

Social and Cognitive Aspects of the Vulnerability to Political Misinformation

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In the last few years, especially after the Brexit referendum and the 2016 U.S. elections, there has been a surge in academic interest for misinformation and disinformation. Social, cognitive, and political scientists' work on these phenomena has focused on two main aspects:

- *Individuals' (and by extension societies') vulnerability to misinformation;*
- *Factors and interventions that can increase individuals' (and societies') resistance to misinformation.*

In this article, we offer a critical review of the psychological research pertaining to these two aspects. Drawing on this review, we highlight an emerging tension in the relevant literature. Indeed, the current state of the art of the political misinformation literature reflects the combined operation of two opposing psychological constructs: excess gullibility on the one hand and excess vigilance on the other. We argue that this conceptualization is important in both advancing theories of individuals' and societies' vulnerability to misinformation and in designing prospective research programs. We conclude with proposing what, in our view, are the most promising avenues for future research in the field.

KEY WORDS: political misinformation, biases, corrections, gullibility, epistemic vigilance

The U.S. elections in 2016, followed after 6 months by the United Kingdom's referendum on European Union (EU) membership that led to Brexit, appears to have brought a sharp awareness in Western academics and public commentators about the challenges presented by misinformation. While the problem of misinformation is not necessarily new (Posetti & Matthews, 2018), little by little, the words “misinformation,” “fake news,” and “post-truth” have filled the everyday vernacular of politicians, journalists, and citizens, even occupying the competitive word-of-the-year position for many dictionaries and journals. For example, *post-truth* “an adjective defined as ‘relating to or denoting circumstances in which objective facts are less influential in shaping public opinion than appeals to emotion and personal belief’” was Oxford dictionary's 2016 word of the year. These notions and

discussions have taken on an even more urgent aspect during the current COVID-19 pandemic. And at the start of 2021, a group of fringe partisans instigated by misinformation and conspiracy theories seized the U.S. Capitol in a blatantly antidemocratic action (Faiola et al., 2021).

As a consequence of these developments, the past months and years have seen a surge in misinformation research, whether specifically in connection to COVID-19 or in general, in an urgent attempt to document and limit the impact of misinformation on individuals and societies (Lazer et al., 2018; Mena, 2019; Pennycook, McPhetres, Zhang, et al., 2020; Pennycook & Rand, 2019a).

In this article, we provide a critical overview of the psychological research that relates to the effects of political misinformation on individuals and societies. After setting the stage and providing a few necessary working definitions, we present and discuss two strands of psychological research. On the one hand, research suggesting that people are (too) gullible towards communicated information, including misinformation. On the other hand, research pointing to citizens' ability to exhibit distrust and skepticism towards other people, societal structures, and institutions. In conjunction, these two phenomena suggest that people may be inherently vulnerable to misinformation on the one hand, especially if this is concordant with their existing beliefs, while being disproportionately resistant to any reasonable attempts to correct the false beliefs this information may generate. We suggest that integrating these two strands of literature within the same framework is a useful step towards understanding the potential effects of political misinformation, as well as the best possible remedies to this contemporary problem.

State of the Art

There is quite some terminological confusion and inconsistency by authors across and within disciplines when it comes to "misinformation" and related notions (Jerit & Zhao, 2020). Since 2017, there has been a convergence on the idea that the term "misinformation" refers to inadvertently false or misleading content and is distinguished from the term "disinformation," which is used for purposefully and intentionally misleading information (Lazer et al., 2018; Tandoc, Ling, et al., 2018; Wardle & Derakhshan, 2017). The close but distinct term "fake news" designates a subcategory of disinformation, constituting "fabricated information that mimics news media content in form but not in organizational process or intent" (Lazer et al., 2018). Note, however, that the latter term has become something of a buzzword (Tandoc, Lim, et al., 2018), and fake news is used either by officials (such as the former U.S. President Trump) and voters to label unwelcome content (van der Linden et al., 2020) or as an umbrella term for any type of online false content in specific disciplines like computer science (see Klein & Wueller, 2017; Zhang et al., 2019).

While sometimes conflated in the literature, it is worth highlighting that the three aforementioned concepts of "misinformation," "disinformation," and "fake news" are distinct from "conspiracy theories." Conspiracy theories are "proposed explanation[s] of some historical event (or events) in terms of the significant causal agency of a relatively small group of persons, the conspirators acting in secret" (Keeley, 1999, p. 116). Belief in conspiracy theories reflects a number of cognitive biases (Klein et al., 2015) and, to some extent, socially deviant behavior (Imhoff et al., 2020; Jolley et al., 2019). While conspiracy theories frequently classify as misinformation, in the sense that they go against conventionally accepted scientific knowledge (e.g., the flat-earth conspiracy theory (van Prooijen et al., 2020)), it should be noted that not all conspiracy theories are demonstrably false (van Prooijen & Douglas, 2018) as, historically, there have been conspiracy theories that were later proved to be true (e.g., the Watergate scandal, which was initially claimed to be a conspiracy theory that had seized the Democratic party).

While we do not disagree with the aforementioned categorization, in the present contribution we chose to use the term "misinformation" as an umbrella term to refer to any of the three aforementioned categories (i.e., misinformation, disinformation, and fake news). Aside from convenience, this

choice is also motivated on three different grounds. First, the main difference between misinformation and disinformation lies in the notion of “intention to mislead,” something which for scholars and journalists alike is hard to assess and agree upon. Second, the term “misinformation” has a long history in the field of social and cognitive psychology (see Loftus, 2005, for an overview of this research), which used experiments to test how easily human memory can be implanted with false information (see the next subsection for a more detailed description of this research). Third, while disinformation—being specifically designed to mislead others—may have slightly more negative repercussions than unintentional misinformation, both are likely to have similar negative effects. For example, a user who reads an alt-right online outlet, which intentionally spreads the rumor that Barack Obama is a Muslim ahead of the 2008 U.S. elections, will end up with the same erroneous idea about the former U.S. president as one who reads the same rumor from a virtual friend who unintentionally spreads the falsehood because she really thinks it is true. For all these reasons, we will use the term “misinformation” to refer to any type of information that is to a lesser or larger extent false about the real state of affairs in the world, and, in this article, we focus on the political reality more specifically. Thus, the discussion that follows can be considered to equally apply both to intentional disinformation/fake news and to unintentional misinformation.

As already noted, the growing interest in misinformation is due to its purported societal consequences. There is a widespread consensus that misinformation has an impact on people’s beliefs and attitudes (Lewandowsky et al., 2017) and, in the political realm, on citizens’ political attitudes, opinions, and eventually voting choices (see Landon-Murray et al., 2019; Vaccari & Morini, 2014). The most prominent discussions around the impact of political misinformation are probably the two last U.S. elections as well as the Brexit referendum in 2016. The “leave” campaign on the Brexit referendum was proven to rely on inaccuracies and misinformation (Andrew, 2017). Misinformation may have also played a role in Donald Trump’s victory in the 2016 U.S. elections (see Parkinson, 2016; Read, 2016). In the context of the COVID-19 pandemic, a health-emergency situation unprecedented in the past century, misinformation not only harms people’s capacity to form an accurate appraisal of the reality of the pandemic and, as a result, their capacity to make efficient political choices and policies, but it costs human lives (Osaka, 2020). This underlying assumption is also the reason why misinformation research has seen an even steeper surge in the last few months, with concentrated efforts from various disciplines, including behavioral sciences (van Bavel et al., 2020), psychology (Pennycook, McPhetres, Zhang, et al., 2020), political science (Clayton et al., 2020), medicine (Tasnim et al., 2020), and computer science (Verspoor et al., 2020) to counter the effects of misinformation in the context of the pandemic.

Given the consensus just described about the potentially adverse effects of misinformation on us, our societies, and democracies, it may seem like a truism that misinformation has dire consequences on the functioning of contemporary societies (see Lewandowsky et al., 2017). Yet, for all the research recently conducted on this topic, the actual effects of misinformation on our world (e.g., election outcomes) have rarely, if only tangentially, been tested (Aral & Eckles, 2019). While an increasing amount of research has focused on mitigating and finding potential remedies to misinformation effects (Cook et al., 2015; Ecker et al., 2010, 2017; Lunn et al., 2020; Pennycook, McPhetres, Zhang, et al., 2020; Pennycook & Rand, 2019b), empirically testing whether political misinformation consumed in real or realistic settings has any impact on people’s beliefs, worldviews, attitudes, and behaviors is inherently difficult.

Given this inherent difficulty, in this article, we provide a comprehensive overview of the main psychological phenomena and findings that can advance our understanding of how individuals process, treat, accept, or reject political misinformation. We split this overview in two distinct thematic subsections. First, we look at phenomena and findings suggesting that people may be too gullible towards available information in general, and misinformation more specifically, thus suggesting that political misinformation may have deep and long-lasting effects on citizens and societies. Second,

we will review evidence suggesting that, parallel to this inherent gullibility, people may also appear to be excessively vigilant. While trust and distrust or gullibility and vigilance seem to be two sides of the human psychology, we argue that citizens' vigilance or mistrust may often be particularly directed towards normatively trustworthy sources that attempt to provide *accurate information* in order to potentially correct citizens' misconceptions. As a result, both the "gullible" and the "skeptical" side of human psychology may make citizens particularly prone to believe misinformation.

The evidence we review in the present contribution, thus, reveals what could be considered a paradox, that is, that citizens may be simultaneously too gullible and too vigilant. Because gullibility and vigilance, however, seem to be asymmetrically addressed to actually untrustworthy and trustworthy sources of information respectively, we speculate that this tension is likely to lead to a spiral of negative effects of political misinformation on citizens and societies. In addition, we explain in detail the reasons why we believe it is important for scholars to simultaneously acknowledge both of these facets of human psychology. We take into account the proposed tension while discussing avenues for future research before ending with a summary and conclusion.

Vulnerability to Political Misinformation

Obviously, misinformation can make people hold erroneous ideas about the world and engage in behavior that is detrimental to themselves and others. No one would dispute that trying to fly off the top of a skyscraper on the assumption that one can defy gravity is detrimental to the individual would-be Icarus. Similarly, holding inaccurate ideas about political matters can be problematic for the proper functioning of both societies and democracy. Erroneously thinking that a foreign foe is a friend can have dire consequences for one's country's foreign affairs. Erroneously thinking that immigrants are the source of all evil in one's national economy can lead to stereotyping and discriminatory behavior, both of which can be threatening to democracy. Obviously, when it comes to politics, it is not always easy or even possible to settle upon a universal agreement of whether each and every idea is true or false.

