How Does Social Media Feed Our Beliefs?

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SAŽETAK

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Društvene mreže postale su dio svakodnevnice većine ljudi u svijetu, te ih većina danas koristi kao glavni izvor informacija. Zbog toga društvene mreže mogu utjecati na naša uvjerenja i izvan digitalnog života. Primjerice, poznato je da su društvene mreže postale izvor širenja dezinformacija, putem kojeg izvršne vlasti pokušavaju utjecati na svoje građane. Ovaj pregledni rad istražuje procese kojima društvene mreže mogu utjecati na naša uvjerenja. Općenito govoreći, naša se uvjerenja stvaraju na temelju heuristika, mentalnih prečaca koji, iako su adaptivni, otkrivaju nesavršenosti u našem rezoniranju jer dovode do pristranosti. Jedna od takvih pristranosti jest efekt izloženosti (eng. mere exposure effect), koji se često koristi u marketingu za mijenjanje naših stavova prema nekom proizvodu. Druge pristranosti, poput pristranosti potvrđivanja (eng. confirmation bias) i bandwagon efekta potaknute su načinom funkcioniranja društvenih mreža (npr. algoritmi koji preporučuju personalizirani sadržaj). Ove pristranosti mogu dovesti do iluzije istine (eng. illusory truth effect), koja također potiče širenje dezinformacija. Kombinacija naših urođenih pristranosti i funkcioniranja društvenih mreža stvaraju tzv. komore jeke (eng. echo chambers), odnosno situacije gdje smo suočeni samo s informacijama koje već znamo. U radu se također razmatraju i pokušaji suzbijanja ovih efekata poput dizajniranja digitalnih nudges, označavanja sumnjivog sadržaja te smanjivanje količine podataka koji se dijele na društvenim mrežama.

ABSTRACT

Keywords: belief change, confirmation bias, heuristics, marketing, social media

Nowadays, social media has become part of the daily routine for most people. Recently, it has also become the main source of news for many people, and as such, it could influence their beliefs in real life. It is known that social media has become a place where misinformation is spread and where governments try to influence their citizens. This review examines the processes by which social media may affect our beliefs. In general, beliefs are formed based on heuristics - mental shortcuts which, although adaptive, reveal flaws in our reasoning that can lead to unwanted biases. One of them is the mere exposure effect, often used in marketing for changing attitudes about certain products. Others, such as confirmation bias and bandwagon effects, are encouraged by the way social media platforms work (e.g., algorithms recommending personalized content). All of these can result in illusory truth effects, encouraging the spread of misinformation. The combination of these innate biases and the way social media works, creates echo chambers, situations where we are only presented with information we already believe in. Attempts at reducing these effects are discussed as well, such as designing digital nudges, flagging suspicious content, and reducing the data shared on platforms.

INTRODUCTION

Social media is one of the most recent results of human ingenuity. Obar and Wildman (2015) mention four main characteristics of social media: social media can be any (1) internet-based application (2) where users generate most of the content. Moreover, it is a (3) service that helps create social networks by (4) connections and interactions of user-specific profiles. Recently, they have become increasingly popular, which is supported by the fact that nearly 61% of the world population uses some sort of social media (Dean, 2021). Engaging with the platforms has become an everyday habit for most people. For example, Facebook alone has around 1.4 billion daily users (Broadband Search, n.d.) and the worldwide average social media use is 2 hours and 24 minutes per day (Dean, 2021), although it varies across countries. The highest daily average usage (4 hours and 11 minutes) was found in the Philippines, while the lowest usage (51 minutes) was found in Japan (Dean, 2021). In a Croatian study on high school students, most students used social media for three or more hours per day (Buljan Flander et al., 2020). Taking the average life expectancy (72 years) and the data about worldwide social media usage into account, a person would spend around 6 years and 8 months of their lifetime on social media platforms (Broadband Search, n.d.). These findings show that social media usage is widespread and makes up a significant part of our daily life. This is not to say that everyone uses social media for the same purposes, though. For example, in the aforementioned Croatian study, high school students stated they use social media mainly for social interaction (Buljan Flander et al., 2020). In another study, 80% of people said they are using it for information seeking and self-education (Whiting & Williams, 2013). Indeed, Facebook (Gottfried & Shearer, 2016) and Twitter (Whiting & Williams, 2013) have become important sources of news for most of their users. This finding is important because it implies that social media might affect people's beliefs or attitudes, for example, about political issues.

