

**Resilient? Perceptions, Spread, and Impacts of Misinformation in the New Political
Information Environment**

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Abstract

Over the past years, Western democracies' media and political environments have experienced important changes. The proliferation of content producers, algorithmically-driven information distribution, declining trust in the media and governments, the rise of right-wing populism, and political polarization are all conducive to a political information environment in which true and false information coexists and citizens are increasingly divided into "truth publics," with different realities, facts, authorities, and narratives. This dissertation focuses on how the current political information environment can influence citizens' perceptions of and vulnerability to misinformation and examines the consequences for social cohesion and democracy.

Specifically, this dissertation asks: 1) How do citizens perceive misinformation, and what influences these perceptions? 2) How does the coexistence of different information environments in multilingual countries influence the spread of misinformation? 3) How is misinformation related to societal polarization?

In response to the first question, the first two chapters show that citizens have a broad understanding of misinformation, perceive many different forms of misinformation as being prevalent and harmful to democracy, and continue to be critical of politicians spreading misinformation. While perceptions of misinformation form a relatively coherent belief system, citizens' perceptions are influenced by their political information environment. Given current political discourses around misinformation, individuals with a right-wing ideology or consuming alternative right-wing media are more likely to perceive media misinformation as prevalent and less likely to perceive misinformation spread by social media users as prevalent and harmful than left-wing and centrist citizens. Right-wing citizens are also more indifferent to misinformation and less likely to support misinformation interventions, partly because they perceive current discourses around misinformation and content moderation as biased against them. I discuss how these findings can hinder the effectiveness of our response to misinformation.

To answer the second question, Chapter 3 takes advantage of the high prevalence of COVID-19 misinformation in the United States and differential exposure to U.S.-based information among Canada's English- and French-speaking populations to evaluate whether language creates a barrier to the spread of misinformation. The results suggest that Francophones

insulated from the English-language information environment had somewhat lower levels of misperceptions than exposed Francophones and Anglophones, in part because of their lower exposure to U.S.-based content on social media. Exposed Francophones (i.e., bilinguals), especially heavy social media users, were slightly more likely to believe and spread misinformation online. However, compared to Anglophones, their misinformation-sharing behaviors were less dependent on their exposure to U.S. content. This chapter highlights the necessity of considering the globalized and interconnected nature of information environments when evaluating national resilience to misinformation.

Finally, Chapter 4 introduces the concept of issue-based affective polarization – the distance between citizens’ positive feelings towards those who share their issue positions and negative feelings towards those who do not. It provides insights into the third question by showing that misinformation contributed to the high level of affective polarization on COVID-19 vaccines and climate change among the Canadian public by intensifying opinion divergence on these issues. Finally, it shows that affective polarization can persist even as the issue becomes less salient. The concluding chapter discusses the theoretical and practical implications of these findings.

Résumé

Au cours des dernières années, les environnements politiques et médiatiques des démocraties occidentales ont connu d'importants changements. La multiplication des producteurs de contenu, la distribution de l'information basée sur les algorithmes, la diminution de la confiance envers les médias et gouvernements, la montée de la droite populiste et la polarisation politique contribuent à un environnement d'information politique dans lequel les informations vraies et fausses se côtoient et les citoyens ont des conceptions différentes de la réalité. La présente thèse de doctorat examine comment l'environnement d'information politique peut influencer les perceptions de la mésinformation et la vulnérabilité des citoyens face à celle-ci, en plus d'en évaluer les conséquences pour la cohésion sociale et la démocratie.

La thèse s'attarde aux questions suivantes : 1) Comment les citoyens perçoivent-ils la mésinformation et qu'est-ce qui influence ces perceptions ? 2) Comment la coexistence de différents environnements d'informations dans les pays multilingues influence-t-elle la propagation de la mésinformation ? 3) Comment la mésinformation contribue-t-elle à la polarisation des citoyens ?

En réponse à la première question, les chapitres 1 et 2 montrent que les citoyens ont une conception élargie de la mésinformation, perçoivent différents types de mésinformation comme étant prévalents et dommageables pour la démocratie et sont critiques face à sa propagation. Bien que les perceptions de la mésinformation forment un système de croyances relativement cohérent, les perceptions des citoyens sont fortement influencées par leur environnement d'information politique. Considérant les discours actuels autour de la mésinformation, les citoyens ayant une idéologie de droite ou consommant des médias alternatifs de droite sont plus susceptibles de percevoir la mésinformation provenant des médias comme étant prévalente et moins susceptibles de percevoir la mésinformation provenant des utilisateurs des médias sociaux comme étant prévalente et dommageable pour la démocratie que les citoyens de gauche. Ils font aussi preuve de plus d'indifférence face à la mésinformation en général et ont moins tendance à appuyer les initiatives visant à contrer celle-ci. Les résultats montrent que ces différences idéologiques pourraient en partie s'expliquer par une perception chez les individus de droite que les discours publics sur la mésinformation sont biaisés contre eux. La thèse aborde les implications de ces résultats pour l'efficacité de notre réponse face à la mésinformation.

Pour répondre à la deuxième question, le chapitre 3 s'appuie sur l'exposition différenciée aux contenus américains en fonction de la langue au Canada pour évaluer comment la langue peut créer une barrière à la propagation de la désinformation. Les résultats suggèrent que les francophones isolés de l'environnement d'information anglophone étaient moins susceptibles de croire la désinformation sur la COVID-19 de par leur plus faible exposition aux contenus américains sur les médias sociaux. De manière un peu surprenante, les francophones consommant du contenu en anglais, surtout ceux utilisant fréquemment les médias sociaux, avaient davantage tendance à croire et propager de fausses informations que les anglophones. Cela dit, leur probabilité de partager de la désinformation était moins dépendante de leur exposition à du contenu en provenance des États-Unis. Ce chapitre met en lumière la nécessité de considérer la nature mondialisée et interconnectée des environnements d'information lorsque vient le temps d'évaluer dans quelle mesure un pays peut être considéré résilient face à la désinformation.

Finalement, le chapitre 4 introduit le concept de la polarisation affective sur les enjeux, soit le fait pour les citoyens d'avoir des sentiments positifs à l'égard de ceux qui partagent leurs opinions sur les enjeux et des sentiments négatifs à l'égard de ceux qui ont des opinions divergentes. Le chapitre démontre, en réponse à la troisième question, qu'il existe un fort niveau de polarisation sur les vaccins contre la COVID-19 et les changements climatiques dans la société canadienne et que la désinformation peut contribuer à la polarisation en accentuant les différends sur ces enjeux. Finalement, les résultats suggèrent que la polarisation affective peut persister dans le temps, même lorsque l'enjeu devient moins saillant. Le chapitre de conclusion discute les implications de ces résultats pour la recherche et les politiques publiques.

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Contribution to Original Knowledge

This dissertation makes a significant contribution by showing how perceptions of misinformation, resilience to misinformation, and the effects of misinformation are largely a reflection of the characteristics of the political information environment. More specific contributions are detailed below.

First, despite the potential consequences of perceptions of misinformation on political attitudes (Jones-Jang et al., 2021), media consumption and trust (Altay, Lyons, et al., 2023; van der Meer et al., 2023; Van Duyn & Collier, 2019), and the success of measures to combat misinformation (F. L. F. Lee, 2022), we still do not have a good understanding of what exactly these perceptions are (Hameleers & Brosius, 2022; Lecheler & Egelhofer, 2022). The first chapter provides descriptive evidence about citizens' perceptions of a comprehensive list of forms of problematic content, showing that, while a large proportion of citizens perceive each of them as frequently occurring in Canada and as harmful to democracy, disruptive forms of misinformation (e.g., foreign interference, astroturfing, news fabrication) are more likely to be defined as misinformation and are perceived as less frequent, but more harmful to democracy.

Second, the dissertation provides original insights into the sources of these perceptions, showing that, based on their ideology and media consumption behaviors, different groups of citizens are more concerned about different types of misinformation. Specifically, those with a right-wing ideology or consuming alternative right-wing media tend to perceive misinformation involving the media as more frequent and misinformation involving social media users as less frequent and harmful to democracy than those with a left-wing or centrist ideology and those not consuming these alternative outlets.

Third, the dissertation demonstrates that perceptions of misinformation form a relatively coherent belief system, something that had not been empirically verified. Specifically, I show that self-reported exposure to misinformation increases the perceived frequency and harmfulness of all types of misinformation and that one of the strongest predictors of whether an individual believes that a situation constitutes misinformation, is happening frequently, and is harmful to democracy is whether they believe that other forms of questionable content constitute misinformation, occur frequently, and are harmful to democracy.

Fourth, the dissertation helps us better understand the demand side of misinformation. Despite claims that we are living in a post-truth era, previous scholarship has not investigated the conditions that make the spread of misinformation less objectionable from a citizen's perspective. Evaluating how the purpose of the misinformation influences citizens' responses, I show that citizens generally perceive the spread of misinformation by politicians as objectionable and that their perceptions are only marginally affected by their issue positions. Put otherwise, they do not consistently perceive it as more acceptable to spread misinformation when the content aligns with their issue preferences. That being said, I find robust evidence that right-wing citizens are generally less critical of misinformation, less concerned about misinformation, and less likely to support measures to counter misinformation. I investigate some of the sources of these ideological differences, showing that right-wing citizens are more likely to believe that the truth is a political construct, more likely to support free speech over combatting misinformation, and more likely to think that public discourses around misinformation and content moderation on social media are biased against them. These perceptions of bias are, in turn, correlated with their tolerance of misinformation. Overall, the results illustrate how the politicization and weaponization of terms like "misinformation" and "fake news" have influenced citizens' perceptions of misinformation.

Fifth, the dissertation uncovers the limitations of focusing on national factors when studying resilience to misinformation, showing how the polarized information environment of neighboring countries, as well as language differences in a multilingual country, can impact resilience to misinformation. The dissertation demonstrates that French-speaking Canadians insulated from the English-language information environment were slightly less likely to hold misperceptions during the COVID-19 pandemic, partly because of their lower exposure to U.S.-based information on social media. The findings also reveal that bilinguals were more likely to believe in and spread misinformation, something that had not been documented in the Canadian context (and in other contexts as well, to the best of my knowledge).

Sixth, I introduce the concept of issue-based affective polarization – which I define as the gap between individuals' feelings toward those who share and those who do not share their issue positions – establish that it measures something different from partisan polarization, and show its relevance with respect to COVID-19 vaccines and climate change. While very few studies have empirically examined the relationship between misinformation and polarization (Druckman &

Levy, 2022), I demonstrate how misinformation can foster divisions on issues and, as a result, contribute to issue-based affective polarization.

Finally, this dissertation takes advantage of several distinctive characteristics of the Canadian case, such as the coexistence of French-language and English-language information environments, high exposure to U.S.-based information, or the relatively low level of elite polarization on COVID-19 and climate change, to increase our understanding of misinformation in the Canadian and Quebec contexts, where it has been studied much less extensively. By doing so, this dissertation both evaluates whether conclusions drawn in other countries apply to the Canadian case and develops and tests theories that can help better understand misinformation in similar contexts (e.g., other multilingual countries).

Contribution of Authors

Mathieu Lavigne is the first author of each chapter of this dissertation. The data collection, analysis, and writing of Chapters 1 and 2 were performed solely by the author.

Chapter 3 is co-authored with Aengus Bridgman, a Ph.D. candidate in the Department of Political Science at McGill University. As the first author, Mathieu Lavigne did most of the writing, performed all survey analyses, and contributed to the social media analysis by defining the social media data needs, creating the random sample of Twitter users for each language and region, building and testing the misinformation dictionary, and helping define the empirical strategy. Aengus was primarily responsible for writing the algorithms to extract data from Twitter using the API, testing the misinformation dictionary, and analyzing the social media data.

Chapter 4 is co-authored with Éric Bélanger, Professor in the Department of Political Science at McGill University. Mathieu Lavigne designed the survey battery and led the writing and data analysis process. He is consequently considered the first author of this chapter.

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Introduction

Donald Trump’s election as president of the United States in 2016 has been followed by an exponential growth in interest in misinformation and fake news among researchers, journalists, and the public, a trend reinforced by the COVID-19 pandemic. Yet, misinformation is hardly a new phenomenon. More than a century ago, Walter Lippman (1922) argued that it is impossible for democracies to develop a sufficiently informed citizenry because of citizens’ lack of interest in and understanding of the political reality, as well as their exposure to information that is heavily distorted through manipulation by political elites and the media. John Dewey’s (1927) diagnostic – which blamed new communication technologies for the fast dissemination of low-quality information¹ – and solutions – civic education and better dissemination of knowledge – sound surprisingly familiar today.

While misinformation has always existed, it is perceived as particularly prevalent and as posing a more critical threat to today’s democratic societies. This “information crisis” (LSE Commission on Truth, Trust, and Technology, 2018), “information disorder” (Wardle & Derakhshan, 2017), “disinformation order” (Bennett & Livingston, 2018), or “post-truth era” (Lewandowsky et al., 2017) experienced across Western democracies can hardly be understood without considering the important changes witnessed in their media and political environments. These transformations have made misinformation easier to produce and disseminate at a large scale and contributed to increased animosity and disputes over facts.

This dissertation is about how the current political information environment shapes citizens’ perceptions of and vulnerability to misinformation, contributing to a more polarized society. Does the recent hype around misinformation make citizens overly concerned about it? Is the current political information environment normalizing the spread of misinformation? Do elite and media discourses on the right and on the left contribute to citizens being more concerned about specific types of misinformation or having different levels of concern about misinformation in

¹ “A glance at the situation shows that the physical and external means of collecting information in regard to what is happening in the world have far outrun the intellectual phase of inquiry and organization of its results. Telegraph, telephone, and now the radio, cheap and quick mails, the printing press, capable of swift reduplication of material at low cost, have attained a remarkable development. But when we ask what sort of material is recorded and how it is organized, when we ask about the intellectual form in which the material is presented, the tale to be told is very different.” (Dewey, 1927, p. 179)

general? To what extent does the coexistence of different information environments in multilingual countries influence citizens' likelihood of being exposed to, believing, and sharing misinformation? How does the misinformation circulating in an information environment, and public discussions around it, impact societal polarization? Overall, I am interested in how public discourses around misinformation and the volume of misinformation in a given information environment interact with citizens' predispositions to influence whether citizens are concerned about or critical of misinformation, support measures to counter misinformation, are more or less likely to believe and share misinformation, and feel animosity towards those holding opinions different than theirs.

I investigate these questions in the Canadian context by combining observational survey analyses, survey experiments, and social media data. I demonstrate that the current political information environment has led to high levels of concern about misinformation in general but that, given the politicization of misinformation debates, important differences exist between left-wing and right-wing citizens, with the latter being more indifferent to misinformation in general. In a context where the U.S. information environment was highly polarized during COVID-19, I show that French-Canadians insulated from that environment were less likely to hold misperceptions throughout the pandemic. Finally, I introduce the concept of issue-based affective polarization², demonstrate its relevance in the case of COVID-19 vaccines and climate change, and illustrate how misinformation can both directly and indirectly foster affective polarization by increasing social disagreement and antagonism on salient issues.

This introductory chapter begins by discussing the current political information environment and how other scholars have theorized about its influence on public opinion. I then present an overview of the literature on resilience to misinformation, citizens' perceptions of misinformation, and the effects of misinformation to highlight some of the gaps that the empirical chapters of this dissertation aim to address. Finally, I present an overview of each chapter, the questions they seek to address, why the Canadian context is a relevant case for studying these questions, and the data and methods I use to answer them.

² We define issue-based affective polarization as the distance between positive feelings towards those who share one's issue positions and negative feelings towards those who do not.

The political information environment

The political information environment can be defined as:

“[t]he supply and demand of political news and political information within a certain society. The supply side encompasses the quantity and quality as well as the structure of political news and information available through various old and new media. The demand side encompasses how various segments within a society make use of political news and information and the quality of that information.” (Van Aelst et al., 2017, p. 4)

One of the promising approaches to understand how politics and the media interact with one another is the Politics-Media-Politics approach. According to that approach, “variations in political ecosystems have a major impact on media systems, values, practices, and resources, which can then have dependent, independent, and conditional effects on political processes” (Wolfsfeld et al., 2022, p. 6). Public opinion constitutes one dimension of political processes. Effects are considered dependent when the media simply amplify what is already happening in the political environment, independent when different media have different effects based on the incentives and constraints they face, and conditional when the interrelation between politics and the media varies based on the characteristics of the political information environment. The political and information environments each have institutional (e.g., distribution of political power, technological infrastructures), cultural (e.g., level of political polarization, sensationalism, level of false or harmful speech), and situational (e.g., election results, public attacks on the media by political elites) components (Wolfsfeld et al., 2022). Below, I discuss recent changes in the political and information environments and how they are likely to shape public opinion in the context of misinformation. These changes have allowed misinformation to grow and become a greater concern than before for Western democracy.

Changes in the media environment

The shift from a low to high-choice media environment and the digital revolution have significantly altered the way we produce and consume information. On the supply side, social media has been the most critical change happening since the turn of the 21st century. Social media has enabled information to spread more easily and rapidly than ever (Tucker et al., 2018). Given the low cost of disseminating information at a large scale online and the fact that anyone can theoretically become a content producer, this digital revolution has significantly reduced the media's gatekeeping role in at least two ways. First, while editorial decisions used to dictate what

information citizens should be aware of, these decisions are now partly made by algorithms, based on the content's virality and users' individual preferences (Blanchett et al., 2022; Schreiner et al., 2021; Trudel & Thibault, 2018). Second, social media makes it easier for politicians and opinion leaders interested in manipulating the public to directly communicate with their target audience, without the media playing the intermediary role (Van Aelst et al., 2017; Vos & Thomas, 2019). This loss in mediation and credibility cues have made the information environment more vulnerable to the dissemination of misinformation (Starbird, 2017).

If we turn our attention to the media themselves, the financial difficulties faced by this industry, especially local media, are not inconsequential for the provision of high-quality information (Lindgren & Corbett, 2023; Public Policy Forum, 2017, 2018). The current market is also characterized by greater competition for attention. The fact that social media algorithms (and consequently engagement) are strong determinants of what content is seen poses important challenges in terms of discoverability and creates incentives for clickbait and sensationalism (Blanchett et al., 2022).

On the demand side, the transition from a low to high-choice media environment is associated with an increased gap in news media use and political knowledge. To put it otherwise, because of the diversity of content available, it has become easier for those not interested in politics to avoid political news (or only consume infotainment) and for those interested in politics to consume even more political content than before. As such, individual capabilities (e.g., education) and preferences (e.g., political interest) have become better predictors of news consumption behaviors, further increasing inequalities in political knowledge between those with different levels of interest and educational attainment (Lind & Boomgaarden, 2019; Prior, 2007). This greater diversity of sources also means that those who do not trust mainstream outlets have alternative media, which do not necessarily respond to the same journalistic norms, they can turn to for information (Benkler et al., 2018). Finally, social media exposes citizens to a personalized and algorithm-driven information environment where misinformation can become viral because of its consistency with existing worldviews and capacity to generate emotive responses (Martens et al., 2018; Vosoughi et al., 2018).

This combination of factors is conducive to an information environment in which true and false information coexist and in which it has become harder for citizens to distinguish between the

two (Lavigne et al., 2023; Van Aelst et al., 2017). As a result, citizens are increasingly divided into “truth publics,” with different realities, facts, authorities, and narratives (Bridgman et al., 2022; LSE Commission on Truth, Trust, and Technology, 2018; Marietta & Barker, 2019).

Changes in the political environment

On the political dimension, the decline in government trust, the rise of right-wing populism, and societal polarization have also contributed to the misinformation problem. First, there is evidence that trust in government has declined in many countries since the 1960s, including the United States and Canada (Dalton, 2017). High levels of distrust are necessarily related to support for populist alternatives and belief in conspiracy theories, given that, by definition, these concepts characterize political elites as being either corrupted or secretly plotting against everyday people (Hameleers, 2021; Rooduijn & van Slageren, 2022). Distrust in governments can also lead citizens to expose themselves to and trust alternative sources of information, which is particularly problematic in situations where communicating information to the public is of utmost importance, like a pandemic (Connolly et al., 2019; Eberl et al., 2021).

Second, many countries around the Western world have experienced the rise of right-wing populist parties or candidates (Mudde, 2007; Norris & Inglehart, 2019; Skocpol & Williamson, 2012). This upsurge has contributed to current discourses of (un)truthfulness because of populism’s tendency to reject information that does not align with their Manichean worldview, to discredit experts and journalists as being part of the elites, and to construct alternative truths that resonate with everyday citizens’ feelings and experiences (Hameleers, 2020c; Waisbord, 2018). On the supply side, right-wing populist politicians have been disproportionately critical of established knowledge and eager to propagate alternative narratives that reinforce their populist appeal (Hameleers, 2020b, 2021; Hameleers & Minihold, 2022). On the demand side, those with populist attitudes are significantly more likely to have hostile media perceptions (Schulz et al., 2020), to perceive mainstream media as the enemy of the people (Fawzi, 2019) and to reject expert knowledge (Merkley, 2020).