In fact, the functioning of democracy relies on the premise that each idea must be permitted in the "marketplace of ideas" (Gilbert et al., 1993). According to a metaphor introduced by John Stuart Mill (1975/1859), abstract ideas can be thought of as being part of an imaginary market from which people can freely "shop" the ones that fit them the best. According to Mill's view, people are not only free but also able to choose correct over wrong ideas in this marketplace. Indeed, the ideal citizens of a democracy can make proper governance choices because they possess necessary, sufficient, and truthful information regarding the political status quo (Berelson, 1952). The marketplace-of-ideas metaphor is particularly useful in conceptualizing the problem of misinformation because the Internet has brought sharp changes in the informational landscape, or the "marketplace of ideas."

While the information produced globally has naturally followed an upward trend since the Renaissance with the emergence of print (Bronner, 2013) and population growth, the Internet has elicited an astronomical production of circulation of such information in the span of just a few decades (Norman, 2005). Today, a citizen does not only have to choose from a marketplace with increasing numbers of professional news outlets but also from one with a disrupted news order (Waisbord, 2018). Before the advent of the Internet, and especially social media, traditional media in the 20th century generally held the role of the gatekeeper, and, following good journalistic practices, filtered out information that was unreliable or disputed. But the Internet and social media have changed the place of traditional media in the political debate (Mair et al., 2019) leading to a marketplace of ideas in which reliable evidence-based information coexists with personal opinion and information of dubious quality at best (Bode & Vraga, 2015). Increasingly, a significant fraction of polled citizens report that they get a large portion of their news online, especially citizens below the age of 35 (Newman et al., 2019, 2020). This is not to overlook that

TV still appears to be the main source of news information for the older generations (Newman et al., 2019) and, certainly for that half of the world's population who do not yet have Internet access (Roser et al., 2021). Moreover, at least some of the news outlets that exist today seem to have little knowledge and concern over information quality and standards of good journalistic practices. "Democracies, whether or not they achieve this ideal, are founded on the precepts of free and truthful information" (McEwan et al., 2018, p. 1), and the contemporary concerns about the corrosive effects of misinformation on societies and democracy (Lewandowsky et al., 2020) clearly entail doubts as to whether people are ultimately able and willing to really choose correct over wrong ideas.

Our position on this is that while we have very little direct empirical evidence on whether consuming misinformation, including political misinformation, will have any measurable significant effect on citizens' beliefs and behavior (Aral & Eckles, 2019; Zimmermann & Kohring, 2020), these concerns are warranted based on a multitude of psychological phenomena and findings. To clarify, there is research, especially from U.S. settings, suggesting that citizens are misinformed on several important topics. Specifically, U.S. citizens have been found to be misinformed among others about foreign policy (Gershkoff & Kushner, 2005), domestic policy (Jerit & Barabas, 2012), scientific policies (Leiserowitz et al., 2011), and former U.S. President Barack Obama (Nyhan & Reifler, 2010). These findings could be viewed as reflecting the impact that widespread misinformation has on citizens' mental states. However, existing research has not yet shown whether there is a causal chain from misinformation consumption to misperceptions or whether citizens appear misinformed instead because of motivated reasoning, mere ignorance, or other factors.

In the present contribution, we argue that despite this lack of direct empirical evidence about a causal impact of misinformation on citizens' knowledge and beliefs, extensive research from social and cognitive psychology on the way people process and consume information, including political misinformation, would seem to suggest that misinformation indeed poses a threat to the way people think and behave in the political realm. In view of this, we provide an extensive overview of the main phenomena and findings of psychological research which indirectly suggest that people are prone to misinformation. The next two subsections offer a synthetic overview of these phenomena.

Social-Cognitive Phenomena Suggesting People are Gullible

Evidence for gullibility from persuasion research. Persuasion research has a long history in psychology but also in political science, sociology, and communication studies with a tradition spanning more than five decades (O'Keefe, 2016). Despite potential inconsistencies and controversies, decades of persuasion research generally seem to converge on the following points: (1) persuasion is ubiquitous, found in many areas of our life and used by many for professional, commercial, political, but even activist purposes (Perloff, 2021); (2) resistance to persuasion requires self-regulation and effort (Burkley, 2008; Wheeler et al., 2007) and is decreased when people are distracted (Baron et al., 1973; Rosenblatt, 1966; but see also Haaland & Venkatesan, 1968; Petty et al., 1976 where distraction failed to increase yielding to persuasion). Specific persuasion theories and studies even support the idea that resistance to persuasion entails an active mental counterarguing process to avoid being swayed by persuasive communications (Brandt, 1979; Keating & Brock, 1974; Osterhouse & Brock, 1970).

Regardless of the exact model, theory, or supposed mechanism involved in resistance to persuasion, research suggests that yielding to persuasion is cognitively easier than resisting it. Given that persuasion refers to changing recipients' mental states (especially attitudes; O'Keefe, 2016), these

findings generally suggest that citizens are more prone to yielding than to resisting misinformation-based persuasion attempts. Obviously, not all political misinformation is persuasive in nature (cf. misinformation that is unintentionally spread by people who genuinely believe it). Hence, findings from persuasion research may not provide sufficient ground to infer that people are generally prone to misinformation. However, something more general about human cognition seems to make people believe information that is available in their environment. We review the relevant psychological findings and phenomena in the next two subsections.

Meta-cognitive myopia: A mechanism for gullibility Several cognitive biases and heuristics that have been identified in psychological research (e.g., confirmation bias—a selective reliance on information confirming our prior beliefs—or the fundamental attribution error—the tendency to underestimate the influence of situational factors in the explanation of behavior) can be viewed as resulting from a general meta-cognitive myopia: an inability of human processors to assess the quality and history of information and a tendency to take such information at face value (Fiedler, 2012). Thus, people seem to be inherently sensitive to information available in their environment but “stubbornly” resist relevant meta-information concerning the history and accuracy of this information.

The concept of meta-cognitive myopia is particularly relevant to the consumption of news and political information in the “post-truth” era. Naturally, if people were willing and able to select the “correct,” true ideas from a marketplace of ideas available in a news environment that contains increasing amounts of misinformation, we ought not to worry about the detrimental effects of misinformation on citizens and society that are often evoked in public and academic debates. One could hope, for example, that people would be able to rely on the source of the news they consume and avoid systematically misleading news providers or rely on contextual cues like weird user names (e.g., John1969765439) suggesting that the source is a bot or a troll. Research on meta-cognitive myopia teaches us that, in various contexts, people promptly utilize the information that is available to them (Fiedler, 2007; Juslin et al., 2007), but fail to critically assess its special characteristics, sources, and history, even when such “meta-information” is readily available to them (Fiedler, 2000, 2012; Fiedler et al., 2020; Kareev et al., 2002). For example, when people are asked to judge changes in proportions, they appear to largely conflate changes in proportions with changes in the absolute sample size on the basis of which proportions need to be estimated (Fiedler et al., 2020). In simple words, people largely neglect the size of the samples whose proportions they need to estimate and compare. This happens even if people receive explicit instructions and feedback on the way they estimate proportions (Fiedler et al., 2020).

Extrapolating to the political context, the pervasiveness of meta-cognitive myopia suggests that citizens are particularly vulnerable to misinformation, as it is easy to survey the information landscape around us but hard to question the processes that created it. On many social media platforms, these processes include algorithmic recommendations that amplify content that agrees with individuals’ prior beliefs (Flaxman et al., 2016). In addition, the environment of online social networks which provides users with easily accessible meta-data like the number of likes and shares of a given piece of (mis)information is likely to be myopically interpreted. For example, a high *absolute number of reactions* to a post can be easily misinterpreted to reflect engagement by a very large *proportion* of online users. Such mechanisms can, thus, magnify social influence effects (see Cialdini & Goldstein, 2004) and introduce instability to the political market (Camargo et al., 2021). Similarly, meta-cognitive myopia may make citizens prone to consume online political content uncritically, with little concern for its source and other relevant contextual information. In fact, a very specific type of meta-cognitive myopia reviewed in the next subsection supports exactly this idea.

Evidence for gullibility from the truth bias A very specific instance of meta-cognitive myopia has to do with the way in which people process linguistically transmitted information. A venerable tradition in both psychology and linguistics strongly suggests that people by default tend to believe messages they encounter (Clark & Chase, 1972; Gilbert, 1991; Gough, 1965; Harris et al., 2008; Lewandowsky et al., 2012; Millikan, 2004). Such a propensity to believe would be both cognitively and evolutionarily efficient in contexts where available information is predominantly accurate (Reber & Unkelbach, 2010). For example, granted that linguistic communication emerged among cooperative agents, most likely linked with close kin relationships, our ancestors most frequently received truthful rather than untruthful linguistic stimuli (Kissine & Klein, 2013). However, a default tendency to believe information we receive can easily result in a *truth bias* in environments where available information is inaccurate: In such environments, people will be more likely to believe false information than to disbelieve true information (Levine et al., 1999; Street & Masip, 2015).

The truth bias has been consistently documented in experimental settings. In their seminal studies, Gilbert and colleagues presented people with statements that were explicitly tagged as true or false (e.g., accompanied by the words “True” or “False,” Gilbert et al., 1990; or displayed in black = “True” vs. red = “False” fonts, Gilbert et al., 1993), under distraction or not. When asked to recall the statements’ truth value, distracted participants were more likely to remember false statements as true compared to the undistracted ones. Furthermore, distracted participants were more likely to be affected by the false statements in consequent judgments they made.

More recently, our own studies provided even stronger evidence for the operation of a truth bias. Specifically, we found that even when people can dedicate all their attention to reading (e.g., in green = true vs. red = false fonts; Pantazi et al., 2018, Study 1) or listening to the tagged true (e.g., narrated by a woman) and false (e.g., narrated by a man; Pantazi et al., Study 2) statements, they still tend to misremember more false statements as true than true statements as false and to be affected by the false statements in consequent judgments they make. If transferred to the context of news consumption and political misinformation, these results strongly suggest that people are particularly prone to believing anything they read. Crucially, any cues that may attest to the falsity or unreliability of a specific piece of news is likely much more subtle and concealed than the explicit tags we used in our experiments, rendering the filtering of unreliable news an even harder task for most citizens than what our research participants had to do.

Another finding suggesting that citizens are inherently prone to misinformation is that the truth bias does not go away, even when the ratio of false to true tagged statements is up to 0.50 (Pantazi et al., 2018, Study 3), that is, in a context where the truth bias can no longer reflect an ecological way of processing linguistic material. In practice, this means that in a contemporary news landscape ripe with misinformation, and which news consumers know to be so, citizens may not be more capable of rejecting misinformation than if it were more sparse. More dramatically, even year-long experience with and expertise in distinguishing truthful from untruthful information (as in the case of professional judges) are not sufficient to counter the truth bias (Pantazi et al., 2020).