Beliefs can be defined as the certainty that something is true or that something will happen in the future (Wyer & Albarracin, 2005). As the processes of belief and attitude largely overlap (Wyer &Albarracin, 2005), the terms will be used interchangeably in this paper. Persuasion, the process of affecting beliefs and attitudes, is one of the core research topics in social psychology (Myers, 2011). Persuasion occurs either through the central path, which focuses on the arguments of a message, or through the peripheral path, focusing on other cues suggesting veracity (Myers, 2011). There are differences in terms of which persuasion path is more effective (convincing), and this efficacy depends both on the individual characteristics of the readers/listeners as well as on the persuasion's topic. According to the elaboration likelihood model, to use the central path, we need to be both motivated and able to process information more deeply (Aronson et al., 2016). For example, when listening to a presentation about how recycling is important, attentive listeners will spend time considering the argument that it reduces pollution (central path). On the other hand, those who are distracted will focus on cues implying whether the message is true or not, such as who

is presenting and whether the visuals are appealing (peripheral path). When using the peripheral path, we rely on heuristics, which are mental shortcuts (Myers, 2011). They can be cognitive, such as the availability heuristic or fluency, which are the ease of recollection from memory or the ease of understanding, respectively (Aronson et al., 2016). They can also be social, such as the bandwagon effect, a phenomenon where we spontaneously follow behaviours or opinions in our environment that seem predominant (Colman, 2015). The persuasiveness of a message can also depend on the medium, for example, face-to-face persuasion is the most effective, whereas written messages are least effective (Myers, 2011). These changes depend on the complexity of the message, with more complex messages being more persuasive in written form (Myers, 2011). Social media are adaptable to the needs of the message since they offer most types of media (e.g., video, audio, written).

Some may argue that reading news on social media does not differ from getting news from television or newspapers. However, there is a fundamental difference in how we are exposed to information. On television programs and newspapers, we choose which channel we want to watch or which paper we want to read, but on social media platforms, algorithms decide for us which content will be shown on our newsfeed (Schwartz, 2017). The reasoning behind this is simple. Companies that provide social media platforms rely on user attention to make a profit (Rosenstein, 2020). Since advertisements are mixed with user-generated content, longer time spent on the app equals more advertisements seen, which ultimately means more profit. A person will spend more time on social media if the content that is recommended to them is similar to something they like. Social media uses algorithms to recommend personalized content (Thornhill et al., 2019). Since these algorithms are important for business and profit, they are kept secret, and we know very little about how they decide to personalize the content (O'Neil, 2008). We know, however, that companies use data about us as input for these algorithms to make decisions (O'Neil, 2008). For example, our likes on Facebook and YouTube are important data about our preferences which may extend across the borders of the platforms. Google, for example, offers a whole suite of applications, such as YouTube and Gmail, whose combined data create a better picture of us. As another example, Facebook offers websites a service called Pixel, which gives both Facebook and the websites access to information about users' behaviour on the websites (e.g. on shopping websites they could see the time spent looking at each article; John, 2018). As far as we know, the data comprises interests, hobbies, behaviours, and specific demographics, which Facebook offers in its ad-manager (Facebook, n.d.). Because of its ability to target certain groups, using social media for advertising seems to be much more efficient compared to traditional media, such as television or radio (Teeny et al., 2020). In addition to the fact that we have less autonomy to choose what we see, we are also exposed to the views of other people, which might additionally influence us. Although these tools are amazing for marketing products, they could also be used for advertising political opinions. Therefore, there is a rising worry that social media may threaten democratic processes (Flynn et al., 2017; O'Neil, 2008; Zarouali et al., 2020).