Third, partisan affective polarization, which can be defined as the increasing distance between people’s positive feelings towards their preferred party (or party family) and negative feelings towards other parties, has been increasing in many, although not all, established

democracies (Boxell et al., 2022; Garzia et al., 2023; Gidron et al., 2020; Iyengar et al., 2012). Affective polarization can reinforce group biases in information processing, making individuals more likely to believe in-party-affirming misinformation (Jenke, 2023). It also increases the perceived stakes of political conflicts, making citizens less likely to punish the leader of their preferred party for spreading misinformation (Nyhan et al., 2020; Swire et al., 2017).

The consequences of the new political information environment

The new political information environment is a complex one, with multiple reinforcing mechanisms. In other words, as the Politics-Media-Politics model suggests, changes in the media and political environments are endogenous. Discourses by populist elites can diminish trust in authoritative sources of information and encourage citizens to consume alternative information sources (Egelhofer et al., 2022), but consuming these alternative sources can also contribute to declining trust in mainstream media, scientists, and politicians (Figenschou & Ihlebæk, 2019; Hameleers et al., 2022). Similarly, echo chambers, filter bubbles, and selective exposure to partisan media have the potential to polarize citizens (Gruzd & Roy, 2014; Levendusky, 2013; but see Guess et al., 2021) as much as polarization can increase citizens' tendency to select stories or outlets aligned with their ideology (Hollander, 2008; Merkley, 2021). This dissertation is not interested in disentangling the direction of causality on that matter. Rather, it seeks to improve our understanding of the consequences of the current political information environment in the context of misinformation.

The literature identifies two principal ways in which the supply of information can influence public opinion: priming and framing. Priming effects refer to the idea that *how much* an issue is discussed can increase its perceived salience and use by citizens when making political evaluations, while framing effects suggest that *how* an issue is discussed influences how citizens understand it (Scheufele & Tewksbury, 2007). For example, the simple fact that politicians and the media extensively talk about misinformation, irrespective of the content of their message, could contribute to citizens being more concerned about the issue (priming). Conversely, how exactly mainstream media, partisan media, or left-wing and right-wing politicians talk about misinformation could lead citizens to develop a different understanding of the issue based on what information they are exposed to (framing).

It is generally admitted that media coverage and elite cues can influence citizens' opinions (e.g., Lecheler & de Vreese, 2018; Van Duyn & Collier, 2019), including whether they are concerned about a given issue and support specific policies as a response (e.g., Maibach et al., 2010). Nevertheless, the effect of these cues is necessarily dependent on citizens' exposure to these messages and existing priors. Ideology, partisanship or interest can influence what types of information citizens are exposed to and their likelihood of accepting the information upon exposure. Some citizens are more likely to be exposed to a given message based on selective exposure³ (Iyengar & Hahn, 2009; Robertson et al., 2023; Stroud, 2008) or the fact that algorithms tend to recommend posts consistent with users' existing preferences (Sunstein, 2018; Thorson et al., 2021). Differences in acceptance are mostly the result of motivated reasoning, i.e., citizens' tendency to selectively accept information consistent with their existing priors (Kunda, 1990; Taber & Lodge, 2006). With this theoretical understanding in mind, this dissertation theorizes about and tests the implications of current discourses around misinformation.

The misinformation literature: Identifying the gaps

Definitions

Before going further into the three dimensions of the misinformation literature examined throughout the empirical chapters, vulnerability to misinformation, perceptions of misinformation, and the effects of misinformation, it is important to define the main concepts that I will be using in this dissertation. The first important distinction is between misinformation and disinformation.⁴ I define *misinformation* as false or misleading information, independent of the disseminator's intentions, whereas *disinformation* is when false or misleading information is deliberately shared to deceive, cause harm, or make political or financial gains (Erlich & Garner, 2023; Humprecht et al., 2023; Wardle & Derakhshan, 2017). Given that it is often difficult to identify the disseminator's intention, except when talking about more extreme or organized forms of deception like fake media or foreign interference, I use the term "misinformation" as an all-encompassing term that can describe a broad range of phenomena, including misleading connections, biased

³ Selective exposure is citizens' greater tendency to select media or stories that are consistent with their political ideology or partisanship.

⁴ At the beginning of the 20th century, mis- and disinformation were often studied from the lens of "propaganda," which is usually understood as information that portrays oneself in a favorable light or the opposition in an unfavorable light to rally public support (Born & Edgington, 2017).

interpretations, conspiracy theories or the fake news genre among others (Allcott & Gentzkow, 2017; Kapantai et al., 2021; Tandoc et al., 2018). The fake news genre is a form of disinformation that mimics the news format and is to be distinguished from the fake news label, i.e., accusations of “fake news” that aim to discredit mainstream media or specific news outlets (Egelhofer & Lecheler, 2019). These different forms of misinformation can have different degrees of deception, with studies showing that misinformation that is closer to the truth (or is only partially false) is more likely to be believed than entirely made-up stories (Bridgman et al., 2022; Hameleers, Humprecht, et al., 2021).

Studying misinformation involves distinguishing what is most likely true from what is most likely false. Given that science and knowledge can evolve, what is defined as misinformation depends on the current state of evidence and expert beliefs and can change over time (Vraga & Bode, 2020). While scientific consensus exists on issues like anthropogenic climate change, knowledge is more contested on other issues. One example is how the lab leak theory about the origin of COVID-19 was perceived as a conspiracy theory at the beginning of the pandemic and came to be perceived as more credible over time, although the most accepted theory continues to be that COVID-19 was the result of an accidental animal-to-human transmission (Gordon & Strobel, 2023; Lewis et al., 2023).

As suggested earlier, terms like “misinformation,” “disinformation,” and “fake news” have been politicized since 2016 and are now used as a label to discredit information one disagrees with. The most blatant example is Donald Trump’s use of the “fake news” label to sow distrust in mainstream media (Egelhofer & Lecheler, 2019; Farkas & Schou, 2018). As such, based on their ideology or the political party they support, citizens tend to have a different understanding of what constitutes misinformation. Right-wing citizens tend to accuse left-wing politicians and left-wing (or mainstream) media of spreading misinformation, while left-wing citizens tend to blame right-wing politicians and media (Lavigne et al., 2023; Tong et al., 2020; van der Linden et al., 2020).

Misinformation refers to false or misleading information per se, whereas *misperceptions* refer to beliefs in misinformation, that is, beliefs that are unsupported or inconsistent with the best available evidence (Nyhan & Reifler, 2010). An important concern in the literature on misperceptions is expressive responding, i.e., the idea that a large number of partisans voluntarily or insincerely report that they believe in politically congenial misinformation to express support

for their party (Schaffner & Luks, 2018). However, there is evidence that surveys can provide meaningful estimates of misperceptions, given that experiments designed to provide financial and non-financial incentives for accurate responses only marginally decrease reported beliefs in misinformation (Berinsky, 2017; Fahey, 2022; Peterson & Iyengar, 2021).

Finally, this dissertation discusses citizens' *perceptions of misinformation*, which refer to attitudes towards misinformation as an issue. These perceptions include a broad range of opinions about misinformation, from citizens' understanding of what constitutes misinformation to whether they believe that misinformation is prevalent and impactful, how concerned they are about it, whether they condemn (or are indifferent to) the spread of misinformation, or whether they support measures to counter misinformation (Hameleers & Brosius, 2022; Lecheler & Egelhofer, 2022).

Susceptibility to misinformation

A significant portion of the literature on misinformation has focused on identifying the characteristics that make individuals more or less likely to believe in and share misinformation. While believing in and sharing misinformation are two distinct phenomena, those most likely to hold misperceptions and spread misinformation often share the same characteristics.

Extensive literature demonstrates that citizens are motivated reasoners and have a confirmation bias, that is, they are more likely to believe in information consistent with their political predispositions and tend to seek out arguments confirming what they already believe (Kunda, 1990; Taber & Lodge, 2006). As such, individuals are significantly more likely to believe in and share misinformation aligned with their partisan identities, ideology, and issue positions (Miller et al., 2016; Morosoli, Van Aelst, Humprrecht, et al., 2022; Van Bavel et al., 2021; Van Bavel & Pereira, 2018). There is also evidence that ideological extremism increases the likelihood of endorsing and sharing partisan misinformation (Enders & Uscinski, 2021; Humprrecht et al., 2023; Rao et al., 2022).

Most research, especially in the U.S. context, finds that right-wing citizens are more likely to believe and share misinformation online than their left-wing counterparts (Allcott & Gentzkow, 2017; Garrett & Bond, 2021; Grinberg et al., 2019; Guess et al., 2019; Pickup et al., 2022). This ideological asymmetry can be explained by the current political information environment, where the most viral misinformation disproportionately comes from right-wing elites, media, or opinion

leaders (Garrett & Bond, 2021; González-Bailón et al., 2023; Mosleh & Rand, 2022). Therefore, this asymmetry does not necessarily reflect attributes inherent to the conservative ideology.⁵ When exposing citizens across the political spectrum to the exact same conspiracy theories and only varying the political orientations of the conspirators, left-wing and right-wing citizens become as likely to endorse them (Enders et al., 2022).

Media usage also strongly influences citizens' vulnerability to misinformation. Those who are heavy social media users and trust social media as a source of information are significantly more likely to believe in and spread misinformation (Boulianne et al., 2022; Bridgman et al., 2020; Humprecht, 2023; Humprecht et al., 2023; Morosoli, Van Aelst, Humprecht, et al., 2022; Pickup et al., 2022), especially if they are politically active (Valenzuela et al., 2019), have a conspiratorial mindset (Enders et al., 2021), or low levels of cognitive reflection (Stecula & Pickup, 2021b). Using or trusting alternative right-wing media also increases the likelihood of endorsing and sharing misinformation (Humprecht et al., 2023; Jamieson & Albarracin, 2020; Motta et al., 2020; Stecula & Pickup, 2021a; Winterlin et al., 2023), while consuming or trusting traditional media is associated with lower levels of COVID-19 and election-related misperceptions (Bridgman et al., 2020; Jamieson & Albarracin, 2020; Romer & Jamieson, 2021; Zimmermann & Kohring, 2020).⁶

As demonstrated in the last paragraph, trust is at the heart of the misinformation crisis, with citizens having to decide what information sources are trustable. As such, anti-intellectualism – the generalized distrust of experts and scientists – is also a significant predictor of the likelihood of believing in and sharing misinformation (Merkley, 2020; Merkley & Loewen, 2021; Pickup et al., 2022; Roozenbeek et al., 2020).

From a psychological perspective, citizens are more likely to believe in misinformation when they tend to think intuitively rather than analytically (Pennycook & Rand, 2019b), have a low tolerance of uncertainty (Alper et al., 2021), and do not believe in epistemic complexity

⁵ Lawson and Kakkar (2022) suggest that the ideological asymmetry is driven by low consciousness conservatives, with high consciousness liberals and conservatives having the same likelihood of sharing misinformation. However, Lin et al. (2023) fail to replicate these findings across five replication studies.

⁶ The effect of consuming and trusting mainstream media on misperceptions likely depends on the media system, with mainstream media presenting a greater risk of disinformation in some countries than in others (see Ruiz-Soler et al., 2021 for disinformation risk assessments in Canada). There is evidence that freedom of the press influences perceptions of misinformation in the European context (Vegetti & Mancosu, 2020).

(Rothmund et al., 2022). Negative emotions like anger can also encourage the motivated acceptance and sharing of misinformation (Weeks, 2015; Wintterlin et al., 2023).

Personality is another psychological component that influences citizens' likelihood of sharing misinformation. While most citizens share misinformation because they endorse it (Buchanan, 2020; Morosoli, Van Aelst, & van Erkel, 2022), those with high levels of narcissism and psychopathy are significantly more likely to share misinformation in general (Morosoli, Van Aelst, Humprecht, et al., 2022) and for entertainment and provocation purposes in particular (Morosoli, Van Aelst, & van Erkel, 2022).

Finally, citizens' likelihood of endorsing and sharing misinformation can vary based on situational factors. Specifically, vulnerability to misinformation and conspiracy theories tends to be higher during societal crises because of the need for answers and the fear, uncertainty, and feelings of lack of control that they engender (van Prooijen & Douglas, 2017). For example, individuals who felt more personal uncertainty during the COVID-19 pandemic were significantly more likely to endorse COVID-related conspiracy theories (Miller, 2020b; Šrol et al., 2021).

Researchers have used the elements listed above to evaluate resilience to misinformation at the national level, arguing, for example, that countries are more resilient to misinformation when they have lower levels of societal polarization, populist vote shares, audience fragmentation, media distrust, and social media use (Humprecht et al., 2020). These individual and aggregate-level approaches make it clear that the political information environment can have a strong influence on citizens' vulnerability to misinformation. What has not been sufficiently considered in the literature, however, is (1) the transnational nature of contemporary political information environments, which implies that resilience can be impacted by cross-national information transfers (for one exception, see Bridgman et al., 2021); (2) the role of language in the dissemination of misinformation, especially in multilingual countries with different information ecosystems coexisting alongside one another (recent studies about vulnerability to misinformation in different languages during the Ukraine war could be considered an exception, see Aslett et al., 2022). As detailed in the *Outline* section, this dissertation aims to start filling this gap by examining how Canadians exposed to the English-language information environment – especially the U.S. information environment, which was more polarized and in which there was more misinformation

circulating (Kerr et al., 2021; Lenti et al., 2023; Merkley et al., 2020; Pickup et al., 2022) – were more likely to believe in and share misinformation during COVID-19.

Perceptions of misinformation

Most of the literature on misinformation focuses on identifying the drivers of misperceptions and misinformation sharing (as detailed in the previous section) and evaluating the effectiveness of different solutions to combat misinformation (e.g., Bode & Vraga, 2015; Carey et al., 2022; Clayton et al., 2020; Roozenbeek et al., 2022; Wood & Porter, 2019). One area of research that remains understudied is citizens' perceptions of misinformation. A better understanding of these perceptions and where they come from is crucial given that they have the potential to increase political cynicism (Jones-Jang et al., 2021), decrease belief in accurate information and trust in the media (Altay, Lyons, et al., 2023; van der Meer et al., 2023; Van Duyn & Collier, 2019; but see Boulianne & Humprecht, 2023), and impact citizens' support for measures to counter misinformation (F. L. F. Lee, 2022).

Citizens are highly concerned about misinformation and its impacts and believe that they are frequently exposed to it (Bridgman et al., 2022; Knuutila et al., 2022; Newman et al., 2020). Yet, studies suggest that most citizens are not exposed to a large volume of misinformation (Allcott & Gentzkow, 2017; Allen et al., 2020; Grinberg et al., 2019), that sharing misinformation is a relatively rare activity (Guess et al., 2019), and that the effect of misinformation is often limited to increasing beliefs in false claims (Guess, Lockett, et al., 2020). This discrepancy has led some researchers to argue that we are experiencing a “perceptual crisis,” given that discussions of misinformation are more common than individuals' actual exposure to it (Hameleers & Brosius, 2022). Consequently, it is particularly important to better understand perceptions of misinformation and how they are influenced by the political information environment.

In the current context, where terms like “disinformation” and “fake news” have been weaponized to delegitimize (sources of) information one disagrees with (Farkas & Schou, 2018; Koc-Michalska et al., 2020; Tong et al., 2020; van der Linden et al., 2020), citizens are likely to have different perceptions of the prevalence of different types of misinformation depending on what political and media discourses they are exposed to. For example, consuming news on social and alternative media, rather than traditional media, is associated with stronger perceptions of mis- and disinformation related to the news media (Hameleers et al., 2022). To improve our

understanding of how and why perceptions of misinformation vary based on the type of misinformation, the first chapter of this dissertation descriptively examines citizens' perceptions of a broad range of potential forms of misinformation and demonstrates that citizens perceive different types of misinformation as more prevalent or harmful depending on their ideology and their media consumption behaviors.

Recent studies also increasingly suggest that there could be an ideological asymmetry in citizens' perceptions of misinformation. For example, Republicans are significantly less likely than Democrats or independents to support content moderation on social media (Kozyreva et al., 2023). However, it remains unclear whether these results generalize outside of the United States (R. Fletcher, 2021; Reuter et al., 2019). We also do not have a good understanding of what causes these ideological differences or what influences the perceived acceptability of spreading misinformation. The second empirical chapter aims to start filling that gap.

Democratic impacts of misinformation

Misinformation has important social and democratic consequences. First, misinformation is likely to distort policy debates and representation (Flynn et al., 2017). Moreover, individuals who held misperceptions about COVID-19 were significantly more likely to refuse to comply with public health guidance and get vaccinated (Roozenbeek et al., 2020). Unfounded claims of massive vote fraud by then-president Donald Trump during the 2020 U.S. presidential election also led to an attempt to overturn the democratic results of the election during the January 6th attack on the U.S. Capitol (Arceneaux & Truex, 2022). In Chapter 4, we focus on how misinformation can increase polarization and damage social cohesion.

The relationship between polarization and misinformation is likely mutually reinforcing (Tucker et al., 2018). However, in reviewing the causes and consequences of affective polarization, Druckman and Levy (2022) note that very few studies directly link misinformation to affective polarization. Moreover, given the literature's focus on the increasingly polarized U.S. context, researchers have paid more attention to how polarization increases vulnerability to misinformation than to the polarizing effects of misinformation.

Polarization has been shown to increase motivated reasoning. As a result, polarized citizens are more vulnerable to in-party-congruent misinformation or misinformation detracting political

opponents (Broockman et al., 2022; Jenke, 2023). In turn, misperceptions about the other party can further increase affective polarization (Ahler & Sood, 2018).

Polarization does not only increase the probability of accepting misinformation upon exposure, but also the probability of being exposed to it in the first place. While the prevalence of echo chambers on social media is probably overstated (Dubois & Blank, 2018; Guess, 2021), those with stronger partisan identities are more likely to deliberately consume ideologically slanted or unreliable (especially on the right side of the political spectrum) news sources online (Robertson et al., 2023). Exposure to partisan media, because they tend to engage in outrage discourses (Sobieraj & Berry, 2011), can strengthen affective polarization (Lelkes et al., 2017; Levendusky, 2013) and further increase misperceptions about opposing candidates (Garrett et al., 2019).

The above paragraphs made it clear that political polarization can increase vulnerability to misinformation, but misinformation also has the potential to polarize citizens. First, misinformation that becomes viral tends to provoke strong negative emotions or generate outrage (Vosoughi et al., 2018), which can increase affective polarization (Serrano-Puche, 2021). Second, conspiratorial beliefs (which constitute one type of misperceptions) tend to be associated with attitudinal changes. Such attitudinal changes often increase the distance between the opinions of those who believe in conspiracy theories and those who do not, which is conducive to interpersonal or intergroup conflicts (Carignan & Morin, 2022; Toribio-Flórez et al., 2023). This argument, while compelling, has not been tested empirically. Consequently, the fourth chapter of this dissertation introduces the concept of issue-based affective polarization – the gap between positive feelings towards individuals who share one’s issue positions and negative feelings towards individuals who do not – and demonstrates how misinformation can increase affective polarization by fostering divisions on issues.

Outline of the dissertation

Research questions and overview

Building on the theoretical background provided in the current introductory chapter, this dissertation aims to address the following general research question:

How and with what consequences does the current political information environment influence citizens’ perceptions of and vulnerability to misinformation?

This general question can be broken down into three sub-questions that are addressed in the four empirical chapters of this dissertation. Because the dissertation chapters are written as stand-alone research articles, the justification and theory included in each article might overlap. However, each chapter focuses on a different research puzzle, as detailed below.

1. How do citizens perceive misinformation and what influences those perceptions?

Chapters 1 and 2 aim to better understand citizens' perceptions of misinformation and how these perceptions are influenced by citizens' ideology and political information environment. Scholars have developed typologies to distinguish between different forms of misinformation (e.g., Kapantai et al., 2021; Tandoc et al., 2018), yet most studies examine perceptions of mis- and disinformation as a whole (Knuutila et al., 2022; Vegetti & Mancosu, 2020) or focus on only a few types of misinformation (F. L. F. Lee, 2022; Newman et al., 2018). To improve our descriptive understanding of citizens' perceptions of misinformation, Chapter 1 relies on an extensive list of potential misinformation scenarios and documents the extent to which they are perceived as constituting a form of misinformation, as frequently occurring in Canada, and as harmful to democracy. The results show that citizens are concerned about the prevalence and impacts of all types of potential misinformation. However, the forms of misinformation that are more intentional and disruptive – what Pamment et al. (2018) label “major-league information influence” – are perceived as less frequent, but comparatively more harmful to democracy.