Gullibility demonstrated in presuppositions: The indirect transmission of misinformation Besides evidence pertaining to meta-cognitive myopia and the truth bias, research in the field of linguistics on the understanding of presuppositions not only suggests that people tend to believe linguistically transmitted information but also that this can happen in a rather insidious way. *Presuppositions* in linguistic theory are propositions that are tacitly transmitted by the explicit propositions exchanged in any given conversational context. To make this clear with an example, imagine a news headline which reads:

Folli-Follie: Another scandal added to the “achievements” of the Greek government

Without knowing anything about Greek politics, even without knowing that there exists a country named “Greece,” you are not only informed that a scandal involving its government just erupted. The word “another” additionally, if indirectly, also informs you that this is not the first time the Greek government is involved in scandals. In other words, the idea that the Greek government has been previously involved in scandals is *presupposed* by the headline. What is interesting with regards to presuppositions like the one just described is that they are very readily believed, or *accommodated* in linguistics jargon, without the receivers of a given communication actually checking their accuracy. In the aforementioned example, you will most probably end up having the idea that the Greek government is corrupt even without it being explicitly said.

Beyond being quite intuitive, the fact that presuppositions are somewhat automatically accommodated is strongly supported by experimental evidence (Kissine & Pantazi, 2020). Probably the best-known research on this is that by Elisabeth Loftus and colleagues. In a series of experiments, they asked participants to watch short excerpts of specific events (e.g., a car crash) and later asked them questions that either contained presuppositions (e.g., “How fast was Car A going when it ran the stop sign?”) or not (e.g., “How fast was Car A going when it turned right?”). Time and again they found that participants asked questions with presuppositions tended to mistakenly *accommodate* the presupposed concept (e.g., 53% of them “remembered” seeing a stop sign even when there was not one, as compared to 35% in the no-presupposition control group; Loftus, 1975; Loftus et al., 1978; Loftus & Zanni, 1975).

The phenomenon of presupposition accommodation contributes additional evidence to the one offered by truth-bias research, tracing the potential impact of political misinformation to linguistic processing itself and the dynamic cognitive processes occurring during language comprehension. Unlike the truth bias, which entails that people would be a priori inclined to believe political misinformation that circulates, *presupposition accommodation* suggests that the impact of political misinformation, as with the headline in the example above, can be an automatic part of the process of language comprehension itself (Kissine & Pantazi, 2020), but a quite indirect and hidden one nonetheless.

Empirical evidence corroborates the possibility that presupposition may be one of the mechanisms regulating the transmission and impact of misinformation. Ecker et al. (2014) showed that a misinforming headline (e.g., “Number of burglaries going up”) in a factual article partially inconsistent with the headline (e.g., describing a short-term increase but a long-term decrease in burglary rates) can distort participants’ memory of the article’s content and central point, as well as their inferences (e.g., about future burglary-rate trends). Similarly, if a person’s face appears next to a misinforming headline, the headline’s positive or negative content is transferred to the person, as documented by people’s later biased judgments of that person. While Ecker et al. (2014) do not attribute their findings to the phenomenon of presupposition accommodation, they can be interpreted along these lines. Arguably, a headline is a presupposition in the context of an article’s content, and its content is inscribed on people’s mental representations. Insofar this headline is misleading with respect to the article’s contents, readers are likely to form an erroneous impression of the entire piece.

The illusory-truth effect: Increased gullibility through repetition Another type of meta-cognitive myopia that attests to the potential of political misinformation to linger and affect the citizenry is the “illusory truth effect,” “illusion of truth effect,” or simply “truth effect.” This is a now well-established phenomenon in social cognition research originally revealed by Hasher et al. (1977). These authors showed that people judge repeated statements (true or false but whose truth-value is generally unknown) as more true compared to new statements they have not encountered before, regardless of

their actual truth value. What is more, the statement's perceived truthfulness is proportional to the number of repetitions. That is, three-times repeated statements tend to be rated as more true compared to statements repeated only twice. While Hasher et al. assumed that the underlying mechanism of the illusory truth effect was statements' frequency of occurrence Bacon (1979) later gave an alternative explanation of the phenomenon, showing that participants deem truer statements they think they have encountered before, rather than statements that they have actually encountered. Thus, the illusory truth effect is due to a subjective feeling of familiarity with the statements rather than due to their actual occurrence. More recent accounts of the truth effect are based on the assumption of a "processing fluency" mechanism (Reber et al., 2004). For example, statements presented in an easy-to-read format are judged as truer compared to statements presented in a hard-to-read format (Reber & Schwarz, 1999). To the extent that previously encountered statements are more easily processed compared to novel ones, they, thus, ring as more true (Dechêne et al., 2010; Unkelbach, 2007; Unkelbach & Stahl, 2009).

The implications of this psychological phenomenon for the "era of fake news and misinformation" are not hard to grasp. The notorious saying often attributed to Joseph Goebbels, "Repeat a lie often enough and it becomes the truth" (Stafford, 2016) nicely reveals the fact that repetition has been identified as a major strategy used by propagandists across the world, long before the empirical demonstration of the illusory truth effect. In fact, the illusory truth effect has historically had its own corresponding persuasion technique, namely "ad nauseam persuasion." As its name suggests, the effectiveness of this technique lies in the infinite repetition of the same tenet, to the point that the targets of the persuasion become sick of its repetition (Gilbert et al., 2013). Given that polarizing misinformation and fake news circulating in online social media attracts at least equal (Mocanu et al., 2015), possibly even greater, attention (Vosoughi et al., 2018) than mainstream but truthful information (as revealed in the numbers of likes and reposts of fake vs. true news), it becomes apparent that the combination of the contemporary information landscape with another mechanism of human cognition can be a hazard for democracy.

By means of the illusory truth effect, the mere repetition of political misinformation can lead to its increased believability. Pennycook et al. (2018) empirically tested the operation of the illusory truth effect for headlines that had been fact-checked and classified as fake news. They found that although fake-news headlines were not rated as particularly accurate, those having been previously encountered were perceived as more true than the ones encountered for the first time. Fake news and political misinformation that become "viral" can therefore be part of a vicious circle, whereby misinformation that gains momentum rings increasingly "truer," which may then lead to a spiral of circulation and engagement. Crucially, the study by Pennycook et al. (2018) also showed that a warning explicitly stating that a fake-news headline has been disputed by fact-checkers does not mitigate this illusory truth effect, corroborating older research on trivia statements, which suggested that it operates regardless of the credibility of the information source (see Begg et al., 1992; Henkel & Mattson, 2011). Thus, according to the authors, "social media platforms help to incubate belief in blatantly false news stories and ... tagging such stories as disputed is not an effective solution to this problem." (Pennycook et al., 2018, p. 1865). The repercussions of these findings are further exacerbated by the fact that repetition cannot only lead to increased believability of misinformation but also to increased intentions by users to circulate it (Effron & Raj, 2020).

An interesting aspect of the illusory truth effect that may exacerbate the effects of political misinformation is that it appears to operate not only on repeated (mis)information per se but also on (mis)information related to a previously encountered topic. Begg et al. (1985) empirically demonstrated that a piece of information may be perceived as truer merely by relating to familiar information. While the impact of familiar topics is weaker compared to that of familiar content, Begg

et al. (1985) demonstrate that in the human mind, information is organized in terms of networks of coherent schemata and narratives. Hence, it is easy to imagine a “spiral of misinformation,” where information or misinformation that relates to previously encountered (mis)information is stored in a mental schema and hence appears more believable, convincing, or true.

This phenomenon leaves open the possibility that misinformation concerning a popular topic or person (e.g., a political figure) will ring as increasingly truer the more well-known this figure is and the more information related to the misinformation is already circulating in news outlets or among social network users. The apparent truth of the fake news that Hillary Clinton was involved in “the Pizzagate” scandal is, thus, likely to have had an extra spur during the preelection period when it was circulated, given Hillary Clinton appeared on the news daily as a presidential candidate. Likewise, it is easy to imagine how posting two pieces of misinformation about the same person or topic (e.g., (1) that Barack Obama is a Muslim, and (2) that Barack Obama was not born in the United States and is thus ineligible to run for president) can render both pieces more convincing.

While one may surmise that the two examples just mentioned would only concern Republicans or Republican-leaning individuals, it should be noted that the illusory truth effect has been shown to operate for trivia as well as for statements of opinion, regardless of whether people think the information is true or false in the first place (Arkes et al., 1989). In fact, the effect appears to operate even if the statements contradict people’s previous knowledge (Fazio et al., 2015).

In sum, findings from the illusory truth effect literature suggest that repetition, particularly likely in algorithmically driven online social media environments, can play a major role in the spread and impact of political misinformation and propaganda even for a well-informed citizenry with prior knowledge or opinions that contradict the misinformation it is potentially exposed to.

Biased information processing and confirmation bias as vehicles for gullibility As just alluded, another important factor in the propagation, consumption, and potential impact of political misinformation on citizens is political identity, that is, people’s preconceptions about politics as well as their prior political values and attitudes. Psychologists have long now known the existence of a “confirmation bias” (see Wason, 1968), that is, “the seeking or interpreting of evidence in ways that are partial to existing beliefs, expectations, or a hypothesis in hand.” (Nickerson, 1998, p. 175). While few people would realise or admit to being subject to the confirmation bias, this bias has been shown to operate in a variety of domains of more or less scientific nature, from number mysticism and witch hunting to judicial reasoning, policy rationalization, ideology, and science (Ditto et al., 1998; Dunning, 2015; Hornsey, 2020; Kraft et al., 2015; Nickerson, 1998). To the extent that people are already misinformed, the confirmation bias can clearly facilitate the impact of misinformation on the people who already hold misinformation-consonant beliefs.

Another type of biased-information processing, motivated reasoning, is even more often identified as a significant factor in the phenomenon of political misinformation. Motivated reasoning makes people process information in a way that is partial to the conclusions they want to arrive at (Kunda, 1990). Partisan or political identity is a particularly strong trigger of motivated reasoning (Hornsey, 2020). Politics is a domain that is neither purely subjective nor purely objective. As there are no straightforward and unanimously accepted solutions to political problems, political decisions in democratic societies require deliberation and voting. Neoliberals and left-leaning citizens and policymakers will hardly ever agree on the best economic policy for any given country, although there is some factual basis on which arguments on both sides of the political spectrum are based. It is therefore no surprise that confirmation bias seems to play a significant role in political thinking (Hornsey, 2020).

