melissa Nichols Saphir, Joseph Graf, Christian Sandvig, and Kyu Sup Hahn. 2001. "Attention to Counter-Attitudinal Messages in a State Election Campaign." *Political Communication* 18 (3): 247–72.
- Cilibrasi, Rudi L, and Paul Vitanyi. 2007. "The Google Similarity Distance." *Knowledge and Data Engineering, IEEE Transactions on* 19 (3): 370–83.
- Coe, Kevin, David Tewksbury, Bradley J. Bond, Kristin L. Drogo, Robert W. Porter, Ashley Yahn, and Yuanyuan Zhang. 2008. "Hostile News: Partisan Use and Perceptions of Cable News Programming." *Journal of Communication* 58 (2): 201–19. doi:10.1111/j.1460-2466.2008.00381.x.
- Conover, Michael, Jacob Ratkiewicz, Matthew Francisco, Bruno Gonçalves, Filippo Menczer, and Alessandro Flammini. 2011. "Political Polarization on Twitter." In *ICWSM*.
- De Choudhury, Munmun, Hari Sundaram, Ajita John, Doree Duncan Seligmann, and Aisling Kelliher. 2010. "'Birds of a Feather': Does User Homophily Impact Information Diffusion in Social Media?" *arXiv:1006.1702 [Physics]*, June. <http://arxiv.org/abs/1006.1702>.
- Dilliplane, Susanna. 2011. "All the News You Want to Hear: The Impact of Partisan News Exposure on Political Participation." *Public Opinion Quarterly* 75 (2): 287–316. doi:10.1093/poq/nfr006.

- DiMaggio, Paul, John Evans, and Bethany Bryson. 1996. "Have American's Social Attitudes Become More Polarized?" *American Journal of Sociology* 102 (3): 690–755. doi:10.2307/2782461.
- Druckman, James N, and Michael Parkin. 2005. "The Impact of Media Bias: How Editorial Slant Affects Voters." *Journal of Politics* 67 (4): 1030–49.
- Eslami, Motahhare, Aimee Rickman, Kristen Vaccaro, Amirhossein Aleyasen, Andy Vuong, Karrie Karahalios, Kevin Hamilton, and Christian Sandvig. 2015. "'I Always Assumed That I Wasn't Really That close to [Her]': Reasoning about Invisible Algorithms in the News Feed." In .
- Färdigh, Mathias A. 2010. "Comparing Media Systems in Europe: Identifying Comparable Countrylevel Dimensions of Media Systems." *QoG WORKING PAPER SERIES, The Quality of Government Institute, Department of Political Science, University of Gothenburg* 2 (20): 1.
- Festinger, Leon. 1962. *A Theory of Cognitive Dissonance*. Vol. 2. Stanford university press.
- Franklin, Bob. 2005. *Key Concepts in Journalism Studies*. Sage.
- Frey, Dieter. 1986. "Recent Research on Selective Exposure to Information." *Advances in Experimental Social Psychology* 19 (1): 41–80.
- Garrett, R. Kelly. 2009a. "Echo Chambers Online?: Politically Motivated Selective Exposure among Internet News users1." *Journal of Computer-Mediated Communication* 14 (2): 265–85. doi:10.1111/j.1083-6101.2009.01440.x.
- Garrett, R Kelly. 2009b. "Politically Motivated Reinforcement Seeking: Reframing the Selective Exposure Debate." *Journal of Communication* 59 (4): 676–99.
- Gentzkow, Matthew, and J Shapiro. 2009. "What Drives Media Slant." *Evidence from US Newspapers, I Econometrica*.
- Gentzkow, Matthew, and Jesse M. Shapiro. 2011. "Ideological Segregation Online and Offline." *The Quarterly Journal of Economics* 126 (4): 1799–1839. doi:10.1093/qje/qjr044.