Chapter 1 further investigates the sources of these perceptions, namely, whether citizens perceive some types of misinformation as more prevalent and harmful based on their ideology and media consumption behaviors. I document how, given attacks on mainstream media by the populist right (Egelhofer & Lecheler, 2019; Farkas & Schou, 2018), those with a right-wing ideology or consuming alternative right-wing media tend to perceive misinformation scenarios involving the media as more prevalent. This dissertation is also written in a context where (1) influential right-wing figures like Donald Trump have been banned from social media platforms and have accused these platforms of anti-conservative biases (Calice et al., 2023; Haimson et al., 2021; Washington Post, 2018), (2) those on the right tend to attribute more importance to protecting free speech than combatting misinformation (Kozyreva et al., 2023) and, (3) because of actual platform violations (e.g., posting misinformation or hate speech), right-leaning users have been more likely to see content they posted online removed by platforms than left-leaning users (Barrett & Sims, 2021;

Haimson et al., 2021; Jiang et al., 2019, 2020). As a result, this chapter demonstrates that those with a right-wing ideology or consuming alternative right-wing media tend to perceive potential misinformation involving social media users as less prevalent and harmful to democracy than left-wing citizens and those not exposed to alternative media. While the findings provide clear evidence that perceptions of misinformation are influenced by the political information environment, I show that perceptions of misinformation nevertheless form a relatively coherent belief system. Specifically, citizens concerned about one type of misinformation are more likely to also be concerned about others and self-reported exposure to misinformation increases the perceived prevalence and harmfulness of all types of misinformation.

Chapter 2 is about citizens' tolerance of misinformation. Claims that we live in a post-truth era where misinformation has been normalized are relatively common (e.g., Kakutani, 2019). Still, very few studies directly assess how much citizens value the truth over other considerations in today's democratic societies. Chapter 2 first examines how acceptable spreading misinformation is considered to be based on the purpose of the misinformation and citizens' issue preferences and ideology. Building on studies in ethics and public opinion, I expected that spreading misinformation would be considered more acceptable when based on socially desirable goals than self-serving goals. I do not find evidence for that theory, with the results showing that citizens tend to consider it unacceptable to spread misinformation no matter what the purpose is.⁷ I then examine how issue preferences and ideology influence the perceived acceptability of spreading misinformation. The results show that citizens who want more action on COVID-19 and climate change perceive it as less acceptable to spread misinformation on these issues than those who oppose more decisive actions, and that those with a left-wing ideology find it less acceptable to spread misinformation in general, even when the goal is to encourage others to take action against COVID-19 and climate change.

This chapter includes a follow-up study to better understand this ideological asymmetry in perceptions of misinformation. I investigate whether ideological differences can be generalized to a broad range of measures of perceptions of misinformation (e.g., citizens' level of concern about misinformation, whether they support different measures to combat it) and examine some of the

⁷ As detailed in Chapter 2 and in the *Discussion* section, this result could partly be explained by the softness of the treatment and social desirability bias.

mechanisms that could help understand why right-wing citizens are more indifferent to misinformation. Perceptions of bias in public discourses around misinformation and content moderation on social media constitute one mechanism of interest, given cues from right-wing elites and media that social media platforms have an anti-conservative bias or censor conservative speech (Calice et al., 2023; Haimson et al., 2021; Washington Post, 2018).⁸ Cue taking from conservative politicians and media combined with greater experience of content moderation among right-wing users (Haimson et al., 2021) are expected to influence perceived platform bias and censorship (Calice et al., 2023; Vogels et al., 2020) and, as a result, make citizens less critical of what is defined as misinformation. Chapter 2 provides some support for that theory.

2. How does the coexistence of different information environments in multilingual countries influence the spread of misinformation?

The third empirical chapter evaluates how the linguistic divide in Canada shapes citizens' vulnerability to misinformation. There is evidence that the pandemic response was more polarized in the United States than in Canada (Kerr et al., 2021; Merkley et al., 2020), with some conservative elites and media downplaying the seriousness of the virus or even spreading misinformation about COVID-19 (Green et al., 2020; Jamieson & Albarracin, 2020; Motta et al., 2020; Romer & Jamieson, 2021; Stecula & Pickup, 2021a). As a result, United States residents were more likely to spread misinformation than residents of other English-speaking countries (Pickup et al., 2022) and might have disproportionately contributed to the global spread of misinformation (Al-Zaman, 2022; Lenti et al., 2023). Chapter 3 takes advantage of the linguistic divide in Canada and the fact that English-language Canadians tend to be highly exposed to content from the United States compared to French-speaking Canadians (F. J. Fletcher, 1998; Newman et al., 2023; Taras, 2015) to examine how language can create a barrier to the cross-country spread

⁸ Evaluating whether an ideological bias exists is a complex issue. For example, biases can be caused both by the input data (the total volume of left-leaning and right-leaning content available on the platform) and the algorithms themselves (Kulshrestha et al., 2019). For example, there is more left-leaning content produced on Twitter, which causes a bias in the input data, but the ranking system somehow reduces that bias by making conservatives more likely to see conservative content and liberals more likely to see liberal content (Kulshrestha et al., 2019). While more research is required, some studies show that Facebook pages that identify themselves as right-leaning or share right-wing content tend to perform similarly or even outperform left-leaning pages (Gogarty et al., 2020; Martinez, 2018, 2019). If right-leaning accounts are more likely to see content they posted removed by social media platforms (Haimson et al., 2021), research suggests that it is because of actual violations of platform rules. There are no partisan or ideological differences in content removal when controlling for volumes of misinformation and hateful speech (Jiang et al., 2019, 2020).

of misinformation. Building on a recent study that shows that exposure to content from the United States was associated with greater vulnerability to COVID-19 misinformation among Canadians (Bridgman et al., 2021), I find that French-speakers insulated from the English-language information environment were less likely to hold COVID-19 misperceptions because of their lower exposure to U.S. content and misinformation on social media.

I also find that Francophones exposed to the English-language information environment, especially heavy social media users, had slightly higher levels of misperceptions than Anglophones, a situation that had not been documented before. I theorize that this difference could stem from the fact that bilinguals can be exposed to misinformation in both French and English and could be more likely to suffer from information overload (Dolinsky & Feinberg, 1986), which is associated with greater vulnerability to misinformation (Andrejevic, 2013; Laato et al., 2020; Tandoc & Kim, 2022). Using a sample of highly active Twitter users, I examine whether exposed Francophones were also more likely to produce misinformation-related tweets and retweets during the pandemic and the extent to which they were impacted by U.S.-based misinformation compared to Anglophones.

3. How can misinformation foster societal polarization?

The concept of affective polarization – the increasing gap between individuals' positive feelings toward their in-group and negative feelings toward the out-group (Druckman & Levy, 2022) – has almost always been studied from a partisan perspective, with many researchers even including political parties in their definition of affective polarization (e.g., Druckman et al., 2021; Gidron et al., 2020). To better understand the consequences of misinformation, Chapter 4 introduces the concept of issue-based affective polarization, defined as the distance between positive feelings towards those who share one's issue positions and negative feelings towards those who do not. Building on the literature on opinion-based groups, which states that political opinions can form the basis of social identities and contribute to in-group and out-group differentiation (Bliuc et al., 2007, 2015; Hobolt et al., 2021), Chapter 4 uncovers high levels of affective polarization on COVID-19 vaccines and climate change in the Canadian public. Such high levels of affective polarization are interesting to observe in a context where elite-level polarization was relatively low. More importantly in the context of this dissertation, Chapter 4 shows that misinformation can both directly and indirectly increase affective polarization by fueling divisions on these issues. The

chapter reveals that these effects can be long lasting, as affective polarization on COVID-19 vaccines had only marginally declined in 2022, after vaccine mandates and other sanitary restrictions had been removed and the issue had become less salient.

Dissertation context

All the articles of this dissertation focus on the Canadian case. Canada is a well-suited case for studying the importance of the political information environment in the context of misinformation for multiple reasons.

First, existing frameworks to compare resilience to misinformation across countries would lead us to believe that Canada is relatively resilient to misinformation (Boulianne, 2021; Humprecht et al., 2020), despite Canada experiencing the same changes in its media and political environments as other countries, including an increase in political and media distrust (Brin et al., 2023; Newman et al., 2023; Dalton, 2017), the rise of right-wing populism (Gillies et al., 2023), and strengthening partisan affective polarization (Boxell et al., 2022; Cochrane, 2015; Johnston, 2023). The federal government has adopted a series of measures over the past five years to combat misinformation, including (1) the Critical Election Incident Public Protocol, to alert the public of severe cases of election interference; (2) the Digital Citizen Contribution Program, to support research and initiatives that increase citizens' resilience to disinformation; and (3) the Elections Modernization Act, which increased ad transparency and limited spending by foreign actors during elections. As such, the 2019 and 2021 Canadian federal elections were minimally impacted by mis- and disinformation (Bridgman et al., 2022; Owen et al., 2020). There also was a relatively high level of elite consensus on COVID-19 in the first stages of the pandemic (Merkley et al., 2020), contributing to the media coverage of the pandemic being less politicized (Pickup et al., 2021; Sommer & Rappel-Kroyzer, 2022) and citizens being less likely to share misinformation upon exposure than in the United States (Pickup et al., 2022).

This relative resilience by no means indicates that Canadians are immune to misinformation. However, it makes Canada a particularly interesting case in the context of this dissertation given Canadians' high exposure to information, media, and cultural products from the United States (Bridgman et al., 2021; F. J. Fletcher, 1998; Newman et al., 2023; Taras, 2015), a country that is considered significantly less resilient (Humprecht et al., 2020; Pickup et al., 2022). When considering perceptions of misinformation, this proximity could contribute to a perception

gap where citizens, informed by cues they receive from the United States, exaggerate the prevalence and impacts of misinformation in the Canadian context (Bridgman et al., 2022). While models of resilience to misinformation tend to focus on national factors (e.g., Humprecht et al., 2020), this proximity also allows me to document the influence of the United States' political and information environments in the Canadian context and demonstrate the importance of considering cross-national information flows when assessing the impacts of misinformation (Chapter 3).

Second, Canada is a multilingual country in which a significant share of the population is unilingual. It has two distinct information ecosystems, one in French and one in English (F. J. Fletcher, 1998; Taras, 2015), making it a good case to investigate how language – or the information environment that one is embedded in – can influence the dissemination of misinformation in multilingual countries, something that has only been minimally examined in the current misinformation literature (Aslett et al., 2022; Cantarella et al., 2023).

Third, Chapter 4 aims to show that issue-based affective polarization can exist beyond partisan identities and can be fueled by misperceptions. The fact that elite polarization on COVID-19 vaccines and carbon pricing, the two issues of interest in this chapter, was relatively low, with the right-wing Conservative Party promising to increase vaccination rates to 90% within two months (Jones, 2021) and including, for the first time, carbon pricing into their platform (Conservative Party of Canada, 2021), makes Canada a relevant case for disentangling issue-based polarization from partisan polarization.

Data

This dissertation required a massive data collection effort, including two original surveys administered during the 2021 Canadian federal and 2022 Quebec provincial elections, as well as a largescale dataset of around 100,000 highly active Canadian Twitter users, all their follows, and all their tweets and retweets in 2020.

Chapters 1, 2, and 4 rely on survey data collected as part of the 2021 Canadian Election Misinformation Project, a partnership led by the Media Ecosystem Observatory (McGill University) and the Policy, Elections & Representation Lab (University of Toronto) that aimed to document and protect against major mis- and disinformation disruptions during the 2021 Canadian federal election. This project received ethics approval at McGill, REB File #: 21-08-028. I acted

as the Lead Survey Analyst of this project, which allowed me to design and include survey batteries and experiments to capture citizens' exposure to and perceptions of misinformation, as well as affective polarization on COVID-19 vaccines and climate change. This survey was administered online to a quota-based (age, gender, region) sample of 7,302 Canadians during the election campaign, of which 2,799 were reinterviewed in the post-election period. The sample was provided by Dynata.

The second and fourth chapters also draw on data collected during the 2022 Quebec provincial election. Given the high demand for research about the role of misinformation in provincial elections in Canada, I acted as the Director of the *Projet sur la désinformation électorale au Québec* (see Lavigne et al., 2023 for the Project's report). This project, conducted with the Centre for Media, Technology, and Democracy at McGill, aimed to identify misinformation circulating during the election period, document citizens' perceptions of misinformation, and evaluate media coverage of misinformation (the latter of which was done in partnership with the *Centre d'études sur les médias* at Laval University). Given the very similar nature of the project, the ethics approval obtained for the Canadian Election Misinformation Project was amended to include other Canadian provincial elections occurring between June 2022 and June 2023. One type of data collected by this project was a rolling cross-section survey of 100 Quebecers per day (for a total of more than 3,700 respondents) during the election campaign, combined with a post-election survey of 1,545 Quebecers recontacted from the campaign-period survey. The survey was administered online using a quota-based (age, gender, region, language) sample provided by Léger. This survey allowed me to field the follow-up study (Study 2) included in Chapter 2, which further examines ideological differences in attitudes towards misinformation. It also included the same questions about affective polarization on COVID-19 vaccines as the ones asked during the 2021 Canadian federal election. These data were used to evaluate, in Chapter 4, whether affective polarization had decreased as the issue became less salient and vaccine passports and other sanitary restrictions were abandoned.

Chapter 3, which focuses on language differences in the likelihood of believing in and spreading misinformation, relies on two data sources. First, I evaluate language differences in misperceptions using a largescale multi-wave survey of Canadians collected by the Media Ecosystem Observatory between March and August 2020. I was provided with the data and did

not participate in creating the survey questionnaire or administering the survey. This project was approved by the University of Toronto Social Sciences, Humanities and Education REB, protocol #00038251. A quota-based (age, gender, region) sample of about 2,500 respondents per week answered the survey for a total of around 40,000 respondents. Dynata provided the sample. The survey has an irregular panel component, with about half of the respondents interviewed during the first four waves also answering a subsequent wave. The survey includes large batteries measuring media consumption behaviors and COVID-19 misperceptions, allowing me to examine how exposure to the English-language information environment (especially U.S. media) was associated with increased misperceptions during the COVID-19 pandemic.

Lastly, I measure language differences in sharing behaviors on social media using a dataset of around 100,000 highly active Canadian Twitter users, with information about all their tweets, retweets, and follows in 2020. These users collectively produced close to 100 million tweets and retweets in 2020. Those Canadian users were identified using Google Maps API (Application Programming Interface), from all followers and follows of an extensive list of Canadian members of parliament, senators, journalists, and media organizations during the 2019 Canadian federal election. This original dataset was collected in early 2021 using Twitter's API. It includes between 15,950 and 25,464 users from each Canadian region (Atlantic, Quebec, Ontario, Prairies, West). More details about the survey and social media samples are included in the empirical chapters and in the *Appendices*.

Methods

All the articles in this dissertation use micro-level data and focus on how individuals' political information environment, measured based on their media consumption behaviors and political orientations, influence their perceptions of and vulnerability to misinformation. As detailed in the *Discussion* section, resilience to misinformation and perceptions of misinformation can also be studied from a macro-level perspective, by evaluating the effects of different political information environments at the country-level.

The dissertation is based on a multi-methods approach. All chapters rely on statistical methods commonly used in the political science literature, like regression models (which may vary in their inclusion of interaction terms, fixed effects, clustered standard errors, post-stratification weights, etc.), T-tests, and causal mediation analysis (Tingley et al., 2014). I use the latter to

examine the direct and indirect effects of misperceptions on affective polarization in Chapter 4. I also rely on entropy balancing (Hainmueller, 2012, 2022), a technique similar to matching, to show that differences in COVID-19 misperceptions hold when balancing linguistic groups on relevant covariates in Chapter 3 and to ensure that the 2021 and 2022 samples are comparable when evaluating whether affective polarization on vaccines has decreased over time in Chapter 4. Details about the packages and software used to perform the analyses are included in the Appendices.

Most of the analyses are observational (or correlational), except for the two online survey experiments in Chapter 2. The first experiment is a question-wording experiment that examines whether the perceived acceptability of politicians spreading misinformation is influenced by their stated purpose. The second experiment uses a prompt to evaluate whether priming perceptions of ideological bias in public discourses around misinformation impacts citizens' attitudes towards misinformation.

Finally, I use qualitative and quantitative content analysis in Chapter 3 to examine whether language influences the spread of COVID-19 misinformation online. I use a dictionary approach to identify misinformation tweets and retweets, with hand coders manually coding a subsample of tweets to ensure the validity of the dictionary. The dictionary is a substantially expanded and translated version of the COVID-19 misinformation dictionary developed by Evanega et al. (2020). It includes misinformation that spread nationally and internationally, covering a broad range of themes such as conspiracy theories (e.g., microchips, 5G, Bill Gates, George Soros), the origin and severity of the pandemic, and fake remedies.

Conclusion

Overall, this dissertation shows how the current political information environment has shaped citizens' perceptions of and resilience to misinformation. More specifically, I improve our understanding of 1) how citizens perceive misinformation and what influences these perceptions, 2) how the coexistence of different information environments in multilingual countries can influence the spread of misinformation, and 3) how misinformation can make citizens more polarized on salient issues. These objectives correspond to the three sections of this dissertation.

Section 1: Citizens' Perceptions of Misinformation

Fears of misinformation, its prevalence, and its impact have received a lot of public attention over the past years. Some researchers have argued that concerns about misinformation are overhyped (McGregor & Kreiss, 2020; Nyhan, 2019) and that public discussions on the topic have contributed to a perceptual crisis, where citizens are more exposed to discussions of misinformation than to misinformation itself (Hameleers & Brosius, 2022). Labels like “misinformation” and “fake news” have also been politicized, leading to different perceptions of misinformation based on individuals' information consumption behaviors and existing political priors (Farkas & Schou, 2018; Koc-Michalska et al., 2020; Tong et al., 2020; van der Linden et al., 2020). Finally, claims that post-truth politics has contributed to the normalization of misinformation and made citizens more indifferent to its spread are common but lack empirical validation. In this context, it has become crucial to better understand citizens' perceptions of misinformation.

Chapters 1 and 2 evaluate different aspects of citizens' perceptions of misinformation: Chapter 1 focuses on how citizens understand misinformation, its prevalence, and its impact, whereas Chapter 2 examines citizens' attitudes towards misinformation, that is, to what extent they tolerate its spread and support measures to combat it. Chapter 1 reveals that citizens generally have a broad understanding of misinformation and are highly concerned about different types of misinformation. Their perceptions of misinformation also form a relatively coherent belief system, with perceptions of one form of misinformation influencing perceptions of others. Both chapters uncover significant ideological differences in perceptions of misinformation. Chapter 1 shows that right-wing citizens and those consuming alternative right-wing media are generally more likely to perceive media misinformation as frequent and less likely to perceive misinformation from social media users as frequent and harmful to democracy than citizens with a more centrist or left-wing ideology and those not exposed to these alternative outlets. Building on these findings, Chapter 2 demonstrates that while citizens from across the political spectrum tend to be critical of misinformation and support measures to combat it, right-wing citizens are nevertheless significantly more indifferent to misinformation and less supportive of government and social media initiatives on this issue. These findings illustrate the consequences of the polarization of misinformation debates and highlight the necessity of assessing how citizens' perceptions of misinformation could influence the effectiveness of our solutions against misinformation.

Chapter 1. Fake, Frequent, Harmful: Unpacking and Explaining the Citizen View of Misinformation

Abstract

Mis- and disinformation have been very salient political issues since 2016, yet we do not have a good understanding of citizens' perceptions of misinformation. To unpack these perceptions, I draw upon an original survey conducted during the 2021 Canadian federal election, in which respondents were exposed to different scenarios that could be perceived as constituting misinformation and that involved the actors commonly associated with misinformation (politicians, the media, social media users, and foreign governments). For each scenario, respondents were asked about the extent to which it constitutes a form of misinformation, occurs frequently in Canada, and is harmful to democracy. The results show that citizens have a broad understanding of misinformation and are concerned (perceived frequency and harmfulness) about most scenarios. Still, citizens' perceptions are largely influenced by their political information environment. Right-wing individuals and those who consume alternative right-wing media tend to perceive potential misinformation involving the media as more frequent, considering right-wing elites' use of the fake news label to attack and delegitimize mainstream media. In contrast, they perceive situations involving social media users (e.g., false information, hate speech) as less frequent and harmful than left-wing and centrist citizens. Despite these differences, perceptions of misinformation form a relatively coherent belief system, with citizens concerned about a specific type of misinformation being more likely to be concerned about others. The findings provide insights into how citizens understand and perceive misinformation in the current information environment and how the politicization of misinformation has influenced these perceptions.

Keywords: perceptions, misinformation, disinformation, fake news, media, social media, ideology

Introduction

Public attention to mis- and disinformation topics has grown exponentially since 2016. Recent scholarship suggests that elite and media discourses around misinformation might have contributed to citizens believing that misinformation is more prevalent and impactful than it actually is (Hameleers & Brosius, 2022; Lecheler & Egelhofer, 2022; T. Lee, 2021), with consequences for

their attitudes towards politics and the media (Guess et al., 2017; Jones-Jang et al., 2021; van der Linden et al., 2020), their ability to distinguish between real and fake news (Van Duyn & Collier, 2019) and their willingness to comply with public health measures during a pandemic (Hameleers et al., 2020). While terms like “misinformation,” “disinformation,” and “fake news” can be used to describe real problems in the information environment, they have also become part of larger political struggles and have been weaponized to discredit individuals, organizations, and information one disagrees with (Farkas & Schou, 2018; Hameleers & Brosius, 2022; Tong et al., 2020; van der Linden et al., 2020). These discourses around misinformation can lead to very different perceptions of misinformation depending on one’s primary source of information and political predispositions. Still, citizens’ perceptions of misinformation, and the basis of these perceptions, remain largely understudied.

