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Towards a General Model of (Mis-)Information Belief and Sharing

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Master's in Social and Organizational Psychology

Supervisor:
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Dedicated to Beatriz Lebre,
I will forever remember your big curious eyes
And the rays of light and kindness that you used to exhale.

"Nothing in life is to be feared,
it is only to be understood.
Now is the time to understand more,
so that we may fear less."
Marie Curie

"It is always advisable to perceive clearly our ignorance."

Charles Darwin[1]

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[1] *In* "The Expression of the Emotions in Man and Animals" (synopsis published in 1872).

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Abstract

The present research proposes and tests a causal model of how people believe and share misinformative news, as opposed to informative news. In a within-subjects experiment, we presented ten news publications with political content, extracted from Facebook, to 259 Portuguese participants. We tested the impact of individuals' prior political beliefs in judging the veracity and probability of sharing informative and misinformative news publications, via perceived emotion (surprise and interest) and credibility (trustworthiness, rigorosity, impartiality). The results showed that participants' ability to distinguish truth from lies was quite limited. Misinformative and informative news were processed in a similar way. Emotional and credibility cues did not only depend on objective news content, but also on prior beliefs. Negative beliefs about the political system increased emotionality in the processing of true and false news. Moreover, greater emotionality increased perceptions of credibility, which in turn increased perceived veracity and probability of sharing news (true or false). The most distinct difference between the two types of news was that participants with more negative beliefs about the political system were more willing to share objectively misinformative news, and more surprised by news (informative or misinformative) they considered to be false, with surprise increasing the probability of sharing such news despite their perceived falsehood. We conclude that people seem to rely on emotional cues, appraised with regard to prior beliefs, and on emotionally biased credibility indicators to guess whether news are true or – independent on veracity - worth sharing.

Keywords: misinformation, fake news, surprise, interest, emotion, political priors, political beliefs, attributed credibility.

Resumo

No presente estudo propomos e testamos um modelo causal de como as pessoas acreditam e partilham notícias desinformativas e informativas. Numa experiência intra-sujeitos, apresentámos dez publicações do Facebook, de notícias com conteúdo político, a 259 participantes portugueses. Testámos o impacto das crenças políticas prévias dos indivíduos no julgamento de veracidade e probabilidade de partilhar publicações de notícias desinformativas e informativas, através da emoção percebida (surpresa e interesse) e da credibilidade (confiabilidade, rigor, imparcialidade). Os resultados demostraram que a capacidade dos participantes de distinguir a verdade da mentira é bastante limitada. Notícias desinformativas e informativas foram processadas de forma semelhante. As pistas emocionais e de credibilidade não dependem apenas do conteúdo objetivo das notícias, mas também de crenças anteriores. As crenças negativas sobre o sistema político aumentaram a emocionalidade no processamento de notícias verdadeiras e falsas. Enquanto uma maior emocionalidade aumentou as perceções de credibilidade, levando ao aumento da veracidade percebida e da probabilidade de partilhar notícias (verdadeiras ou falsas). A diferença mais distinta entre os dois tipos de notícias era que participantes com crenças mais negativas sobre o sistema político estavam mais dispostos a partilhar notícias objetivamente desinformativas e mais surpresos com as notícias (informativas ou desinformativas) que consideravam falsas; com o aumento da surpresa a aumentar a probabilidade de partilha, apesar da sua falsidade percebida. Concluímos que as pessoas confiam em pistas emocionais, avaliadas em relação a crenças anteriores, e em indicadores de credibilidade com enviesamentos emocionais, para adivinhar se as notícias são verdadeiras ou – independentemente da veracidade – partilháveis.

Palavras-chave: desinformação, notícias falsas, surpresa, interesse, emoção, antecedentes políticos, convicções políticas, credibilidade atribuída.

Introduction

The global problems that derive from the freedom to create content online and the facility to spread it, combined with the risks that raising the level of scrutiny on the social media represent to the freedom of speech, culminated in an epidemic of disinformation, or as it has been called: an *infodemic*, as it was declared by the WHO (World Health Organization) in 2020[2] (Zarocostas, 2020). In the recent years, the world witnessed a growing amount of concern about the dangers that fake news represents for the public health and the social fabric of nations, because they corrupt our ability to respond to real problems. The first bells rang in June 2016, when the Brexit-vote took the pro-European conservative elites in Great Britain, which had intended to use the Brexit-referendum as a means to contain the influence of Pro-Brexit populists in the conservative party, by surprise. Shortly after, in November 2016, the presidential elections in the United States of America left no doubts that Brexit was not a singular incident but another brick in the walls of the post-truth world. In both cases, social media and disinformation intentionally spread were largely considered responsible for the election results and the consequences that followed (Bovet & Makse, 2019). The concerns about fake news have been reinforced in 2020 with the outbreak of a global pandemic and with the United States of America presidential elections. Regarding the prevalence of fake news, some studies suggest that sharing fake news on social media is a rare activity (Guess et al., 2019). Specifically on Facebook one study concluded that only a minority of Facebook users engaged in fake news sharing (Allen et al., 2020). However, the full range of misinformation types is not captured in these studies (Pennycook & Rand, 2021), which usually only focuses on fabricated news content, planted intentionally to advance or undermine a certain political propaganda. Moreover, despite the fact that people reveal to be more willing to share true than false news (Pennycook et al., 2018), it has been demonstrated that fake news in Twitter travel faster, deeper and wider than true news (particularly so if the news are political) – and this is not because of bots, but because of humans (Vosoughi et al., 2018). Also, fake news in the months after the 2016 USA elections had been found to generate more interactions with social media users than accurate news (Lazer et al., 2018).

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[2] WHO defined an infodemic as the excess of information, including disguised forms of misinformation, circulating in digital or other channels during a disease outbreak
https://www.who.int/health-topics/infodemic#tab=tab_1

With trust in traditional mass media suffering an erosion (Lazer et al., 2018), social media has set the stage for the growth of marginal and self-proclaimed anti-system populist political movements (Waisbord, 2018) and anti-science movements (Hotez, 2020). These movements are often fuelled by content circulating online that is, in itself, false, fabricated, misleading, provided in a false context, or implying a false connection, in sum, content with some degree of falsehood and more broadly known as *fake news* (Wardle & Derakhshan, 2018). It can serve different purposes, such as satire, maximizing revenues, political propaganda, promoting conspiracy theories, or cause damage to the reputation of an entity — being it an individual, a group, or an organization. While we use the term *fake news* in this paper, we need to acknowledge its current politicization, due to appropriation by different political groups that use it to coin and discredit the adversary views or ideologies (Brummette et al., 2018). In this paper, the term fake news is used based on the Cambridge dictionary definition (*Fake News*, n.d.): false stories that appear to be news, spread on social media, created to influence political views.

With this study, we address the question of how people interact differently with false and accurate news, in terms of how they decide to share them and believing in them. Because fake news travel even faster when the content is political (Vosoughi et al., 2018), we will focus on political news. There are several processes involved in the way people process and interact with news content online. Despite an increasing body of research on these processes, one unsolved issue is whether the intricacies of such processes and the relations between them vary when the news is false from when the news is true. Here, we propose a cognitive model for responses to political news content (accurate and false), as a means to provide a wider picture of why people believe in accurate and false news content, and how believing in accurate and false news content is related, or not, to the willingness to share it. In that sense, our primary outcome variable is sharing, but we also consider deception, both as an outcome variable and as a predictor of sharing.

Literature overview

Psychological research on fake news has attempted to determine the psychological factors and processes involved in the belief and further spreading of fake news from various theoretical grounds. Indeed, the call for action has been catalysing a vast production of studies on the psychology of fake news. On July 2nd, 2021, Web of Science returns 2821 results of papers published on the topic. In the field of Psychology and social sciences, most of this research has focused on either the role of the stimuli/news characteristics, or the role of the individual's characteristics, to study the psychological factors of the spread of fake news, reflected in the degree to which people are deceived by and share fake news.

Belief versus Share. Pennycook et al. (2021) found a dissociation between headlines veracity and sharing intentions, with the effect of veracity being significantly more prominent in belief than in sharing. However, it seems intuitive that people would share news because they believe in them, that is, because they mistake them to be true. Yet, evidence tells a different story; research has been finding that the belief that a certain news content is true does not entirely explain why people are willing to share it (Pennycook & Rand, 2021, Pennycook et al., 2021, Pennycook et al., 2020). More specifically, one study found that only 33% of sharing intentions were related to news that were also believed in (Pennycook et al., 2021), so, what about the other 67%?

