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The Role of Beliefs and Behavior on Facebook: A Semiotic Approach to Algorithms, Fake News, and Transmedia Journalism

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This article discusses, from a Peircean semiotic perspective, (1) the logic of algorithms employed by Facebook to foster audience engagement as it relates to the spreadability of fake news in the context of transmedia journalism, and (2) how our own methods of fixation of beliefs influence this process. The methodological approach encompasses a qualitative conceptual study of Peircean semiotics, focusing on concepts such as truth, reality, representation, fixation of beliefs, and collateral experiences, as a proposition to investigate the relationship between algorithms, fake news, and transmedia journalism. The research findings point to the fact that social media networks such as Facebook have their share of responsibility in the current fake news furor, but audiences are also involved in this issue as their behavior and beliefs play an important role in feeding Facebook's algorithms.

Keywords: algorithms, Facebook, fake news, fixation of beliefs, Peircean semiotics, transmedia journalism

Fake news became a buzzword in 2016 during the presidential election in the United States (Bakir & McStay, 2018) and in the aftermath of the Brexit referendum in the United Kingdom. The concept, however, is definitely not new. Orson Welles' legendary 1938 radio adaptation of H. G. Wells' *War of the Worlds*, for instance, which was presented in part as news bulletins with reports from the novel read on the air as if a real alien invasion were taking place (Gambarato & Nanì, 2016), would now probably have been perceived as fake news. Nevertheless, there are different definitions and typologies of the expression. Tandoc, Lim, and Ling (2018) describe fake news as "viral posts based on fictitious accounts made to look like news reports" (p. 138). For Wiggins (2017), "*fake news* refers to news stories which are not based on objective or verifiable fact, evidence, testimony, etc." (p. 16). Tandoc et al. (2018) consider fake news indeed an oxymoron in the sense that news is supposedly and normatively based on truth. Thus, news is related to "independent, reliable, accurate, and comprehensive information" (Kovach & Rosenstiel, 2007, p.

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11). Nevertheless, Alzamora and Bicalho (2018) appropriately remind us that "truth is not necessarily an attribute of news" (p. 3). According to Lippmann (1922/2004),

> the function of news is to signalize an event, the function of truth is to bring to light the hidden facts, to set them in relation with each other, and make a picture of reality on which man can act. (p. 194)

A few typologies have emerged as a result of studies deconstructing fake news. Tandoc et al. (2018), for instance, propose six types of fake news: (1) news satire, which typically uses humor and/or exaggeration; (2) news parody, which uses nonfactual information to inject humor; (3) news fabrication, referring to news that is not based on fact, but is published in the style of news articles to give the impression of legitimacy; (4) photo manipulation, involving manipulation of real images or videos to establish a false narrative; (5) advertising and public relations, in which advertising and press releases are published as news; and (6) propaganda, meaning news created by political entities to influence public perceptions. For Wardle (2017), there are seven categories of fake news: (1) false connection, when headlines, images, and/or captions do not support the content; (2) false context, when legitimate content is shared in a false context; (3) manipulated content, involving the manipulation of visuals and/or information with the intention to deceive; (4) satire/parody, with no intention to cause harm but with the potential to fool audiences; (5) misleading content, conveying misleading information to frame individuals or issues; (6) imposter content, involving the impersonation of genuine sources; and (7) fabricated content, when entirely false content is designed to deceive and cause harm. Although news parody and news satire, for instance, can be part of the conceptualization of fake news, in this article, fake news is primarily understood according to Allcott and Gentzkow's (2017) definition: "news articles that are intentionally and verifiably false, and could mislead readers" (p. 213).

Regardless of the fake news subject, news stories that are not based on verifiable facts cast doubts on established beliefs, such as the belief in traditional news media. Fake news takes advantage of the established belief that an external reality is being represented in news reports. Journalists develop criteria for fact verification, accuracy, and methods of gathering information in order to provide a certain level of confidence in their reports. They are, or should be, concerned with objectivity and biases, ethics and social responsibility (Kovach & Rosenstiel, 2007; White, 2017). Fake news, on the other hand, presents reports in which the external reality is absent or purposely distorted. The distinction between fake news and news involves the relationship between the report and the external fact on which it is based, as well as the intention behind the reporting. It is not always possible, however, to make a sharp distinction between the two when journalists use faulty methods and/or they are employed by companies concerned with motives other than offering reliable reports. Notorious examples of fake news masquerading as news can be found in reports broadcast on the U.S. cable news channel Fox News (Schram & Fording, 2018) and the Russian international television network RT (Russia Today; Dowling, 2017). Thus, there are also a number of fake news reports published by traditional media outlets (White, 2017), generating a consequent increase in distrust for traditional journalism (Siddique, 2018).

From a semiotic perspective, every report is a sign that represents something. Signs, however, represent their objects in reference to some idea and not in all respects (CP 2.228 [c. 1897]).[1] Signs, therefore, being more or less accurate, can be used to deceive. To discuss fake news from a Peircean semiotic perspective, we begin by examining the idea of an external reality that should be represented in a news story and cannot be found in fake news reports, and by exploring the processes by which our beliefs are shaped. For Peirce, reality is something independent of what individuals may think of it. Reality may affect our thoughts, producing an idea that coincides with it. But reality per se is always an external object (a dynamic object), not an immediate object of thought. Peirce's proposal that reality does not depend on thought, but may coincide with it, raises the possibility for thought to represent at least part of reality. For Peirce, "the real must influence thought or I could not by following any rules of reasoning arrive at any truth" (W3:60 [1872]).[2] The possible connection between thought and reality gives us hope to reach reality or truth at the end of a reasoning process (W3:54 [1872]).