For all the reasons described above, this article aims to investigate the processes by which social media can affect and change our beliefs. Firstly, this paper will examine several mechanisms of belief formation and change. Secondly, the connection between social media and beliefs will be discussed. Finally, strategies for reducing these effects are presented.

HEURISTICS ANDBIASES

Belief is our certainty that a fact is true or that something will happen in the future (Wyer & Albarracin, 2005). Although beliefs are based on our knowledge, we rarely use our whole knowledge to form a belief (Wyer &Albarracin, 2005). Instead, our brain aims to work fast, using as few resources as possible, and this tendency leads to the creation of mental shortcuts known as heuristics (Myers, 2011). For example, when meeting someone on a plane for the first time, we might become very friendly when we hear they are from the same place as us. This simple fact that we are from the same group, is enough for us to like each other and is known as in-group bias (Aronson et al., 2016). The biological purpose of heuristics is to keep us alive rather than produce the most accurate answers (Myers, 2011). Historically, in this particular example, members of our group were usually a sign that we were safe, which might have led to this bias.

Heuristics, such as the in-group bias, are the base for peripheral path persuasion (Aronson et al., 2016). Even though we could use the central path for persuasion and analyze information more thoroughly, we are not always motivated to do so (Aronson et al., 2016). Research suggests that social media increases cognitive load, which makes it harder for us to comprehend what we read (Jiang et al., 2016). In other words, we do not have the conditions to engage with information on a deeper level. As a result, during such cognitive overload, we use the peripheral path to interpret information and rely on heuristics (Myers, 2011). As an example, Wang et al. (2021) found that higher cognitive overload resulted in more attitude change. When participants had less time to read the posts, the positivity (or negativity) of the content improved (or worsened) their attitude towards the object of the posts. Furthermore, when users are experiencing information overload, they tend to prioritize a selected subset of sources that they will share (Gomez-Rodriguez et al., 2014). Perhaps that is a result of heuristics insofar that we use the sources as signs that the information must be right, instead of evaluating the information itself. It might be that even if we use social media to educate ourselves (Whiting & Williams, 2013), we might not be able to do so because we are bombarded with information (Gomez-Rodriguez et al., 2014). Therefore, heuristics are important for understanding the processes of changing and forming beliefs.

One of the heuristics we rely on when forming beliefs is the availability heuristic, or the tendency to think that something is true because it is easily accessible in memory (Myers, 2011). In other words, if we can recall information easily, we may automatically assume that it is correct (Wyer & Albarracin, 2005). For example, while browsing our feed

we might read positive comments about a law that will be introduced in our country. We might easily remember seeing a few headlines talking about it in a positive light, so we might assume that the comments are correct. If we put in more effort to recall more about the law, we would probably find more negative sides to it. However, as we are not motivated enough, it is easier to use mental shortcuts and draw fast conclusions. Accordingly, one experiment showed that participants who had to remember six occasions on which they were assertive rated themselves as more assertive than participants who had to remember twelve occasions of being assertive (Schwarz et al., 1991). The researchers argued that it was simply easier to recall six than twelve instances, which is why people mistakenly equated the ease of retrieval with correctness. Other participants may have reasoned this way: As it was hard to remember twelve instances of me being assertive, it must mean that I am not assertive at all (Schwarz et al., 1991). Generally, frequently accessed information becomes more easily available (Wyer & Albarracin, 2005). This is one of the reasons for the bandwagon effect, the phenomenon where the more people are doing something, the likelier it is that we will do the same (Colman, 2015). For example, when we see many signals about a prevalent opinion on social media, it should become more easily available in our memory because of its frequency (Wyer & Albarracin, 2005). However, we might also simply want to fit in. Changing one's beliefs or behaviours because of a real or imagined social pressure is called conformity (Myers, 2011). We might be afraid that we will be missing out if we are not doing what everyone else is doing (or thinking).