One reason for this partial disconnection may be that individuals are not paying attention. Consistent with this reasoning, shifting participants' attention to an accuracy reminder at the start has been found to raise the participant's accuracy rate (Pennycook et al., 2020, Pennycook et al., 2021), and adding a warning to the news, advising that the content had been disputed by 3rd party fact-checkers, reduced participants' intent to share the fake news (Pennycook et al., 2018). Another recent study found that while exposition to fact-checking videos improves truth discernment, it does not reduce fake news sharing (Bor et al., 2020), providing further evidence on the disconnection between veracity and sharing. Moreover, truth discernment and fake news sharing seem to have different correlates (Bor et al., 2020). The authors found that individuals that have a better ability to tell true from false (truth discernment) have a higher digital literacy, score higher on cognitive reflection, and their political identity is closer to the Democrats; while individuals that share more fake news tend to be older and to have

their political identity closer to the Republicans (Bor et al., 2020). Contrary to such evidence for independence of sharing from believing, another study found that belief in fake news was a predictor of willingness to share fake news (Pereira et al., 2018); but, overall, the research points to a partial disconnection between what people believe in and what they are willing to share. Such a disconnection suggests that individuals are willing to share content that they believe to be false, more research on this is needed.

Research also suggests that the majority of the individuals that share fake news, does so to protect their in-group values or their group identity by promoting arguments that are favourable to one's in-group, or unfavourable to one's out-group (Pereira et al., 2018, Van Bavel & Pereira, 2018), or as a means to connect – a necessity increased by social isolation (Petersen et al., 2018).

Attributed Credibility. The abundance of information people are exposed to online makes social media a very fertile ground to rely on cognitive heuristics (Metzger & Flanagin, 2013, Metzger et al., 2010). One of the most important heuristics studied with regard to fake news, is attributed source credibility, that is, relying on heuristic cues when deciding if news content online is trustworthy.

According to the elaboration likelihood model, when the information is not directly relevant and/or individuals lack prior knowledge on the subject, have low motivation and/or are unable to elaborate upon the information, they tend to engage instead in the peripheral route of information processing (Petty & Cacioppo, 1986). In this situation individuals look for heuristic cues that help them validate the information, such as source credibility or repetition (Petty & Cacioppo, 1986). In fact, the influence of credibility in the formation or actualization of individuals' attitudes is more pronounced when the individuals lack the prior knowledge and the prior attitudes on the topic of interest (Kumkale et al., 2010).

The same processes are expected to be at play when it comes to news processing on social media (regardless of their level of accuracy). In the context of fake news, more recent research on the effect of attributed credibility found that including source reputation ratings next to the news articles influences their believability, with lower source ratings leading to lower belief in both fake and true news (Kim & Dennis, 2018). Another study demonstrated that the association of brands with fake news, when the

fake news' perceived credibility was high, did not damage the attitudes of the consumers towards the brands (Visentin et al., 2019). In addition, individuals are more likely to share content that they perceive as credible and trustworthy (Buchanan & Benson, 2019, Stefanone et al., 2019).

Aside from the arguments from the persuasion literature, it is worth looking at credibility from a Bayesian perspective[3], which adds another layer to the issue. Credibility assessments influence the degree to which individuals update their previous beliefs, but credibility assessments are also influenced by individuals' previous beliefs. An individual's source credibility attribution depends both on the new incoming information and on the judgements of what constitutes a credible source. The latter differ according to held beliefs (e.g., an individual who distrusts science will not consider a scientific paper as a credible source, and because of that new information presented by a scientific paper will not be taken into account, (Druckman, 2019)).

The perceived news source credibility can be heightened when the message is favourable to the individual's previous beliefs about the content of the message. One study proved that the perceived credibility of public opinion polls depends on the favourability of the reported results for the individual's positioning on the issue (Kuru et al., 2017). Another study found that checking a source's credibility as a strategy against misinformation may not be as effective as previously assumed, because individuals tend to trust sources that reinforce their beliefs (Tsang, 2020).

According to deception theories individuals look out for sender demeanor cues, that is, non-verbal interpersonal cues that individuals assume to be indicative of deception. Conversely, Truth Default Theory states that sender demeanor cues do not in fact reflect actual deception and that relying on such cues leaves individuals with a no better than change accuracy detection, and that chances of lie detection can instead be improved by comparing what is said with what is known (Levine, 2014). In the age of

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[3] The Bayesian perspective, based on the Bayes Theorem, refers to a theoretical framework of how individuals make inferences and derive updated conclusions in the face of new information, given their prior knowledge, values or beliefs. Bayesian decision making involves basing decisions on outcome probability, which is based in the previously held information and the new incoming evidence (Gleason & Harris, 2019). In other words, the Bayesian framework refers to a theoretical information processing model of how people, when faced with new information, draw upon their prior beliefs and new evidence to arrive at updated beliefs. Given an individual's belief about the state of the world, and their degree of certainty about the belief, when coming across a new piece of information, the individual will arrive at an updated conclusion (Druckman, 2019).

social media, sender demeanor cues can be compared or analogous to the number of likes a certain post has — with a high number of likes inducing accuracy perception (Luo et al., 2020), and consider if their friends endorsed the message (as opposed to unfamiliar or institutional sources) as a measure of credibility – both are cues that individuals search for when evaluating accuracy, and likelihood of deception in social media, but none is a reliable indicator of actual truth.

Put together, the evidence calls for more studies on the interplay between credibility and previous beliefs in the belief and sharing of fake news. It is known that credibility by itself raises believability and likelihood of sharing, and that perceptions of credibility vary depending on individuals' prior beliefs. However, it is still unclear to what extent do credibility perceptions depend on individual's priors to exert influence in individual's belief and sharing of news content. The present study provides some preliminary answers to this question.

Research on which individual characteristics promote the spread of fake news has been following various directions. In the current study, we will focus on two dimensions: (i) emotions and (ii) political biases.

Emotions. Communication on social media does not allow for in-person face-to-face interaction, but despite this fact, emotions can be transmitted on social media on a massive scale (Kramer et al., 2014). On the context of fake news, can emotions make people more vulnerable to the falsities spread online? A well-known study using big data suggests that the reason why fake news spread faster than true news is their increased novelty and newness, as a piece of information that was previously unknown about the world (Vosoughi et al., 2018). In terms of the users' expressed emotionality, this aspect of novelty then translates into increased surprise and disgust in their responses to fake news, while responses to accurate news inspire other emotions such as joy and trust (Vosoughi et al., 2018). Since then, the literature on the effect of emotions on susceptibility to fake news has been growing, but it has been mainly focusing on the effect of emotions on veracity beliefs, while the impact of previous beliefs on emotions has not yet been yet fully understood —even less so with regard to emotions related to an aspect of "wanting to know more", that is, emotions that trigger individuals to further explore a certain subject. For example, an individual who believes in the global warming evidence may be surprised when reading the following news headline "Europe

expects the coldest summer ever registered", and proceeds to search for information that discredits the claim or would otherwise dissolve the discrepancy with the prior belief. Such emotions may play a particularly relevant role in the processing of news.

Surprise is one of the emotions that fosters knowledge exploration (Vogl et al., 2019). According to the Bayesian perspective, surprise is a consequence of the impact that a certain piece of information has on the prior beliefs, which depends of its objective singularity (Itti & Baldi, 2009), and its transformative power that is measured in the difference between the prior and the posterior beliefs (Baldi & Itti, 2010). To impact previous beliefs, the incoming information needs to be relevant, at a close location, and unexpected given all that is known. Following in a Bayesian perspective of decision making, it is this latter aspect of novelty, as something that was previously unknown about the world, that increases interest and gives the fake news an added value that justifies the sharing (Itti & Baldi, 2009).

The role that emotion[4] plays when individuals are deciding upon the veracity of news content has been demonstrated to have neurophysiological manifestations (Lutz et al., 2020). More specifically, the researchers demonstrated that a smaller heart rate variability was related to increased likelihood of disbelief in the news, while the relative number of eye fixations was related to an increased likelihood of belief in the news.

Another recent study found that heightened emotionality across a variety of mood dispositions was positively correlated with deception by fake news and negatively with ability to distinguish true from false (Martel et al., 2020). The authors found that the relation between emotionality and fake news detection stood for a wide variety of emotions, except those closer to an aspect of knowledge, namely: "interest", "alert", "determined", and "attentive". Moreover, no significant relationship emerged between emotionality and belief in true news, except for "attentive" and "alert" (Martel et al., 2020). Such results indicate that emotions that raise the individual's attention levels may play a distinguished role in the process of being deceived by fake news.

According to the appraisal theory, emotions are elicited not only through the events themselves but through the subjective evaluations (appraisals) that individuals make of those events or situations (Scherer et al., 2001). This view allows us to address

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[4] Emotions are defined by three components: the subjective experience that makes emotions personal experiences, the physiological response, and the behavioral response.

the interindividual and intraindividual variability of responses to the same event, as well as the variability of situations eliciting the same emotions (Scherer et al., 2001). In the context of fake news, the appraisal theory allows us to comprehend the differences between individuals' emotional responses to the same piece of news content. Individuals' evaluations (appraisals) on a given situation are drawn upon previous acquired beliefs, motives, thoughts, or values (e.g., the individual that overpublishes content about their political party, because of a belief that doing so can change others political preferences). For once, and serving as an example on the role of appraisals in emotional outcomes, one study found that the epistemic beliefs (i.e., what individuals believe to constitute knowledge and knowing) allowed to predict emotional outcomes, which in turn predicted learning outcomes (Trevors et al., 2017). This leads us to the next topic.