In this article, we discuss, from a Peircean semiotic perspective, (1) the logic of algorithms employed by Facebook to foster audience engagement as it relates to the spreadability of fake news in the context of transmedia journalism, and (2) how our own methods of fixation of beliefs influence the process by which fake news is spread. The methodological approach encompasses a qualitative conceptual study of Peircean semiotics (Burks, 1958a, 1958b; Hartshorne & Weiss, 1932a, 1932b, 1933a, 1933b, 1934, 1935; Houser et al., 2000; Kloesel et al., 1986, 1989; Kloesel, Fisch, Houser, De Tienne & Niklas, 1993; Moore et al., 1982, 1984), focusing on concepts such as truth, reality, representation, fixation of beliefs, and collateral experiences, as a proposition to investigate the relationship between algorithms (Bakir & McStay, 2018; Bakshy, Messing, & Adamic, 2015; Dubois & Blank, 2018), fake news (Allcott & Gentzkow, 2017; Tandoc et al., 2018), and transmedia journalism (Gambarato & Alzamora, 2018; Wiggins, 2017). Across the humanities and in diverse studies, scholars are applying Peirce's ideas to issues and areas beyond those he addressed in his own work (Fabbrichesi & Marietti, 2006). The goal is to apply the philosophical tools developed by Peirce to "the treatment of new problems and the formulation of new themes" (Fabbrichesi & Marietti, 2006, p. xiv), such as the ones investigated in this article.

The research findings, following Peirce's a priori method that fixes beliefs that are agreeable to reason and eliminate doubt, indicate that we may believe what we are inclined to believe. Stories that conform to what we already believe are taken as true, regardless of whether they correspond to experience or not. They eliminate the uncertainty of the uncomfortable state of doubt. This is very similar to what happens with filter bubbles (Pariser, 2011) and echo chambers on social media in general and on Facebook in particular. Even though, as we will see, there is a manipulative role played by the configuration of algorithms on Facebook, our own cognitive preferences lead us to develop contexts in which filter bubbles and echo chambers are stimulated, creating a fertile terrain for fake news to grow.

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[1] Following the established practice, the designation CP, followed by volume and paragraph number, refers to the *Collected Papers of Charles S. Peirce* (Hartshorne & Weiss, 1932a, 1932b, 1933a, 1933b, 1934, 1935; Burks, 1958a, 1958b). In square brackets is the date Peirce wrote the text.

[2] Following the established practice, the designation W, followed by volume and page number, refers to the *Writings of Charles Sanders Peirce* (Houser et al., 2000; Kloesel et al., 1986, 1989; Kloesel, Fisch, Houser, De Tienne & Niklas, 1993; Moore et al., 1982, 1984). In square brackets is the date Peirce wrote the text.

Fixation of Beliefs

Peirce's ideas about the process of reasoning and the hope to reach reality or truth at the end of it (W3:54 [1872]) are closely connected to his description of the methods of inquiry. In *The Fixation of Belief*, Peirce (W3:242–257 [1877]) presents four methods for the fixation of beliefs: (1) the method of tenacity, (2) the method of authority, (3) the a priori method, and (4) the scientific method. In the method of tenacity, there is no room for raising doubts (W3:248–250 [1877]). Once a belief has been established, people will constantly reiterate it for themselves, and no contrary opinion posed by others will affect their confidence in it. Peirce (W3:249 [1877]) affirms that a person who is so convinced of his or her beliefs is like an ostrich that buries its head in the sand when it senses danger, feeling calm and safe afterward. This is similar to what can often be observed in polarized discussions and quarrels in social media networks such as Facebook. Franco (2017) emphasizes that in the current context of political polarization, it is common to see people online clinging tenaciously to their ideas and beliefs. Even though tenacity cannot ensure the trustworthiness of belief, it is very efficient in making people act without hesitation and discomfort. Although this method shields the person against the influence of others, it is also alien to truth, given that truth, for Peirce, is a shared belief.

The method of authority takes into account beliefs constituted within communities, where there are institutions that aim to perpetuate certain dogmas and to prevent new ones from being established (W3:250–252 [1877]). Such institutions eliminate individuals' freedom to change their minds according to their own apprehensions of reality. To establish a common opinion, individuals are discouraged from thinking for themselves and questioning the beliefs propagated by the institutions. On Facebook, this kind of belief is frequently found in interactions related to religious debates and political viewpoints (Franco, 2017). Another pertinent example is the infamous case when President Trump dismissed "CNN as 'fake' and Fox News as 'real'" (Schwartz, 2018, para. 1), expressing the correlation of his political interests with the interpretation of the facts represented by media outlets.

The third method is the a priori method that fixes beliefs that are "agreeable to reason" (W3:252–253 [1877]); in other words, we tend to believe in things that agree with what we already believe. Stories that conform to what we already believe are taken as true, regardless of whether they correspond to experience. This tendency is also known as *confirmation bias* (Gorman & Gorman, 2016; Kolbert, 2017), but Mercier and Sperber (2017) prefer the term *myside bias*, arguing that humans are well equipped to (reasonably) identify the flaws of someone else's arguments. Corroborating Mercier and Sperber's view, Gorman and Gorman's (2016) research points to the fact that people experience genuine pleasure when encountering information that supports their own beliefs, even if they are wrong. This is quite close to what happens with filter bubbles and echo chambers on social media. Facebook uses filters (algorithms) to organize and distribute information. These filters are programmed to select what a given person is already inclined to like and to display in that person's news feed primarily this type of information. Using the a priori method to select information, Facebook—one of the major sources of news worldwide (Reuters Institute, 2017)—tends to hide from people anything that is at odds with their own interests and opinions. Consequently, Facebook users get a false impression of overall agreement with their own beliefs because of the lack of exposure to conflicting opinions. Beliefs provide peace of mind and satisfaction, which we do not want to lose.