This paper uses an innovative survey design conducted during the 2021 Canadian federal election to examine citizens’ perceptions of different scenarios that could be associated with the “misinformation” label. Specifically, respondents were asked about the extent to which described situations constitute misinformation, occur frequently in Canada, and are harmful to democracy. This article has two main objectives: (1) comparing perceptions of different types of potential misinformation at the aggregate level and (2) better understanding what might influence perceptions of misinformation at the individual level. Using descriptive statistics and visual representation, I first unpack citizens’ perceptions of different types of potential misinformation. I show that most citizens are concerned about misinformation, as they consider that each scenario is occurring frequently and is harmful to democracy. However, perceptions do vary based on the type of misinformation: scenarios that involve greater levels of deception, like news fabrication or astroturfing, are generally perceived as more harmful (although variation in perceived harmfulness is relatively low) but as occurring less frequently than other forms of misinformation like the use of clickbait titles or biased media coverage.

Second, I turn to individual-level dynamics and examine how citizens’ information environment – i.e., their ideology, their media consumption behaviors, and their exposure to misinformation – informs their perceptions of different types of misinformation. I also evaluate whether citizens’ perceptions of misinformation form a coherent belief system and find evidence that, while individuals have different perceptions of different types of misinformation, their

perceptions of one potential misinformation scenario largely depend on their evaluation of other potential misinformation scenarios.

Canada is a case where the gap between reality and perceptions of misinformation is likely to be important. On the one hand, when considering the factors included in national resilience models, Canada is expected to be relatively resilient to misinformation (Boulianne, 2021; Humprecht et al., 2020). Canadians have (or had until very recently⁹) comparatively high levels of trust in major news outlets (Newman et al., 2018; Owen et al., 2020), which present a relatively low risk of disinformation compared to mainstream media in other countries (Brin et al., 2021). The federal government has been relatively proactive in adopting policies and regulations to combat misinformation and research shows that misinformation did not significantly impact the results of the 2019 and 2021 federal elections (Bridgman et al., 2022; Garnett & Pal, 2022; Owen et al., 2020). On the other hand, because of Canada's proximity to the United States and the volume of public discussions of misinformation, Canadians express high levels of concern (Bridgman et al., 2022) and tend to believe that they are frequently exposed to it (Boulianne, 2021; Boulianne, Belland, Tenove, et al., 2021).

This paper provides insights into citizens' perceptions and knowledge of misinformation, showing that citizens are highly concerned about most types of misinformation, that perceptions of one type of misinformation tend to influence perceptions of others, and that perceived exposure to misinformation tends to influence perceptions of all types of misinformation. The findings further demonstrate how citizens' information environment tends to make them more concerned about some types of misinformation than others and reveal notable left-right ideological differences on that matter. A detailed examination of citizens' perceptions of misinformation can contribute to identifying democratic vulnerabilities and informing government and media responses to misinformation. Specifically, determining what is understood as constituting misinformation and perceived as frequent and harmful for democracy can help political actors and traditional media organizations concerned with restoring public trust to adopt tailored legislative, operational, or educational measures to address citizens' concerns.

⁹ That comparative advantage has been disappearing given the important decline in trust in the media in Canada since 2018, especially among Anglophones, see Newman et al. (2023) and Brin et al. (2023).

Unpacking citizens' perceptions of (different types of) misinformation

Misinformation can be defined as false or misleading information – i.e., information that is not consistent with the best available evidence (Vraga & Bode, 2020). Misinformation is thus understood as an overarching concept that encompasses falsehoods that are shared both accidentally or with the intention to deceive or cause harm (the latter is referred to as disinformation) (Hameleers & Brosius, 2022; Wardle & Derakhshan, 2017). The term “fake news” refers to either disinformation that mimics the news format or a label used to discredit news one disagrees with (Farkas & Schou, 2018; Egelhofer & Lecheler, 2019).

The emerging literature about *perceptions* of misinformation suggests that citizens worldwide believe that they are exposed to high volumes of misinformation on social media and are highly concerned about misinformation and its impact (Newman et al., 2020; Knuutila et al., 2022). This is especially the case in countries with liberal democratic governments (Knuutila et al., 2022), where misinformation has been a particularly salient topic of public debate in recent years (Van Duyn & Collier, 2019). Concerns over misinformation are on the rise in liberal democracies: majorities now perceive misinformation as a major threat to their country, with the proportion of people concerned being comparable to the proportion of people concerned about climate change (Poushter et al., 2022). These perceptions somehow contrast with recent research suggesting that citizens do not encounter that much misinformation online (e.g., Allcott & Gentzkow, 2017; Allen et al., 2020; Grinberg et al., 2019), that fake news represent a tiny proportion of Americans' media diet (0.1%), that sharing misinformation is a relatively rare activity (Guess et al., 2019), and that misinformation often has little effects beyond increasing beliefs in false claims (Guess, Lockett, et al., 2020).

Aggregate-level dynamics

We know little about whether citizens have independent and informed opinions about different types of misinformation. Based on previous studies, we can anticipate that citizens will perceive a broad range of questionable materials as misinformation (F. L. F. Lee, 2022; Nielsen & Graves, 2017) and will perceive different types of misinformation as frequent and impactful (Newman et al., 2018). However, we should observe differences based on the type of misinformation.

Pamment et al. (2018) suggest that disinformation exists on a continuum, ranging from minor-league information influence – such as the common and moderately illegitimate activities of being selective with facts or decontextualizing information – to major-league information influence – such as the more disruptive activity of creating fake news outlets. There is evidence that citizens’ understanding of misinformation follows this logic. Building on focus groups, Nielsen and Graves (2017) show that citizens’ perceptions of fake news also fall along a continuum, with the most extreme form being news fabrication. Depending on the broadness of their fake news or disinformation definition, many citizens also consider poor journalism (e.g., sensationalism), propaganda (e.g., hyperpartisan content), native advertising (sponsored content), factual errors, misinterpretation, and ungrounded suspicion as fake news or disinformation (F. L. F. Lee, 2022; Nielsen & Graves, 2017).

In terms of prevalence, I expect citizens to perceive more extreme forms of misinformation as less frequent. Among other things, there are actual differences in prevalence. Studies of the misinformation circulating during the COVID-19 pandemic find that misinformation is much more often based on the reconfiguration of existing information (reworked, twisted, recontextualized information) than complete fabrication (87% vs. 12%) (Brennen et al., 2020). Major league fakes (foreign interference, astroturfing, news fabrication) also necessitate more resources than minor forms of deception (Pamment et al., 2018). Moreover, major forms of deception, like astroturfing, tend to be less readily observable by citizens than more apparent forms of misinformation, like the use of sensationalist headlines by the media or politicians exaggerating their promises, which have become part of the popular discourse (Thomson & Brandenburg, 2019). Preliminary evidence suggests that people indeed believe that they are more frequently exposed to factual mistakes, poor journalism, or biased coverage than completely made-up stories (Barthel et al., 2016; Newman et al., 2018).

Naturally, not all forms of misinformation are equally harmful to democracy.¹⁰ Forms of misinformation that involve a clear intention to deceive are arguably more dangerous, given that they are expressly created for malicious purposes (Kumar & Shah, 2018). As such, citizens are more likely to perceive misinformation as a problem when it has negative social or political consequences (Tully et al., 2022). When evaluating different types of media misinformation in the

¹⁰ See Tenove (2020) for a review of how mis- and disinformation harm democracy.

U.S. and the U.K., citizens' concerns are the highest for stories that are completely made up or where facts are twisted to push an agenda. In contrast, their level of concern is a bit lower for poor journalism practices such as factual mistakes and clickbait (Newman et al., 2018).

Building on these studies, I expect that citizens will identify more extreme forms of deception with misinformation more often, will perceive them as more harmful to democracy, but will believe that they occur less frequently in Canada. Conversely, more common or benign forms of misinformation, like clickbait titles or exaggerated campaign promises, will be defined as misinformation less often and will be perceived as occurring more frequently but as being less impactful. Overall, I ask:

RQ1: How do citizens perceive different types of questionable content?

RQ2: Are more intentional and disruptive forms of misinformation (i.e., disinformation) more likely to be identified as misinformation, perceived as infrequently occurring in Canada, and perceived as harmful to democracy?

Explaining citizens' perceptions of misinformation

Extensive literature shows that the characteristics of the media and political environments – which comprise things such as media consumption behaviors (including audience fragmentation), the strength of public service media, elite (populist) rhetoric, and societal polarization – can have substantial effects on citizens' perceptions of (information from) politicians, the media, and social media platforms (e.g., Calice et al., 2023; Rooduijn et al., 2017; Tsifti & Ariely, 2014; Van Duyn & Collier, 2019). Building on that literature, I argue that perceptions of misinformation largely depend on the political and information environment that citizens are embedded in (Humprecht et al., 2020). In other words, citizens' experiences with misinformation, which can include their self-reported exposure to misinformation, their experience with content moderation policies (e.g., seeing their post or someone else's post being removed by social media platforms), and their exposure to elite or media discourses about misinformation, will influence their perceptions of the frequency and harmfulness of specific types of misinformation. Below, I explain how ideology and exposure to alternative right-wing media are expected to influence perceptions of misinformation from politicians, the media, and social media users.

Perceptions of misinformation from the media and politicians

Farkas and Schou (2018) identify three types of discourses in which the “fake news” label has been used: (1) as a critique of digital capitalism, i.e., the economic incentives to create “cheap” content that attracts a lot of visitors and interactions; (2) as a critique of mainstream media by the populist right-wing; and (3) as a critique of the type of discourses spread by right-wing elites and media. As such, while terms like “misinformation,” “disinformation,” and “fake news” can be used to describe real problems in the information environment, they have also become part of larger political struggles and have been weaponized to discredit individuals, organizations, and information one disagrees with (Hameleers & Brosius, 2022; van der Linden et al., 2020).

Related to the weaponization of misinformation is the rise of anti-elite sentiments, including distrust of politicians and governments, mainstream media, and intellectuals (Bennett & Livingston, 2018; Motta, 2018; Tong et al., 2020). Conspiratorial, populist¹¹, and anti-elite rhetoric contribute to these sentiments by presenting mainstream politicians, the media, and experts as part of a corrupted and lying establishment that misleads everyday people (Egelhofer & Lecheler, 2019; Hameleers, 2020b, 2020a; Hameleers & van der Meer, 2021; Merkley, 2020; Schulz et al., 2020; Waisbord, 2018). While both left-wing and right-wing citizens, media, and politicians tend to accuse opposing media and politicians of spreading false information (Tong et al., 2020), attacks towards the media in Western democracies have mostly come from the populist right and alternative right-wing media, who have often accused mainstream media of publishing “fake news,” having a left-wing bias, not being critical enough of those in power (or too critical depending on who is in power), or even being complicit in a large conspiracy (Egelhofer & Lecheler, 2019; Figenschou & Ihlebæk, 2019; Lavigne et al., 2023; Rae, 2021; Rossini et al., 2021).

These elite and media cues can impact citizens’ perceptions, reducing their trust in politicians and mainstream media and their ability to distinguish between accurate and false information (Van Duyn & Collier, 2019). Indeed, studies show that right-wing individuals are more likely to associate the fake news label with mainstream media (van der Linden et al., 2020) and

¹¹ Populism is a thin ideology or a communication style drawing on a dichotomy between the virtuous people and the corrupted elite (Mudde, 2004). There are affinities between populism and conspiracism, which is based on the idea that powerful groups are involved in secret plots that are detrimental to everyday people (Uscinski & Parent, 2014).

that those who consume alternative right-wing media are more likely to believe that the media commonly spread mis- and disinformation (Hameleers et al., 2022). The relationship between media consumption and trust is likely to be mutually reinforcing: those with low levels of political and media trust are more likely to turn to alternative information sources, but consuming alternative right-wing media can increase distrust further, given that these outlets tend to position themselves as media critics (Figenschou & Ihlebæk, 2019; Latzko-Toth, 2018) and have been quite critical of the government's pandemic response during COVID-19 (Boberg et al., 2020; Motta et al., 2020).¹²

The effect of ideology and right-wing media consumption on perceptions of misinformation from politicians is likely to be influenced by the ideology of the party in power. This is mainly because, per social identity theory (Tajfel & Turner, 1986), citizens use different standards when evaluating their in-groups and out-groups, being much less critical of deviant behaviors from their in-group than of the same behaviors from out-groups. For example, citizens tend to blame adversarial politicians for spreading misinformation (Tong et al., 2020), while not punishing the leader of their preferred party when they do so (Croco et al., 2021; Nyhan et al., 2020; Swire et al., 2017). The perceived credibility of a source is also an important determinant of the perceived credibility and acceptance of a message (Pornpitakpan, 2004). Consequently, what citizens perceive as misinformation will depend on who and what they trust (Marietta & Barker, 2019; Muirhead & Rosenblum, 2019), and we know that citizens tend to have higher levels of trust in governments that share their ideology (Hetherington & Rudolph, 2020). If we assume that citizens first think about the government when asked to evaluate politicians and since the governing party in Canada at the time of the survey can be considered a center-left party, I expect citizens with a right-wing ideology or consuming alternative right-wing media to perceive misinformation-related scenarios involving politicians as occurring more frequently than left-wing citizens and those not exposed to these outlets.

H1: Right-wing citizens perceive misinformation involving political and media actors as more frequent than left-wing citizens.

¹² Right-wing alternative media tended to downplay the severity of the virus and even spread COVID-19 misinformation, which can significantly decrease trust in the government's response (Jamieson & Albarracin, 2020; Motta et al., 2020; Stecula & Pickup, 2021a).

H2: Citizens exposed to alternative right-wing media perceive misinformation involving political and media actors as more frequent than those who do not consume these outlets.

While right-wing citizens and those who consume alternative right-wing media are expected to perceive political and media misinformation as more frequent, it is unclear whether they will also perceive political and media misinformation as more (or less) *harmful to democracy*. On the one hand, right-wing citizens are more likely than left-wing citizens to believe that false information is deliberately disseminated to hide reality from the people rather than for unintentional causes (Hameleers & Brosius, 2022), which could strengthen their perceptions of harmfulness. On the other hand, an increasing number of studies suggest that right-wing citizens are less critical of and concerned about misinformation (De Keersmaecker & Roets, 2019), less likely to support anti-misinformation measures (Saltz et al., 2021), and more likely to favor free speech over combatting misinformation (Knight Foundation-Ipsos, 2022; Kozyreva et al., 2023), as detailed in the next section. Therefore, I ask:

RQ3: Do ideology and alternative right-wing media consumption influence the perceived harmfulness of political and media misinformation?

Perceptions of misinformation from social media users

I expect left-right ideological differences in perceptions of misinformation on social media for at least three reasons: (1) different understandings of free speech rights; (2) perceptions of ideological bias in public discourses around misinformation and measures aimed at fighting it; and (3) left-right differences in epistemic beliefs. As an exploratory chapter, the goal of this study is more to document left-right differences in perceptions of misinformation than to test the underlying mechanisms, something I will turn to in the next chapter.

First, recent polls suggest that while citizens on both the left and the right perceive free speech as an important right in a democracy, they have a different understanding of what should be protected by free speech rights. For instance, Republicans are more likely than Democrats to consider that people spreading misinformation online (e.g., about the 2020 election results or the COVID-19 vaccine) constitute legitimate examples of people expressing their free speech rights (Knight Foundation-Ipsos, 2022). Relatedly, right-wing citizens are significantly more likely to believe that content moderation on social media is suppressing free speech (Ballard, 2019),

significantly less likely to consider that preventing the spread of false information is very or extremely important in a democracy (Knight Foundation-Ipsos, 2022), and less supportive of content removal in general (Kozyreva et al., 2023).

Second, despite evidence that there are no partisan differences in content moderation when controlling for actual platform violations (e.g., vaccine misinformation, hate speech) (Jiang et al., 2019, 2020; Barrett & Sims, 2021), right-wing citizens are more likely than left-wing citizens to believe that public discourses around misinformation and anti-misinformation measures on social media (e.g., content moderation, labeling) are ideologically biased (Calice et al., 2023; Saltz et al., 2021; Vogels et al., 2020). These ideological differences could partly be explained by elite and media cues. Indeed, right-wing elites and media have been more likely to claim that social media platforms' algorithms and content moderation support the views of liberals over conservatives (Haimson et al., 2021), which can influence citizens' perceptions (Calice et al., 2023). These perceptions could also come from an information environment in which high-profile misinformation has disproportionately been propagated by right-wing actors or been aligned with conservative interests (Benkler et al., 2018; Garrett & Bond, 2021; Mosleh & Rand, 2022) and where right-wing citizens are more likely to report that content they posted online was removed because it contained misinformation (Haimson et al., 2021). These considerations likely shape individuals' answers to questions about the prevalence or harmfulness of online misinformation.

Finally, there might exist differences in epistemic beliefs between left-wing and right-wing citizens. Evidence from the U.S. suggests that there is an increasing ideological gap in anti-intellectualism – the generalized distrust of experts, scientists, and intellectuals (Gauchat, 2012; Marietta & Barker, 2019; Motta, 2018), which could make right-wing citizens more likely to value citizens' perspectives over expert knowledge. Consequently, I hypothesize that:

H3: Right-wing citizens perceive potential misinformation spread by social media users as less frequent and harmful than left-wing citizens.

H4: Citizens exposed to alternative right-wing media perceive potential misinformation spread by social media users as less frequent and harmful than those who do not consume these outlets.

Do perceptions of misinformation form a coherent belief system?

Zaller (1992) describes accessibility as an important determinant of public opinion. Simply put, if individuals report that they were recently exposed to misinformation, this direct experience with misinformation is likely to be readily accessible from memory and increase their perceptions of the prevalence and severity of misinformation in general (Chang, 2021). Studies also find that exposure to higher rates of false news can decrease belief in accurate news stories (which will wrongly be considered misinformation) and trust in the media (Altay, Lyons, et al., 2023; van der Meer et al., 2023). Consequently, I expect that:

H5: Perceived exposure to misinformation increases the perceived frequency and harmfulness of all types of misinformation.

Finally, conspiratorial beliefs tend to form a monological belief system, in that people who believe in one conspiracy theory are significantly more likely to believe in others (Miller, 2020a). I posit that a similar belief system might exist at the individual level for perceptions of misinformation. In other words, perceptions of one type of misinformation should be related to perceptions of other types of misinformation. Both scholars and the public hold very different perceptions of what constitutes misinformation, with some having a more encompassing understanding of misinformation than others (Kapantai et al., 2021; Nielsen & Graves, 2017). Citizens who treat a wide range of questionable materials as misinformation are more likely to see misinformation everywhere and thus to perceive misinformation as prevalent (Lee, 2022). Having a broad understanding of misinformation and perceiving it as prevalent are also associated with its perceived severity and impact (Chang, 2021). Overall, because of their psychological and political predispositions, or the type of information they consume, citizens might be more or less concerned about all types of misinformation. Therefore, I expect the following:

H6: Perceptions that one scenario constitutes misinformation, occurs frequently, and is harmful to democracy are strongly positively correlated with perceptions that other scenarios constitute misinformation, occur frequently, and are harmful to democracy.

Methods

Data

This article builds on data collected in the post-election survey of the 2021 Canadian Election Misinformation Project. The survey was administered by Dynata to an online quota-based sample (on age, gender, and region) of 7,302 Canadian citizens during the campaign period, with 2,799 respondents also answering the post-election survey. The post-election survey was conducted between September 30 and October 14 (97% of answers were recorded between September 30 and October 4). I use post-stratification weights on age and gender within each region to make the data more representative of the Canadian population.¹³ More information about the sample is included in Appendix 1A.

Design

Respondents were exposed to a random sample of five scenarios (out of 16) describing questionable content that could be perceived as constituting misinformation. For each scenario, respondents were asked about the extent to which it: a) constitutes a form of misinformation; b) occurs frequently in Canada; and c) is harmful to democracy (each measured on a four-point scale).

Scholars have developed typologies of misinformation and fake news, which include fabrication, misleading connection, omission, hoax, biased content, rumors, and clickbait among others (Brin et al., 2021; Kapantai et al., 2021; Newman et al., 2018; Tandoc et al., 2018; Wardle, 2017; Zannettou et al., 2019). Building on these typologies, I created a list of scenarios to measure citizens' perceptions of different types of misinformation. I also included some types of harmful content that do not *necessarily* include false information (e.g., hate speech or trolling) to see whether they are also defined as misinformation.¹⁴ This approach is consistent with previous research; see Lee (2022). The scenarios focus on four types of actors that are commonly blamed for spreading mis- or disinformation: politicians and political parties, the media, social media users, and foreign governments (Bradshaw & Howard, 2019; Hameleers, Brosius, et al., 2021; Newman et al., 2020). Each actor is associated with the types of misinformation they are the most likely to use. I intentionally kept the scenarios ideologically neutral, by providing no information

¹³ Removing respondents who completed the survey in less than 5 minutes (the median completion time is 21 minutes) or failed an attention check has little influence on the results, see Appendix 1C.

¹⁴ Hate speech can be associated with disinformation based on some definitions. For example, the Global Disinformation Index defines disinformation as “adversarial narratives that create real world harm” (Brin et al., 2021).

about the topic of the misinformation. This list does not aim to exhaust all types of potential misinformation and actors but to provide a broad understanding of perceptions of relatively common forms of potential misinformation. Table 1.1 presents the scenarios.