Political Biases. The literature on biased thinking and fake news has been mainly focused on two distinct accounts of cognitive theory to explain how people arrive at wrong conclusions, and thus are deceived by fake news: (i) the classical account to reasoning, arguing that it is a lack of reasoning that makes people susceptible to fake news, and (ii) the motivated reasoning account, arguing that people reason to arrive at pre-determined self-serving conclusions, that reasoning is goal oriented and can have various motivations, e.g., directional versus accuracy goals (Druckman, 2019). According to the classical reasoning account, it is the failure to engage in analytical thinking[5] that makes people susceptible to fake news; while according to the motivated reasoning account, it is the failure to engage in unbiased reasoning that makes people susceptible to fake news. The research has been finding contradictory results (Knobloch-Westerwick & Kleinman, 2012, Pennycook & Rand, 2019, Sindermann et al., 2020) but, so far, the evidence is more favourable to the classical reasoning account (Pennycook et al., 2021, Pennycook & Rand, 2021). That is reinforced by the finding that deception by fake news can be reduced by inducing an accuracy focus on the individuals (Brashier et al., 2020, Pennycook et al., 2021).

Still, even when required to engage in analytical thinking, individuals are deceived by fake news. It seems to be the case that when individuals' beliefs are heavily distorted or skewed, more attentive, effortful thinking may not prevent deception

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[5] Analytical thinking is defined as analyzing patterns in information, solving problems and access and employ previously acquired knowledge when doing so (Leron & Hazzan, 2009).

(Pennycook & Rand, 2021). A recent study was able to prove that ideology and identity protection purposes help to explain the spread of political misinformation (Pereira et al., 2018). More specifically, the researchers found that both democrats and republicans are more likely to believe in news that allows them to maintain a positive view of their in-group member, and that both republicans and democrats were more willing to share fake news holding negative views on the out-group members (an effect more pronounced for the republicans) (Pereira et al., 2018). Conversely, another study found that the effect of concordance with the headlines was significantly more prominent in sharing than in believing (Bor et al., 2020).

Overall, however, the evidence is contradictory, with some authors showing that deception occurs by lack of analytical reasoning and others showing that deception is the product of motivated reasoning (preference for reaching a certain conclusion). In either of these processes, the individual thinking process is drawn upon priors (previous beliefs). For this reason, we believe that addressing the issue of biases in fake news spreading requires taking such prior beliefs held by the individuals into account.

The fact that prior beliefs have an influence on believing or sharing of news does not necessarily imply that the reasoning itself must be biased by a motivation to achieve a preferred outcome. Priors can influence the individuals reasoning either because it lacks effort and attention or because it lacks neutrality and impartiality.

In the field of political fake news, research often lacks the necessary measures to distinguish between these two processes. For instance, researchers have been asking people with which political party or candidate they identify the most (e.g., (Pennycook & Rand, 2019), or for their political beliefs in the end of the survey (Pennycook & Rand, 2020) and then calculated how such partisanship influences their reception of political news. However, they have not been asking what their assumptions on the current state of political affairs are, prior to being presented with the news items. Only the latter would allow distinguishing the prior beliefs related to the news at stake (i.e., beliefs potentially responsible for motivated reasoning) from other beliefs that could, for instance, refer to source credibility, as discussed above (i.e., beliefs potentially responsible for heuristic biases due to lack of reasoning).

Another problem with the existing evidence for motivated reasoning was outlined by Mandel (2014), applying a Bayesian framework. According to such framework, priors are beliefs or assumptions about reality that have a certain personal likelihood of being true, which depends on the individual's degree of certainty or confidence about them, and inform the personal probability of a given event (Mandel, 2014). Such priors may bias the reasoning because individuals are motivated to confirm their priors (motivated reasoning). However, it is also possible that priors bias the reasoning in the absence of motivation by the outcome: First, priors regarding the content of the message can exert influence on the information processing if they impact the weighting of the message encountered (e.g., if more weight is given to information that is considered more likely according to the prior). Second, priors regarding credibility may credit or discredit a certain message for instance depending on its source or on whether the message is impartial in its conclusions or justified by rigorous investigation. Both of these processes depend on people's previous beliefs and will reflect on the degree through which the encountered message will be integrated, rejected, or ignored (Druckman, 2019).

In the context of fake news, when accessing a new news story veracity, an individual accesses a "priors map" (previously acquired information in storage), that is related to the news story, to determine the probability of it being true or false, as well as to decide if it is, or not, worth sharing. This leads the individual to engage in biased thinking, but it is worth noting that biased thinking does not necessarily lead to wrong conclusions. For example, an individual encounters a video on YouTube advocating that the earth is flat, but because they do not believe in conspiracy theories, they dismiss the theory immediately.

To sum up, research has been providing evidence on the relevance of attributed news credibility for both believing of and willingness to share fake news – with higher rates of news credibility increasing the likelihood of believing and sharing.

Emotion is also a key factor in the spread of fake news. Research has been showing that reliance on emotional processing of information reduces individual's ability to distinguish true from false and increases deception. However, the effect of emotion on the willingness to share and on evaluations of credibility is not yet well understood.

Research on the role of beliefs in the spread of fake news, being them prior political beliefs or accuracy judgments on the news at stake, has been producing contradictory evidence. Attributed accuracy does not seem to be a requirement for sharing fake news, with most studies finding a nearly inexistent relationship between belief and willingness to share news posts. On the predictive power of political beliefs in the spread of fake news, research is also contradictory, although the majority of studies points to a minor or irrelevant role of political preferences and argues that people are deceived by fake news because they do not pay attention and not because they want to reach pre-determined conclusions.

The interplay between beliefs and emotion in the context of fake news is not yet well understood, particularly how individuals' political priors affect their emotions when presented with the news, and how the elicited emotions influence the attributed credibility of the news. Moreover, it is still an open question what cognitive paths, if any, in online news processing and sharing are specific to fake news, and what cognitive paths are common to the processing and sharing of fake and accurate news alike.

The present research

The main goal of this study is to provide an integrative perspective of how individuals' priors relate with truth discernment and likelihood of sharing fake as opposed to accurate news. We will examine not only the detection of fake news, but also psycho-social and motivational factors that determine the spreading of politically relevant false as compared to accurate news stories. More precisely, we test the roles of perceived information credibility and perceived information emotionality in mediating the relationship between political priors and truth discernment and likelihood of sharing fake versus accurate news posts.

Moreover, different from previous research we distinguish in our analyses between sharing of objectively (in-)accurate content and sharing of content that is considered by the sharing person as true vs. fake (the subjective value of truth vs. lies), as imperfect detection implies that both are not the same. That distinction allows separating the problem of detection of inaccuracy from other factors of news-sharing.

A common perspective in the literature of emotions is the one in which emotions affect beliefs (e.g., Frijda, 2000). Literature about emotions and fake news has been attempting to disclose this relationship, in which emotion affects beliefs on the veracity of true and false news. In the current study, we will be looking in both directions, that is, we will be looking at the influence of beliefs on emotional outcomes, and at the influence of emotional outcomes on beliefs.

Moreover, and in contrast to previous research, our study we will be looking at political beliefs framed in terms of the individuals' priors. We choose this approach because the usage of priors allows to formally address what individuals' beliefs and assumptions about a topic are, which will then inform their judgment and use of new information (Lee & Vanpaemel, 2018). Measuring individuals priors (e.g., rather than their political affiliation per se), will make cognitive models more complete, allowing for better inferences and predictions (Lee & Vanpaemel, 2018). More precisely, in our research we will explore how do individuals' priors influence their judgements on how interesting and surprising the news are, as well as their judgements on the news credibility, which in turn influence believability and likelihood of sharing.

We test seven hypotheses in our research:

H1: Perceiving news as being accurate positively predicts likelihood of sharing.

H2: Emotion mediates the impact of political priors on perceived accuracy.

H3: Emotion mediates the impact of political priors on likelihood of sharing.

H4: Perceived message credibility mediates the impact of political priors on perceived accuracy.

H5: Perceived message credibility mediates the impact of political priors on likelihood of sharing the news content.

H6: The impact of political priors should be stronger on the likelihood of sharing fake as compared to accurate news.

H7: Emotion should mediate the relation between individuals' political priors and willingness to share news that individuals had identified as being false or accurate.