The last method presented by Peirce is the scientific method. Contrary to the tenacity method, in the scientific method, an individual opinion cannot be considered the truth, for truth is a shared opinion (W3:253–255 [1877]). The main characteristic of the scientific method is that, according to it, our beliefs must not be formed solely by our own individual thinking. Rather, they must be formed by something external that is not influenced by our own thoughts, namely, external events. A common belief based only on external events and shared by everyone is what Peirce calls the *ultimate conclusion* (W3:254 [1877]; W3:55 [1872]).

This process of investigation according to the scientific method is twofold. The first step is reasoning, in which a belief generates other beliefs in the mind; this step does not yet involve an external element independent of thought. The next step is observation, in which by observing something, a new belief is brought into mind, bringing in external elements to become part of the reasoning process. Each observation is unique and does not correspond to the event because the observation is already a representation of the event in the mind. According to De Tienne (2003),

> Peirce makes a sharp distinction between an event and a fact, a fact being precisely what can be abstracted from a slice of time and represented into a proposition by the power of thought. Facts are discrete representations, events are not. (p. 42)

This means that facts, the result of observation, are already a product of thought. For Peirce, to represent means "to stand for, that is, to be in such a relation to another that for certain purposes it is treated by some mind as if it were that other" (CP 2.273 [c. 1903]). In this context, every news report (regardless of whether it is fake or not) involves the process of representation and, consequently, interpretation of reality.

Reality and thought are related in such a way that reality affects thought. By adopting certain methods of thought, we may reach reality. Peirce says, "Reality must be so connected with our thought that it will determine the conclusion of true investigation. But the conclusion depends on the observations" (W3:55 [1872]). Even though conclusions can be reached through a process that involves specific investigations by individuals, the final result, which is identified as truth, is independent of any one individual. The necessary connection between thought and reality makes Peircean semiotics a powerful theory to use when reflecting on fake news and the ways to overcome it.

The Journalistic Method and the Principle of Thought

Journalistic reports, in the best-case scenario, bring us facts, the result of the reporter's observation of an event. Every news report is a particular observation of an event and is accurate to a greater or lesser degree. The first problem with the accurateness of news reports is that published reports are not necessarily the result of an investigative process based on reasoning and observation. A news media company may report what is actually a reiteration of what journalists at other media companies have written, without any effort to observe the original event or to gain collateral experience of it. For Peirce,

> A Sign may bring before the Mind a new hypothesis, or a sentiment, a quality, a respect, a degree, a thing, an event, a law, etc. But it never can convey anything to a person who

> has not had a direct experience or at least original self-experience of the same object, collateral experience. (MS L 463:14 [c. 1908])[3]

What this means is that sometimes media companies do not even do their own investigation to reach their conclusions. This is one of the reasons certain fake news reports spread so quickly, and it is the context for the infamous Pizzagate fake news case (Frankovic, 2016):

> On December 4, 2016, a man carrying an assault rifle walked into a pizza restaurant in Washington, DC. He was intent on "self-investigating" whether the restaurant, Comet Ping Pong, was the headquarters of an underground child sex ring allegedly run by then presidential candidate Hillary Clinton and her former campaign manager, John Podesta. . . . He was motivated by stories he had read on right-wing blogs and social media that had developed this line of thought. In the process of his "self-investigation," he fired several shots into the ceiling of the restaurant. No one was injured, but it was just one of the several threats made to the pizzeria after the news report spread through social media sites, such as Facebook, Reddit, and Twitter. . . . The viral news report, however, was a hoax. (Tandoc et al., 2018, p. 137)

The problem, however, is not only the spread of fake news reports, but also the degeneration of standards of accuracy followed by news companies that claim to be committed to good journalism. Thus, a main issue is the publishing of news articles written without observation of the facts being reported. The real causal connection between the sign and its object is key for accuracy. Although Peirce (W3:66–68 [1873]) says that a causal connection between our ideas and the things they represent is necessary to reach real knowledge, he also admits that there is a causal connection among different ideas in the mind. Hence, we may understand a causal connection as containing both a connection of ideas with external events and an internal causation among ideas in the mind. In the case of fake news, it is necessary to consider both the relation to the external event and the internal causation, for both can modify the way the story is told and interpreted.