As people hold quite diverging evaluations of the same politicians, policies, and facts (Gaines et al., 2007; Jacobson, 2010; Westen et al., 2006), they also find different news pieces (Allcott & Gentzkow, 2017) and news sources reliable (Schulz et al., 2020), depending on their political affiliations. What is more, people may interpret political information and news according to their party identification or ideology. For example, Republicans consider objective inconsistencies in the speeches of a Republican candidate (e.g., George W. Bush) as less inherently inconsistent and more justifiable compared to inconsistencies uttered by a democratic candidate (e.g., John Kerry) (Westen et al., 2006). And, as expected, this pattern of evaluation is reversed for Democrats (Westen et al., 2006). These opposing judgments based on opposite partisanship or ideology are also specifically linked to emotional responses, rendering motivated political reasoning distinct from other types of reasoning (Westen et al., 2006).

Similar results are obtained when Republican and Democratic candidates are asked to evaluate arguments for and against policies, namely affirmative action and gun control (Taber & Lodge, 2006). Such ingroup-biased thinking about sociopolitical matters can already be observed in early and late adolescence (Klaczynski, 2000). Based on empirical findings like the ones just described, ideologically motivated cognition has been proposed as a type of information processing that promotes citizens' need to form and maintain beliefs that signify their loyalty to important affinity groups (Flynn et al., 2017; Kahan, 2013). It is also often assumed that mental and emotional processes involving aspects of motivated reasoning (Kraft et al., 2015) are an important determinant of political news consumption in general and misinformation consumption and acceptance more specifically. However, the empirical evidence regarding the potential role of ideology-driven motivated reasoning in the consumption of political news (and, hence misinformation) appears to be mixed.

On the one hand, both Democrats and Republicans hold factual misperceptions which are partial to their party (Bode & Vraga, 2015; Duran et al., 2017; Kraft et al., 2015; Uscinski & Parent, 2014). Such asymmetrical misperceptions across the political spectrum can, at first sight, be considered to reflect biased political information and misinformation consumption. Indeed, lab-based findings suggest that people prefer to be exposed to congenial news outlets rather than noncongenial ones (Garrett, 2009; Iyengar & Hahn, 2009). People's ideology also largely determines their patterns of conspiracy beliefs, as they tend to find conspiracy theories that are compatible with their ideology and partisan identity more plausible than those that are not (Miller et al., 2016). And terms like "echo chamber"—describing the contemporary online information-consumption environment as leading to increasing exposure to exclusively congenial news and information (Sunstein, 2001)—and "filter-bubbles"—denoting algorithmically induced echo chambers, owing to the common practices of online media to recommend personalized news content (Pariser, 2011)—have become increasingly popular buzzwords in academic and nonacademic circles (Allcott & Gentzkow, 2017; Garrett & Weeks, 2013).

Empirical analyses of online content diffusion and circulation do provide some evidence for the existence of homogeneous echo chambers (Del Vicario et al., 2016; Schmidt et al., 2017; Zollo et al., 2017). This evidence would seem to support the idea that in the contemporary online environment people consume information in close-ended segregated environments offering them information and misinformation that will keep being consumed by mere compatibility with the recipient's ideology, skewing political misperceptions even more. In a news ecology where people continuously, unintentionally receive or intentionally seek consonant information that largely confirms their views of the political status quo, the feature of information veracity becomes a somewhat trivial aspect of information consumption (McEwan et al., 2018). This apparent negligence for truth, in turn, may have the potential to equalize facts with opinion statements (McEwan et al., 2018) and make people not only prone to seek or avoid information in line with what they believe, but also to judge the veracity of newly encountered information subjectively, in line with their previous beliefs (Sunstein et al., 2017).

Despite this evidence, the role of echo chambers has been questioned by some scholars (Bakshy et al., 2015; Garrett et al., 2016; Gentzkow & Shapiro, 2011). Similarly, the idea that people are incurable, motivated reasoners has been contested on empirical (Redlawsk et al., 2010) and theoretical grounds (Druckman, 2012). Indeed, there is also extensive evidence against this idea. Detailed surveys of people's willingness to read discordant news (Dubois & Blank, 2018; Garrett et al., 2016) suggests that they are in fact more inclined to read noncongenial news than what is traditionally considered. For example, people are not a priori more likely to abandon reading a news article that goes against their prior beliefs (Garrett, 2009). And some recent studies suggest that people's susceptibility to misinformation is more determined by their ability to think analytically rather than their ideological predispositions (Pennycook & Rand, 2019b). Likewise, interventions against misinformation seem to have a positive effect on people's ability to discern it regardless of whether it is compatible or not with their ideology (Clayton et al., 2020; Guess et al., 2020a). Pennycook and Rand (2019b) actually showed that people are better able to discern misinformation that confirms rather than disconfirms their ideological beliefs. Probably the best proxy to citizens' information consumption patterns online is their actual Internet browsing behavior, and when this is analyzed, people do seem to read articles and news sources that are noncongenial to their beliefs (Flaxman et al., 2016). Similar results are obtained from Twitter data suggesting that people come in contact with a variety of noncongenial information (Barberá et al., 2015). Finally, experiments have shown that there are tipping points to motivated reasoning: While people's opinions about their preferred candidate seem to polarize in view of negative information about that candidate, this phenomenon does not perpetuate ad infinitum (Redlawsk et al., 2010). After a certain threshold of negative information about a preferred candidate, people's opinions of them ultimately start to become more negative (Redlawsk et al., 2010).

In sum, as much as terms like "echo chambers" and "filter bubbles" have entered the public discourse, empirical evidence supporting these phenomena is mixed. Given the scarce empirical support for the consumption of political information and misinformation, citizens' political misperceptions which are widely documented may not necessarily be owing to citizens' choice and consumption of politically skewed news according to their political beliefs (cf. Kull et al., 2019). It can be that when citizens are surveyed about the increasingly complex political reality of their country and the world, they try to give their best estimate, which is naturally expected to be biased by their prior political views, beliefs, and attitudes. An alternative explanation is that survey respondents are not especially motivated to respond to questions of political knowledge accurately. When incentivized, people seem to provide more accurate answers to a survey questioning them about political facts, which are less aligned with their ideological predispositions (Prior et al., 2015), suggesting that in such surveys people may reply in a "wishful-thinking mode" rather than explicitly saying what they think is factually true. Thus, while there is certainly evidence that partisanship may play a role in the current phenomena of misinformation effects and political misperception, this idea begs for more robust empirical evidence.

Is it "the system's" fault? In the preceding sections, we examined how several features of human social cognition corroborate contemporary concerns for the reception side of misinformation, suggesting that political misinformation is indeed impactful and potentially dangerous for citizens and democratic societies. However, the proneness of human cognition to misinformation may be further exacerbated by the current news environment, as this has been shaped after the advent of the Internet. Over the last few decades, the Internet has not only led to a significant increase in the number of available news providers (Webster, 2011) but actually revolutionized information exchange among peers in various domains of public life (Lin et al., 2016). The facilitation of information exchange both in the domain of political news and in general appears to have come together with a compromise in the quality of the information citizens are exposed to. As a result, it becomes increasingly harder

to trust and verify the veracity of consumed information. Indeed, the collapse of traditional news structure with the advent of the Internet may further aggravate the operation and impact of cognitive biases and motivated processes of human social cognition (McEwan et al., 2018).

To be sure, people have always had to rely on information provided by others, and for the most part, this turns out well. After all, societies couldn't function without at least some degree of communal trust in what other fellow citizens say and do (Bronner, 2013). As humans, we are extremely dependent on our peers, and beginning with our early lives, we have to heavily rely on information acquired from others (Clément, 2010; Lackey, 2007). The language apparatus has itself enhanced our ability to communicate information (Jackendoff & Pinker, 2005; Pinker & Jackendoff, 2005), rendering information exchange among humans pervasive (Boesch & Tomasello, 1998; Clément, 2010). Our capacity to exchange massive amounts of information enables us to acquire information not only as individuals throughout our lifespan but also across generations and to develop well-adapted tools, beliefs, and practices that are too complex for any single individual (Boyd et al., 2011). As humans, we have, thus, always acquired a huge amount of information through testimony from others (Bergstrom et al., 2006; Burge, 1993; Coady, 1994; Goldman, 1999; Weiner, 2003).

However, the recent shifts brought about by the Internet have also been accompanied by significant changes in our information sociocognitive systems (see Bessi et al., 2014). First, social media and online news providers have largely replaced printed news outlets (Hong, 2012), leading to greater media fragmentation (Webster & Ksiazek, 2012) and a chaos in the news provision market (Waisbord, 2018). The Internet has removed barriers for any single person or company to enter the news industry (Allcott & Gentzkow, 2017). In addition, the current online information and news landscape has made it possible to monetize online content through advertisement, which in turn lowers the stakes for big news publishers related to the reputation of the accuracy of their content (Allcott & Gentzkow, 2017). But besides reduced stakes related to news providers' "quality assurances," the advertising model seems to even incentivize the circulation of misleading content for news providers, as misleading but sensational news seem to be an important driver of news traffic leading to greater user engagement (Silverman, 2015).

In the contemporary news industry, not only are citizens less and less able to be certain of the veracity of information, but also it is easier for false content to circulate in online platforms and social media (Wardle & Derakhshan, 2017). And given the evidence for the phenomena of the truth bias (Pantazi et al., 2018, 2020), presupposition accommodation (Kissine & Pantazi, 2020), and the illusory truth effect (Pennycook et al., 2018) described previously, an environment with higher rates of falsehood almost inevitably entails that citizens will end up believing more of it, therefore becoming increasingly misinformed.

Besides such drastic changes in the quality of information and the amount of misinformation available, however, the Internet and its related technological advances has brought about broader significant changes in the cognitive market (Bronner, 2016) and the sociocognitive conditions of information consumption (Bessi et al., 2014). The primary source of information for a literate citizen in a Western democracy at the beginning of the 20th century was through printed media (see Klein et al., 2015). The average citizen in today's information age (Castells, 1996) is constantly and, often, simultaneously bombarded with a disproportionate amount of information competing for her attention (Wu & Huberman, 2007), be it from social media and networking applications or e-mails, texts, and constant phone connectivity. Before the advent of the Internet and its widespread use, Herbert A. Simon had aptly captured the sociocognitive implications that it would bring via the concept of "attention economy":

In an information-rich world, the wealth of information means a dearth of something else: a scarcity of whatever it is that information consumes. What information consumes is rather

obvious: it consumes the attention of its recipients. Hence a wealth of information creates a poverty of attention and a need to allocate that attention efficiently among the overabundance of information sources that might consume it. (Simon, 1971, pp. 40–41)

Simon's suggestion has never been timelier, and yet today in the age of information overload (Himma, 2007) it seems to be the least achievable since the time it was written. In the domain of online news consumption more specifically, users feel "informationally overwhelmed" (Chen & Masullo Chen, 2020; Holton & Chyi, 2012; Ji et al., 2014; Pentina & Tarafdar, 2014; Schmitt et al., 2018), which in turn is linked to a number of negative psychological phenomena, like boredom (Klapp, 1986), low psychological well-being (Matthes et al., 2020; Swar et al., 2017), decrease in news enjoyment (York, 2013), and ultimately news fatigue, paralysis and, ultimately, avoidance (Song et al., 2017).