We tested these hypotheses in an online survey, in which we presented participants a number of true and false political news posts, all with negative implications for the functioning of the democratic political system, and participants had to indicate to which degree they believed in the accuracy of the news and would be willing to share them. We also measured participants' prior beliefs in the functioning of the democratic system and for each news post whether they considered the provided information as credible and their emotional response.

Method

Participants

We collected data of 317 participants, of which 259 completed the survey. All participants have Portuguese nationality. Their age was comprised between 17 and 70 years (M = 33,2; SD = 11); 135 participants identified as male, 121 as female, and 3 participants preferred not to answer this question. According to the district of residence and respective population density, participants were classified as living in a rural, more interior area (n=89), or in an urban, more coastal area (n=169). Seven participants had nine or fewer years of formal education, 61 had 12 or fewer years of education (n=61), 105 had obtained graduation, 75 had a master or postgraduation, and eleven had a Ph.D. Sixty-nine participants identified with left-wing parties, 50 with the left-centre party, 22 with the right-centre party, 30 with right-wing parties and 59 with no political party. Thirty participants preferred not to answer this question. Data were collected according to convenience and snowball sampling methods.

Materials

The stimuli consisted of ten news posts extracted from Facebook public groups with political content. These posts contained some to no degree of misleading content or false connections and fall in the category of misinformation[6]. For extraction we used *CrowdTangle*, a tool owned by Facebook, intended for social scientist's research on the social network. It allows for data collection and analysis on Facebook's open pages, groups, or profiles. Using this platform, two independent researchers and fact-checkers extracted over a hundred of Portuguese political-related posts published on open groups between September and December of 2020, and categorized them according to Claire Wardle's mal-, mis- and disinformation categories: Imposter content, misleading content, fabricated content, manipulated content, false context, false connection, and satire or parody (Wardle & Derakhshan, 2018). Out of this sample, five posts containing

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[6] *Fake news* come in many forms, but can be grouped into three groups: (i) disinformation, which refers to false content shared knowingly so, (ii) misinformation, which refers to false content shared naively so, and (iii) mal-information, which refers to content meant to hurt a certain individual or group reputation (Wardle & Derakhshan, 2017).

misleading or manipulated information and five posts containing accurate information were selected (see appendix 1).

The picture and name of the publishing user profile were removed, in order to prevent identification. The remaining cues, such as the number or likes and reactions to the post, and the descriptive text accompanying the posts created by the sharing person, were maintained.

All the selected posts portray political actors and/or events in a demeaning manner or depict problematic issues of the current democratic system landscape. This choice was deliberate and had the intention to put the focus on the participants ability to tell the truth removing what could be obvious interferences of political concordance versus discordance.

Procedure

Participants were presented with the introductory information on the purpose of the study and then asked for their informed consent, which was followed by the socio-demographic questions (age, biological sex, nationality, area of residence, and academic qualifications). Then participants were shown a set of five questions on the participants political beliefs (voting, trust in sovereign institutions, parliamentary representation, corruption, and political party of preference), followed by two questions asking participants if they were social media users, and which of the social media platforms they used. The next set of questions was the ten-item personality inventory (TIPI), a short scale based on the Big Five personality inventory, tested for the Portuguese population (Nunes et al., 2018)[7]. In the main section of the survey, participants were presented with the news posts, half of them true and half of them false. The order of the presented news was randomized. Following each news post, participants would be asked if it was true or false, if the news story was surprising or interesting, and if it was credible, rigorous, and trustworthy. After the presentation of all news stories participants were asked if they had made any search on the web to answer the questions, and if they that answered the survey on their personal smartphone, their personal computer or work/professional computer. Participants were then debriefed and shown

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[7] These questions were included in the survey for exploratory reasons, that go beyond the scope of this work, and therefor results on them are not reported here.

their accuracy score, which was based on their correct/incorrect answers on whether the news stories were true or false, and a message of gratitude for their participation.

Design

The study was a within-subjects experiment containing two conditions (exposure to informative vs. misinformative news posts) and conducted in a Qualtrics survey, which was distributed on social networks such as Facebook, WhatsApp, and Instagram.

To avoid dropout (Deutskens et al., 2004), the survey followed the principles of interactivity and cognitive load reduction to promote engagement with the participants. It was designed in a form of a quiz, in the sense that it returned participants their accuracy score derived from the correct identification of misinformative and informative news items. Participants would be attributed the character of (i) detective Sherlock Holmes if they identified correctly more than 70% of the news items as being "true" or "false"; (ii) inspector Gadget if they correctly identified 40 to 70% of the news items; and (iii) Mr. Magoo if they correctly identified less than 40% of the news items.

Also, the survey used a multiform planned missings design specifically in the section directed to the post's evaluation. Multiform design present only a subsample of the stimuli to each participant, which allows to reduce participants' cognitive effort and possible fatigue by reducing the number of items for each participant, without losing too much statistical power for the analysis of the overall sample (Chang & Little, 2018). Each participant was shown six items out of a total of ten news posts, having 60% of the items presented to each participant while getting 100% of information covered, 6 forms were created and randomized to be evenly presented to participants (Table 1).

Table 1

Schematics for Six-Form Planned Missing Design.

Block Form	X	A	B	C	D	Information coverage (%)
1	2 items	2 items	2 items	—	—	60
2	2 items	2 items	—	2 items	—	60
3	2 items	2 items	—	—	2 items	60
4	2 items	—	2 items	2 items	—	60
5	2 items	—	2 items	—	2 items	60
6	2 items	—	—	2 items	2 items	60

Note. Each of the blocks (X, A, B, C, D) contained one misinformative item and one accurate item. The X block was present in all 6 forms and, therefore, its two items were shown to all participants.

Measures

Political Priors. Following the criteria of theoretical and social relevance (Lee & Vanpaemel, 2018), the assessment of priors used was operationalized by a set of five questions about participants' preferred political party, trust in Portuguese sovereign bodies, belief in parliamentary representation, perception of corruption and voting behaviour.

Political Party. Participants were asked to select the Portuguese political party they identify with the most. This item was then recoded from left to right (1 being the *Portuguese Communist Party*, the farthest left Portuguese party with parliamentary representation, and 10 being *Chega*, the farthest right Portuguese party).

Trust in Portuguese Sovereign Bodies. Participants were asked "What is your average degree of thrust in the Portuguese sovereign bodies? (Courts, President of the Republic, Assembly of the Republic, Government)" and responded on a scale from 1 (Very low) to 7 (Very high).

Parliamentary Representation. Participants were asked "In your opinion, does the group of deputies from parties with parliamentary seats represent the Portuguese population?", responding on a scale from 1 (No, by no means) to 7 (Yes, completely).

Perceived Corruption. Participants were asked "Corruption is the main problem in the Portuguese political system. Do you agree with this statement?", responding on a scale from 1 (Entirely disagree) to 7 (Entirely agree). (The scale was later reversed.)

Voting Behaviour. Participants were asked "In electoral acts, how regularly do you vote?", responding on a scale from 1 (Never) to 7 (Always).

Perceived Accuracy. The six news items were followed by a binary question on whether participants believed they were true (coded 5) or false (coded 1). Separate accuracy indices for informative and misinformative news were calculated by averaging the scores of news coded in each category. Higher values indicate that more news were believed to be true, ranging from 1 (indicating that all news were believed to be false) to 5 (indicating that all news were believed to be true). For the manipulation the news items had been classified according to the fact-checking and their objective truth or falsity. In a following, the news items were also classified according to what participants identified as true and false. For further analyses, the subsequent news-related measures were aggregated based on these two classifications (manipulation and subjective truth attribution). Thus, separate indices of emotionality, credibility and likelihood of sharing were created for objectively true and false news items as well as for news items that the participants believed to be true or false.

Reported Emotionality. Both interest[8] and surprise[9] are emotions related to an aspect of knowledge, and despite some controversy, both have the components that had been argued to define emotions[10] (Silvia, 2008). We considered interest and surprise

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[8] Interest is an emotion that causes attentional efforts towards an object, process or event. It has significant long-term adaptive functions, which include motivating people for autonomous exploration and learning (Silvia, 2001), (Silvia, 2008). Interest is close to an aspect of analytical thinking (Martel et al., 2020), and that fact has been in the root of some disagreement on whether interest accounts for an emotion. Disagreement, however, is not uncommon across theories of emotions, which does not have to be problematic, once these contradicting views reflect different taxonomies (Silvia, 2001), (Griffiths, 2008).

[9] Surprise refers to a sense of astonishment and wonder that one feels toward the unexpected (Mellers et al., 2013). Surprise has been classically considered to be one of the basic universal emotions (Ekman et al., 1983). However, it's close ties with a belief-based experience in terms of how people make predictions and draw probabilities of events make surprise both related to beliefs and to emotion (Mellers et al., 2013).