Another relevant heuristic is fluency, or the ease with which we can perceive or understand something, e.g., pictures or concepts (Lee & Labroo, 2004). If it is easy for us to understand something, we tend to think that it must be right then. In line with this, participants were more successful and confident in judging a court case when it was arranged as a narrative than when it was arranged as a collection of testimonies (Pennington & Hastie, 1992). The narrative was easier to understand (i.e., perceived more fluently), which led to more confident and correct verdicts (Pennington &Hastie, 1992). This is one of the mechanisms advertisers rely on (Lee & Labroo, 2004). Advertisements are matched to our interests and/or personality, allowing us to perceive the message more fluently, which then increases our positive attitudes towards them (Teeny et al., 2020). Matching the message with the recipient's characteristics is called personalized matching, and it is one of the reasons why social media platforms collect data about us (Teeny et al., 2020). Another form of using fluency is through the mere exposure effect, where repeated exposure to a stimulus increases positive attitudes towards it (Zajonc, 1968). Repetition makes it easier for us to perceive, which is we understand it more fluently (Lee & Labroo, 2004). Ultimately, this leads to the illusory truth effect, believing that something is true because we have encountered it frequently (Wang et al., 2016). In line with this, Hasher et al. (1977) showed that participants rated statements as more truthful because they were exposed to them more often. Nadarevic et al. (2020) also showed that on social media, the repetition of information has increased users' ratings of how accurate

the information is. The core difference between the availability heuristic and the illusory truth effect is that with the availability heuristic, we treat easily recalled information as being true, while the illusory truth effect mistakes frequently encountered misinformation as being true.

We are more likely to believe some information is true if it is easier to recall (availability heuristic) or more easily understood (fluency heuristic). Most of the time, it might serve us well (e.g., in survival situations, Myers, 2011), but it can also have detrimental effects. Generally, people want to be sure that their worldview is a good representation of reality (Wyer & Albarracin, 2005). That is, we want to believe in the things we already believe in because it means that we understand the world we live in (Wyer & Albarracin, 2005). Confirmation bias is the tendency to seek and interpret evidence that supports our already existing beliefs (Nickerson, 1998). This might also be a byproduct of the mentioned heuristics: what we already know is easier to retrieve and more easily perceived and therefore we don't question it. As already described, social media tries to provide us with content that we are more likely to enjoy. Usually, the recommended content is similar to what we have previously watched. Through this, social media exacerbates our confirmation bias. Not only do we actively look for content that confirms our existing beliefs, but we are also exposed to the platform which gives us content congruent with our beliefs (Thornhill et al., 2019).

Schwartz (2017) created a mathematical model to represent how people form connections with others, showing that we befriend people similar to us. In his model, people were more likely to form connections to similar people who were far away than to people who were physically close but different. Social media makes this even easier because the physical distance is not an issue anymore. This leads to the creation of echo chambers, situations where we are exposed only to information that we agree with (Garimella et al., 2018). And even if we don't necessarily agree with them, it might seem like everyone else does, which might make us conform (Aronson et al., 2016). However, similar to the bandwagon effect, echo chambers might also change our beliefs because we are exposed to repetition of the same information, making it easily available in memory (Wyer & Albarracin, 2005) and increasing its fluency (Lee & Labroo, 2004). The result is a feedback loop where we get more and more biased views on topics.

To conclude, we form beliefs by using mental shortcuts, namely fluency and the availability heuristic. We also have a natural bias towards exposing ourselves to information congruent with our beliefs, as well as towards widely accepted information. Social media intensifies this with its algorithmic recommendation system. Eventually, this leads to an environment where we can quickly lose touch with reality because we are surrounded by messages that only confirm what we already believe in.