Research in cognitive psychology has established for many decades now that information overload leads to impaired cognitive performance in a variety of cognitive tasks (Franconeri et al., 2013), and in the past, it was argued that it reduced people's ability to scrutinize information and made them more gullible (Gilbert et al., 1990, 1993). More recent studies have showed that gullibility per se is unlikely to be affected by cognitive load (Fiedler, Armbruster, et al., 1996; Fiedler, Walther, et al., 1996; Pantazi et al., 2018), but the general notion that information or cognitive load impairs cognitive abilities remains uncontested. Given that cognitive ability is one of the most reliable predictors of people's ability to discount or reject misinformation (Pennycook & Rand, 2019b), we are faced with an irony whereby an ever-richer informational environment may actually make citizens more ill informed. This irony may be further exacerbated by the extremely fast news processing that seem to be quite common among online news consumers: A third of online news consumers appear to spend 15 s per article (Haile, 2014), which is unlikely to allow for a proper analysis and evaluation of the quality of consumed information (Garrett et al., 2016).

To sum up this section, the current marketplace of ideas as this is formed in the (mis)information age (see Mocanu et al., 2015), seems to contain not only information of decreasing quality but also of increasingly unmanageable amounts. As the previous sections devoted to the sociocognitive biases of human reasoning suggest, human cognitive abilities may not be especially adapted to the contemporary environment of political information (Mair et al., 2019). Specifically, bias, gullibility, and information overload make it difficult for people to cope with and filter out the misinformation they are exposed to. After all, it may be hard, if not impossible, for citizens to realize how being ill-informed may influence the functioning of their representative democratic country, itself inserted within a wider globalized world context (Kahan, 2013). This in turn may lower people's motivation to form accurate beliefs and political perceptions.

Resistance to Misinformation

The previous section has offered an overview of the psychological evidence suggesting that people are gullible. In this section, we will be adopting the opposite perspective and examine whether and to what extent people may be able to resist misinformation. Specifically, we will show that alongside the evidence suggesting that people may be "too gullible" to resist misinformation, there are instances where they appear to be overly skeptical, doubtful, and mistrustful. We will also discuss how the two perspectives may be reconciled in the next section.

So far, we have reviewed evidence suggesting (1) that human cognition is by default vulnerable to political misinformation and (2) that the contemporary informational environment facilitates the circulation and potential effects of political misinformation on citizens. But what about skepticism and the possibility of resisting this information? Does this mean that we are doomed to live with increasingly politically ill-informed citizens and, therefore, an incompetent electorate? After all, citizens in possession

of inaccurate information can end up with opinions, beliefs, and actions that depart significantly from the ones they would have in a world where they are correctly informed (Thorson, 2016).

Trust and Epistemic Vigilance

While the previous subsection depicted a “gullible” view of human cognition, other strands of research focus on whether citizens are able to showcase some degree of “epistemic vigilance” when faced with political (mis)information. Indeed, many psychologists, anthropologists, and evolutionary scientists argue that, because of the role of language as a massive information transmitter, humans must have developed a suite of cognitive mechanisms, or modules, aimed at the protection from misinformation and cheating (Bergstrom et al., 2006; Clément et al., 2004; Cosmides & Tooby, 1992; Schul et al., 2004; Sperber et al., 2010).

From an evolutionary perspective, the argument is that verbal communication can only have perpetuated if it is advantageous both for the speakers and for the addressees in the long run (i.e., regardless of whether both the speaker and the addressee benefit from a specific exchange they have; Sperber, 2001). According to such a view of verbal communication as a positive-sum gain, the speaker is always better off if the addressee believes her message, regardless of whether the message is true or false. This is because a speaker gives the kind of information that will have the intended results she wishes to have on an addressee. For the addressee, if the speaker is truthful, it is better to believe than to disbelieve her message; if the speaker is untruthful, it is better to disbelieve than to believe it. As Sperber (2001) points out, the dilemma is intractable and has to be addressed within the specific context of each exchange, that is, taking into account the identity of the speaker, her intentions, the stakes for the listener etc. Much of the evolutionary speculation on such grounds ends up ad hoc, assuming that if communication is there, humans must have developed cognitive mechanisms that keep them protected from speakers who are untruthful, intentionally or not (Clément, 2010; Cosmides & Tooby, 1992; Mascaro & Sperber, 2009; Sperber, 2001; Sperber et al., 2010). But does the empirical evidence align with this assumption of the existence of epistemic vigilance as a sufficient mechanism to protect humans and citizens in a democracy from misinformation?

The main source of evidence for the vigilant view consists in experimental studies showing adults displaying signs of vigilance when processing incoming information. Vigilance is expected to operate in order to protect addressees from unreliable speakers, either out of ignorance or, most consequentially, due to a conscious intention to mislead. In the second case are speakers whom addressees do not know well (thus whose intentions they ignore) or whom addressees know to be ill intentioned. Such speakers, in turn, are likely to elicit feelings of mistrust in addressees. Thus, mistrust is a good candidate trigger for vigilance.

A series of studies have shown that eliciting a mistrustful mindset in audiences makes them adopt information-processing strategies that are not used habitually. For example, in normal (trustful) conditions, people recognize a target word more quickly when primed with a target-congruent word. By contrast, when they are experimentally led to be in a suspicious mindset, target-word categorization is facilitated by incongruent prime words. Similarly, when the solution to a task requires a nonroutine strategy, distrusting participants outperform trusting ones, who, in turn, outperform the distrusting ones when the task solution requires use of a routine strategy (Schul et al., 2008). Kleiman et al. (2015) further show that distrust, operationalized either as a dispositional personality characteristic or as an experimentally elicited mindset, blocks accessibility effects. Distrust, then, seems to lead to a differential information processing compared to trust, arguably by activating concepts that are opposite to the incoming information. Although this preliminary evidence suggests that distrust could potentially change the way that incoming information is processed and thus moderate its endorsement, to our knowledge no study has directly assessed whether distrust could lead to higher misinformation resistance.

Another line of research that can provide insights into the potential of vigilance mechanisms comes from psycholinguistics. In the past few decades, psycholinguists have started viewing language comprehension as a complex process: When people process utterances and interpret their meaning, they rely not only on syntactic and semantic information, but also on pragmatic information related to the specific context of these utterances, as well as more general information, like world knowledge. As such, evaluation has been argued to be “a fundamental semantic notion and a genuine dimension of meaning” (Malrieu, 1999, p. 2). In other words, semantic as well as general knowledge will be used by an addressee in order to interpret and validate statements they receive and process.

A telling demonstration of this aspect of statement processing comes from Hagoort et al. (2004). They showed that semantic anomalies of the form “Dutch trains are sour,” and world-knowledge violations (“Dutch trains are white”; in reality, Dutch trains are yellow) elicit the same event-related brain potential, namely a negativity around 400 ms upon encountering the “violating” sentence-final word. Such effects have been found both for locally inconsistent statements, that is, statements that contradict participants’ knowledge about a fictional story they read in an experimental context (Van Berkum et al., 1998) and for “globally” inconsistent statements, such as “I have a big tattoo on my back” when uttered by a speaker with an upper-class British accent (Van Berkum et al., 2008).

Along similar lines, Isberner and Richter (2014) provide behavioral instead of neurophysiological evidence for validation as an automatic component of statement comprehension. They designed a Stroop task where participants read true and false statements for which they either had strong or a weak background knowledge. The statements were presented word by word and were followed by one of two probe words at their end: true or false. Crucially, participants were not required to respond to the statement’s truth value but rather to reply to the probes by pressing different buttons upon encountering each of them. Participants’ reactions were faster when the probe was congruent with a statement’s truth value, than when it was incongruent. This means that the statements’ truth values interfered with the probe words, even if participants were not required to assess the statements’ validity in the task. Thus, psycholinguistic research provides some evidence for the automatic validation of incoming statements against background general knowledge.

All the evidence reviewed in this subsection would suggest that citizens have in place some of the necessary cognitive mechanisms that would enable them to filter correct and incorrect information. But how can this evidence be compromised with all the findings described above concerning the persistent nature of political misinformation and misperceptions, as well as the limited efficacy of corrections? An important notion here is that the implicit measures of the studies just described are informative of how people process information in real time, but they are not directly informative as to the imprint this information has on people’s memory, beliefs, and attitudes. This leaves open the possibility that any epistemic-vigilance mechanisms may affect the way people process information in real time, but that this differential processing may not be sufficient to ultimately help people form more accurate representations of the political world.

As already described, being prone to believing content in the context of small collaborative groups, like the ones in which language likely emerged, was efficient and advantageous. However, because this proneness to believe (Kissine & Klein, 2013) or “truth-default” (Levine, 2014) mechanism of linguistic communication would leave people largely exposed to deceivers, epistemic vigilance has coevolved along the way (Kissine & Klein, 2013; Levine, 2014). In other words, epistemic-vigilance mechanisms appear to operate within an otherwise gullible cognitive system and are limited by boundary conditions (Kissine & Klein, 2013; Pantazi et al., 2018). But what are these boundary conditions and cues that would maximize the efficiency of epistemic-vigilance mechanisms against misinformation?

Source Credibility

In view of the above discussion on the likely evolutionary origins of gullibility and the role of epistemic vigilance as a shield against deceptive communicators, one of the most apparent factors that could determine whether people are able to resist (mis)information is the credibility of the source of the (mis)information. The role of source credibility has been traditionally studied within persuasion research, which has shown that, in some instances, high-credibility sources of persuasive messages lead to higher message impact compared to low-credibility sources (Guillory & Geraci, 2013; Pornpitakpan, 2004). Such results would suggest that people may rely on cues such as source credibility to decide whether to believe a piece of information or not. However, other studies have revealed that source credibility does not affect the way people process textual information (Sparks & Rapp, 2011) or whether people believe misinformation on social media (Dias et al., 2020; Vidgen et al., 2021). Likewise, meta-information about the source of misinformation does not seem to affect people's ability to discern or believe it (Bronstein et al., 2019; Dias et al., 2020; Pennycook & Rand, 2019c), contrary to what ought to be the case if (meta-)cognitive functions were integral in the processing and rejection of misinformation. These misinformation-specific findings are aligned with findings concerning the limited role of meta-information (like the source of information) in political persuasion more generally. For example, Nyhan (2011) presents several experiments revealing that statements made under oath in Congressional or court testimony do not have a significant effect on people's beliefs and attitudes, thus suggesting that source may play only a minimal role in political persuasion in general. In short, the evidence on whether people rely on source as a cue to believe or reject misinformation is equivocal.