[10] A contemporary perspective on emotions, is that emotions motivate activity and compel people to take action (Ridderinkhof, 2017). They are characterized by three components: one is subjective and related to individual differences on how emotion is experienced, another is physiological and refers to

because of their importance for motivating knowledge exploration and/or the pursue of epistemic goals.

Reported Interest. Participants were asked to indicate how interested they were in each news item on a scale from 1 (Very little) to 7 (Very much).

Reported Surprise. Participants were asked to indicate how surprised they were by each news item on a scale from 1 (Very little) to 7 (Very much).

Perceived Credibility. Credibility of each news post was measured by three items using a scale from 1(Very little) to 7 (Very much):

Perceived Trustworthiness. Participants were asked how trustworthy they believed each news item to be.

Perceived Impartiality. Participants were asked how impartial they believed each news item to be.

Perceived Rigorosity. Participants were asked how rigorous they believed each news item to be.

Likelihood of Sharing. Following accuracy and credibility measures, participants were asked how probable it was that they would share each news item. The scale ranged from 1 (Very low) to 7 (Very high).

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measurable physical reactions, at last, emotions have an expressive component, which refers to behavioural responses.

Results

Missing Data Treatment

Missing data was dealt with using the multiple imputation method, this method allows for the prediction of the missing data based on the observed data, thus making valid inferences (Sterne et al., 2009). Unlike other types of missing data, the missing data produced by the used multiform-design were missing completely at random (MCAR), as the random distribution of participants to the six forms assured that missing values were not related to the variables or the items themselves (Silvia et al., 2014), (Rubin, 1976). The method was run on SPSS, where five imputation datasets were created. For the multiple imputation we used the EM method[11], in which each iteration ran to calculate the missing values is based on the observed values in the data and draws inferences of maximum likelihood under those observations. The results for all imputations were pooled manually and used to interpret the results.

Misinformative Versus Informative News

This study is a within-subjects experiment with two conditions (i.e., exposure to informative vs. misinformative news posts). The correlations between participants political prior variables and variables associated with participants informative and misinformative news processing are summarized in Table 2. These results support the hypothesis that political priors should have a stronger impact on sharing misinformative than informative news (H6), as the correlations of political priors are overall stronger with sharing of misinformative than with sharing of informative news. The also indicate that there is no empirical support for the hypothesis that perceived a news as accurate would increase the likelihood of sharing it, as both variables were uncorrelated, both for informative and for misinformative news.

The mean differences between the processing of misinformative and informative news posts across participants are summarized in Table 3.

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[11] https://www.ibm.com/docs/en/spss-statistics/27.0.0?topic=analysis-estimating-statistics-imputing-missing-values

Table 2

Person Correlations of political priors with measures for informative (info) and misinformative (misinfo) news

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1 Political Party																		
2 Trust Sovereign Bodies	-.12																	
3 Parliamentary Representations	-.16*	.64**																
4 Perceived Corruption (reversed)	-.04	.23**	.22**															
5 Voting Behaviour	-.17**	.16**	.15*	.06														
6 Surprise info	.11	-.09	-.07	-.06	-.09													
7 Surprise misinfo	.03	-.15*	-.12	-.16*	-.15*	.52**												
8 Interest info	.04	-.20**	-.15*	-.11	-.05	.46**	.35**											
9 Interest misinfo	.06	-.26**	-.16*	-.15*	-.09	.37**	.43**	.49**										
10 Rigorosity info	-.03	-.01	-.02	-.10	-.01	.35**	.24**	.55**	.31**									
11 Rigorosity misinfo	.01	.00	.02	-.04	-.09	.22**	.30**	.30**	.38**	.38**								
12 Trustworthiness info	.01	-.06	-.07	-.09	-.06	.32**	.21*	.53**	.31**	.71**	.28**							
13 Trustworthiness misinfo	-.07	-.04	.01	-.02	-.06	.14	.22**	.18*	.44**	.22**	.58**	.25**						
14 Impartiality info	-.03	-.03	-.04	.01	.01	.34**	.26**	.42**	.26**	.53**	.27**	.55**	.25**					
15 Impartiality misinfo	-.05	-.11	-.02	.01	-.05	.23*	.32**	.31**	.39**	.24*	.45**	.26**	.47**	.40**				
16 Belief info	.08	-.01	-.03	.07	-.01	.05	-.04	.08	.00	.16*	.01	.19	.00	.07	.05			
17 Belief misinfo	-.09	-.02	-.05	.04	-.03	-.05	.01	-.05	.15	-.01	.23**	.01	.36**	-.03	.17	.09		
18 Share info	.13	-.03	-.09	-.18**	-.10	.24*	.24**	.49**	.27**	.50**	.23**	.44**	.17*	.36**	.19**	.00	.04	
19 Share misinfo	.07	-.27**	-.24**	-.22**	-.11	.22**	.25**	.33**	.43**	.30**	.30**	.24**	.34**	.17*	.26**	-.04	.15	.48**

Note. * $p < 0.05$, ** $p < .01$ (2-tailed). Results pooled over 5 imputations.

Table 3

Mean differences between misinformative and informative news posts, and their statistical relevance seen in the general linear model results columns

		M (SD)	GLM		
			df	F	p
Share	Misinformative	1.76 (0.62)	1, 258	12.53	< .001
	Informative	1.91 (0.64)			
Belief	Misinformative	4.1 (1.23)	1, 258	42.04	< .001
	Informative	4.39 (1.05)			
Surprise	Misinformative	3.03 (0.88)	1, 258	9.12	< .001
	Informative	2.88 (0.83)			
Interest	Misinformative	2.9 (0.85)	1, 258	72.43	< .001
	Informative	2.46 (0.82)			
Rigorosity	Misinformative	2.84 (0.74)	1, 258	75.15	< .001
	Informative	2.4 (0.74)			
Impartiality	Misinformative	2.65 (0.74)	1, 258	35.01	< .001
	Informative	2.35 (0.73)			
Trustworthiness	Misinformative	2.78 (0.71)	1, 258	36.43	< .001
	Informative	2.44 (0.73)			

Despite the likelihood of sharing and the perceived accuracy of informative news stories being higher than misinformative news stories, participants seem to be more emotional about the misinformative news items, and – unexpectedly - to evaluate them as more credible (more trustworthy, rigorous, and impartial). The latter result can be explained by the increased surprise and interest that participants report in the misinformative news posts.

To further analyse the data, a structural equation modelling (SEM) analysis was conducted on RStudio using Lavaan — a package built to conduct this type of analysis on R programming language (Rosseel, n.d.). The model tested the effect of political priors on likelihood of sharing the presented news, with emotional response, perceived credibility and accuracy as mediators. Political priors and perceived credibility were estimated as latent variables and for each of them the path of one indicator was set to 1 in order to define the scale. The other variables were entered to the model as manifest variables as they had less than 3 indicators (Figure 1).

In order to compare both groups of news with each other, we tested the model separately for misinformative and informative news items estimating mirrored paths for both groups of items (see Figure 1). The model was constructed under the function sem() and the estimator used was maximum likelihood (ML). Model fit values revealed a model well-adjusted to data, varying across imputations $131.99 < \chi^2 (98) < 173.92$, $p <$ .013; $0.942 <$ Comparative Fit Index (CFI) < 0.972; $0.92 <$ Tucker-Lewis Index (TLI) $<$ 0.962; $0.037 <$ Root mean square error of approximation (RMSEA) < 0.055, $p > 0.3$[12]; Standardized root mean square residual (SRMR) < 0.059[13]. Furthermore, results across imputations were averaged following Rubin's rules for multiple imputation datasets[14, 15].