- Goel, Sharad, Winter Mason, and Duncan J. Watts. 2010. "Real and Perceived Attitude Agreement in Social Networks." *Journal of Personality and Social Psychology* 99 (4): 611–21. doi:10.1037/a0020697.
- Goldman, Seth K, and Diana C Mutz. 2011. "The Friendly Media Phenomenon: A Cross-National Analysis of Cross-Cutting Exposure." *Political Communication* 28 (1): 42–66.
- Gottfried, Jeffrey, and Elisa Shearer. 2016. "News Use Across Social Media Platforms 2016." Pew Research Center. *Pew Research Center's Journalism Project*. May 26. <http://www.journalism.org/2016/05/26/news-use-across-social-media-platforms-2016/>.
- Groseclose, Tim, and Jeffrey Milyo. 2005. "A Measure of Media Bias." *The Quarterly Journal of Economics*, 1191–1237.
- Hallin, Daniel C, and Paolo Mancini. 2008. "Systémy Médii v Postmoderním Světě." *Praha: Portál*, 275–316.
- Hallin, D.C., and P. Mancini. 2004. *Comparing Media Systems: Three Models of Media and Politics*. Communication, Society and Politics. Cambridge University Press. <https://books.google.hu/books?id=954NJChZAGoC>.
- Hart, William, Dolores Albarracín, Alice H Eagly, Inge Brechan, Matthew J Lindberg, and Lisa Merrill. 2009. "Feeling Validated versus Being Correct: A Meta-Analysis of Selective Exposure to Information." *Psychological Bulletin* 135 (4): 555.
- Ho, Daniel E, and Kevin M Quinn. 2008. "Measuring Explicit Political Positions of Media." *Quarterly Journal of Political Science* 3 (4): 353–77.

- Hollander, Barry A. 2008. "Tuning out or Tuning Elsewhere? Partisanship, Polarization, and Media Migration from 1998 to 2006." *Journalism & Mass Communication Quarterly* 85 (1): 23–40.
- Howard, Philip N. 2010. *Routledge Handbook of Internet Politics*. Taylor & Francis.
- Iyengar, Shanto, and Kyu S Hahn. 2009. "Red Media, Blue Media: Evidence of Ideological Selectivity in Media Use." *Journal of Communication* 59 (1): 19–39. doi:10.1111/j.1460-2466.2008.01402.x.
- Iyengar, Shanto, Kyu S. Hahn, Jon A. Krosnick, and John Walker. 2008. "Selective Exposure to Campaign Communication: The Role of Anticipated Agreement and Issue Public Membership." *The Journal of Politics* 70 (1): 186–200. doi:10.1017/S0022381607080139.
- Iyengar, Shanto, and Sean Westwood. 2014. "Fear and Loathing Across Party Lines: New Evidence on Group Polarization." *American Journal of Political Science* 58.
- Jacomy, Mathieu, Tommaso Venturini, Sebastien Heymann, and Mathieu Bastian. 2014. "ForceAtlas2, a Continuous Graph Layout Algorithm for Handy Network Visualization Designed for the Gephi Software." *PloS One* 9 (6): e98679.
- Jamieson, Kathleen Hall, and Joseph N Cappella. 2008. *Echo Chamber: Rush Limbaugh and the Conservative Media Establishment*. Oxford University Press.
- Jensen, Jens F. 2008. "The Concept of Interactivity--Revisited: Four New Typologies for a New Media Landscape." In , 129–32. ACM.
- Johnson, Thomas J, Shannon L Bichard, and Weiwu Zhang. 2009. "Communication Communities or 'CyberGhettos?': A Path Analysis Model Examining Factors That Explain Selective Exposure to Blogs1." *Journal of Computer-Mediated Communication* 15 (1): 60–82.
- Kiesler, Charles A. 1971. *The Psychology of Commitment: Experiments Linking Behavior to Belief*. Academic Press.