Corrections and Debunking

In a properly functioning marketplace of ideas, the goal is to let ideas compete with each other and the best of them or the ones closest to truth are supposed to somehow “magically” prevail (Gurevitch & Blumler, 1990). So, in principle, if a piece of misinformation enters the marketplace of ideas, introducing a correction in this same marketplace of ideas debunking the misinformation should “undo” its impact. Unfortunately, research has not substantiated this optimistic view.

Early work in social psychology has shown that once people process a piece of information, a trace of it remains in their mind affecting their thought and judgment even after clear correcting information (Ross et al., 1975). This is partly because information in memory is stored in networks (Gerrie et al., 2006), and thus retracting the misinformation does not cancel the causal explanations or other information stored in memory that may be related to misinformation (Anderson et al., 1980; Blanc et al., 2008; Johnson & Seifert, 1994; Seifert, 2002). The phenomenon of resistance to misinformation correction, or the “continued influence effect” (Johnson & Seifert, 1994, p. 31), which was initially revealed as a feature of human memory and cognition, has since been replicated time and again not only for generic information (Wilkes & Leatherbarrow, 1988) but also in the domain of political misinformation (Lewandowsky et al., 2012). Research has shown that people are still misinformed about political issues, even after receiving corrective information related to these misperceptions (Thorson, 2016). Corrections against real-world political lies also fail to reduce voting intentions and support for lying politicians (Aird et al., 2018; Swire-Thompson et al., 2020).

Factors Determining Attendance to Meta-Information Cues

While the effects of corrections appear limited, there are a few factors that may increase people's attendance to such cues and, ultimately, their resistance to misinformation. Warning people that they may be encountering misinformation has been found to make them slightly more resistant to it (Clayton et al., 2020; Greene et al., 1982) and to enhance the efficacy of corrections, although it does not completely undo the effect of having encountered misinformation (Ecker et al., 2010; Schul, 1993). In addition, corrections of misinformation that are stronger (i.e., are repeated or are processed more deeply) can be more effective at reducing misperceptions (Ecker, Lewandowsky, Swire, et al., 2011; Ecker et al., 2020; Hamby et al., 2020). And because of the network structure of the information stored in memory, corrections appear to work better if they include a causal explanation of why the initial misinformation or misperception is inaccurate (Johnson & Seifert, 1994; Nyhan & Reifler, 2015). Finally, corrections of political misinformation work better if they come from a source that is socially close (i.e., a "follower" of the person posting a misinformation piece) as opposed to a stranger (Margolin et al., 2018).

Other factors predict a reduced effectiveness of corrections. First, in the same way that people are prone to believing misinformation if this suits their prior beliefs, they are also less likely to accept corrections if these contradict their prior beliefs (Nyhan & Reifler, 2010; Nyhan et al., 2013). Nyhan et al. (2013) tested the effects of corrections on U.S. citizens' (mis)perceptions that the Affordable Care Act would create death panels. They found that corrections work among those who were unfavorable to Sarah Palin—who was the one introducing the misinformation—but also for those who were supportive of her but possessed low political knowledge. Interestingly, the correction made those supporting Palin and scoring high in political knowledge believe the misperception even more strongly—an effect the authors called backfire. While ample research revealed similar results of a reduced effect of corrections contradicting people's prior beliefs (Ecker & Ang, 2019; Lewandowsky et al., 2005; Weeks, 2015), more recent attempts to replicate the backfire effect have failed (Aird et al., 2018; Clayton et al., 2020; Swire-Thompson et al., 2020; Wood & Porter, 2019). Although there seems to be a consensus that backfire effects have been exaggerated in the literature and the press, there does appear to be a bias for citizens to accept misinformation corrections if these fit their own ideology (Nyhan, 2021).

Besides establishing that corrections of misinformation may be contingent on their compatibility with the recipient's prior beliefs, Nyhan et al.'s (2013) study is of noteworthy for yet another reason: It suggests that higher knowledge, at least in the political domain, does not necessarily reveal higher sensitivity to misinformation corrections. Therefore, aside from contextual factors like the compatibility of meta-information cues and the recipients' own beliefs or the existence of "alternative information" to replace the removed misinformation, cognitive abilities appear as another candidate factor determining people's attendance to meta-information cues and their resistance to misinformation.

The Role of Cognitive Abilities

Since, as we saw in the previous section, gullibility seems to be entrenched in several aspects of human cognition, one would expect that people with higher cognitive abilities would be better at heeding misinformation corrections and rejecting misinformation and would be, ultimately, less misinformed. After all, whether one believes misinformation in the first place depends on assessments of meta-cognitive cues like the source of the information (Fiedler, 2012; Lewandowsky et al., 2012) or the consistency of misinformation with other established knowledge (Richter et al., 2009). Given that the continued effect of misinformation is largely a function of the architecture of human cognition and memory (Lewandowsky et al., 2012), people with sharper cognitive skills might more easily integrate the corrections in their mental representations or they might even intentionally forget (see Johnson, 1994) the misinformation.

Similar to the evidence on the efficacy of meta-informational cues like misinformation corrections, the evidence concerning the role of cognitive ability in the reception and rejection of misinformation is mixed. On the one hand, research studies like the one by Nyhan et al. (2013) showed that, if anything, cognitive skills, like better political knowledge, exacerbate the involvement of motivated reasoning in the processing of misinformation corrections that are inconsistent with one's ideology. Other studies tend to further suggest that higher cognitive abilities, like numeracy (Kahan et al., 2017), may actually exacerbate instead of mitigate the role of motivated reasoning in the acceptance of misinformation and related debunking information. For example, while people with higher numeracy skills are better at interpreting data on politically neutral topics (like new skin-rush research) they become significantly worse (i.e., more polarized) when faced with data on politically loaded issues (i.e., gun control).

On the other hand, analytical thinking appears to be linked to an improved detection of actual fact-checked misinformation (Pennycook, McPhetres, Bago, et al., 2020; Pennycook & Rand, 2019b, 2019c). Elicitations of analytical thinking also appear to lower belief in conspiracy theories (Swami et al., 2014) and so do appeals to rational arguments (Orosz et al., 2016). To the extent that conspiracy beliefs reflect endorsement of misinformation, these findings tend to corroborate the idea that higher analytical thinking may be linked to citizens' ability to resist misinformation.

Interestingly, the relationship between analytical thinking and misinformation discernment appears unrelated to whether the misinformation converges or diverges from people's political opinions (Pennycook & Rand, 2019b). This finding would suggest that not only may analytical thinking play an important factor in the phenomenon of political misinformation, it can possibly help overcome the influence of motivated reasoning and partisanship, evidence for which we reviewed above. Indeed, increased thinking before assessing the veracity of fake-news headlines improves the ability to distinguish them from true headlines in a causal manner (Bago et al., 2020).

This has the interesting repercussion that people's behavior differs depending on whether they are asked to rate the accuracy of fake-news headlines about COVID-19, as opposed to their intentions to share such headlines: People are more willing to share fake news which they explicitly recognize as false. If people, however, are nudged to think about the accuracy of the headlines they view, their willingness to share fake-news headlines is significantly reduced (Pennycook, McPhetres, Zhang, et al., 2020). According to Pennycook and colleagues, this finding suggests that part of the allure of misinformation is due to people failing to reflect critically enough on information before resharing it. Thus, the circulation and impact of misinformation may be reduced if people were made to think more, harder, and deeper about the political content they consume. Actually, similar nudges have also been found to also work on the supply end of misinformation. Specifically, politicians who were sent letters reminding them about the possibility of being fact-checked shared more accurate information in the immediate follow-up period (Nyhan & Reifler, 2013).

Gullibility and Vigilance: The Results of Two Different Types of Processing?

The evidence suggesting that higher cognitive abilities are linked to (Pennycook, McPhetres, Bago, et al., 2020; Pennycook & Rand, 2019b, 2019c) or lead to (Bago et al., 2020; Orosz et al., 2016; Swami et al., 2014) increased resistance to misinformation may lead to the presumption that gullibility and vigilance are merely the results of two different types of processing (see Evans, 2008; Kahneman, 2011): If people are engaged in system-1 processing, which is intuitive and automatic, they will tend to be gullible, whereas if they engage in system-2 processing, which is deliberative and effortful, they would prove to be vigilant. Nevertheless, if one looks at the entire picture, it becomes

clear that the two processing types are not directly mapped on individuals' proneness or resistance to misinformation.

First, as we saw in the previous subsection, system-2 processing may not only reduce but also enhance people's proneness to misinformation, supposedly because it may make them engage more in motivation-driven—as opposed to accuracy-driven—processes, such as motivated reasoning and confirmation bias (Bago et al., 2020; Kahan et al., 2017). Thus, so-called system-2 processing may actually lead to gullible behavior.

Second, mistrust and skepticism, traditional indicators of “vigilance,” may paradoxically render citizens more gullible (cf. van Prooijen, 2019) if it is misdirected towards trustworthy and reliable sources of information. Research from political psychology provides substantial evidence that people are more than capable of exhibiting high levels of vigilance and mistrust when it comes to politics. In fact, mistrust in politicians, national parliament, and other conventional institutions (e.g., the European Union) has been for a long time identified as a pressing contemporary political issue (Dalton, 2004; Dogan, 2005). While the narrative that political and institutional trust in Western democratic countries are following a downward trend is contested based on longitudinal data that tease apart long-term trends from short- or medium-term fluctuations (Norris, 2011; van de Walle et al., 2008), it remains uncontested that a considerable portion of the populations in Western democracies experiences mistrust towards institutions. For example, over the past two decades, the Eurobarometer almost invariably shows that more Europeans mistrust their national governments and parliaments than trust them (Eurobarometer, <https://ec.europa.eu/commfrontoffice/publicopinion/index.cfm/Chart/getChart/chartType/lineChart/themeKy/18/groupKy/89/savFile/187>). While trust in government in the United States appears to be more variable with annual levels of trust ranging between 20% and 80% in the period from 1958 to 2004, most of these years mistrust outweighed trust (National Election Study cited in van de Walle et al., 2008).