SOCIAL MEDIA AND BELIEFS

Because of the confirmation bias, we tend to strengthen our already held beliefs. This bias might be an attempt to avoid cognitive dissonance, which are uncomfortable emotions that result from having two contra-

dicting beliefs (Wyer & Albarracin, 2005). For example, Bakshy et al. (2015) found that people only clicked on 7% of links about opposing opinions. Not only do we avoid opposing opinions, but we also rate information that contradicts our beliefs as less reliable (Nadarevic et al., 2020). That is, when users were presented with an article that contradicted what they were shown first, they tended to reject the contradictory information. This might also be due to the primacy effect, a situation when information presented first is the most persuasive and changes our attitudes the most (Myers, 2011). This first information could then become the basis for future confirmation bias against contradicting information. These tendencies are further exacerbated by the habit of social media users to read only the headlines instead of the whole article (Waage, 2018). One experiment has shown that people practically ignored both the headline and the article, paying more attention to the comments on the post, citing the comments as more accurate, even when they were contradictory to the article (Anspach & Carlson, 2018). The result is an environment where people skim headlines, or use comments, to form beliefs, and mostly ignore or reject opposing information. These are the users' behaviours, but the way social media operates worsens these effects. One factor that exacerbates such users' behaviours is social media's goal to show only the content that the user will like (O'Brien, 2022). Facebook uses certain users' behaviors as indicators of enjoyment. One of the indicators are meaningful interactions, among which are the length of engagement with the content or commenting on it (O'Brien, 2022). However, these can be abused. For example, the Azerbaijani government uses hundreds of fake accounts to post comments in favor of the government below controversial articles (Lewis & Hilder, 2018). The algorithm should, therefore, push these posts into popularity because of the amount of the engagement. If this happens enough times, people would be exposed to these positive opinions many times, leading to the mere exposure effect. The mere exposure effect leads to higher processing fluency and, as the stimuli are available in memory, our positive attitudes are enhanced (Lee & Labroo, 2004). Additionally, the vast number of comments would make it seem like everyone in the country has the same beliefs, perhaps activating the bandwagon effect and making these opinions more available in memory.

A more accepted form of affecting beliefs is marketing. As described, personalized marketing tries to increase fluency and change our attitudes (Lee & Labroo, 2004). The logic behind this is that if something is similar to us, it must be good. For example, similarity between an influencer and a follower was a predictor of increasing trust in branded posts (Lou & Yuan, 2019). If an advertiser wants to sell a shampoo, they change the message to fit the people they are targeting. They could, for example, choose to distinguish people with hedonistic from those with utilitarian goals, that is, either pleasure-oriented or functionality-oriented goals (Teeny et al., 2020). For the hedonistically motivated, the beauty of the hair would be made salient, while for the utilitarians, they would show how the shampoo keeps the hair healthy. Social media allows such targeting because of the huge amount of data we share about ourselves. There are many other psychological constructs which the message can match (for a detailed review see Teeny et al., 2020). For ex-

ample, using the Big 5 personality model, changing whether an advertisement appealed to people high or low in openness resulted in more clicks on the ad when the design matched the personality compared to a non-matched ad (Matz et al., 2017). As mentioned, Facebook likes are a powerful tool for assessing user personality as well (Youyou et al., 2015). Using this kind of targeting to influence users' beliefs about certain issues was the basis for Cambridge Analytica's 2016 presidential campaign for Trump (Rosenberg et al., 2018). An example of an issue they used was the right to own guns in the USA and matched the advertisements with personality traits (Concordia, 2016). People high in conscientiousness and neuroticism, would have seen a message emphasizing the danger of burglary, while highly agreeable people would have seen messages about the American tradition of teaching hunting (Concordia, 2016). Although it has been disputed how effective this personalized advertisement is (Rathi, 2019), research has shown that such matching is a valid strategy to change beliefs (Myers, 2011; Teeny et al., 2020).