- Knobloch-Westerwick, Silvia, and Steven B Kleinman. 2012. "Preelection Selective Exposure Confirmation Bias versus Informational Utility." *Communication Research* 39 (2): 170–93.
- "Korelace Politických Stran Na Facebooku S Výsledky Voleb Do Evropského Parlamentu." 2015. Accessed October 4. <http://databoutique.cz/post/87676505248/korelace-politických-stran-na-facebooku-s-výsledky>.
- Kruskal, Joseph B, and Myron Wish. 1978. *Multidimensional Scaling*. Vol. 11. Sage.
- Lawrence, Eric, John Sides, and Henry Farrell. 2010. "Self-Segregation or Deliberation? Blog Readership, Participation, and Polarization in American Politics." *Perspectives on Politics* 8 (1): 141–157. doi:10.1017/S1537592709992714.
- Layman, Geoffrey C., Thomas M. Carsey, and Juliana Menasce Horowitz. 2006. "Party Polarization in American Politics: Characteristics, Causes, and Consequences." *Annu. Rev. Polit. Sci.* 9: 83–110.
- Lazarsfeld, P.F., B. Berelson, and H. Gaudet. 1948. *The People's Choice: How the Voter Makes Up His Mind in a Presidential Campaign*. Columbia University Press. <http://books.google.hu/books?id=S-lnIFR02FIC>.
- Lazarsfeld, P.F., and R.K Merton. 1954. "Friendship as a Social Process: A Substantive and Methodological Analysis." *Freedom and Control in Modern Society* 18 (1): 18–66.
- Lehman-Wilzig, Sam N, and Michal Seletzky. 2010. "Hard News, Soft News, 'general' news: The Necessity and Utility of an Intermediate Classification." *Journalism* 11 (1): 37–56.
- Limor, Yehiel, and Rafi Mann. 1997. "Journalism: Reporting, Writing and Editing."

- Lowe, Rosemary H, and Ivan D Steiner. 1968. "Some Effects of the Reversibility and Consequences of Decisions on Postdecision Information Preferences." *Journal of Personality and Social Psychology* 8 (2p1): 172.
- Lowin, Aaron. 1969. "Further Evidence for an Approach-Avoidance Interpretation of Selective Exposure." *Journal of Experimental Social Psychology* 5 (3): 265–71.
- Mancini, Paolo. 2013. "Media Fragmentation, Party System, and Democracy." *The International Journal of Press/Politics* 18 (1): 43–60.
doi:10.1177/1940161212458200.
- McPherson, Miller, Lynn Smith-Lovin, and James M Cook. 2001. "Birds of a Feather: Homophily in Social Networks." *Annual Review of Sociology* 27 (1): 415–44.
doi:10.1146/annurev.soc.27.1.415.
- Meffert, Michael F, and Thomas Gschwend. 2012. "When Party and Issue Preferences Clash: Selective Exposure and Attitudinal Depolarization." In .
- Messing, Solomon, and Sean J Westwood. 2011. "An Era of Social Media Effects? How Social Media Change the Way We Consume News and Reduce Partisan Selective Exposure." In .
- Messing, Solomon, and Sean J. Westwood. 2012. "Selective Exposure in the Age of Social Media: Endorsements Trump Partisan Source Affiliation When Selecting News Online." *Communication Research*, December, 93650212466406.
doi:10.1177/0093650212466406.
- "Mission of Slobodný Vysielač." 2013. *Facebook Page of Slobodný Vysielač*.
https://www.facebook.com/SlobodnyVysielac/info/?tab=page_info.
- Moy, Patricia, and John Gastil. 2006. "Predicting Deliberative Conversation: The Impact of Discussion Networks, Media Use, and Political Cognitions." *Political Communication* 23 (4): 443–60.
- Mutz, Diana C. 2006. *Hearing the Other Side: Deliberative versus Participatory Democracy*. Cambridge University Press.
- Mutz, Diana C, and Jeffery J Mondak. 2006. "The Workplace as a Context for Cross-Cutting Political Discourse." *Journal of Politics* 68 (1): 140–55.