To comprehend the relationship between a news report and the external event represented in it, it is necessary to obtain a certain level of direct or collateral experience with the event in question. The ability to acquire this experience is what gives the news media its authority: They can access documents, places, and people that very few individuals can. Because we are generally provided with little information about the methods journalists use to conduct specific investigations, we cannot assess the validity or thoroughness of their methods. Although there are a number of journalistic techniques and principles supposed to guide the inquiries of news reporters (Thomson Reuters, 2008), it is rare that such procedures are clearly presented to the reader and their weaknesses considered and frankly stated. Another issue is the use of anonymous sources and off-the-record or confidential information. There are justifiable reasons for the use of these—mainly protecting the safety of the individuals who provide sensitive information—but they diminish the verifiability and reliability of reports. Noticing these problems, the International Fact-Checking Network, an independent organization

[3] Following the stablished practice, the designation MS, followed by folder and page number, refers to Peirce's manuscripts in the Robin Catalogue. The "L" refers to Peirce's correspondence (Robin, 1967). In square brackets is the date Peirce wrote the text.

devoted to the cross-checking of news reports, added a "commitment to transparency of methodology" (Poynter Institute, n.d., para. 4) to its code of principles, pledging to "explain the methodology they use to select, research, write, edit, publish and correct our fact checks. They encourage readers to send claims to fact-check and are transparent on why and how they fact-check" (Poynter Institute, n.d., para. 4). The network also claims a commitment to transparent sources, saying,

> Signatories want their readers to be able to verify findings themselves. Signatories provide all sources in enough detail that readers can replicate their work, except in cases where a source's personal security could be compromised. In such cases, signatories provide as much detail as possible. (Poynter Institute, n.d., para. 2)

Furthermore, we are supposed to consider traditional media news reports as not influenced by something external to thought. But as the Pizzagate case illustrates (Frankovic, 2016; Tandoc et al., 2018), news reports can eventually become more akin to fiction than to reality, fiction being, according to Peirce, that "whose character depends on what some mind imagines it to be" (W3:49 [1872]), and reality being what "is independent of how you and I or any number of persons think about it" (W3:49 [1872]). Fake news reports such as the Pizzagate story are not devoid of an external object, but they are more influenced by internal thoughts than by an external event. The result is that this kind of report does not reach a conclusion based on the reality. We may try to recognize what has been affected by an external event and what has been affected by internal thoughts. Distinguishing, however, what is independent of thought from the thought itself is not an easy task. Peirce affirms that "the distinction between what is not merely external to my mind or yours but is absolutely independent of thought and what exists in thought, generally speaking, is I think far from being clear" (W3:49 [1872]).

A sign creates a chain of thoughts in the mind. For Peirce (W5:242–247 [1885]), there are three principles—or habits of thought—by which one idea is associated with another, forming such a chain: (1) feeling, or the sense of similar qualities, in which similar ideas come one after the other without any consideration or consciousness of the process; (2) recognition of something that calls our attention and that connects to some quality through a proposition; and (3) association of ideas that brings with it the sense of learning, working like an inference that

> contains a general description and purports to really represent the fact; but it does more, it professes to give in its premises such a representation of the fact that by contemplation of them something else may be learned about the thing. (W5:245 [1885])

As the third principle involves the other two, representation can only excite an idea in another mind if the two previous conditions are satisfied. Furthermore, it is necessary to associate the qualities of the sign itself, which may not be related to its meaning, to the external objects that cause the sign in order to reach an inference that is the synthesis of the whole process. In such a process, we pass from a particular to a general assertion. According to De Tienne (2003), "The power of generality resides in its governing connections, and connections are the warp and woof of continua. Apprehending the laws governing the connections is what learning is all about" (p. 43). The apprehension of general laws suggests a future tendency, which is based on experience and feelings caused by events. A tendency

does not determine how the future will be, but it indicates that some laws may be actualized in the future. Every actualization is a modification of a law because it incorporates new and unexpected elements into it.

If a general law is a law of mind, we may understand it as a habit of mind that will be created in the end of the inquiry process. After an investigation, one could, for instance, believe that a given news report is a good representation of an event, or one could discredit it. This belief or disbelief may affect future actions of the reader, such as deciding to share it or not, or to save the link to the news source for future investigation, or even to remember it so as to never read reports from that source again.

Fake News and the Logic of Algorithms

The complexity of fake news is intrinsically intertwined with the logic of the algorithms behind social networks such as Facebook. The mechanisms of personalization and tailored content play a special role in this context, possibly creating filter bubbles—in which intellectual isolation is caused by digital algorithms that selectively assume what kind of information the user would like to see—and echo chambers, in which closed media systems reinforce beliefs. Wiggins (2017) notes the sophistication of the algorithmic constitution of Facebook with regard to users' news feeds, highlighting that "nearly every interaction with content on Facebook informs the algorithm to accommodate accordingly" (p. 19). Previously, Facebook used the EdgeRank algorithm to determine what content should be displayed in a user's news feed (Bakir & McStay, 2018). In 2013, however, Facebook changed to a machine-learning algorithm that considers more than 100,000 weight factors when producing news feeds (McGee, 2013). Everything counts: not just Facebook's agenda, which informed the 2018 decision to prioritize news feed content from family and friends over that from brands and media organizations (Chaykowski, 2018), but also whatever a user likes, loves, shares; whatever groups a user belongs to; who a user follows or unfollows; how often a user accesses Facebook; from which device it is accessed; with which friends a user interacts most; and so forth.

The logic of algorithms to personalize content on search engines, news aggregators, and social networks such as Facebook therefore potentially creates filter bubbles and echo chambers that can lead to ideological segregation, perpetuation of misinformation, and confirmation biases. Echo chambers are formed when information, ideas, and/or beliefs are reinforced by repetition within a closed system (Sunstein, 2001), whereas filter bubbles are "algorithmically created echo chambers" that arise "when algorithms applied to online content selectively gauge what information a user wants to see based on information about the user, their connections, browsing history, purchases, and what they post and search" (Bakir & McStay, 2018, p. 161). As "false information is fed into self-reinforcing algorithmic and cognitive systems, or digital 'echo chambers'" (Bakir & McStay, 2018, pp. 160–161), it creates a fertile terrain for fake news to grow on Facebook. Nevertheless, other recent studies (Dubois & Blank, 2018; Flaxman, Goel, & Rao, 2016) suggest that the impact of echo chambers in news consumption may be exaggerated. Flaxman and colleagues (2016) conclude that although search engines and social networks are associated with the formation of echo chambers, the magnitude of the consequent effects is relatively modest. For Dubois and Blank (2018), the echo chamber is overstated in its connection to political interest and the lack of diverse perspectives.