Table 1.1. Scenarios that could be associated with misinformation.

Actor	Situation	Typology
A politician	1. Making promises they can't keep to get elected 2. Mischaracterizing an opponent's position 3. Omitting information when answering a question 4. Spreading rumors about a political opponent	1. Lie 2. Misrepresentation 3. Omission 4. Rumor
A political party	5. Using fake accounts to simulate wide popular appeal for their policies	5. Astroturfing
A media outlet	6. Publishing opinion pieces as if they were factual reporting 7. Publishing stories that they later need to retract 8a. Promoting a particular ideology 8b. Favoring the perspectives of elites over citizens' concerns 9. Consciously reporting on an event that did not occur 10. Using sensationalist headlines to attract more readers	6. Misleading content 7. Error 8a. Biased/one-sided 8b. Biased/one-sided 9. Fabrication 10. Clickbait
A user	11. Propagating false information on social media 12. Sharing a modified photo or video on social media 13. Targeting a group with hate speech on social media 14. Deliberately posting inflammatory, irrelevant, or offensive comments on social media	11. General 12. Manipulated content 13. Hate speech 14. Trolling
A foreign government	15. Using propaganda to influence public opinion	15. Foreign propaganda

Empirical strategy

The empirical analysis is threefold. First, I provide an overview of how citizens perceive different types of misinformation, showing, through visual representation, the extent to which each scenario is perceived as constituting misinformation, as frequent, and as harmful to democracy. This analysis, combined with t-tests comparing perceptions of misinformation at the individual level, provides descriptive evidence that more extreme forms of deception (like news fabrication, foreign propaganda, and astroturfing) are more commonly perceived as constituting misinformation and as harmful to democracy but are perceived as occurring less frequently.

Second, I use OLS regression to examine how respondents' self-reported exposure to misinformation, ideology, and media consumption can help understand the perceived frequency and harmfulness of each scenario, with different models estimated for each scenario and outcome. Given the number of scenarios, I use the Benjamini-Hochberg procedure to control the false discovery rate (Benjamini & Hochberg, 1995):

$$\text{Perceived frequency / harmfulness}_i = \alpha_i + \beta_1 \text{Exposure to misinformation}_i + \beta_2 \text{Ideology}_i + \beta_3 \text{Consumption right-wing media}_i + \beta_4 \text{Frequency news consumption}_i + \beta_5 \text{Frequency news consumption social media}_i + \mathbf{X}_i \boldsymbol{\beta} + \varepsilon_i$$

Self-reported exposure to misinformation is measured using the following question: "The next questions will ask about misinformation, by which we mean false or misleading information. In the past week, have you seen, read, or heard any political misinformation related to the election?", with answers including "no," "unsure," and "yes". Ideology is measured using the traditional 0-10 left/right scale. I measure exposure to right-wing media with a dichotomous variable coded as 1 if respondents selected a right-wing media outlet (Rebel News, Post Millennial, True North) when asked to select the news outlets that they have used for political information over the past week (the list contains 24 outlets). The frequency of news consumption in general and on social media is based on how frequently respondents watched, read, or listened to news about politics (on social media) over the past week. The former is measured on a 5-point scale ranging from never to every day, while the latter is measured on a 6-point scale ranging from never to several times a day. $\mathbf{X}\boldsymbol{\beta}$ is a vector of the following covariates: age, gender (male=0, female=1), education (high school or less, some university or less, university degree), and region (Atlantic, Quebec, Ontario, Prairies, British Columbia).¹⁵ The exact wording and answer categories are provided in Appendix 1D.

This method does not allow me to clearly identify the causal relationship between media consumption behaviors and perceptions of misinformation. For example, it can both be true that (a) those who believe that the mainstream media frequently spread misinformation will start consuming alternative right-wing media; and (b) consuming alternative right-wing media will make respondents more likely to believe that the mainstream media frequently spread misinformation. Still, the analysis allows me to observe how perceptions of *different types* of

¹⁵ I was advised to also include ideological extremity or language in the model. It seems more appropriate to include ideology than ideological extremity given that being on the far left or on the far right has very different effects on perceptions of misinformation. Language is not a significant determinant of perceptions of misinformation as measured in the current article.

misinformation are more or less strongly associated with ideology and media consumption behaviors.

Finally, I use OLS regression to test whether perceptions of misinformation form a consistent belief system, that is, how much citizens' perceptions of a given form of misinformation depend on their perceptions of other forms of misinformation. Here, the three dependent variables measure respondents' perceptions that a given scenario constitutes misinformation, occurs frequently, and is harmful to democracy. The independent variables measure the same perceptions averaged for the four other scenarios that each respondent was exposed to. The model is estimated at the scenario (s) level (i.e., there are five observations for each respondent(i)) with clustered standard errors. The model is as follows:

$$\text{Perceptions that a scenario constitutes misinformation / occurs frequently / is harmful to democracy}_{is} = \alpha_{is} + \beta_1 \text{Perceptions that other scenarios constitute misinformation / occur frequently / are harmful to democracy}_{is} + u_{is}$$

$$\text{Where: } u_{is} = \alpha_s + \varepsilon_{is}$$

Results

Unpacking citizens' perceptions of misinformation

Figure 1.1 shows the percentage of respondents who believe that each scenario (1) probably or definitely constitutes a form of misinformation; (2) occurs quite or very frequently in Canada; and (3) is quite or very harmful to democracy. The results are classified based on the actor involved and ordered by the percentage of respondents who believe that they constitute misinformation.

Each scenario is considered a form of misinformation by a majority of respondents. Scenarios describing media biases are the least likely to be defined as misinformation (58% and 64%), while social media users spreading false information online (80%), astroturfing (79%), and news fabrication (78%) are the most frequently associated with misinformation. Perceptions that the described situation is harmful to democracy do not vary much across scenarios, ranging from 65-66% (clickbait, media's ideological biases) to 75% (astroturfing and news fabrication).¹⁶ In general, while all scenarios are perceived as harmful, scenarios that are perceived as the most

¹⁶ Removing inattentive respondents does not change the conclusions presented in this chapter, although it slightly increases variation in responses, see Appendix 1C. The percentage of respondents who perceive each scenario as constituting misinformation, frequently occurring, and being harmful could be slightly overestimated given that answers could be primed by the fact that all scenarios were related to problematic content or information.

harmful to democracy, such as political astroturfing, news fabrication, and foreign propaganda (74%), tend to imply higher levels of intentionality and deception and require more resources. As expected, these scenarios are also perceived as occurring less frequently (between 37% and 43% of respondents perceived them as occurring frequently) than scenarios that imply more minor league fakes, such as politicians omitting information when answering questions (74%) or exaggerating their electoral promises (77%). These results suggest that citizens have a relatively broad understanding of misinformation and perceive most types of potential misinformation as occurring frequently and as harmful to democracy. This does not imply that citizens' perceptions are uninformed or do not vary across scenarios, since more disruptive scenarios are more likely than less disruptive ones to be identified as misinformation and are perceived as less frequent but more harmful to democracy (although variation in perceived harmfulness is low).

To further validate these findings, I used t-tests to evaluate whether citizens are more likely to perceive each of the more disruptive scenarios (news fabrication, astroturfing, foreign propaganda) as constituting misinformation, frequently occurring in Canada, and being harmful to democracy (using the full 4-point scale) compared to their average perceptions of the other scenarios they were asked about. The results show that news fabrication, astroturfing, and foreign propaganda are, indeed, significantly more likely to be understood as constituting misinformation and are perceived as occurring less frequently in Canada than the other scenarios. News fabrication and astroturfing (but not foreign propaganda) are perceived as significantly more harmful to democracy than the other scenarios. The results are included in Appendix 1B.

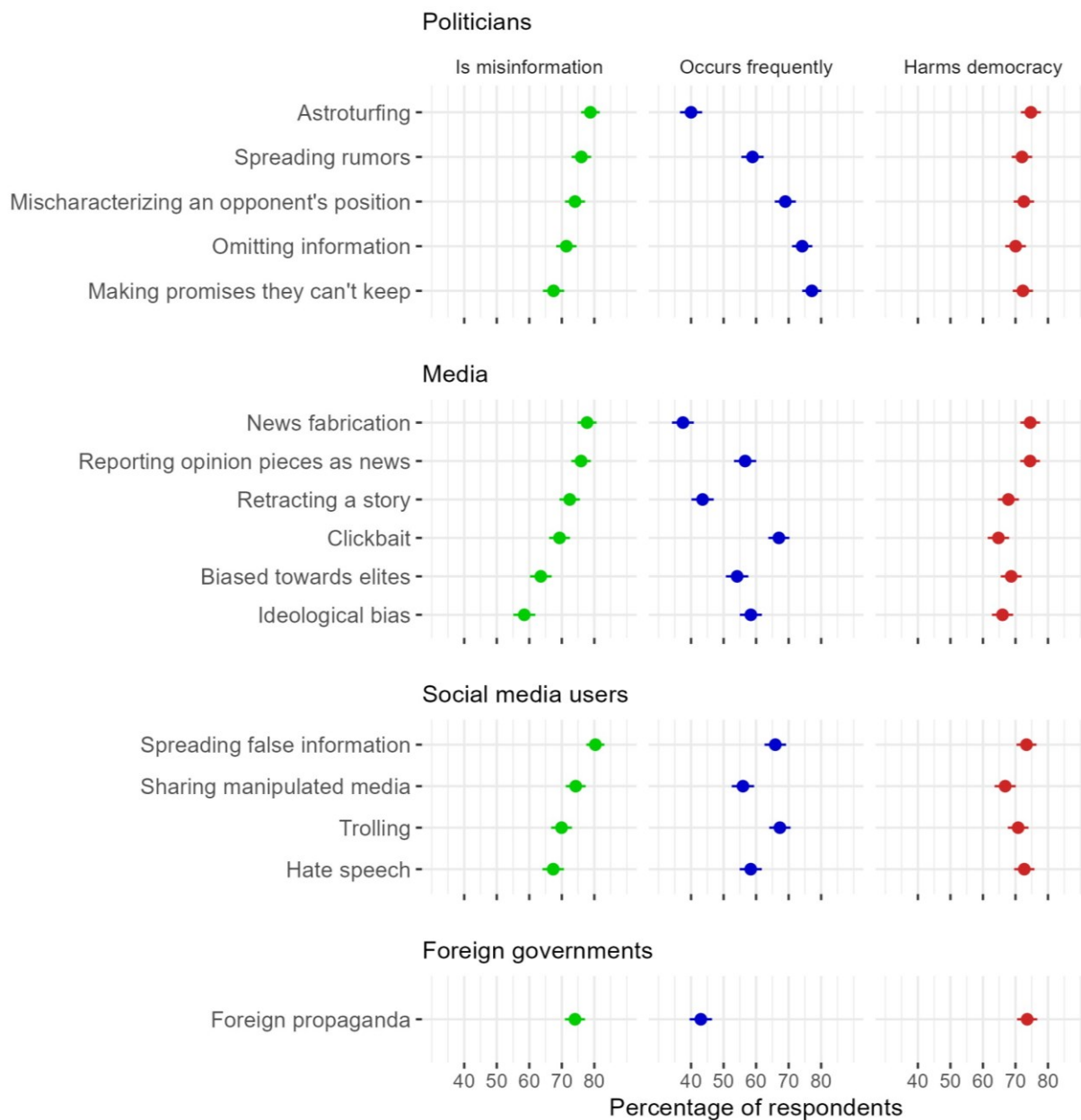


Figure 1.1. Weighted percentage of respondents who believe that each scenario constitutes misinformation, occurs frequently, and is harmful to democracy, with 95% confidence intervals.

Explaining citizens' perceptions of misinformation

In this section, I use OLS regression to evaluate how citizens' ideology and alternative right-wing media consumption informs the perceived frequency and harmfulness of each misinformation scenario. The models also include perceived exposure to misinformation (see next section), the

frequency of news consumption in general and on social media, socio-demographic variables, and regional fixed effects. Complete regression tables are presented in Appendix 1B.

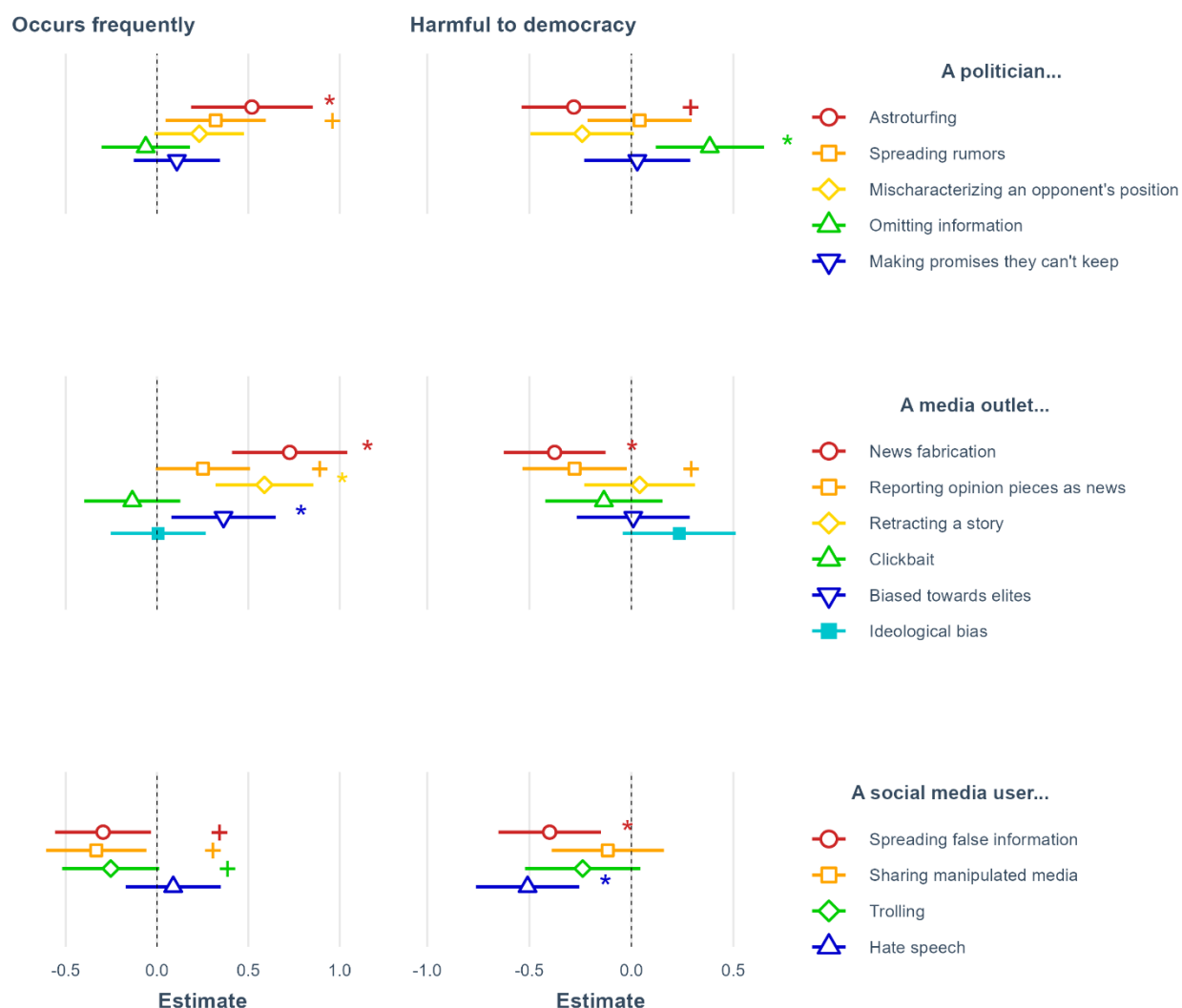


Figure 1.2. Association between ideology (total effect based on the 0-10 left-right scale) and perceptions that the scenarios occur frequently and are harmful to democracy (4-point scales). OLS regression coefficients reported with 95% confidence intervals. The star (*) and plus (+) signs indicate whether the correlation is significant at $p < .05$ and $p < .1$ when controlling the false discovery rate.

Figure 1.2 shows the effect of moving from the extreme left to the extreme right of the 0-10 ideology scale on the perceived frequency and harmfulness of each misinformation scenario, each measured on a 4-point scale. I find mixed evidence that citizens with a right-wing ideology

perceive misinformation from politicians as more frequent than those with a left-wing ideology (H1). Right-wing citizens are more likely to believe that political parties frequently use fake accounts to simulate support for their policies ($\beta = .52$, 95% CI = [.19, .85], $p < .01$, adj. $p < .05$) and that politicians frequently spread rumors about political opponents ($\beta = .31$, 95% CI = [.05, .60], $p < .05$, adj. $p = .05$). However, ideology does not influence perceptions that politicians frequently omit information when answering questions, make promises they can't keep, or mischaracterize their opponent's position. Ideology also does not consistently affect the perceived harmfulness of misinformation originating from politicians (RQ3). Right-wing citizens are more likely to believe that omitting information when answering questions is harmful to democracy ($\beta = .36$, 95% CI = [.10, .62], $p < .01$, adj. $p < .05$), while left-wing citizens are more likely to believe that astroturfing is harmful to democracy ($\beta = -.34$, 95% CI = [-.59, -.09], $p < .01$, adj. $p < .05$), which is consistent with other results showing that left-wing citizens perceive all types of social media mis/disinformation as more harmful to democracy.¹⁷

Given that criticisms of mainstream media (including the use of the delegitimizing 'fake news' label) disproportionately come from right-wing actors (Egelhofer & Lecheler, 2019; Figenschou & Ihlebæk, 2019), I also hypothesized that right-wing citizens would be more likely to believe that misinformation involving the media occurs frequently in Canada (H1). I find relatively strong support for that hypothesis. Indeed, having a right-wing ideology is positively associated with believing that the media frequently fabricate news stories ($\beta = .73$, 95% CI = [.41, 1.04], $p < .001$, adj. $p < .001$), publish stories that they later need to retract ($\beta = .59$, 95% CI = [.32, .86], $p < .001$, adj. $p < .001$), favor the perspective of elites over citizens' concerns ($\beta = .36$, 95% CI = [.08, .65], $p < .05$, adj. $p < .05$), and publish opinion pieces as if they were factual reporting ($\beta = .25$, 95% CI = [-.01, .51], $p = .06$, adj. $p = .08$). While ideology does not seem to influence the perceived frequency of ideologically biased coverage and clickbait titles, the results generally suggest that citizens' perceptions of the media are dependent on their political predispositions and environment. Ideological differences are minimal regarding the perceived harmfulness of most types of media misinformation. Nevertheless, the results show that right-wing citizens are less likely than left-wing citizens to believe that fabricating news ($\beta = -.37$, 95% CI = [-.61, -.12],

¹⁷ Astroturfing *per se* has not really been politicized as an issue and public discussions and media coverage of astroturfing have been quite limited in Canada.

$p < .01$, adj. $p < .05$) and publishing opinion pieces as if they were factual reporting ($\beta = -.30$, 95% CI = $[-.56, -.05]$, $p < .05$, adj. $p = .06$) is harmful to democracy.

I also find support for the hypothesis that right-wing citizens perceive harmful content spread by social media users as less frequent and damaging to democracy than left-wing citizens (H3). While there are no ideological differences in the perceived frequency of hate speech, right-wing citizens tend to believe that false information ($\beta = -.30$, 95% CI = $[-.56, -.03]$, $p < .05$, adj. $p = .06$), modified photos and videos ($\beta = -.33$, 95% CI = $[-.61, -.06]$, $p < .05$, adj. $p = .06$), and trolls ($\beta = -.25$, 95% CI = $[-.52, -.01]$, $p = .06$, adj. $p = .08$) are less prevalent on social media than left-wing citizens. There also is a negative relationship between having a right-wing ideology and the perceived harmfulness of false information ($\beta = -.38$, 95% CI = $[-.62, -.14]$, $p < .01$, adj. $p < .01$) and hate speech ($\beta = -.46$, 95% CI = $[-.71, -.20]$, $p < .001$, adj. $p < .01$) on social media. The association is negative but not statistically significant for manipulated content and trolling.

Figure 1.3 shows how exposure to alternative right-wing media is associated with citizens' perceptions of misinformation. I do not find evidence that consuming alternative right-wing media makes citizens more likely to believe that politicians frequently spread misinformation (H2). The coefficient is positive in four models out of five but does not reach statistical significance.

The results provide some evidence that exposure to alternative right-wing media increases perceptions that the media frequently spread misinformation (H2), which was expected given how these alternative media position themselves as media critics (Figenschou & Ihlebæk, 2019). The right-wing media coefficients are positive in all models and significantly so in two models out of six: those who consume alternative right-wing media are significantly more likely to believe that the media frequently fabricate news ($\beta = .41$, 95% CI = $[.11, .72]$, $p < .01$, adj. $p < .05$) and report opinion pieces as news ($\beta = .62$, 95% CI = $[.35, .89]$, $p < .001$, adj. $p < .001$). The coefficients are also close to significance in the models about the media frequently publishing stories that they later need to retract ($p = .07$) and favoring the perspectives of elites over citizens' concerns ($p = .10$), although the p -value is greater than .10 when controlling the false discovery rate. Consuming alternative right-wing media does not seem to have a strong influence on the perceived harmfulness of political and media misinformation.