Figure 1

Mediation model of the impact of political priors on belief and likelihood of sharing misinformative versus informative news items.
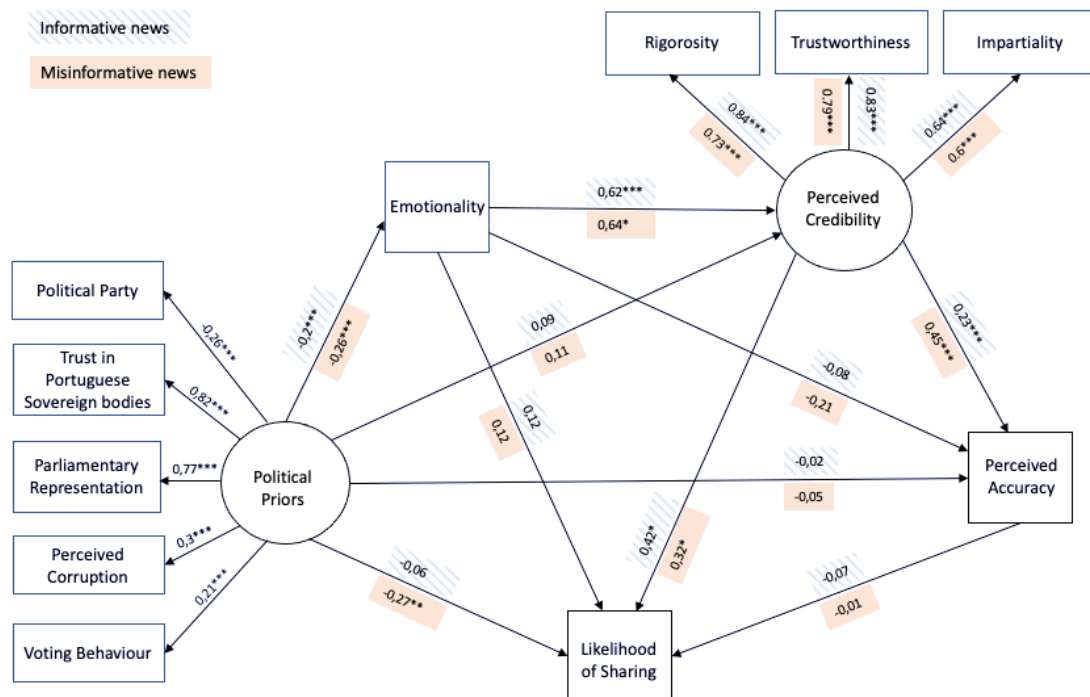
Note. Standardized regression coefficients. *$p < .05$, **$p < .01$, ***$p < .001$

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[12] Lowest *p* value for RMSEA across imputations.
[13] Highest across imputations.
[14] https://bookdown.org/mwheymans/bookmi/rubins-rules.html
[15] For the calculation of the degrees of freedom for the significance tests of regression weights, recommendations by Lipsitz et al., (2002) were followed.

Direct Paths Associated with Biased Reasoning. Participant's Political Priors negatively affected the level to which participants found the items interesting and/or surprising. The more they indicated to have positive beliefs about the current democratic political system, the less emotional they reported to be about the news items. Moreover, the degree to which participants found both misinformative and informative news items to be surprising and interesting (higher in Emotionality) significantly and positively predicted the degree to which participants perceived the news to be trustworthy, rigorous, or impartial (Perceived Credibility). Finally, perceived credibility predicted likelihood of sharing and perceived accuracy of misinformative and informative news items. When participants perceived news items to be more credible, they were more likely to share them and to perceive them as accurate. Interestingly, the results indicate that the perceived accuracy of misinformative and informative news items did not explain the reported likelihood of sharing when controlling for their shared predictors. Thus, in line with previous results, news items were not more likely to be shared by participants depending on their perceived accuracy.

Apart from effects mediated by emotionality and credibility, we found that participants political priors did not directly influence the perceived accuracy of the misinformative and informative news items. Both direct effects of political priors on perceived accuracy of the misinformative, and informative news items proved to be statistically insignificant. However, there was a significant and inverse direct effect of political priors on reported likelihood of sharing misinformative news items (β = -0.265, SE = 0.075, p = .007). The more negative were participants political priors, the higher was the likelihood of them sharing misinformation. In contrast, the direct effect of political priors on the likelihood of sharing informative news items was not significant (β = -0.055, SE = 0.036, p = .13).

Moreover, apart from effects mediated by perceived credibility, there was no significant direct effect of emotionality on perceived accuracy and likelihood of sharing either misinformative or informative news items.

Indirect Effects. The results obtained with the SEM analysis indicate that political priors may indeed influence participant's perceived accuracy of misinformation and information, but they do so through emotional cues and perceived credibility of the message. This indirect effect of political priors on perceived accuracy through

emotionality and perceived credibility was only statistically significant for misinformative news posts (β = -0.073, SE = 0.026, p = .007), with the indirect effect for the informative news posts being insignificant (β = -0.030, SE = 0.019, $p < .14$).

The indirect effect of political priors on likelihood of sharing through emotionality and perceived credibility was significant for both, misinformative news posts (β = -0.055, SE = 0.017, p = .005) and informative news posts (β = -0.059, SE = 0.016, $p < .001$). However, because of the above mentioned direct effect of political priors on likelihood of sharing misinformation, this mediation was only partial for fake news, whereas it was complete for true news.

News Perceived as True or False

The fact that attribution of truth to the news did not seem to have any direct influence on the likelihood of sharing suggests that participants seem to be inclined to knowingly share at least some news that they considered to be false. To better understand the motivations behind such sharing of assumed to be false news, we tested whether the relationship between some of the measured constructs would be different for news that participants judged to be true as compared to news they judged to be false. For each participant the posts were grouped in two different categories: those that participant had identified as being true, and those that participant had identified as being false and indices of emotionality (and subindices of surprise and interest), credibility (and subindices of trustworthiness, impartiality and rigorosity) and likelihood of sharing were calculated for each type of news. Correlations between political prior variables and variables associated with believed-to-be true and believed-to-be false news are summarized in table 4, and mean comparisons by repeated measures GLMs are summarized in Table 5.

Table 4

Person Correlations of political priors with measures for news judged by participants to be true or false

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1 Political Party	--															
2 Trust in Sovereign Bodies	-.12															
3 Parliamentary Representations	-.16*	.64**														
4 Perceived Corruption (reversed)	-.04	.23**	.22**													
5 Voting Behaviour	-.17**	.16**	.15*	.06												
6 Surprise true	.01	-.03	-.03	-.11	-.09											
7 Surprise false	.13	-.20*	-.15*	-.12	-.12	.36**										
8 Interest true	.03	-.20**	-.15*	-.16**	-.04	.46**	.28**									
9 Interest false	.09	-.25**	-.17*	-.08	-.10	.25**	.44**	.35**								
10 Rigorosity true	.00	.04	.03	-.08	-.01	.33**	.10	.49**	.14*							
11 Rigorosity false	.02	-.06	-.03	-.08	-.08	.28**	.29**	.24**	.43**	.19*						
12 Trustworthiness true	-.05	-.01	.01	-.04	.00	.32**	.13	.55**	.16*	.66**	.20**					
13 Trustworthiness false	.03	-.09	-.08	-.12	-.13	.18*	.18**	.15*	.39**	.10	.51**	.11				
14 Impartiality true	-.05	.01	.02	.04	.04	.32**	.19*	.40**	.17*	.47**	.16*	.55**	.12			
15 Impartiality false	-.02	-.15*	-.10	-.04	-.08	.24**	.25**	.20**	.39**	.15*	.44**	.12	.48**	.17**		
16 Share true	.08	-.18**	-.16*	-.22**	-.11	.30**	.11	.52**	.16**	.39**	.21*	.36**	.14	.23**	.19*	
17 Share false	.09	-.05	-.13*	-.13	-.09	.11	.19*	.18*	.27**	.16*	.25**	.12	.33*	.10	.24	.22**

Note. * $p < 0.05$, ** $p < .01$ (2-tailed). Results pooled over 5 imputations.

Table 5

Mean differences and their statistical relevance for the news posts items that participants identified as true and false

| | | M (SD) | GLM | | |
			df	F	p
Share	Believed-to-be false	1.76 (0.54)	1, 258	35.25	< .001
	Believed-to-be true	1.89 (0.77)			
Surprise	Believed-to-be false	2.95 (0.98)	1, 258	0.14	.7
	Believed-to-be true	2.96 (0.84)			
Interest	Believed-to-be false	2.33 (0.83)	1, 258	525.91	< .001
	Believed-to-be true	2.97 (0.93)			
Rigorosity	Believed-to-be false	2.18 (0.76)	1, 258	792.07	< .001
	Believed-to-be true	2.96 (0.8)			
Impartiality	Believed-to-be false	2.24 (0.83)	1, 258	266.05	< .001
	Believed-to-be true	2.7 (0.76)			
Trustworthiness	Believed-to-be false	1.99 (0.63)	1, 258	1656.55	< .001
	Believed-to-be true	3.11 (0.84)			

The GLM revealed that participants estimated that they were less likely to share believed-to-be false news items than believed-to-be true news items, a result that at first glance seems to contradict the dissociation between accuracy judgments and likelihood of sharing that was found in the previous SEM analysis. Note, however, that it can be explained by the shared variance between accuracy judgments and the predictors of sharing identified in the previous analysis. Moreover, the difference between believed-to-be true and false news items on the predictors of sharing was much stronger than the difference in likelihood of sharing them, which raises the question whether surprise could play a particular role in the sharing of believed-to-be false news. Interestingly, participants found believed-to-be false news items to be equally surprising as to believed-to-be true news items. This result stood out by surprise being the only measure with identical means for the news that participants believed-to-be false and believed-to-be true. To further explore the role of surprise, we, therefore, proceeded with a SEM analysis using participants reported Surprise about believed-to-be false versus believed-to-be true news as the mediators of the relation between participants political priors and

likelihood of sharing. The model controlled for the covariance of the perceived likelihood of sharing of believed-to-be true and false news, and the covariance of the reported surprise of believed-to-be true and false news (see Figure 2). The model presented in the picture represents a path analysis with a serial mediation for both the believed-to-be false and believed-to-be true news, calculated under the sem() function. The estimator used was maximum likelihood (ML) and loadings were fixed across imputations. Values reveal a well-adjusted model to data, varying across imputations $28 < \chi^2(23) < 35$, $p > .052$[16]; $.957 <$ Comparative Fit Index (CFI) $< .983$; $.933 <$ Tucker-Lewis Index (TLI) $< .974$; $.028 <$ Root mean square error of approximation (RMSEA) $< .045$, p $> .846$[17]; Standardized root mean square residual (SRMR) $< .053$.