Given these high levels of political and institutional mistrust, if vigilance was exclusively associated to a skeptical and analytical system-2 processing, misperceptions should be rather limited in today's societies. But citizens are misinformed and prone to misperceptions in today's societies (Flynn et al., 2017). Crucially, political and institutional mistrust and cynicism (Abalakina-Paap et al., 1999; Pantazi et al., 2020; Swami, 2012) positively predict ones' tendency to believe in conspiracy theories. Thus, in a certain way mistrust or suspicion reflect an increased proneness to misinformation, to the extent that conspiracy theories are frequently (though not always) false and inconsistent with scientific evidence (van Prooijen, 2019). In fact, some of us have explained how belief in conspiracy theories is jointly explained by both system-1 and system-2 processes (van Prooijen et al., 2020). In short, the distinction between vigilance and gullibility is not as clear, as is the distinction between system-1 and system-2 processes, and there does seem to be a direct mapping among the two sets of distinctions.

Evidence From Web-Traffic Data

So far, we have looked at whether, from a psychological perspective, citizens are gullible or rather vigilant towards misinformation. An alternative source of empirical evidence that can potentially inform us about the size of the misinformation problem are studies on online news traffic. These studies can give us an idea of (1) how widespread misinformation is and (2) how much attention it attracts.

Unfortunately, studies of online (mis)information engagement are just as equivocal as research from psychology and political science. On the one hand, some studies suggest that misinformation is pervasive (Bessi et al., 2015), attracts at least as much engagement (Mocanu et al., 2015), diffuses further and faster than truthful information (Vosoughi et al., 2018), and elicits similar interaction patterns as truthful information (Bessi et al., 2014; Mocanu et al., 2015). Computational social-science evidence on the effects of corrections largely mirrors experimental studies addressing the

same question. For example, unsubstantiated rumors continue to spread in social networks even after they are repeatedly corrected online (Friggeri et al., 2014). Moreover, fact-checking information that debunks a rumor does not appear to reduce the circulation of the rumor on social media (Garimella & Eckles, 2020; Shin et al., 2017). And some people appear to be motivated to seek out misinformation and avoid potential corrections to it (Bessi et al., 2015; Mocanu et al., 2015) in a way that parallels experimental findings on the role of motivated reasoning in the reception of misinformation and corrections.

Other research, however, draws different conclusions, namely that misinformation is viewed by only a small portion of segregated online users (Guess et al., 2018), and only a small portion of respondents appear to remember viewing misinformation, at significantly lower levels than truthful information (Allcott & Gentzkow, 2017; Grinberg et al., 2019). In addition, Friggeri et al. (2014) find that corrections appearing online related to a specific unsubstantiated rumor can lead to a significant reduction in circulation. Juul and Ugander (2021) find that spreading behavior is similar for false and true news once the size of an information cascade is controlled for; the authors do find, however, that false-news cascades are often larger. Thus, the evidence coming from the study of Internet data concerning the potential impact and magnitude of the misinformation problem for citizens is not more conclusive than the experimental evidence reviewed in the preceding sections. It should be noted that a major challenge for observational studies of large-scale online data is the lack of ground-truth datasets of what is actually misinformation and the large expense of creating such datasets (Garimella & Eckles, 2020).

Is the Evidence With Regards to the Impact of Misinformation on Societies Conclusive?

In the preceding sections, we reviewed empirical findings suggesting both that people can be gullible and that they can be skeptical. Given these conflicting findings, how easy is it for social scientists to determine the type and size of the effects that misinformation may have on citizens, and ultimately on the proper function of democratic countries? We argue that, first, there are several limitations in the existing evidence to allow us to distinguish between two competing accounts of the misinformation phenomenon. The first account is the most commonly adopted, explicitly or implicitly, in research on the topic. It suggests that recent advances in information technology and the growing circulation of misinformation make citizens increasingly misinformed. The second competing, albeit not mutually exclusive, account is that the widely circulating misinformation is only the symptom of problems with ill-functioning democracies. In other words, according to this second account, misinformation is only the symptom of an already ill-informed society instead of the main cause of the electorate's misperceptions.

Unfortunately, the state-of-the-art research does not necessarily allow us to determine which of the two accounts is closer to reality or whether some combination of the two is likely. The reasons for this are many-fold. First, given the fears of the potential impact of misinformation on society, most of the empirical research on misinformation has, understandably, focused on factors that may mitigate people's misperceptions instead of actually documenting whether misinformation has any considerable impact on citizens.

Second, as evidenced in the preceding subsection, citizens on the one hand fail to showcase sufficient epistemic vigilance—in the normative sense—to be shielded against the misinformation that inevitably enters the marketplace of ideas. On the other hand, they often appear to misplace their “epistemic vigilance” on information that is, in fact, accurate, but may simply contradict their already erroneous beliefs or their strongly held ideology.

Third, while some studies show that being exposed to political misinformation indeed distorts people's political beliefs or perceptions, these experiments have only limited external validity: An overwhelming majority of this type of research has focused on U.S. samples, and the effect of the

material presented to participants in the context of an experimental study on their real-life political beliefs and decisions remains unknown. In addition, generalizing from experimental findings at the individual level to our entire societies is less than straightforward.

For example, while in experimental settings individual participants appear to be quite susceptible to believing and being affected by information they encounter, several rigorous studies as well as a systematic meta-analysis of 40 field studies testing the effects of political campaigns and advertisement on voting behavior suggests that the effect is near to zero (Kalla & Broockman, 2018). Similar results were obtained from a more recent study on political advertisement which, in almost 60 independent real-time experiments found a small effect of political advertisement on voters' opinions and voting intentions in the months leading to the 2016 U.S. general elections (Coppock et al., 2020). If the effect of political campaigns and advertisements, two of the most prominent strategies to affect citizens' political behavior, is very small, then it may be likely that the effect of misinformation (which, as explained in the introductions often consists of unintentionally spreading misinformation instead of purposefully organized misinformation campaigns) is also not very big.

Most Promising Avenues for Future Research

From the preceding critical review, the landscape of research on the effects of political misinformation appears blurry. In this section, we make some critical comments and offer some suggestions into how social scientists can better determine the effects of political misinformation on citizens and, ultimately, our societies as a whole.

Importance of Acknowledging Both Ends of the Gullibility–Vigilance Continuum

As we suggested before, citizens sometimes appear to be gullible towards information that is factually inaccurate (e.g., conspiracy beliefs) and overly skeptical and doubtful of information that is in fact accurate (e.g., evidence-based health recommendations). We suggest that it is particularly important for researchers to take both of these phenomena into account when addressing misinformation effects. While research explicitly focusing on either of the two ends is naturally still needed in order to replicate and clarify previous findings, future studies should ideally seek to simultaneously take both gullibility and vigilance into account in order to identify the boundary conditions of each. Studies in social and cognitive psychology testing the boundary conditions of gullibility and vigilance in controlled settings will be necessary. So will empirical research in political science and psychology addressing the joint operation and trade-offs of gullibility and vigilance towards misinformation in more realistic, real-world settings. Future studies should also consider whether there might be certain user-interface design choices that result in greater gullibility or vigilance. Research along these lines can improve scholars' understanding of how people receive misinformation and corrections and will also allow them to formulate more specific hypotheses about how people will react to misinformation of different types and in different contexts.

In addition, the consideration that people can be both too gullible and too vigilant will allow scholars to design studies and propose better-informed solutions to the challenge posed by misinformation. For example, while it may appear reasonable for someone who thinks that the electorate is overly gullible that a proper solution to the problem of fake news and misinformation would be to increase people's skepticism and critical thinking, such an intervention may actually backfire if, for example, it makes people more skeptical towards legitimate information by reducing general sociopolitical trust. Thus, proposed interventions targeted to one end of the gullibility–vigilance spectrum should at least avoid having unintended effects on the other end. Ideally, interventions would

simultaneously reduce excessive gullibility and orient vigilance towards the right types of political actors, sources, and information.

Third, the recognition that every citizen bears in themselves a degree of gullibility and a degree of vigilance may help depolarize the political discourse around political fake news and misinformation (see Schulz et al., 2020). This discourse often involves Manichaeian views of “foolish compliants” versus “clever skeptics” (e.g., among conspiracy theorists who may view themselves as the illuminated savants of their communities) or of “deviant paranoids” versus “rational trusters” (e.g., on the side of more mainstream citizens who identify with official, nonconspiratorial explanations of events). The view that citizens may on different occasions be both too gullible and too vigilant may therefore help make the discourse around political misinformation less politicized: Citizens are not simply passive, gullible consumers who either fall for “fake news” or eschew paranoid cognition (depending on which side of the debate one is).

How to Document the Actual Impact of Misinformation and Determine the Actual Size of the Problem

As it has become apparent in this article, scholars are not yet in a position to clearly understand the size and nature of the misinformation phenomenon. Although misinformation research has seen a sharp spur due to recent political events and has seen an even steeper rise in 2020 owing to the high stakes of COVID-19-related misinformation, it will still take a good deal of research to actually understand whether or not it has the potential to significantly affect political processes and outcomes. Ideally, future research in this domain will be highly interdisciplinary (Lazer et al., 2018) and will require increased cooperation between fact-checking organizations, academics, and community organizations (Meedan, 2021).

One fruitful avenue is to combine experimental and cross-sectional studies commonly used by psychologists, with the opportunities offered by increasingly available web-traffic data. While, up to now, these have been largely used separately by psychologists/political scientists on the one hand and computer scientists on the other, systematically pairing data documenting people’s political beliefs and behavior with information about their online news consumption habits can offer valuable insights into the real-world effects of political misinformation. A few studies have already made progress in this direction (Guess et al., 2019; Guess et al., 2020b; Guess et al., 2020c), generally suggesting that the effects of online misinformation consumption may not be as strong as generally assumed. Nevertheless, there should be more and more systematic efforts in this direction, in order, for example, to unravel potentially systematic or long-term effects and relationships (see, e.g., Yan et al., 2021).

In addition, studies assessing the online circulation metrics of misinformation, as a proxy for the magnitude of the phenomenon of political misinformation, are not fully reliable (Wardle & Derakhshan, 2017). Given the unmanageable amount of available circulation data, these studies necessarily rely on small selected samples of all the available circulation data. Decisions on the size and source of the sampling procedure for these studies should be conducted based on careful considerations about the hypotheses that are sought to be tested and the level of generalizability of the conclusions that is asked. What is more, as our understanding of online behavior is advancing parallel to its expansion to increasing shares of the population, scholars need to find ways of adding nuance to studies based on data mined from social media and web traffic. Studies following this path should take into account the context and type of behavior in order to potentially distinguish between the sharing of a misinformation piece reflecting actual belief in it, sharing misinformation for identity or entertainment reasons (Majmundar et al., 2018), and sharing in order to make fun or ridicule the misinformation, its source, and its audience (Wardle & Derakhshan, 2017).