- Mutz, Diana C, and Lori Young. 2011. "Communication and Public Opinion Plus Ça Change?" *Public Opinion Quarterly* 75 (5): 1018–44.
- Nikolov, Dimitar, Diego FM Oliveira, Alessandro Flammini, and Filippo Menczer. 2015. "Measuring Online Social Bubbles." *PeerJ Computer Science* 1: e38.
- Open Society Foundations, Miroslav Kollar, and Tomáš Czwitkowics. 2013. *Mapping Digital Media: Slovakia: A Report by the Open Society Foundations*. Open Society Foundations.
- "Our Obsession with 'Like'—Part 1." 2014. *Psychology Today*.
<http://www.psychologytoday.com/blog/behind-online-behavior/201405/our-obsession-part-1>.
- Palonen, Emilia. 2009. "Political Polarisation and Populism in Contemporary Hungary." *Parliamentary Affairs* 62 (2): 318–34. doi:10.1093/pa/gsn048.
- Pariser, Eli. 2011. *The Filter Bubble: What the Internet Is Hiding from You*. Penguin UK.
- Popescu, Marina, Gabor Toka, Tania Gosselin, and Jose S Pereira. 2011. "European Media Systems Survey 2010: Results and Documentation." *Data Set. Colchester, UK: Department of Government, University of Essex*.
- Price, Vincent, Joseph N Cappella, and Lilach Nir. 2002. "Does Disagreement Contribute to More Deliberative Opinion?" *Political Communication* 19 (1): 95–112.
- Prior, Markus. 2009a. "Improving Media Effects Research through Better Measurement of News Exposure." *The Journal of Politics* 71 (3): 893–908.

- . 2009b. “The Immensely Inflated News Audience: Assessing Bias in Self-Reported News Exposure.” *Public Opinion Quarterly*, nfp002.
- . 2013. “Media and Political Polarization.” *Annual Review of Political Science* 16 (1): 101–27. doi:10.1146/annurev-polisci-100711-135242.
- Resnick, Paul, R Kelly Garrett, Travis Kriplean, Sean A Munson, and Natalie Jomini Stroud. 2013. “Bursting Your (Filter) Bubble: Strategies for Promoting Diverse Exposure.” In , 95–100. ACM.
- Rojas, Hernando. 2010. “‘Corrective’ Actions in the Public Sphere: How Perceptions of Media and Media Effects Shape Political Behaviors.” *International Journal of Public Opinion Research* 22 (3): 343–63. doi:10.1093/ijpor/edq018.
- Rowe, Ian. 2015. “Deliberation 2.0: Comparing the Deliberative Quality of Online News User Comments Across Platforms.” *Journal of Broadcasting & Electronic Media* 59 (4): 539–55.
- Sears, David W, and Jonathan L Freedman. 1965. “Effects of Expected Familiarity with Arguments upon Opinion Change and Selective Exposure.” *Journal of Personality and Social Psychology* 2 (3): 420.
- . 1967. “Selective Exposure to Information: A Critical Review.” *Public Opinion Quarterly* 31 (2): 194–213.
- Šlerka, Josef, and Lenka Krsová. 2015. “Data Boutique - Tzv. Proruské Zpravodajské Weby Na Facebooku? (1. Část).” <http://databoutique.cz/post/113772071738/tzv-prorusk%C3%A9-zpravodajsk%C3%A9-weby-na-facebooku-1>.
- Smoleňová, Ivana. 2015. “The Pro-Russian Disinformation Campaign in the Czech Republic and Slovakia.” *Prague Security Studies Insititute*.
- Socialbakers. 2014. “How to Stay on Top of the Social Conversation.” *Socialbakers.com*. <http://www.socialbakers.com/blog/2209-how-to-stay-on-top-of-the-social-conversation>.