Taking another factor into consideration, Tandoc et al. (2018) indicate that "receiving information from socially proximate sources can help to legitimate the veracity of information that is shared on social

networks" (p. 139). Proximity can thus also contribute to and influence the dissemination of fake news when users trust those who made the information available to them, even if that information is not true. This factor can be intensified by the dynamics of Facebook's decision to prioritize the content generated by a user's friends and family, and by the tendency of people to share information that conforms to their opinions (Schkade, Sunstein, & Hastie, 2007). Moreover, "Facebook favours emotional content that hits people whether or not it is true" (El-Sharawy, quoted in Bakir & McStay, 2018, p. 161). In *The Fixation of Belief*, Peirce claims that beliefs originate in sentiment and that there is an inevitable emotional factor in the formation of our beliefs: the irritation of doubt. As the irritation of doubt causes a struggle to reach a state of belief, we prefer to avoid it (W3:242–257 [1877]). On Facebook, this disposition leads us to privilege content, situations, and interactions that confirm our state of belief. A recent quantitative study by Vosoughi, Roy, and Aral (2018) on the spreading of true and false news online demonstrates that false news spreads faster and reaches more people than true news. They suggest that the degree of novelty and the emotional reactions of recipients may be the reasons behind this discrepancy. Hence, whether the content on Facebook is true or false seems less relevant than whether it reinforces our soothing, satisfactory, and comfortable fixed beliefs.

Biases are formed from beliefs and preconceived notions. Ciampaglia and Menczer (2018) identify three types of bias: (1) bias in the brain, related to cognitive biases originating "in the way the brain processes the information that every person encounters every day" (para. 4); (2) bias in society: "When people connect directly with their peers, the social biases that guide their selection of friends come to influence the information they see" (para. 8); and (3) bias in the machine, related to biases that arise "directly from the algorithms used to determine what people see online. Both social media platforms and search engines employ them" (para. 13). Facebook is aware of its role in promoting the latter type of bias. In May 2018, Facebook announced that it was addressing the issue of fake news and took the following measures: (1) announced that the company would fund academics studying fake news and make its data available to them; (2) launched a public education campaign to clarify what fake news is and what people can do to stop its spread; and (3) released a 12-minute video titled *Facing Facts*, starring Facebook managers who are fighting fake news (Thompson, 2018). Initiatives like these show that the company is starting to acknowledge some of its sins and is seeking some sort of redemption.

Transmedia Journalism

Large broadcasters and media conglomerates (such as CNN in the United States) are as knowledgeable about the transmedia advancements in journalism as independent news professionals and companies. "Transmedia journalism is already a reality that although likely more modest than comprehensive, is growing and improving" (Gambarato, 2018, p. 96).

Transmedia journalism, as well as any other application of transmedia storytelling in fictional and nonfictional realms, is characterized, at minimum by (1) multiple media platforms, (2) content expansion, and (3) audience engagement (Gambarato & Tárcia, 2017).

Transmedia journalism can take advantage of different media platforms such as television, radio, print, and, above all, the Internet and mobile to tell deeper news stories. The 24-hour news cycle and the

proliferation of social media networks are particularly influential in the emergence of transmedia journalism, a hybrid of the mass media logic of transmission and the social media logic of sharing (Gambarato & Alzamora, 2018). The digitalization of journalism now allows instantaneous updating as a possible way to correct errors, flaws, and imprecise information that could mislead audiences or generate false news. Nevertheless, digital errors leave traces—or indices in Peircean terms—such as screenshots that can actually encourage further exploitation and dissemination of a falsehood, for instance, as memes, images, or posts on social media. The multiplatform scenario, on the other hand, can promote collaboration to prevent the potentially damaging effects of echo chambers by offering audiences a variety of media and formats, which could expose people to more diverse content, perspectives, and beliefs (Dubois & Blank, 2018).

Content expansion, another key element of transmedia journalism, facilitates the enrichment of the narrative and amplifies the circulation of news through the connections of online social media. "News stories meant to be spread throughout multiple media platforms should not simply transpose or repurpose content from one medium to another but expand the news, taking advantage of the media platforms available" (Gambarato & Tárcia, 2017, p. 1394). Thus, transmedia strategies in journalism, with their potential to develop deeper news stories, can contribute to combating the spread of fake news. More accurate and well-crafted news stories can emerge and be favored in the context of transmedia journalism. However, one of the challenges for transmedia journalism is the strict time constraints characteristic of news media. Breaking news is, therefore, not the most suitable option for expansion of transmedia content. Wiggins (2017) criticizes the spreadability of transmedia content as a factor that could stimulate the viral consumption and distribution of news, regardless of its truth or falsity.