Finally, data availability is another major challenge and a strong case can be made for scholars and regulators to demand that social media platforms make their data more available

to researchers interested in studying misinformation effects. The content that is fact-checked is an unknown, biased subset of all misinformation available online; yet, building larger data-sets is a complex, time-consuming, and expensive process. Furthermore, content takedowns may help reduce the spread of misinformation, but they also prevent rigorous study unless platforms make such data available to researchers. In a recent commentary of the *Harvard Kennedy School Misinformation Review*, misinformation experts offer short commentaries on the type of research that they could and would do in a world where social media platforms more readily shared their data with scholars (Pasquetto et al., 2020). Indicatively, such an action on behalf of social media platforms would allow scholars to test the effectiveness of anti-misinformation interventions in real-world settings, a better gauge of the characteristics that are linked to vulnerability to misinformation and the effects of misinformation on social capital and participation. In sum, there are very good reasons for advocating a higher data accessibility by online platforms for research on the impact of political misinformation.

Definitions and Nuances

Scholars who wish to advance our understanding of the effects of political misinformation on citizens need to overcome two more hurdles. On the one hand, largely owing to the many research traditions that have been concerned with the issue of misinformation throughout the years, there is a multitude of terminology and operationalizations of similar constructs. In the misinformation literature, one can find different terms that refer to very similar constructs. For example, both the “continued influence effect” (see Ecker, Lewandowsky, Swire, et al., 2011) and “belief echoes” (see Thorson, 2016) refer to the fact that misinformation appears to affect people’s beliefs even after they have processed corrective information. These terminologies should be unified to facilitate cross-disciplinary communication and avoid duplication of efforts. On the other hand, there is a lack of clarity in terms of definitions and operationalizations. A study purporting to consider misinformation effects can investigate anything from the continued effect of misinformation presented within an experimental setting to the effects of corrections on misperceptions that participants may hold prior to the experiment. A clarification not only of concepts related to political misinformation research but also a common framework for their methodological operationalization to be used by misinformation scholars would benefit the field. For example, open discussions about the most meaningful way of documenting misinformation effects on citizens and societies could clarify whether scholars should look for the effects of misinformation on political attitudes or on political beliefs and ideology. The former are easily measured but possibly transient and therefore prone to potentially larger effects, while the latter are quite likely much less malleable, thus leading to expectations for smaller effects, but would be much more relevant and indicative of potentially considerable effects of political misinformation on citizens and societies. The ultimate goal would, of course, be to design and implement studies that manage to link exposure to misinformation with much more understudied but significant behaviors, like voting, and compliance with public health measures.

Ultimately, as argued throughout this article, the reason political misinformation has attracted so much interest is because of its supposed effects not only on individual citizens but on society as whole. Current studies either capture the former or the latter: Experimental studies test how individuals react to various pieces of misinformation and corrections; studies of misinformation-circulation metrics on the other hand look at a coarser level whether misinformation is prevalent in contemporary societies (as proxied through their online expression). Dedicated studies should seek to bridge these two levels and look at the effects of political misinformation on individuals as well as the repercussions of these individual-level effects for societies and democracy as a whole. In an exemplary effort, Guess et al. (2019) pair individuals’ responses to survey with their web-traffic data to understand the individual-level variables of fake-news sharing during the 2016 U.S. election. In this

respect, social scientists could borrow methods from computational social science looking at how individual-level behaviors lead to dynamic collective phenomena.

Most Promising Solutions for Rendering Individuals and Societies Better Informed

Given that gullibility and vigilance are not mutually exclusive and that they are both responsible for the contemporary problem of misinformation, an important question is how to make people less gullible towards misinformation and more appropriately vigilant towards false and nefarious, instead of truthful and beneficial, information. A number of practical steps in this direction are possible while best-practice research along the lines just described is designed and looking for the means to be implemented.

Fact-checking, despite its caveats and limitations, is useful. Fact-checking can reduce gullibility towards misinformation (Porter & Wood, 2021), and meta-analyses reveal that corrections are partly, albeit significantly, effective in reducing people's misperceptions (Chan et al., 2017; Walter & Tukachinsky, 2020), despite the fact that corrections on political misinformation appear to have a weaker effect than correction on, for example, health issues (Walter & Murphy, 2018); they are clearly better than nothing. Given that the closer in time the misinformation and its correction are processed, the better the correction works (Walter & Tukachinsky, 2020), advances in "claim matching" to automatically match repeated instances of misinformation with already published fact-checks (Kazemi, Garimella, Gaffney, et al., 2021; Shaar et al., 2020) are noteworthy, especially in the context of misinformation tip lines (Kazemi, Garimella, Shahi, et al., 2021). Warning tags against misinformation also appear to be a better-than-nothing solution (Walter et al., 2020). In addition, given the network structure of our mental representations, corrections work better if they provide material to reconstruct the causal scheme that is left open by the retracted misinformation (Walter & Murphy, 2018).

Recently, an alternative method to tackle the effects of misinformation whose efficiency has recently been proven is to inoculate people against the potential future misinformation through prebunking (van der Linden et al., 2017), although Cook et al. (2017) report only partially efficient prebunking interventions. The idea of prebunking is to expose people to a short or weak version of misinformation so that they become more resistant towards future misinformation. An exciting format of a prebunking intervention has actually been developed by Roozenbeek and van der Linden (2018) in the form of a fake-news game. It appears that people who play a game teaching them the most prominent techniques used by online misinformation spreaders makes them able to detect misinformation they encounter later on. The effectiveness of the game has been tested in several studies (e.g., Roozenbeek & van der Linden, 2019; Basol et al., 2020), and it appears to last over the long run (Maertens et al., 2021). Similar to prebunking, it may be possible to inoculate people against whole classes of misinformation (Scales et al., 2021) rather than focusing on one claim at a time. These are particularly promising techniques, although, like the others, they are unlikely to completely "unring the bell" of misinformation that citizens consume.

Interventions like debunking and prebunking can, of course, go hand in hand with interventions targeting citizens' literacy. Individuals' media or digital literacy is often proposed as a factor determining their vulnerability to misinformation (Brashier & Schacter, 2020; Graham, 2021). Indeed, interventions targeting people's digital media literacy have appeared to improve their ability to discern between true news and misinformation (Guess et al., 2020a). Still, more research appears to be needed in order to clarify the potential of literacy to shield citizens against misinformation. For example, another study failed to find a link between people's digital and media literacy and their ability to detect misinformation, which instead appeared to be linked to information literacy, a general ability to rely on proper information to act upon the world (Jones-Jang et al., 2021).

Fact-checking, corrections, prebunking, and debunking, as well as inoculation, all aim at reducing people's "vulnerability to misinformation" by reducing their gullibility or increasing their vigilance towards misinformation. A complementary strategy would be to reduce people's vigilance and skepticism towards accurate information. To the extent that citizens' mistrust is directed towards trustworthy sources of epistemically truthful information (such as democratically elected governments, scientists, and decent journalists), they will necessarily be more misinformed. Thus, an important step in tackling the problem of misinformation, and many other social problems, is to try to increase people's institutional trust. Recent research suggests that small changes in political procedures that reduce people's mistrust and cynicism may be able to reduce their belief in conspiracy theories (Pantazi et al., 2021).

Naturally, another complementary strategy would be to tackle the problem of political misinformation at its roots, or the supply end, namely by attempting to control its circulation. For example, online platforms, and especially social media, could seek to monitor the truthfulness of the content that is circulated through them. In fact, public appeals to the ban of misinformation circulation became especially vocal in the wake and aftermath of the recent 2020 U.S. elections for fear of its misleading voting decisions and instigating unwanted behaviors. These fears appeared to be, indeed, confirmed in January 2021 when rioters in Washington D.C. seized the U.S. Capitol. While it has not been empirically confirmed that the rioters resorted to this action due to following the orders of the outgoing U.S. President Donald Trump, it was clear that the former president supported these actions with his online activity, which ultimately led Twitter to ban his account. This was a case where banning misinformation supply seemed to engender greater benefits than the cost of restrictions to the freedom of speech, but this is a delicate balance.

Of course, the debate becomes much harder as far as a more generalized control of online content is concerned. The main counterargument for social media platforms to control the supply of political misinformation is that this will come at the cost of a reduced freedom of speech. Indeed, granted that what is or what is not true is particularly hard to determine, especially in the political domain where values and emotions are often more crucial than facts themselves, starting to control content on the pretense of low or dubious quality can be seen as a way of no return to an autocratic online system. There is also an open question of accountability. Libel and misinformation laws have been used to stifle press freedom and restrict free speech (Lee & Lee, 2019; Puente, 2020), and the role of governments in fact-checking is an evolving area (see Kajimoto, 2021, for an overview).

Still, we believe that there is some space for the regulation and accountability of online platforms and content authors. Lewandowsky et al. (2017) make a classification of misinformation types and accordingly propose tentative remedies. For example, to counter misinformation classified as "systemic lies" that purposefully support a specific agenda, they propose increased elite accountability, automated content detection, and increased literacy. For misinformation classified as "bullshit" that blatantly disrespects reason, they propose automated content detection, efforts to dilute echo chambers, and installing gatekeepers in the news environment. Despite the inherent difficulties that information classification entails, we agree with the authors that small steps into at least discussing such possibilities are both warranted and needed.

The advent of every new medium has been followed by a dedicated regulatory body charged with safeguarding a certain quality standard without necessarily leading to autocratic dystopias. After all, content was much more regulated on TV (see the ban of cursing, the drug/addiction ads regulations), and, if anything, the Internet reverberates the voices of individual citizens in ways that no other medium had ever done in the past. As an example, social media algorithms are geared towards grabbing our attention so the content that they promote is neither neutral nor necessarily geared towards truth. Regulation might require greater transparency in the algorithms social media companies use, allow for on-device APIs for mobile apps, and/or allow users to use alternative algorithms of their choice that could be more aligned with the virtues of truth, objectivity, and, ultimately, democracy.

Conclusion

In this article, we examined whether the state-of-the-art research from cognitive, social, and political psychology, as well as from political science and computer science, suggest that political misinformation can have a significant impact on citizens and our societies. As the evidence suggests, political misinformation appears to affect the way people think, although more research is necessary to indeed verify the causal relationships between political misperceptions and misinformation circulated online. In addition, attempts to correct political misperceptions owing to misinformation are not always effective, and, if they are, they cannot completely “undo” the impact that misinformation had in the first place. We argue that these effects reveal a tension in human cognition between two mechanisms, namely a default gullibility and an epistemic vigilance that is activated occasionally. We further propose that the two mechanisms appear to “misfire” in the domain of political information, resulting in people appearing overly gullible towards inaccurate information and overly vigilant towards truthful information. We concluded this article by arguing that this tension between gullibility on the one hand and epistemic vigilance on the other ought to be taken into account in research on political misinformation. Lastly, we identified some caveats for future research and list promising approaches to curbing political misinformation.

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