Figure 2

Analysis of the effect of political priors on likelihood of sharing through reported surprise, for both news items that the participants believed to be false and news items the participants believed to be true.
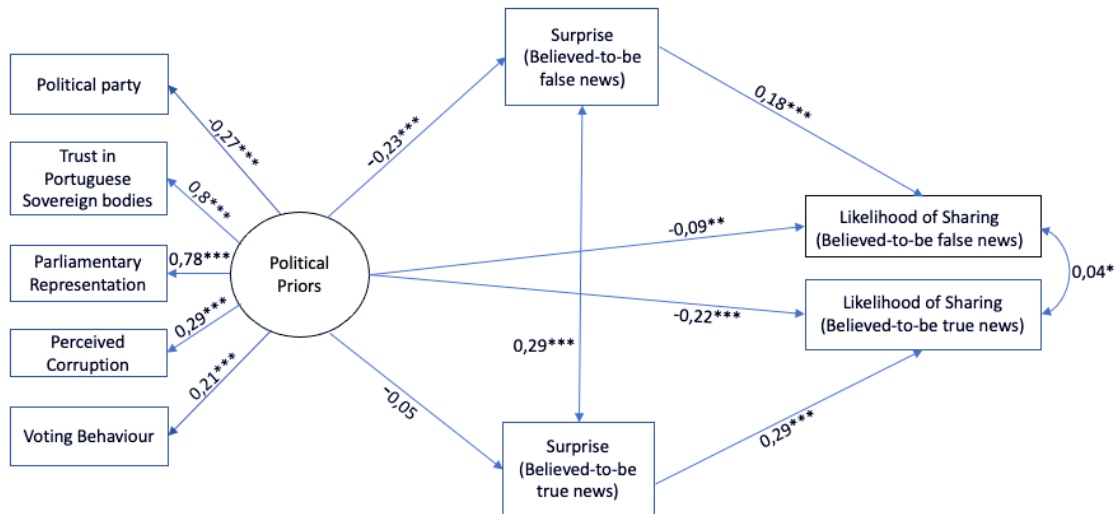
Note. Standardized regression coefficients. *$p < .05$, **$p < .01$, ***$p < .001$

Results reveal that both surprise and negative political priors lead to a higher likelihood of sharing of both believed-to-be false and believed-to-be true news items.

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[16] Lowest *p* value across imputations.
[17] Lowest *p* value across imputations.

However, these direct effects were stronger for the likelihood of sharing believed-to-be true news, than for the likelihood of sharing believed-to-be false news.

Moreover, the indirect effect of participants political priors on likelihood of sharing through the degree of reported surprise was only significant for the believed-to-be false news items ($\beta = -0.042$, $SE = 0.018$, $p = 0.049$), but not for the believed-to-be true news items ($\beta = -0.015$, $SE = 0.016$, $p = 0.36$). These differential indirect effects were due to the fact that political priors were more related with surprise coming from believed-to-be false news, and less with surprise coming from believed-to-be true news.

Discussion

The current research intended to increase the understanding of processes that lead to believing and sharing of misinformative as compared to informative news posts. Based on previous literature that had identified the lack of systematic information processing as an important predictor of belief in fake news, but also evidence for independence of willingness to share news from the attributed veracity, we proposed that both attribution of truth to news and sharing them should depend on perceived message credibility, emotional responses to the news content and prior beliefs with regard to the topic of the news. Based on this reasoning, we tested seven hypotheses in an online experiment in which we exposed Portuguese participants with informative and misinformative political news, all with rather negative connotations, and asked them to guess whether each news was true or false. We also asked them to indicate their emotional response for each news (i.e., how much they felt surprised and interested in the news), how credible they found the news (i.e., whether it was trustworthy, rigorous and impartial) and how willing they would be to share the news on social media. Before the presentation of the news participants prior beliefs regarding the functioning of the democratic political system were measured.

Overall, results showed that participants had great difficulties to figure out which news were actually true and which ones were false. Moreover, the first hypothesis (H1), that perceiving news as being accurate would increase the likelihood of sharing, was not supported by the results. This hypothesis is plausible from a common sense point of view, but the fact that it is not supported by our results is consistent with previous research (Pennycook et al., 2021). Results did, however, support the hypotheses that were directly derived from our theoretical reasoning, namely that both emotional responses to the news and perceived message credibility mediate the impact of political priors on perceived accuracy (H2 and H4, respectively) and likelihood of sharing (H3 and H5, respectively). Unexpectedly, the impact of emotionality on both, believing and sharing was fully mediated by perceived credibility.

The results also support the hypothesis that the impact of political priors is stronger on sharing of misinformative than of informative news (H6). Interestingly, the hypothesis that perceived surprise particularly would mediate the relation between political priors and sharing was only supported for news that participants believed to be

false, but not for news that they believed to be true. For sharing of the latter, surprise contributes as well, but the degree of felt surprise about believed-to-be-true news did not depend on political priors.

To proceed with this discussion, we need to first acknowledge that despite the news items used as stimuli in this study being as naturalistic as possible (i.e., original Facebook publications), participants were not in their natural social media environment while processing the news, and were advised in advance that the study was about fake news detection. So, the results have to be interpreted and discussed in light of the fact that there was an accuracy focus embodied in the survey design[18]. Moreover, the current study is conceptualized in terms of individuals political priors (beliefs), that is, participants political priors were tested prior exposition to the news. This option had the objective to understand the effect that individual's assumptions about the political democratic environment had on their processing of news about the political democratic environment.

The results obtained demonstrate that political beliefs affect the news processing in terms of believing, indirectly, and sharing, both directly and indirectly.

Individuals whose beliefs about the political system are more negative, and more politically inclined to the right ally, are more emotional about the news (both accurate and false news). This effect may be caused by an increased desire to find information that confirms the held negative views about the world. This higher emotionality, in terms of interest and surprise, then translates in an increased perception of credibility in the news, even more so if the news is indeed accurate. The linkage between emotionality and perceived credibility was not expected and is worth of further explorations in the context of fake-news. On the one hand, one should keep in mind that we only measured emotions that were linked to epistemic concerns, that is, surprise and interest. Other emotions may have a more direct impact on willingness to believe or share that does not involve perception of credibility. On the other hand, the suggestion that people perceive as more credible the news posts that make them more interested or surprised is one with damaging consequences for the journalistic work. Indeed, reliance on emotion to build knowledge reflects an erosion of the shared principles and premises

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[18] As seen previously, evidence has proved that this accuracy focus improves individual's detection of fake news.

from the enlightenment period, and is leading to a movement of distrust in mainstream media and science (Dahlgren, 2018).

As expected, perceived credibility increases the news perceived accuracy, an effect that is almost double for misinformative news, but very strong for both misinformative and informative news. Perceived credibility has a greater effect in perceived accuracy than in likelihood of sharing. Individual's willingness to share news posts depends on their political beliefs through how much emotional and credible they find the news posts to be. Nonetheless, specifically in the case of misinformative news posts, it also depends on the individual's political beliefs directly. As expected, individuals with more negative beliefs about the political system, are more willing to share misinformative posts. An effect, that is not explained by emotion, or credibility, or perceived accuracy. All else being taken into account, people are still willing to share fake news, not because the news are novel or interesting, nor because they think the news are credible, but because the news serve their political beliefs in some way (e.g., values, ideology or identity protection purposes). This being the major difference we found between misinformative and informative news processing. This link requires further explorations.

The impact of political beliefs in likelihood of sharing misinformative and informative news alike, is mediated (fully for informative news and partially for misinformative news) by reported emotionality (surprise and interest) about the news, and perceived credibility (trustworthiness, impartiality, rigorosity). That is, people's political beliefs and assumptions about the Portuguese political democratic system, will indirectly influence the degree to which they will be willing to share both false and accurate news through the degree that the news are perceived as surprising and interesting for the individuals and the degree through which the news are perceived as credible.

As expected, results indicate that believing that a news item is false does not prevent willingness of sharing it. Despite being more willing to share news they believe to be true, participants are still willing to share news items they had identified as being false. Individuals will believe more accurate news than fake news, but this perceived accuracy of the news (either true or false) does not reflect in a higher willingness to share the perceived as accurate news. As expected, we found that believing and sharing

news content are two unrelated outcomes of the same pathway, with sharing intentions being independent from the perceived truthiness of the news.