Another side of social media is the rise of misinformation, especially relevant during the COVID-19 pandemic (Shahi et al., 2021). Misinformation is defined as any belief that is either false or contradictory to the best information currently available to the public (Flynn et al., 2017). For example, we may believe that the unemployment is rising because it is supported on media, but if we look up the statistics we could find that it is actually decreasing. One of the possible drivers of misinformation might be the illusory truth effect, when false information is shared and repeated in echo chambers, reinforcing the belief in this information. Indeed, on social media, rumours and falsehoods spread about six times faster than the truth (Vosoughi et al., 2018). We might want to read and share this type of content because most rumours are novel and exciting (Vosoughi et al., 2018). This fast propagation of rumours was also shown with misinformation about COVID-19, for example, claims that some governments promoted herbal drinks as a cure (Shahi et al., 2021). In line with this, social media use was associated with greater belief in conspiracy theories about COVID-19, as well as reduced health-protective behaviours (Allington et al., 2020). Although science aims to update the information on social media based on the latest evidence, people tend to stick to the first information they hear (Nadarevic et al., 2020). This could result in less effective health-related advice in the context of a pandemic, where the science changes constantly. In other words, our belief may be based on misinformation or outdated information. However, the rejection of new information is smaller for credible sources, such as the Ministry of Health (Nadarevic et al., 2020). Nevertheless, social media seems to facilitate the spread of falsehoods, which then might inhibit acceptance of true information.

These effects (i.e., confirmation bias, echo chambers, bandwagon and illusory truth effects) can be used against us because of the advertising tools social media provides. Anyone who pays for their posts will have better reach than those who don't. Organic reach, or something going viral without being paid for, is declining on Facebook (O'Brien, 2022). This is worrying because it implies that regular users are losing the ability to make their voices heard. On the other hand, profiles that pay to the platforms more, can push their posts and create the appear-

ance of widely shared opinions. They can even use psychological effects intentionally, such as creating groups designed as echo chambers, to achieve their goals. This happened in 2016 when Russian bots and fake accounts tried to divide American citizens on controversial issues, and they spent one hundred thousand dollars to achieve this (Nott, 2020). According to McCarthy (2017), their goal was to polarize Americans by creating echo chambers. They created many different pages where they engaged people in conversations about issues and sharing content to achieve this. Even only six of these pages had accumulated more than 18 million engagements, meaning that hundreds of millions of people were potentially affected across all social media. They did not try to achieve this by only supporting one political orientation. Instead, they started pages in support of any topic that was controversial at the time, such as race, gender, class, or faith. Echo chambers themselves already lead to polarization (Schwartz, 2017). However, exposing people to contradicting information on very prominent issues can lead to backfire effects, i.e., stronger support for already held political beliefs (Flynn et al., 2017). Bail et al. (2018) showed that a bot retweeting politically opposed viewpoints resulted in even more conservative views for conservatives. These effects are problematic by themselves, but it is even more worrying that social media allows foreign countries to use them for such purposes.

Taken together, these findings show that people tend to seek information that strengthens their beliefs, and social media exacerbate this behaviour. The psychological mechanisms that make this happen are confirmation bias, the bandwagon effect, fluency and availability heuristic. The social media platforms offer several systems that feed these biases and heuristics, such as the advertising tools and the algorithms that recommend personalized content. They lead to echo chambers which facilitate bandwagon effects, and which polarize us even more. These systems can also be used to change user attitudes.

COUNTERMEASURES

There are attempts at combating the potential danger of the discussed biases. One of these attempts are nudges, which can be any aspect of a design (technological, architectural, industrial, etc.) which predictably alters a person's behaviour without preventing to choose other choice. For example, when designing the space of a cantina, putting water, instead of soft drinks near the cash register, will predictably alter the behaviour of consumers in the way that more water will be purchased, but it doesn't stop anyone from buying soft drinks and it does not affect the financial incentives of consumers (i.e., it doesn't cost the consumer anything to avoid the nudge). In line with this, Thornhill et al. (2019) designed a digital nudge where users had the option to see articles from the whole political spectrum about certain events. Their goal was to break echo chambers and thus reduce confirmation bias. More specifically, when someone saw a news article about a particular event, they could click on an icon and the app would find the news about the same event from different sources. The idea was to expose people to a wider selection of interpretations of

the same event. The shown sources were selected because of their trustworthiness (e.g. CNN, The Times, Fox News). Indeed, participants were more likely to question politically biased news when the digital nudge (i.e., another source) was present. Accordingly, the "related stories" feature generated by the Facebook algorithm, which appeared under links to articles, reduced positive attitudes on articles which were spreading misinformation (Bode & Vraga, 2015). Being exposed to the wider spectrum of political or expert opinions can nudge people to examine the content they are presented with more critically