Finally, those who consume alternative right-wing media are significantly less likely to believe that hateful content is frequent on social media ($\beta = -.47$, 95% CI = $[-.73, -.21]$, $p < .001$,

adj. $p < .01$) and that social media users frequently spread false information ($\beta = -.29$, 95% CI = $[-.54, -.03]$, $p < .05$, adj. $p = .05$). They also tend to perceive each misinformation scenario involving social media users – whether they imply hate speech, false information, manipulated content, or trolling other users – as significantly less harmful to democracy than those not exposed to these outlets (H4). The politicization of perceptions of harmful content could have significant implications for how citizens perceive and respond to measures that aim to address online harms, something we turn to in the next chapter.

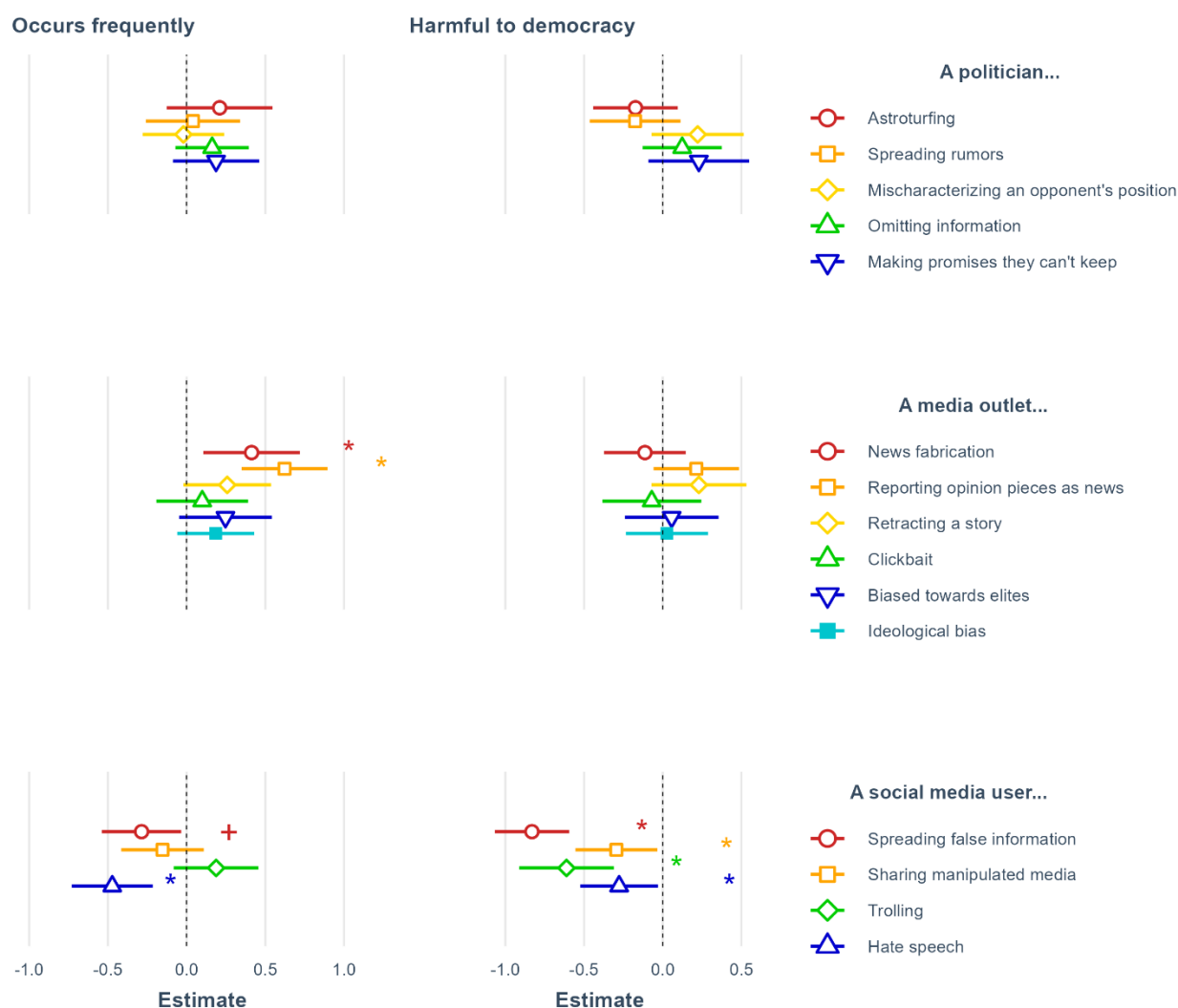


Figure 1.3. Association between exposure to alternative right-wing media and perceptions that the scenarios occur frequently and are harmful to democracy. OLS regression coefficients reported with 95% confidence intervals. The star (*) and plus (+) signs indicate whether the correlation is significant at $p < .05$ and $p < .1$ when controlling the false discovery rate.

Perceptions of misinformation as a belief system

Despite individual-level differences in perceptions of different types of misinformation, we expect citizens' perceptions to form a relatively coherent belief system. Figure 1.4 focuses on the relationship between self-reported exposure to misinformation and perceptions of misinformation. As hypothesized (H5), those who report that they were exposed to misinformation during the campaign tend to perceive all types of misinformation as occurring more frequently and as being more harmful to democracy. However, the effect sizes are a bit smaller and not always significant at $p < .05$ when the dependent variable is the perceived harmfulness. These results, which could partly be explained by the fact that direct experience with misinformation makes it readily accessible from memory, illustrate how the greater prevalence of misinformation in an information environment could increase citizens' wariness about all types of content.

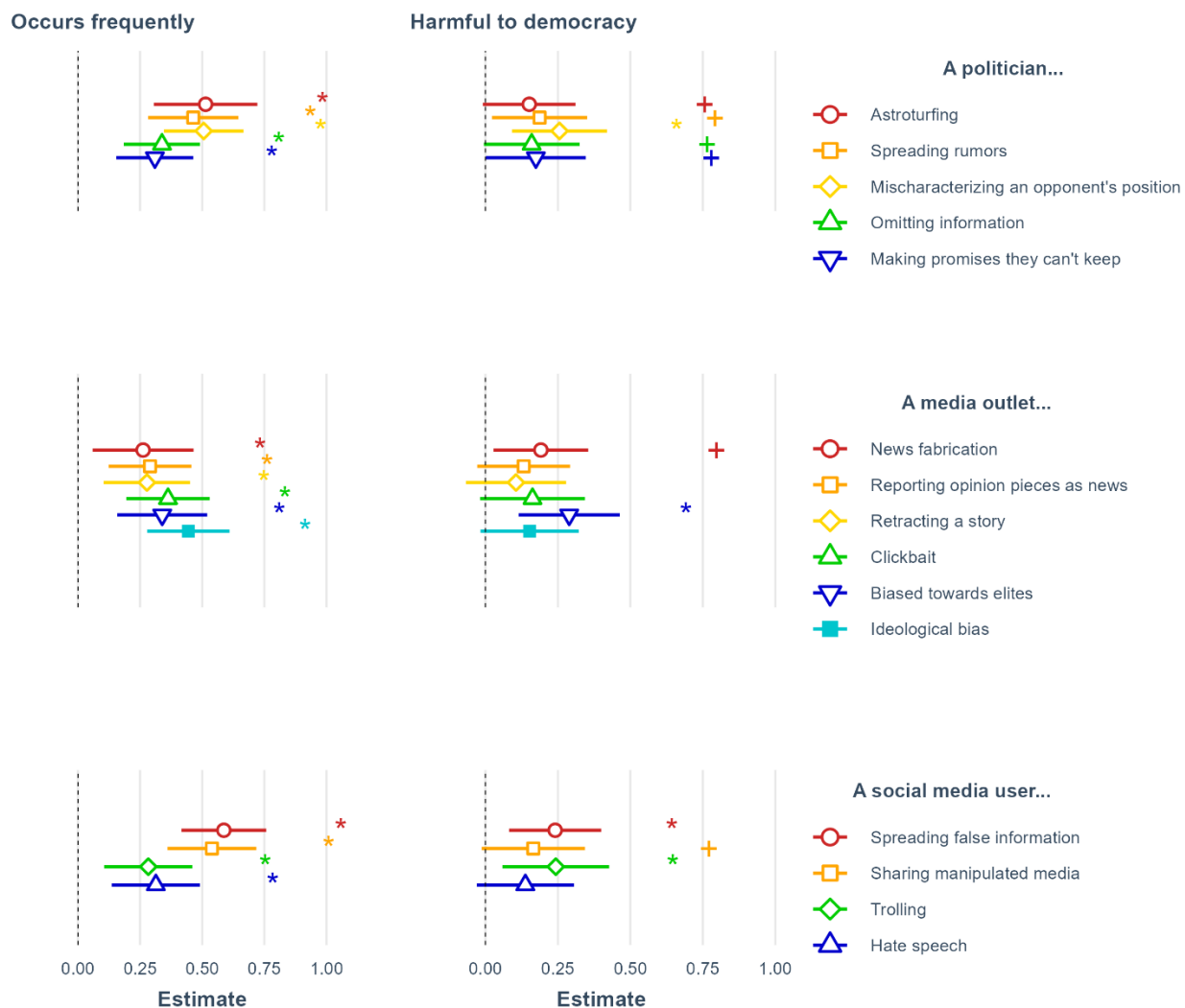


Figure 1.4. Association between self-reported exposure to misinformation and perceptions that the scenarios occur frequently and are harmful to democracy. OLS regression coefficients reported with 95% confidence intervals. The star (*) and plus (+) signs indicate whether the correlation is significant at $p < .05$ and $p < .1$ when controlling the false discovery rate.

Figure 1.5 further examines whether perceptions of misinformation form a coherent belief system by testing the extent to which respondents' perceptions of a given scenario are correlated with their perceptions of the other scenarios they were exposed to. The results of OLS regressions show that, as expected, citizens are significantly more likely to associate a scenario with misinformation and to believe that it occurs frequently and is harmful to democracy when they think the same about the other types of potential misinformation they were asked about (H6). Specifically, a one-point increase in perceptions that the four other scenarios that they were exposed to constitute

misinformation, occur frequently, and are harmful to democracy is respectively associated with a 0.68-point (95% CI = [.65, .71], $p < .001$), 0.75-point (95% CI = [.72, .77], $p < .001$), and 0.74-point (95% CI = [.72, .76], $p < .001$) increase in perceptions that the remaining scenario constitutes misinformation, occurs frequently, and is harmful to democracy on a 4-point scale. These effects are substantial and provide evidence that perceptions of misinformation are correlated at the individual level and form a relatively coherent belief system. Some individuals have a broad understanding of misinformation and express high levels of concern about all types of potential misinformation, while others have a narrower understanding of misinformation and are less inclined to perceive different types of questionable content as frequent and harmful to democracy.

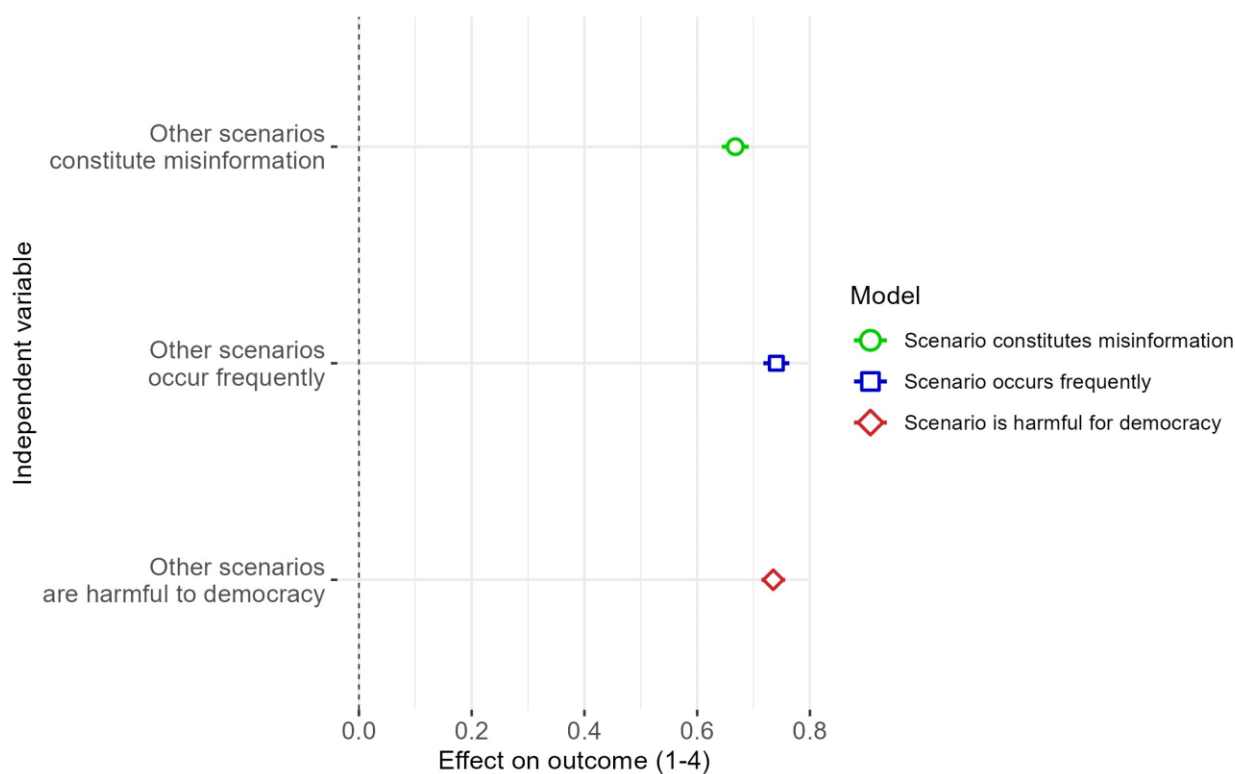


Figure 1.5. Perceptions that a given scenario constitutes misinformation, occurs frequently, and is harmful to democracy based on perceptions of the other scenarios. OLS regression coefficients reported with 95% confidence intervals. Coefficients represent the effect of a one-point change in perceptions of misinformation on the four-point scale. Outcomes are measured on a four-point scale.

Conclusion

This paper improves our understanding of citizens' perceptions of misinformation by examining how citizens perceive different forms of misinformation, how their ideology and the type of information they are exposed to influence their perceptions, and whether perceptions of misinformation form a coherent belief system. The results first show that citizens have a relatively broad understanding of misinformation. Each of the scenarios that they were exposed to, including those that do not necessarily involve false information like trolling and hate speech, was defined as misinformation by a majority of respondents. While citizens perceive most types of misinformation as occurring quite frequently and as being harmful to democracy, the types of misinformation that involve greater resources and are intentionally deceptive and disruptive (e.g., astroturfing, news fabrication) were more likely to be defined as constituting misinformation and were perceived as occurring less frequently but being more harmful to democracy than the other types of misinformation (although variation in perceived harmfulness between scenarios was low).

This paper shows that perceptions of misinformation are largely influenced by citizens' political information environment. In other words, citizens have different perceptions of misinformation based on their ideology and the type of information and media they are exposed to. First, because of current discourses around misinformation and fake news, citizens with a right-wing ideology and those who consume alternative right-wing media tend to believe that the forms of misinformation related to the media occur more frequently than left-wing citizens and those not exposed to these media.¹⁸ However, right-wing citizens tend to perceive news fabrication and reporting opinion pieces as news as being less harmful to democracy than left-wing citizens. Second, previous research has shown that right-wing citizens are more likely than left-wing citizens to prioritize free speech over combatting misinformation (Knight Foundation-Ipsos, 2022), to believe that anti-misinformation measures on social media platforms are biased (Saltz et al., 2021), and to report that content they posted was removed because it contained misinformation (Haimson et al., 2021). In line with these conclusions, we find evidence that those with a right-wing ideology and those who consume alternative right-wing media tend to report that questionable content on social media – whether it involves false information, manipulated content,

¹⁸ All coefficients but one are in the expected direction, although some fail to reach statistical significance, especially in the case of right-wing media consumption.

hate speech, or trolling – occurs less frequently and is less harmful to democracy than their left-wing counterparts and those who do not consume these outlets (some of the coefficients are only significant for ideology *or* right-wing media consumption, however).

While perceptions of misinformation are influenced by the political information environment, they nevertheless form a relatively coherent belief system. The findings demonstrate that believing that one was recently exposed to misinformation increases the perceived frequency and harmfulness of all types of misinformation. Moreover, a strong predictor of whether an individual believes that a situation constitutes misinformation, occurs frequently, and is harmful to democracy is whether they believe that the other situations they were asked about also constitute misinformation, occur frequently, and are harmful to democracy.

The findings have important implications for Canadian democracy and for the fight against misinformation. First, they suggest that it is important to pay attention to the perceived prevalence and impact of specific categories of misinformation to grasp how citizens understand the current information environment and how different discourses might impact their perceptions. Second, they provide insights about some of the challenges we must overcome, including the left-right ideological divide in perceptions, to restore public trust in the media and limit the spread and impacts of misinformation on social media.

This study certainly suffers from some limitations. Mainly, the design is correlational, meaning we cannot entirely disentangle the direction of causality. For example, some researchers argue that perceptions of mainstream media disinformation can also lead individuals to consume alternative media outlets (Hameleers et al., 2022). Still, this study allows us to identify how the relationship between media consumption and perceptions of misinformation depends on the type of misinformation. The study also focuses on a single country while, as I have argued, perceptions of misinformation depend on the political information environment. Given the international coverage of the cited literature, I expect the effects of exposure to misinformation, ideology, and media consumption to be generalizable across most Western democracies. Still, future research should further investigate how the information environment of different countries impacts citizens' perceptions of misinformation.

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Chapter 2. Understanding the Demand Side: Who Tolerates the Spread of Misinformation?¹⁹

Abstract

Misinformation poses an important challenge for democracy, yet we know little about citizens' attitudes towards misinformation, including their willingness to tolerate its dissemination. In a first experimental study administered during the 2021 Canadian federal election, respondents were asked how acceptable it is for a politician to spread false information on climate change and COVID-19 for randomly assigned purposes. The results show that most citizens consider it unacceptable for politicians to spread misinformation, no matter the purpose. However, I find the perceived acceptability of misinformation to be slightly lower among citizens who oppose more action on COVID-19 and climate change, and substantively higher among citizens with a right-wing ideology. I investigate further these ideological differences using observational and experimental data collected during the 2022 Quebec provincial election. Drawing on an original battery measuring different dimensions of attitudes towards misinformation, I find that right-wing citizens are consistently more indifferent to misinformation and less likely to support measures to combat it than left-wing citizens. I test one of the mechanisms behind this ideological asymmetry using both a prompt experiment and observational analyses. I find mixed evidence that ideological differences can be explained by perceptions on the right that public discourses about misinformation are biased against them. The findings suggest that we should not overgeneralize claims that citizens no longer care about facts and that it might be necessary to depoliticize the misinformation label to successfully address the misinformation challenge.

Keywords: perceptions, misinformation, disinformation, issue positions, ideology, public opinion

Introduction

Delli Carpini and Keeter describe political information as being “the currency of democratic citizenship” (1996, p. 8). Pushing the metaphor further, we could conceive of misinformation as

¹⁹ Previous versions of this chapter were presented at the 2022 annual conference of the American Political Science Association and Canadian Political Science Association.

counterfeit money, which is threatening the integrity of our democracies. While misinformation has always circulated in the public sphere, its disruptive potential is arguably greater today. Encouraged by populist far-right discourses, segments of the electorate are increasingly distrustful of governments, experts, and the media and turning to alternative, less reliable sources of information (Fawzi, 2019; Hameleers, 2020c; Merkley, 2020; Müller & Schulz, 2021). At the same time, social media make this “alternative” information readily available and allow it to spread faster and farther than ever (Martens et al., 2018). Scholars have paid a lot of attention to misinformation over the past years, yet they have not paid sufficient attention to citizens’ perceptions of misinformation, which include citizens’ understanding of what constitutes misinformation, how concerned they are, the extent to which they condemn the spread of misinformation, or whether they support measures to counter it (Hameleers & Brosius, 2022; Lecheler & Egelhofer, 2022). Claims that we are living in a post-truth era where misinformation has been normalized and citizens are less concerned about facts are common (Kakutani, 2019; Nyhan, 2020). Still, very few studies directly assess how much citizens value the truth over other considerations in today’s democratic societies.

Using two pre-registered survey experiments²⁰ administered during the 2021 Canadian federal election and the 2022 Quebec provincial election, this paper improves our understanding of citizens’ attitudes towards misinformation. In the first experiment, I examine whether the perceived acceptability of a politician spreading misinformation on salient policy issues of the day – here, climate change and COVID-19 – is influenced by the purpose of the misinformation, as well as citizens’ issue preferences and ideology. In the second study, I find consistent ideological differences on a range of attitudes towards misinformation – right-wing citizens are more indifferent to misinformation and less supportive of actions to combat it. I use a second experiment to test whether perceptions that public discourses about misinformation are biased against one’s ideology can explain these ideological differences. Citizens’ attitudes towards misinformation have important democratic implications. If citizens do not care about the truth or do not condemn misinformation, politicians have greater incentives to use falsehoods to manipulate their political attitudes and behaviors, which can lead to suboptimal public policies and a lack of accountability.