- “Stats for Top Media Facebook Pages.” 2015. *Socialbakers.com*. Accessed October 4. <http://www.socialbakers.com/statistics/facebook/pages/total/media/>.
- Stroud, Natalie Jomini. 2007. “Media Use and Political Predispositions: Revisiting the Concept of Selective Exposure.” *Political Behavior* 30 (3): 341–66. doi:10.1007/s11109-007-9050-9.
- . 2010. “Polarization and Partisan Selective Exposure.” *Journal of Communication* 60 (3): 556–76. doi:10.1111/j.1460-2466.2010.01497.x.
- . 2011. *Niche News: The Politics of News Choice*. Oxford University Press on Demand.
- Struhárik, Filip. 2016. “Aké Perly Píšu Falošní Diskutéri Podporujúci Smer? A Pod Ktorými Článkami Sa Objavili? (Prehľad).” *Denník N*. <https://dennikn.sk/blog/ake-perly-pisu-falosni-diskuteri-podporujuci-smer-a-pod-ktorymi-clankami-sa-objavili-prehľad/>.
- Sunstein, Cass R. 2002. “The Law of Group Polarization.” *Journal of Political Philosophy* 10 (2): 175–95.
- . 2009. *Republic. Com 2.0*. Princeton University Press.
- Tarbush, Bassel, and Alexander Teytelboym. 2012. “Homophily in Online Social Networks.” In *Internet and Network Economics*, edited by Paul W. Goldberg, 512–18. Lecture Notes in Computer Science 7695. Springer Berlin Heidelberg. http://link.springer.com/chapter/10.1007/978-3-642-35311-6_40.
- “The Power of ‘Like.’” 2012. *Psychology Today*. <http://www.psychologytoday.com/blog/rewired-the-psychology-technology/201207/the-power>.
- Thielman, Sam. 2016. “Facebook News Selection Is in Hands of Editors Not Algorithms, Documents Show.” *The Guardian*. May 12.

<http://www.theguardian.com/technology/2016/may/12/facebook-trending-news-leaked-documents-editor-guidelines>.

- Thurman, Neil. 2011. "Making 'The Daily Me': Technology, Economics and Habit in the Mainstream Assimilation of Personalized News." *Journalism* 12 (4): 395–415.
- Tóth, Borbála, Marius Dragomir, Mark Thompson, Magda Walter, Yuen-Ying Chan, Christian S Nissen, Dušan Reljic, Russell Southwood, Michael Starks, and Damian Tambini. 2012. "Mapping Digital Media: Hungary." *Open Society*.
- Trilling, Damian, Marijn van Klinger, and Yariv Tsfati. 2016. "Selective Exposure, Political Polarization, and Possible Mediators: Evidence From the Netherlands." *International Journal of Public Opinion Research*, edw003.
- Ulbis, Stacy G. 2013. "THE MORE I HEAR THE LESS I LIKE: Exposure to Political Discussion and Partisan Intolerance."
- Valentino, Nicholas A., Antoine J. Banks, Vincent L. Hutchings, and Anne K. Davis. 2009. "Selective Exposure in the Internet Age: The Interaction between Anxiety and Information Utility." *Political Psychology* 30 (4): 591–613. doi:10.1111/j.1467-9221.2009.00716.x.
- Vozab, Dina, Antonija Čuvalo, and Zrinjka Peruško. 2013. "Audiences as a Source of Agency in Media Systems: Post-Socialist Europe in Comparative Perspective." *Mediální Studia*, no. 2: 137–54.
- Wallsten, Kevin. 2005. "Political Blogs and the Bloggers Who Blog Them: Is the Political Blogosphere and Echo Chamber." In , 1–4.
- Wojcieszak, Magdalena. 2008. "False Consensus Goes Online: Impact of Ideologically Homogeneous Groups on False Consensus." *Public Opinion Quarterly* 72 (4): 781–91. doi:10.1093/poq/nfn056.