Another way to alleviate confirmation bias and the spread of misinformation are flags, such as the "Disputed" or "Rated False" tags, which Facebook already uses (Clayton et al., 2019). Their aim is to draw attention to the credibility of the article's content. The "Rated False" tags were found to be the most successful, while general warnings about the trustworthiness were least effective because they also decreased belief in real news (Clayton et al., 2019). In other words, even if the news was true, the participants relied on the flag suggesting that it is false. They might make the reputation of the source more salient. Source credibility affected judgements of truth considerably, with worse credibility leading to lower truth ratings (Nadarevic et al., 2020).

All these techniques rely on someone who needs to rate the trustworthiness of the sources, and in the case of flags, that would be someone fact-checking the article. This raises the question of who that person could be. Having professional fact-checkers is extremely expensive and impractical (Gaozhao, 2021; Thornhill et al., 2019). Moreover, people accepted flags regardless of whether the news was real or not (Gaozhao, 2021). In other words, even when a real article was flagged as fake, participants believed the flag more than the content of the article. The flags are thus not always reliable, also seen in the case of the British Medical Journal, when the journal was flagged and censored by independent fact-checkers (Coombes & Davies, 2022). Furthermore, in the case of the success of the related articles feature in lowering positive attitudes towards fake news (Bode & Vraga, 2015), we are relying on the platform's algorithm, which is not ideal. This is because the Facebook algorithm is not transparent, i.e. we don't know how it makes its decisions (O'Neil, 2008). In the worst-case scenario, under a real article, the feature could recommend articles with misinformation, ultimately lowering attitudes about the real article. Therefore, the biggest critique of all these strategies is the need to put trust in someone else. If someone else is deciding what news is correct, then they also have the opportunity to influence our beliefs.

Another solution, which puts the responsibility on the users themselves, could be reducing the data we give to the platforms. Since the algorithms make their decisions based on our data, we can prevent them from collecting it. The European Union took the first steps in this respect by recognizing a person's fundamental right to protect their data (GDPR, 2018). As a result, all platforms allow us to handle most of our data, although they might not make it easy to do. Despite this, individuals can take steps to restrict their digital footprint, by using browsers with built-in tracking protection, such as Mozilla Firefox.

Finally, we might stop using social media provided by large tech

companies. The viable alternative is free and open source (FOSS) software. FOSS is any software that respects the fundamental rights of the individual to run, copy, study, change, improve, and distribute software (GNU.org, n.d.). Put differently, they are like group efforts where everyone can improve the program, and everybody can see what the changes were and how they improve the program. These are programs where we can, for example, see how the algorithms work, what they use as input and why they recommend something. Currently we lack this knowledge, and it is a part of why these algorithms can be so disruptive (O'Neil, 2008). Another positive side of these applications is that they do not collect unnecessary data because they do not offer advertising. Many very widely used programs are free and open source: Mozilla Firefox, VLC media player, R statistics software, and GNU plus Linux to name a few. Alternatives to social media are: Signal (WhatsApp), Mastodon (Twitter), and Pixelfed (Instagram). However, it is important to note that the effects of social media might be present whether they are proprietary, such as Google Chrome, or FOSS, such as Mozilla Firefox. Still, the possibility of more customization might help reduce the effects of our biases.

CONCLUSION

In conclusion, social media is a powerful tool for controlling the spread of information and, as a result, is connected to the way we form our beliefs. Various organizations and governments across the globe have already realized this and are spending large sums of money to push their content on the platforms. The negative effects are a product of bandwagon effects, confirmation bias and the echo chambers that emerge on the platforms. In addition to that, the tools for advertising offer an opportunity to target certain groups over others. This is mostly used in marketing, but can also be utilized for propaganda and subversive content. They are effective because of the mere exposure effect that leads to fluency and availability, which we use as a heuristic to form our beliefs. Certain steps can be taken to mitigate these effects, such as designing nudges, flagging misinformation, reducing data which the platforms receive, or simply by switching to other software where we can have a part in the decision-making process.

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