²⁰ The two studies were pre-registered at Open Science Framework (OSF). They can be accessed at: https://osf.io/3bfgw/?view_only=195990910ef34d8495ee16d51e264d6e
https://osf.io/vxz4h/?view_only=320df4f085a6430f8c7cf97dc589e5ae.

Additionally, if issue positions and ideology influence the perceived acceptability of misinformation, political polarization could make misinformation less objectionable, with important implications for the quality of information circulating about important societal issues.

Misinformation can be defined as information that is not consistent with the best available evidence (Vraga & Bode, 2020). As such, I use misinformation as a broad term that encompasses false information that is spread accidentally (e.g., because someone is uninformed about an issue) or intentionally, to achieve specific goals and objectives (e.g., shape citizens' behavior).²¹ Canada is an interesting case for studying perceptions of misinformation. While expected to be relatively resilient to misinformation, in part because of comparatively high levels of trust in mainstream media, which presents a low risk of disinformation (Boulianne, 2021; Ruiz-Soler et al., 2021), misinformation has come to play a larger role in Canadian politics throughout the pandemic, leading the government to invoke emergency powers to stop social unrests during the Truckers for Freedom movement. Political polarization, populist attitudes, and political distrust are on the rise in Canada (Dalton, 2017; Johnston, 2023; Medeiros, 2021) and the country has been affected by the polarization of the U.S. political information environment (Bridgman et al., 2021).

This paper makes four major contributions. First, despite claims that facts have become less salient in opinion formation, the results suggest that citizens still condemn the spread of misinformation. Second, I demonstrate how issue preferences matter for the perceived acceptability of misinformation, with citizens being generally more critical of misinformation inconsistent with their issue preferences. Third, I show that right-wing individuals are more tolerant of misinformation and less supportive of actions to combat it than left-wing individuals. I further evaluate how perceptions that public discourses about misinformation are biased against them potentially contribute to making them less concerned about misinformation. Fourth, I provide a new battery for measuring individuals' attitudes towards misinformation and discuss what these attitudes entail for the success of misinformation interventions.

²¹ False or misleading information that is intentionally spread to deceive or cause harm is usually called "disinformation," see Wardle and Derakhshan (2017).

Explaining citizens' attitudes towards misinformation

Intent, consequences, and the perceived acceptability of spreading misinformation

Research suggests that misinformation does not constitute a large portion of most people's media diet across developed democracies (Allen et al., 2020), but citizens tend to believe that they are frequently exposed to misinformation online and express high levels of concern about it (Bridgman et al., 2022; Newman et al., 2023). While misinformation or lies are usually condemned as wrong by citizens, they can be considered more acceptable in some circumstances than others. There is a long tradition of discussing the appropriateness of lies in political philosophy, with Plato arguing that there exists such a thing as "noble" lies and studies in ethics proposing that falsehoods can be morally justifiable when they rest on benevolent motives, such as avoiding serious harm through deceit, protecting the general interest, or reaching important societal goals (e.g., McCabe, 2021). As such, there is a range of lies told by political leaders, with some lies being somehow justifiable (e.g., protecting national security) and others being clearly unacceptable (e.g., covering up crimes) (Pffiffer, 1999). Overall, the acceptability of misinformation is contingent upon the disseminator's intent, the seriousness of the deception, and its consequences (Pamment et al., 2018).

Individuals have these considerations in mind when evaluating misinformation. Lies and deception are condemned more strongly when used for personal advantage, whereas altruistic lies are perceived as more acceptable (Dunbar et al., 2016; Seiter et al., 2002). Falsehoods leading to negative consequences for individuals, the social fabric, and democracy are also condemned more strongly than more benign falsehoods (Robinson, 1994; Tully et al., 2022). Based on these considerations, I hypothesize that:

*H1: Citizens are least accepting of politicians spreading misinformation for personal or electoral gains, and most accepting of politicians spreading misinformation for socially desirable goals.*²²

²² The hypotheses were simplified to make them more digestible to the reader. The original formulation can be found in Appendix 2B.

Issue positions and the perceived acceptability of spreading misinformation

Post-truth denotes a situation in which appeals to emotions and personal beliefs become more important for opinion formation than facts themselves (Oxford Languages, 2016). MacMullen (2020) argues that there exist three consciously post-factualist mindsets: (1) *metaphysical post-factualism*, where people deny the existence of objective facts or universal truths; (2) *epistemic post-factualism*, where people believe that they have no reliable or unbiased ways of determining the truth; and (3) *motivated post-factualism*, where individuals care more about individual or political objectives than they care about the truth. Each of these post-factualist mindsets can make individuals perceive the spread of “false” information as less objectionable.

Finding a relationship between issue preferences and the acceptability of misinformation would be an illustration of motivated post-factualism. Extensive literature shows that citizens are more likely to believe in and share information consistent with their existing priors, even when that information is false (Van Bavel & Pereira, 2018). When asked to evaluate the acceptability of spreading misinformation, citizens might be conflicted between the perceived importance of norms of truth in public life and their desire to advance an agenda they care about. In such a situation, citizens are likely to reduce cognitive dissonance – discomfort associated with conflicting attitudes – by giving precedence to one value or attitude over the other (Festinger, 1957). For example, they may decide that protecting the environment is worth more than the truthfulness of political statements on this issue, and thus that spreading misinformation is worth it in terms of potential risks versus rewards. When having to decide between the facts and their core beliefs, citizens tend to prioritize their core beliefs, given that facts are often (perceived as) uncertain while core beliefs are more certain (Marietta & Barker, 2019). Consequently, the greater the attitudinal congruence of a message and the perceived importance of an issue, the greater the likelihood that citizens will interact with a post (like, comment, share), even if it contains misinformation (Morosoli, Van Aelst, Humprecht, et al., 2022; Nekmat & Ismail, 2019).

According to social identity theory, individuals define themselves based on who they perceive themselves to be and their membership in various groups (Tajfel & Turner, 1986). Positions on highly salient and polarizing issues like climate change or COVID-19 have been associated with membership in and loyalty to identity-defining groups (Bliuc et al., 2015). Social identity theory suggests that people evaluate their in-group and out-groups differently, condemning

out-groups' behaviors while excusing similar behaviors from their in-group. This logic applies to misinformation, with citizens blaming adversarial politicians and media organizations for spreading misinformation (Tong et al., 2020; van der Linden et al., 2020) while not punishing the leader of their preferred party when they do so (Nyhan et al., 2020; Swire et al., 2017).

Social identity theory provides different mechanisms through which issue positions can influence the perceived acceptability of misinformation. To begin with, issue positions convey social meanings and people might feel the need to express which side they are on (Kahan, 2017). Moreover, citizens tend to ascribe negative characteristics to out-groups, which increases the perceived acceptability of prejudice or aggression towards these groups (Tajfel & Turner, 1986). On threatening issues like COVID-19 and climate change, the moralization of compliance with public health measures or reducing one's carbon footprint is associated with citizens' dehumanizing, wanting to punish or exercise social control over those with deviant behaviors (Brauer & Chekroun, 2005; Kasper et al., 2022). Since lies are perceived as more acceptable when it is felt that major harm can be avoided only through deceit, people concerned about climate change and COVID-19 are arguably more likely to believe that lying to encourage action on these issues is in the general interest, especially when targeting those with deviant behaviors, while lying for other purposes can prevent the important response that these issues require. Consequently, I expect that:

H2: The perceived acceptability of politicians spreading misinformation is greater when that information advances a person's preferred policy position.

Is there an ideological asymmetry in attitudes towards misinformation?

While both left-wing and right-wing individuals are susceptible to ideologically aligned misinformation, studies suggest that right-wing individuals are usually less able to discern between truths and falsehoods, more prone to conspiratorial thinking, and more likely to spread misinformation online than those with a left-wing ideology (Garrett & Bond, 2021; van der Linden et al., 2021; but see Enders et al., 2022). This phenomenon is likely a by-product of *the current* political information environment, in which right-wing politicians and media are more likely to spread misinformation, high-profile misinformation is more closely aligned with conservative interests (Benkler et al., 2018; Garrett & Bond, 2021; Mosleh & Rand, 2022), and populist radical right parties are reluctant to object to misinformation (Diermeier, 2023).

This asymmetry likely shapes citizens' attitudes towards misinformation. The few existing studies on this topic suggest that, while the approval of misinformation is low among both left-wing and right-wing individuals, right-wing individuals tend to find it more acceptable for politicians to spread misinformation (De Keersmaecker & Roets, 2019) and are less supportive of misinformation interventions by governments, social media platforms, and traditional media (Bridgman et al., 2022; Kozyreva et al., 2023; Lyons et al., 2020).

Various cognitive mechanisms could explain these ideological differences. First, there might exist differences in epistemic beliefs, with the right being increasingly associated with anti-intellectualism (Marietta & Barker, 2019) and relativism (Kakutani, 2019). Put otherwise, conservatives are more likely to believe that truth is a political construct (Garrett & Weeks, 2017), which could make the spread of so-called misinformation more tolerable (MacMullen, 2020). Second, right-wing individuals might assign greater importance to protecting free speech than controlling disinformation (Knight Foundation-Ipsos, 2022; Kozyreva et al., 2023). Finally, ideological differences could stem from an identity-protection mechanism, as many right-wing individuals believe that the fight against misinformation is biased against the right and that the misinformation label is used to suppress conservative ideas (Haimson et al., 2021). Therefore, I hypothesize that:

H3. Right-wing individuals (a) have higher baseline perceptions that public discourses on misinformation and content moderation on social media are biased against them; (b) are less critical of and concerned about misinformation; and (c) are less likely to support anti-misinformation measures.

I contend that perceptions of bias are one of the mechanisms explaining ideological differences in attitudes towards misinformation. The media bias literature offers an interesting starting point to theorize about perceptions of bias in public discourses on misinformation. Media bias studies indicate that perceptions of bias stem from the interaction between elite cues and individuals' social networks and partisanship/ideology (Feldman, 2017). Partisans tend to believe that the media is biased against their preferred party (Vallone et al., 1985), but perceptions are influenced by media portrayal by political elites (Watts et al., 1999). For example, disinformation accusations tend to reduce citizens' trust in the accused outlet (Egelhofer et al., 2022). Research shows that cues can also influence bias perceptions on related topics, including algorithmic news curation (Calice et

al., 2023). Consequently, providing individuals with information about potential biases could increase their perceptions of bias in general (H4) and more strongly so when biases are described as targeting their in-group (H5). While motivated reasoning plays an important role in how individuals process information, we can expect the provision of information to increase bias perceptions in general given that many citizens might not have a high knowledge and strong attitudes on this issue and, as such, might not suffer from the same confirmation/disconfirmation biases as citizens with strong political predispositions (Taber & Lodge, 2013).

H4. Individuals exposed to a cue suggesting that the fight against misinformation might principally have detrimental effects on the right/left will be more likely to believe that public discourses on misinformation are biased against the right/left.

Still, individuals are likely to react differently to public discourses about misinformation based on how consistent these discourses are with their existing political predispositions and identities (Taber & Lodge, 2013). Despite evidence that there are no partisan differences in content moderation when controlling for actual platform violations (e.g., hate speech) (Barrett & Sims, 2021; Jiang et al., 2019), many right-wing elites claim that content moderation and other anti-misinformation measures are biased against conservative views (Haimson et al., 2021). As indicated earlier, right-wing respondents might also be aware – or can be made aware – that high-profile misinformation is currently more closely aligned with conservative interests (Garrett & Bond, 2021). As a result, citizens on the right tend to perceive more biases in misinformation interventions on social media than citizens on the left, contributing to lowering their support for such interventions (Saltz et al., 2021). While current elite discourses mainly target right-wing individuals, research in experimental settings suggests that partisan cues can also increase bias perceptions among left-wing individuals (or Democrats) (Calice et al., 2023).

Studies suggest that citizens consider the spread of misleading information as less severe and more justifiable when it comes from their preferred party than when it comes from an opposing party (Claassen & Ensley, 2016) and react more positively to fact-checking messages targeting political opponents (Shin & Thorson, 2017). Similarly, they are more likely to perceive ideas by political opponents as false or harmful, which increases their willingness to censor them (Kubin et al., 2022). Consequently, citizens are likely to find misinformation more permissible, be less concerned about it, and be less likely to support anti-misinformation measures when told that their

ideological in-group is more likely to believe and share misinformation. Conversely, they are likely to be more concerned about misinformation and more likely to support anti-misinformation measures when misinformation primarily originates from the ideological out-group.

H5. Being exposed to cues suggesting that the fight against misinformation might principally have detrimental effects on one's ideological in-group will make individuals (a) more likely to believe that public discourses on misinformation and content moderation are biased against them, (b) less concerned about misinformation, and (c) less likely to support anti-misinformation measures. The reverse effects will be observed when cues are targeting the ideological out-group.

H6. Individuals who believe that public discourses on misinformation are biased against their ideology are less concerned about misinformation and express lower support for initiatives against misinformation.

Study 1: The perceived acceptability of spreading misinformation

Methods

Data

I test for the hierarchy of acceptability of misinformation (H1) and the influence of issue positions (H2) using a pre-registered survey experiment conducted between August 23 and August 29, 2021, during the Canadian federal election. The survey was administered by Dynata²³ via the Qualtrics platform to an online quota-based sample (age, gender, and region) of 1,896 Canadian citizens. The sample size was determined based on imperatives for the broader Media Ecosystem Observatory election project.²⁴ The sociodemographic composition of the sample is presented in Appendix 2A.²⁵ As pre-registered, respondents who straight-lined matrix questions or answered

²³ This sample provider is commonly used in research published in the top journals of the discipline (e.g., Broockman et al., 2022; Merkley & Loewen, 2021; Uscinski et al., 2021).

²⁴ Given this lack of control over the sample size, power calculation was not included in the pre-analysis plan.

²⁵ I do not use post-stratification weights when analyzing the experimental results given that, when relying on data that offer a good representation of the population, the sample average treatment effect (SATE) is not substantially different from the population average treatment effect (PATE) and helps avoid the power losses associated with weighting. The SATE could be slightly more conservative than the PATE given that those who hold the most extreme views about misinformation, such as those who have a strong conspiratorial mindset, tend to have lower trust in surveys (Lavigne et al., 2023). Post-stratification weights are unlikely to fix that given the lack of information about the baseline values in the population.

the survey in less than 4.5 minutes (the median completion time is around 15 minutes) were excluded from the analysis.²⁶

Design

Respondents were asked to evaluate the extent to which they would consider it acceptable or unacceptable for a politician to spread false or misleading information on two issues: climate change and COVID-19. I selected these two issues because of their salience and the fact that attitudes are relatively polarized (Smith & Mayer, 2019), which is more convenient for studying the effect of issue preferences on the perceived acceptability of misinformation. Indeed, while there was partisan consensus at the beginning of the pandemic on the necessity to adopt strong actions to combat the virus (Merkley et al., 2020), the 2021 election coincided with the federal and provincial governments discussing the implementation of vaccine mandates, with crowds of angry protesters following incumbent prime minister Justin Trudeau during the campaign, forcing events to be canceled or postponed (Boynton & Bimman, 2021).

For each issue, respondents were randomly assigned to one of five treatment conditions manipulating the purpose of the misinformation.²⁷ The manipulation was included in the survey questions measuring the perceived acceptability of misinformation (like a question framing experiment), as follows: "To what extent would you consider it acceptable or unacceptable for a politician to spread false or misleading information about climate change/COVID-19 [purpose]?", with five purposes: (1) [empty] (control condition); (2) because they don't know any better; (3) for personal or electoral gains; (4) for the purpose of protecting the economy; (5) for the purpose of urging people to reduce their ecological footprint/comply with public health measures. These conditions were chosen to reflect both low (don't know any better) and high (personal or electoral gains) intentionality, and to distinguish between misinformation shared for individual and collective purposes (protect the economy, urge people to reduce their ecological footprint/comply with public health measures). Between 321 and 382 individuals were exposed to each treatment condition.

²⁶ The results are consistent when including these respondents, see Appendix 2C.

²⁷ Respondents were provided with the purpose of the misinformation to make it possible to evaluate how they react to different types of misinformation. In real-world settings, perceptions of the purpose of the misinformation are also likely to be an object of motivated reasoning and to depend on cues from political elites and the media.

The key outcome is the perceived acceptability of spreading false or misleading information, measured on a 0-10 scale. “Don’t know” answers are excluded from the analysis, with the number of valid completes being 1,794 for COVID-19 and 1,777 for climate change. Issue positions on climate change and COVID-19 were measured using the following questions: “Please indicate how strongly you agree or disagree with the following statements. The federal government should...” (1) Take more action to address climate change; (2) Take more action to reduce the spread of COVID-19 variants in Canada.²⁸ The answers are measured using five-point agreement scales. Descriptive statistics are presented in Appendix 2A.

Methods

I test the hierarchy of misinformation hypothesis using t-tests, where each treatment condition is compared to the control condition, controlling for familywise error rate using the Bonferroni correction. “For personal or electoral gains” is expected to be the least acceptable purpose for spreading misinformation given that it implies intentionality (compared to not knowing any better) and the misinformation is used for personal/political advantage rather than for the common good. Protecting the economy and urging people to reduce their ecological footprint/comply with public health measures are also expected to be considered more acceptable than the control condition, given that they can be conceived as socially desirable goals.

I test the influence of issue positions using OLS regression, by interacting issue positions with the purpose of the misinformation.²⁹ The purpose variable is dichotomized. In the first two models, it is coded as 1 when the purpose is to urge citizens to comply with public health measures/reduce their ecological footprint (priority of those who want more action on these issues) and 0 otherwise. In the following two models, it is coded as 1 when the purpose is to protect the

²⁸ Issue positions were measured after the experiment, which can result in collider bias. However, there are strong reasons to believe that issue positions on COVID-19 and climate change were not influenced by the treatment. First, there were many survey questions in between. Second, there are no differences in issue positions based on the treatment condition. Third, issue positions are not statistically different from those of the subsequent week, when the experiment was no longer fielded.

²⁹ The pre-registration plan indicated that I would also estimate the relationship between issue positions and the perceived acceptability of misinformation within the subsamples exposed to specific treatments (urge citizens to comply with public health measures/reduce their ecological footprint/protect the economy). I only report these results in Appendix 2B given that they are statistically equivalent to interacting issue positions with the purpose of the misinformation.

economy (priority of those who do not want more action) and 0 otherwise. Robust (HC2) standard errors are estimated.

$$\mathbf{H2:} \quad \textit{Acceptability of spreading misinformation}_i = \alpha_i + \beta_1 \textit{Treatment}_i + \beta_2 \textit{Issue positions}_i \\ + \beta_3 (\textit{Treatment}_i * \textit{Issue positions}_i) + \varepsilon_i$$

I expect those who want more government action on climate change and COVID-19 to perceive it as more acceptable for a politician to spread misinformation to urge citizens to reduce their ecological footprint or comply with public health measures and less acceptable to spread misinformation for other purposes. Conversely, those who oppose government action on climate change and COVID-19 should find it more acceptable for politicians to spread misinformation to protect the economy, given that protecting the economy tends to be valued more by those opposing climate change and COVID-19 mitigation measures and to be used as an argument to justify inaction on these issues (lockdowns and closure of schools and non-essential businesses were common pandemic measures in Canada; opposition to these measures was partly based on economic considerations) (Coelho et al., 2021; Drews & van den Bergh, 2016).

Finally, I ran an exploratory analysis (pre-registered as such) examining how ideology shapes the perceived acceptability of misinformation. Ideology is measured on a 0-10 left-right scale, and to facilitate visualization, recoded into a categorical variable to distinguish between those clearly on the left (0-3) (21% of the sample), moderates (4-6) (48%), and those clearly on the right (7-10) (32%). The results are consistent when including only those with a score of 5/10 in the “moderates” category.