Audience engagement entails mechanisms of interactivity, such as the option to watch a video, enlarge photographs, access maps, click on hyperlinks, and share information through social media networks. Moreover, audience engagement deals with participation, for instance, through creating user-generated content, blurring the lines between news production and consumption (Gambarato & Tárcia, 2017). Audiences are directly involved in the fake news dynamics as

> it seems that fake news is co-constructed by the audience, for its fakeness depends a lot on whether the audience perceives the fake as real. Without this complete process of deception, fake news remains a work of fiction. It is when audiences mistake it as real news that fake news is able to play with journalism's legitimacy. This is particularly important in the context of social media, where information is exchanged, and therefore meanings are negotiated and shared. The socialness of social media adds a layer to the construction of fake news, in that the power of fake news lies on [*sic*] how well it can penetrate social spheres. (Tandoc et al., 2018, pp. 148–149)

Although most people may continue to believe and spread fake news reports that reiterate their already fixed beliefs, through fake news experiences, we may learn more about news reports, the conditions in which they are produced, and how we should interpret them. These experiences enlarge the field of interpretants—the effect of the process of semiosis or signification—we can have from these signs. Whereas reports were once seen as referring exclusively to external events, now, by being exposed to a growing number of experiences with fake news stories, we are starting to think more about the reliability of news

reports. The discovery of the low reliability of the information provided by news media is leading to an increase in awareness of how traditional news reports may refer to and represent many other interests and beliefs.

Belief and doubt are states of mind that alternate within an inquiry process. Doubt stimulates inquiry, and belief, according to Peirce, is what "guides our desires and shape our actions" (W3:247 [1877]). At the end of an inquiry, an opinion is formed, which is a new belief that will guide our actions until an experience brings in a new doubt about the established belief. The desire to find out new things relates to fallibilism, which is Peirce's idea that one must be "at all times ready to dump his whole cart-load of beliefs, the moment experience is against them" (CP 1.55 [c. 1897]). It is important to note that experience is what introduces doubt into our thoughts. The doctrine of fallibilism does not assert that there is no thought to whose accuracy we can trust. Although people can be more or less sure about their own particular chains of thought, "people cannot attain absolute certainty concerning questions of fact" (CP 1.147 [c. 1897]). Experience, then, has an important role in creating doubts and modifying beliefs.

Thus, we may view this state of uncertainty about news reports, which is the result of a great number of experiences with false or imprecise stories told by journalists and news media, as not all negative because it brings in doubts to the established belief in news media and other media corporations. More than discovering that a certain story is not true or does not accurately report events, every experience with fake news reports reinforces doubts about the trustworthiness of news companies or journalists. If this belief were not challenged, no investigation into the truth of news reports would be performed.

Experience can bring more elements into our thoughts and make us doubt the thought itself. "The first condition of learning is to know that we are ignorant. A man begins to inquire and to reason with himself as soon as he really questions anything and when he is convinced he reasons no more" (W3:14 [1872]). Having multiple and plural experiences may help us to be less influenced by our own fixed beliefs.

Final Considerations

As evidenced by Bakshy et al. (2015), even though algorithms play a crucial role in manipulating the content prioritized in Facebook's news feed and potentially influence the circulation and spread of fake news reports, the online behaviors and beliefs of the users themselves directly influence the way these algorithms perform. The traces of users' online presence and activity are key to the formation of filter bubbles and echo chambers. Search engines, news aggregators, and social media networks such as Facebook bear their share of responsibility for the current fake news furor, but audiences are also deeply involved in it because their behavior and beliefs are fundamental to Facebook's functioning. The acclaimed South Korean-born German philosopher Byung-Chul Han, in an interview with Carles Geli, stated that global communication and likes only tolerate more of the same; the same does not hurt! (Geli, 2018, para. 6). Byung-Chul Han's perspective coincides with Peirce's a priori method of fixing beliefs, in which beliefs that are agreeable to reason and eliminate doubt are fixed, so they do not "hurt." Stories that conform to what we already believe eliminate the discomfort, the irritation, of doubt. Thus, our own cognitive preferences expressed in digital environments offer a fertile terrain for fake news to grow. Transmedia journalism has the potential to offer tools to combat the proliferation of false information by amplifying diverse voices,

developing news stories in greater depth, and investigating sources and data. However, it also has the potential to enhance and expand the penetration of news stories that are not actual, factual, or based on evidence or testimony. In the midst of this reality, Ford (2007), one of the pioneers of transmedia journalism, emphasizes that "the purpose of a transmedia news story is to inform the readers in the best way possible" (para. 6). It seems that it is the people themselves—those who use Facebook and other social media networks—who must play a decisive role and learn, from experience, to take pleasure in doubting.

References

Allcott, H., & Gentzkow, M. (2017). Social media and fake news in the 2016 election. *Journal of Economic Perspectives, 31*(2), 211–236.

Alzamora, G. C., & Bicalho, L. A. G. (2018, June). *A dinâmica transmídia de fake news: Interações sociais em torno da concepção pragmática de verdade* [The transmedia dynamics of fake news: Social interactions around the pragmatic conception of truth]. Paper presented at the XXVII Encontro Anual da Compós, Belo Horizonte, Brazil. Retrieved from http://www.compos.org.br/data/arquivos_2018/trabalhos_arquivo_Z5Y0PUC80AOYRVKDACM6_27_6302_26_02_2018_14_47_23.pdf

Bakir, V., & McStay, A. (2018). Fake news and the economy of emotions: Problems, causes, solutions. *Digital Journalism, 6*(2), 154–175.

Bakshy, E., Messing, S., & Adamic, L. A. (2015). Exposure to ideologically diverse news and opinion on Facebook. *Science, 348*(6239), 1130–1132.