As a result of the disconnect between individuals belief and willingness to share news, interventions intending to increase awareness to fake news result in a decrease in overall belief but not in a decrease of sharing intent (Bor et al., 2020).

Surprise was the one variable that had equal means across news items that participants believed-to-be false and news items that participants believed-to-be true, with participants reporting to be more interested in the news they believed to be true, and, as expected, to find them more credible than the news they believed to be false. For this reason, we focused on the role that surprise plays in the willingness to share news that individuals believed were accurate versus news that individuals believed were false. According to our expectations, we found that surprise mediates the relationship between individual's political beliefs and willingness to share news that they believed-to-be false - with this mediative role of surprise being smaller for the impact of political beliefs in the believed-to-be true news. This calls for a reflection about the role of *truth* in the post truth adjacent political environment. It seems to be the case that not only the objective, tested, empiric value of truth doesn't weight on our digital behaviour, but the subjective attribution of truth doesn't also explain people's sharing behaviours.

Individuals holding more positive beliefs about the political system and that identify more with the left ally parties, are less willing to share news, regardless of their attributed truth, or lack of (although the effect is stronger for the believed-to-be true news). There is also a direct effect of surprise in the likelihood of sharing both believed-to-be true and believed-to-be false news, which means that both believed-to-be true and believed-to-be false news have a higher likelihood of being shared if and when they cause surprise on the individuals. In the case of believed-to-be true news the elicited surprise does not seem to depend on the individual's political beliefs, differently from believed-to-be false news. In the case of the believed-to-be false news, more negative beliefs about the political system, seems to be predictive of higher surprise with the believed-to-be false news items, translating in a statistically significantly higher likelihood of sharing. The results suggest that people less identified with the political system may be more emotional about the overall news, and more prone to share them regardless if they perceive them as being accurate or false (the purpose of such sharing

is not the focus of this study, but the literature suggests it may be due to ideology or identity protection (Pereira et al., 2018).

Even with an accuracy focus embodied in the study, we conclude that people are very poor lie detectors. The way information is processed, and people distinguish between misinformation and information is through peripherical reasoning routes, picking on cues, either emotional, or cues that point to the credibility of the publisher. An accuracy focus helps reducing this issue, but without the regulation needed for the certification of accredited entities, under an independent management, the proliferation of fake news will continue to be a problem for our mental health and social systems.

Methodological Innovations

The current study has two main innovations in its design, (i) the multiforms design method, which allowed to have a more efficient data collection; and (ii) responsiveness, following this gamification principle, we designed the survey returning a cartoon character depending on the number of news correctly identified as true or false, which resulted in a higher engage and fewer drop-outs.

Limitations

The presented study relied only on self-report measures. Additionally, the pool of news items used in the survey contained a solely negative portrayal of the political actors depicted in them. Also, it is worth noting that, as the cognitive model here proposed is a causal model, it relies only in correlational data, as the only variables manipulated are moderators in the model.

Future directions

We suggest that future studies would use a pool of items that reflects both positive and negative portrayals of the issue at hand, and that the role of more emotions on the belief and share of fake news differently from accurate news. Additionally, we believe that it would be interesting to test the produced causal model on issues related to other than democratic partisan politics (e.g., public health, environmental sustainability, or the migration crisis).

Conclusion

The current work is not a literature review, but the cognitive model produced with it summarizes some of the findings that have been described in the most recent literature. The main contribution of this study is to distinguish between misinformative and informative news in terms of how individuals believe and are willing to share them, and to show that political misinformation has an advantage over political information because of the negative prior beliefs that individuals hold about the political landscape, and the heightened emotionality (specifically surprise) that it elicits in them. Moreover, individuals tend to give more credit to the news that give them more emotions, that is, the surprise and interest individuals manifested in the news predicted the degree to which they would perceive the news (both misinformative and informative) as credible.

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Attachments

Group 1: Set of misinformative news stories used in the survey.

partilhou uma ligação.
11 de setembro de 2019

Querem apagar a história, que canalhas! Então derrubem a ponte Dr. Oliveira Salazar,
derrubem o hospital Santa Maria, Dona Estefânia, São Francisco Xavier, Egas Moniz,
IPO, da Cruz Vermelha e outros. Derrubem a fundação Gulbenquia. Arranquem todas as escolas
industriais que ainda existe como Secundária. Não queriam porque não deixavam os canalhas
deixavam mamar

MSN.COM
Parlamento condena criação do museu Salazar
Votação teve a abstenção do PSD e CDS

👍😡😢 1,6 mil   889 comentários   720 partilhas

partilhou uma ligação.
18 de setembro de 2019

Isto é uma vergonha ter que pagar a estes chulos um canal que nem vejo

RTP FAZ SUBIR CONTA DA LUZ EM 6%
CONTRIBUIÇÃO PARA O AUDIOVISUAL
CONSUMIDORES PAGAM 991 MILHÕES EM SEIS ANOS

SEMANARIOEXTRA.COM
Electricidade sobe 6% para pagar salários MILIONÁRIOS da RTP

😡👍😢 mil   223 comentários   2 mil partilhas

👍 Gosto   ➦ Partilhar

partilhou uma ligação.
9 de setembro de 2019

JOANA AMARAL DIAS:
SENHORES COMO ANTÓNIO MEXIA VAMPIRIZAM A EDP

MEXIA GANHA 6 MIL EUROS POR DIA

70% DAS FAMÍLIAS NÃO CONSEGUEM AQUECER AS SUAS CASAS

PORTUGALGLORIOSO.BLOGSPOT.COM
EDP: Mexia ganha 6 mil euros por dia
Nos últimos 5 anos, Mexia ganhou 10 milhões euros! Em Portugal 70%...

447   95 comentários 780 partilhas

---

partilhou uma ligação.
18 de setembro de 2019

Proteção Civil um tacho pequeno para tantos socialistas

Manuel Jordão Gonçalves	Ricardo Ribeiro	Augusto Leite
Técnico	Realizar estudo	Assessor
33 113€/ano	37 214€/ano	46 971€/ano

DIREITAPOLITICA.COM
O ESCÂNDALO QUE SE PASSA NA PROTECÇÃO CIVIL
Quem nos protege da protecção civil? Licenciaturas falsas, boys contratados ...

704   89 comentários 1,6 mil partilhas

👍 Gosto   ↪ Partilhar

18 de setembro de 2019

O grande animal está a revelar-se, o que dirá se a filha for violada?????

Portugal - Liberdade em Democracia
11 de setembro às 23:10 · 🌐

...

PAN PROPÕE PERDÃO PARA VIOLADORES SEXUAIS

Uma das propostas do programa eleitoral do PAN, propõe que vitimas de violação sexual possam vir a perdoar os seus agressores.

André Silva, chama a esta proposta "justiça regenerativa".

O PAN pretende assim desculpabilizar violadores e agressores sexuais que cometem um dos crimes mais chocantes e cujas vitimas por vezes são menores e crianças de tenra idade.

😡👍😢 381   525 comentários 651 partilhas

😡👍😢 655   759 comentários 378 partilhas

👍 Gosto   ➤ Partilhar

Group 2: Set of accurate news stories used in the survey.

partilhou uma ligação.
16 de setembro de 2019

O Mundo e a pedofilia? FDP

PLENO.NEWS
Ex-chefe da ONU é condenado a 9 anos por pedofilia
Peter Dalglish foi detido no ano passado com dois meninos em seu quarto

143   36 comentários 18 mil partilhas

👍 Gosto   ↪ Partilhar

o partilhou uma ligação.
19 de setembro de 2019

SICNOTICIAS.PT
Ramalho Eanes diz que há uma "epidemia da corrupção" na sociedade portuguesa

1,1 mil   288 comentários 1,1 mil partilhas

partilhou uma ligação.
1 de outubro de 2019

Público

PUBLICO.PT
Jovens do CDS querem proibir políticos corruptos de exercerem funções públicas durante 20 anos

1,2 mil   288 comentários 410 partilhas

partilhou uma ligação.
4 de outubro de 2019

Eu não quero acreditar !?...

24.sapo.pt
SAPO24

24.SAPO.PT
Eleições: Costa recebe apoio de Manuela Eanes que pede respeito pela instituição militar

562   603 comentários 49 partilhas

partilhou uma ligação.

30 de setembro de 2019

https://expresso.pt/.../2019-09-30-PS-recusa-reuniao-urgente-...

E é isto....não passa nada não interessa nada...

EXPRESSO.PT
PS recusa reunião urgente no Parlamento sobre Tancos
O PSD pediu um debate de urgência sobre Tancos na Assembleia, o CDS...

473

249 comentários 385 partilhas

👍 Gosto   ➤ Partilhar