Burks, A. W. (Ed.). (1958a). *Collected papers of Charles Sanders Peirce: Volume 7. Science and philosophy*. Cambridge, MA: Harvard University Press.

Burks, A. W. (Ed.). (1958b). *Collected papers of Charles Sanders Peirce: Volume 8. Reviews, correspondence, and bibliography*. Cambridge, MA: Harvard University Press.

Chaykowski, K. (2018, January 11). Facebook focuses news feed on friends and family, curbing the reach of brands and media. *Forbes*. Retrieved from https://www.forbes.com/sites/kathleenchaykowski/2018/01/11/facebook-focuses-news-feed-on-friends-and-family-curbing-the-reach-of-brands-and-media/#6fd525555b69

Ciampaglia, G. L., & Menczer, F. (2018, June 20). These are the three types of bias that explain all the fake news, pseudoscience, and other junk in your news feed. *Nieman Lab*. Retrieved from http://www.niemanlab.org/2018/06/these-are-the-three-types-of-bias-that-explain-all-the-fake-news-pseudoscience-and-other-junk-in-your-news-feed/

De Tienne, A. (2003). Learning qua semiosis. *S.E.E.D. Journal (Semiotics, Evolution, Energy, and Development), 3*(3), 37–53.

Dowling, T. (2017, November 29). 24-hour Putin people: My week watching Kremlin "propaganda channel" RT. *The Guardian*. Retrieved from https://www.theguardian.com/media/2017/nov/29/24-hour-putin-people-my-week-watching-kremlin-propaganda-channel-rt-russia-today

Dubois, E., & Blank, G. (2018). The echo chamber is overstated: The moderating effect of political interest and diverse media. *Information, Communication & Society, 21*(5), 729–745.

Fabbrichesi, R., & Marietti, S. (2006). *Semiotics and philosophy in Charles Sanders Peirce*. Newcastle, UK: Cambridge Scholars Press.

Flaxman, S., Goel, S., & Rao, J. M. (2016). Filter bubbles, echo chambers, and online news consumption. *Public Opinion Quarterly, 80*, 298–320.

Ford, S. (2007, April 5). *Transmedia journalism: A story-based approach to convergence* [Blog post]. Retrieved from http://www.convergenceculture.org/weblog/2007/04/transmedia_journalism_a_storyb.php

Franco, J. R. (2017, July 17). *Notas para se pensar as bolhas online a partir de Peirce* [Notes to consider the online bubbles from Peirce's perspective] [Blog post]. Retrieved from https://transobjeto.wordpress.com/2017/07/17/notas-para-se-pensar-as-bolhas-online/

Frankovic, K. (2016, December 27). Belief in conspiracies largely depends on political identity. Retrieved from https://today.yougov.com/news/2016/12/27/belief-conspiracies-largely-depends-political-iden/

Gambarato, R. R. (2018). Transmedia journalism: The potentialities of transmedia dynamics in the news coverage of planned events. In M. Freeman & R. R. Gambarato (Eds.), *The Routledge companion to transmedia studies* (pp. 90–98). New York, NY: Routledge.

Gambarato, R. R., & Alzamora, G. (Eds.). (2018). *Exploring transmedia journalism in the digital age*. Hershey, PA: IGI Global.

Gambarato, R. R., & Nanì, A. (2016). Blurring boundaries, transmedia storytelling and the ethics of C. S. Peirce. In S. Maras (Ed.), *Ethics in screenwriting: New perspectives* (pp. 147–175). Melbourne, Australia: Palgrave Macmillan.

Gambarato, R. R., & Tárcia, L. (2017). Transmedia strategies in journalism: An analytical model for the coverage of planned events. *Journalism Studies, 18*(11), 1381–1399.

Geli, C. (2018, February 7). Byung-Chul Han: "Hoje o indivíduo se explora e acredita que isso é realização" [Byung-Chul Han: "Today the individual exploits him/herself and believes it is realization"]. *El País*. Retrieved from https://brasil.elpais.com/brasil/2018/02/07/cultura/1517989873_086219.html?id_externo_rsoc=FB_CC

Gorman, S., & Gorman, J. (2016). *Denying to the grave: Why we ignore the facts that will save us*. Oxford, UK: Oxford University Press.

Hartshorne, C., & Weiss, P. (Eds.). (1932a). *Collected papers of Charles Sanders Peirce: Volume 1. Principles of philosophy*. Cambridge, MA: Harvard University Press.

Hartshorne, C., & Weiss, P. (Eds.). (1932b). *Collected papers of Charles Sanders Peirce: Volume 2. Elements of logic*. Cambridge, MA: Harvard University Press.

Hartshorne, C., & Weiss, P. (Eds.). (1933a). *Collected papers of Charles Sanders Peirce: Volume 3. Exact logic (published papers)*. Cambridge, MA: Harvard University Press.

Hartshorne, C., & Weiss, P. (Eds.). (1933b). *Collected papers of Charles Sanders Peirce: Volume 4. The simplest mathematics*. Cambridge, MA: Harvard University Press.

Hartshorne, C., & Weiss, P. (Eds.). (1934). *Collected papers of Charles Sanders Peirce: Volume 5. Pragmatism and pragmaticism*. Cambridge, MA: Harvard University Press.

Hartshorne, C., & Weiss, P. (Eds.). (1935). *Collected papers of Charles Sanders Peirce: Volume 6. Scientific metaphysics*. Cambridge, MA: Harvard University Press.

Houser, N., Eller, J., De Tienne, A., Lewis, A., de Waal, C., & Davis, D. B. (2000). *Writings of Charles Sanders Peirce: A chronological edition: Volume 6. 1886–1890.* Bloomington, IN: Indiana University Press.

Kloesel, C. J. W., Fisch, M. H., Houser, N., De Tienne, A., & Niklas, U. (Eds.). (1993). *Writings of Charles Sanders Peirce: A chronological edition: Volume 5. 1884–1886*. Bloomington, IN: Indiana University Press.

Kloesel, C. J. W., Fisch, M. H., Roberts, D. D., Houser, N., Simon, M., & Niklas, U. (Eds.). (1989). *Writings of Charles Sanders Peirce: A chronological edition: Volume 4. 1879–1884.* Bloomington, IN: Indiana University Press.

Kloesel, C. J. W., Fisch, M. H., Roberts, D. D., Houser, N., Ziegler, L. A., & Niklas, U. (Eds.). (1986). *Writings of Charles Sanders Peirce: A chronological edition: Volume 3. 1872–1878.* Bloomington, IN: Indiana University Press.

Kolbert, E. (2017, February 27). Why facts don't change our minds. *The New Yorker*. Retrieved from https://www.newyorker.com/magazine/2017/02/27/why-facts-dont-change-our-minds

Kovach, B., & Rosenstiel, T. (2007). *The elements of journalism: What newspeople should know and the public should expect*. New York, NY: Three Rivers Press.

Lippmann, W. (2004). *Public opinion*. New York, NY: Dover Publications. (Original work published 1922)

McGee, M. (2013, August 16). *EdgeRank is dead: Facebook's news feed algorithm now has close to 100k weight factors*. Retrieved from https://marketingland.com/edgerank-is-dead-facebooks-news-feed-algorithm-now-has-close-to-100k-weight-factors-55908

Mercier, H., & Sperber, D. (2017). *The enigma of reason*. Cambridge, MA: Harvard University Press.

Moore, E. C., Fisch, M. H., Kloesel, C. J. W., Roberts, D. D., Ziegler, L. A., & Atkinson, N. P. (Eds.). (1982). *Writings of Charles Sanders Peirce: A chronological edition: Volume 1. 1857–1866.* Bloomington, IN: Indiana University Press.

Moore, E. C., Fisch, M. H., Kloesel, C. J. W., Roberts, D. D., Ziegler, L. A., & Vandergrift, J. A. (Eds.). (1984). *Writings of Charles Sanders Peirce: A chronological edition: Volume 2. 1867–1871.* Bloomington, IN: Indiana University Press.

Pariser, E. (2011). *The filter bubble: What the Internet is hiding from you*. New York, NY: Penguin Press.

Poynter Institute. (n.d.). *International fact-checking network fact-checkers' code of principles*. Retrieved from https://www.poynter.org/international-fact-checking-network-fact-checkers-code-principles

Reuters Institute. (2017). *Digital news report*. Retrieved from http://www.digitalnewsreport.org/

Robin, R. (Ed.). (1967). *Annotated catalogue of the collected papers of Charles S. Peirce*. Amherst, MA: University of Massachusetts.

Schkade, D., Sunstein, C. R., & Hastie, R. (2007). What happened on deliberation day? *California Law Review, 95*, 915–940.

Schram, S., & Fording, R. (2018, March 24). *The Fox News–fake news–Trump nexus*. Retrieved from http://www.publicseminar.org/2018/03/the-fox-news-fake-news-trump-nexus/

Schwartz, J. (2018, July 13). Trump opens rift in press corps as he disses CNN as "fake" and Fox News as "real." *Politico*. Retrieved from https://www.politico.com/story/2018/07/13/trump-media-cnn-fox-fake-news-719279

Siddique, H. (2018, January 22). Just one in four Britons trust news on social media, finds survey. *The Guardian*. Retrieved from https://www.theguardian.com/media/2018/jan/22/just-one-in-four-britons-trust-news-on-social-media-finds-survey

Sunstein, C. (2001). *Echo chambers: Bush vs. Gore, impeachment, and beyond*. Princeton, NJ: Princeton University Press.

Tandoc, E. C., Jr., Lim, Z. W., & Ling, R. (2018). Defining "fake news": A typology of scholarly definitions. *Digital Journalism, 6*(2), 137–153.

Thompson, N. (2018, May 23). Exclusive: Facebook opens up about false news. *Wired*. Retrieved from https://www.wired.com/story/exclusive-facebook-opens-up-about-false-news/

Thomson Reuters. (2008). *Reuters handbook of journalism*. Retrieved from https://www.trust.org/contentAsset/raw-data/652966ab-c90b-4252-b4a5-db8ed1d438ce/file

Vosoughi, S., Roy, D., & Aral, S. (2018). The spread of true and false news online. *Science, 359*(6380), 1146–1151.

Wardle, C. (2017, February 16). *Fake news: It's complicated*. Retrieved from https://medium.com/1st-draft/fake-news-its-complicated-d0f773766c79

White, A. (2017). *Ethics in the news: EJN report on challenges for journalism in the post-truth era*. London, UK: Ethical Journalism Network. Retrieved from https://ethicaljournalismnetwork.org/wp-content/uploads/2017/01/ejn-ethics-in-the-news.pdf

Wiggins, B. E. (2017). Navigating an immersive narratology: Factors to explain the reception of fake news. *International Journal of E-Politics, 8*(3), 16–29.