Results

The perceived acceptability of misinformation based on the purpose of the misinformation

Figure 2.1 shows the average perceived acceptability of spreading false or misleading information on COVID-19 and climate change based on the treatment condition, i.e., the aim of the misinformation. I find little support for the hypothesis that there is a hierarchy of acceptability of misinformation (H1). Citizens are, in general, very critical of misinformation, with the average acceptability being less than 3 out of 10, no matter the purpose of the misinformation. I use t-tests

to compare each of the four treatment conditions to the control condition. The results suggest that the aim of the misinformation has little to no effect on its perceived acceptability, see Table 2B.1.³⁰

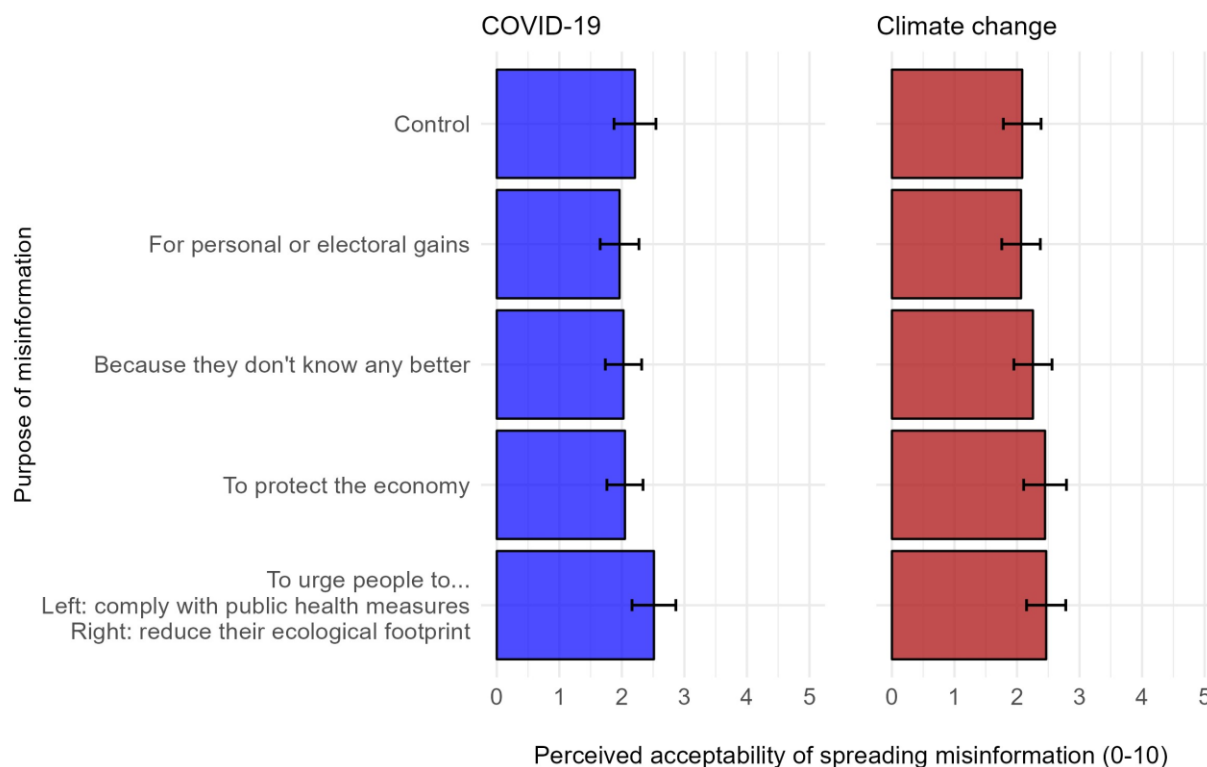


Figure 2.1. Average perceived acceptability of spreading false or misleading information on COVID-19 and climate change across treatment conditions, with 95% confidence intervals.

The perceived acceptability of misinformation by issue positions

I evaluate whether individuals consider congruent misinformation more acceptable (H2) by interacting – in an OLS model – a dichotomized treatment variable (urging people to take action is equal to 1 and other purposes are coded as 0) and issue preferences. The results are reported in Figure 2.2, with the top panels showing the *marginal effects* and the bottom panel showing the model-based *predicted probabilities*.³¹

³⁰ I correct for multiple testing using the Bonferroni correction, which is an overly conservative method that limits the risk of false positives but can substantially reduce statistical power. Nevertheless, differences were already insignificant before applying that correction. This lack of differences could partly be explained by the fact that the treatment was not strong enough, as further discussed in the concluding section.

³¹ Complete regression tables for all pre-registered analyses are reported in Appendix 2B, while models with controls are included in Appendix 2C. The results are consistent when controlling for ideology, trust in politicians and political parties as a source of information, political interest, and socio-demographic variables, see Tables 2C.4 and 2C.5.

The results do not support the hypothesis that those with a preference for more action on COVID-19 and climate change find it more acceptable for politicians to spread misinformation to encourage individuals to act on these issues. Issue positions on COVID-19 and climate change do not impact the perceived acceptability of spreading misinformation to increase compliance with public health measures ($\beta = .29$, 95% CI = [-.97, 1.54], $p = .65$) or encourage citizens to reduce their ecological footprint ($\beta = -.95$, 95% CI = [-2.20, .29], $p = .13$).

Despite not finding ideologically congruent misinformation more acceptable, those who support more action on COVID-19 and climate change could be more critical of misinformation spread for other purposes, given the potentially adverse consequences. I find some support for that sub-hypothesis. On the one hand, issue positions on *COVID-19* do mitigate the relationship between the purpose of the misinformation and its perceived acceptability. Individuals who want more action on COVID-19 find it significantly more acceptable for politicians to spread misinformation to encourage citizens to comply with public health measures than to spread misinformation for other purposes, while the reverse is true among those who oppose more action (interaction $\beta = 2.46$, 95% CI = [1.08, 3.84], $p < .001$). On the other hand, the interaction effect is in the expected direction but not statistically significant when looking at the mitigating effect of climate change positions ($\beta = .61$, 95% CI = [-.75, 1.97], $p = .38$), with individuals who want more action on climate change being more critical of misinformation on this issue no matter what the purpose is.

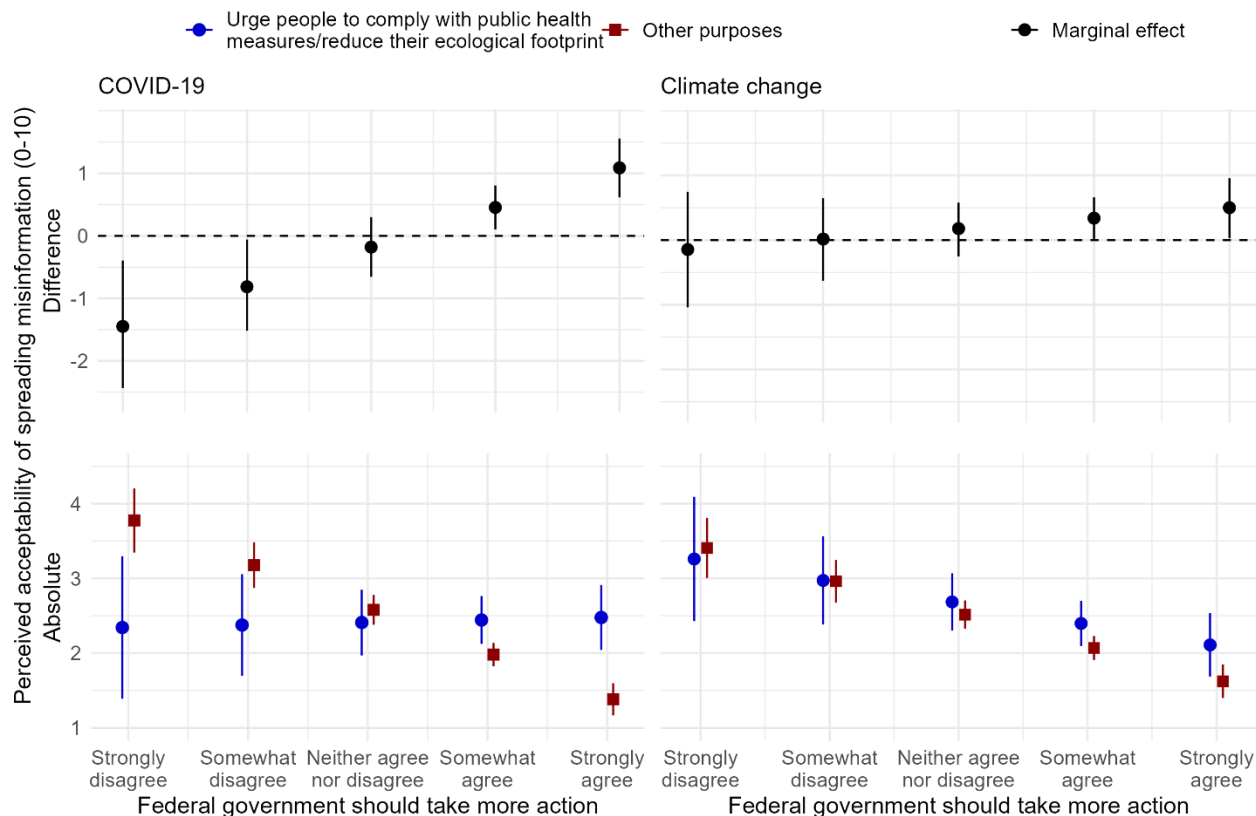


Figure 2.2. Influence of issue positions on the perceived acceptability of spreading misinformation to urge people to comply with public health measures/reduce their ecological footprint and for other purposes. Results based on OLS interaction models. Marginal effects (top panels) and predicted probabilities (bottom panels) plotted with 95% confidence intervals.

Next, I examine whether opposition to climate change and COVID-19 measures increases the perceived acceptability of spreading misinformation to protect the economy. In the pre-registered bivariate regression analysis, a change from completely agreeing to completely disagreeing that the government should take more action on COVID-19/climate change increases by respectively 1.83 points (95% CI = [.69, 2.96], $p < .01$) and 1.71 points (95% CI = [.49, 2.92], $p < .01$) the perceived acceptability of spreading misinformation to protect the economy on the 0-10 scale. However, as reported in Figure 2.3, being opposed to more action on these issues does not make misinformation that aims to protect the economy more acceptable than misinformation spread for other purposes, i.e., spreading misinformation is perceived as more acceptable no matter the purpose.

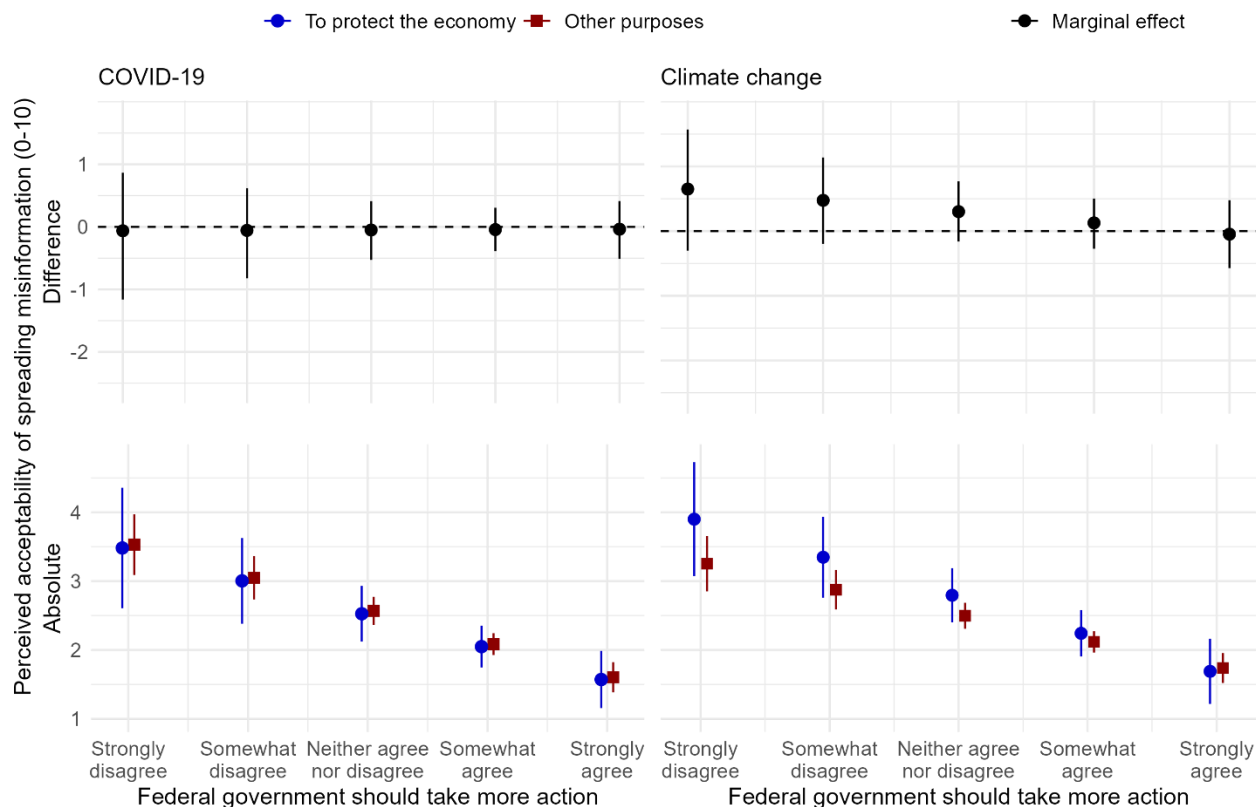


Figure 2.3. Influence of issue positions on the perceived acceptability of spreading misinformation to protect the economy and for other purposes. Results based on OLS interaction models. Marginal effects (top panels) and predicted probabilities (bottom panels) plotted with 95% confidence intervals.

The perceived acceptability of misinformation by ideology

Next, I conducted an exploratory analysis (pre-registered as such) examining how ideology influences the perceived acceptability of spreading misinformation. Figure 2.4 reports the distribution of the perceived acceptability of misinformation by ideology. The mode answer among all ideological groups is 0. However, the percentage of respondents providing that answer is significantly greater on the left (respectively 67% and 63% of respondents for COVID-19 and climate change) than on the right (33% and 31%). Answers are concentrated on the lower end of

the scale among left-wingers, while the distribution is bimodal among right-wing respondents, with around one-quarter of respondents providing 7 or 8 as their answer on the 0-10 scale.³²

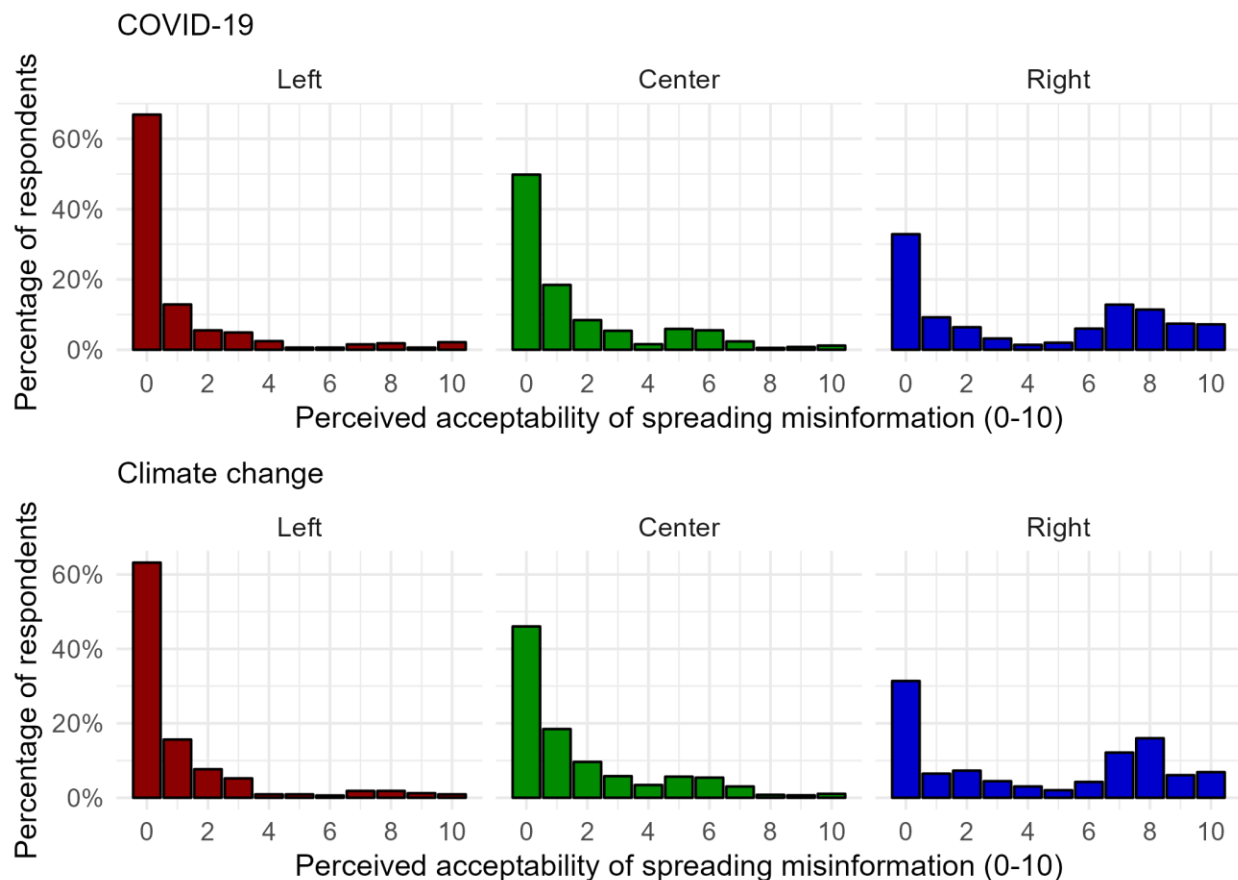


Figure 2.4. Distribution of the perceived acceptability of spreading misinformation on COVID-19 and climate change by ideology.

Building on linear interaction models, Figure 2.5 shows the predicted acceptability of spreading misinformation based on the purpose of the misinformation and ideology. No matter the purpose of the misinformation, right-wing citizens perceive misinformation as more acceptable than left-wing citizens. In general, the purpose of the misinformation has a similar effect on acceptability across the political spectrum. However, there is greater ideological polarization in the perceived acceptability of spreading misinformation on climate change to protect the economy (compared to the control condition, see Table 2B.5 and 2B.6). As illustrated in Figure 2.5, protecting the

³² The association between ideology and the acceptability of misinformation is similar when measuring ideology in terms of support for government measures to reduce social and economic inequalities, see Table 2C.7 in the chapter's appendices.

economy is the least acceptable reason for spreading misinformation on climate change among those on the left, while it is the most acceptable reason among those on the right, with an average perceived acceptability of almost 5 on the 10-point scale.

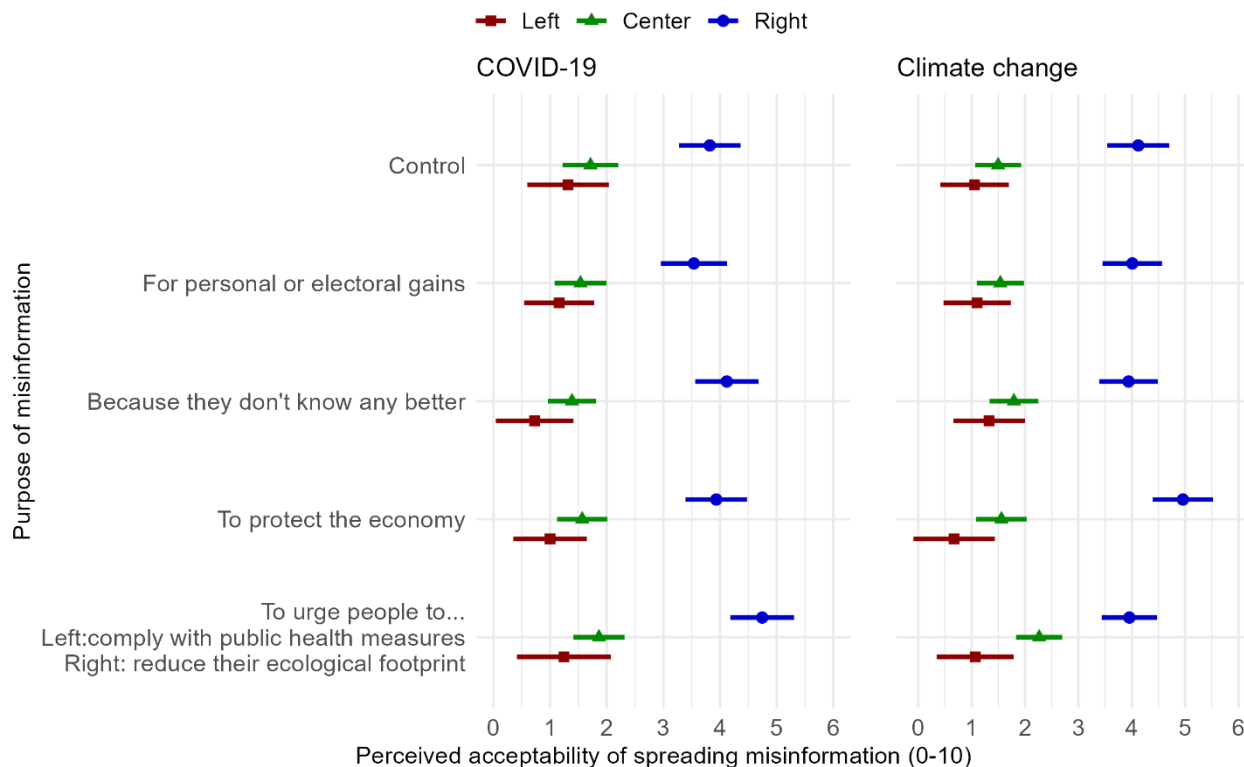


Figure 2.5. Perceived acceptability of spreading misinformation based on the purpose of the misinformation and ideology. Predicted probabilities based on OLS interaction models with 95% confidence intervals.

Discussion

Study 1 shows that most citizens are critical of misinformation, no matter what the purpose is, but that citizens who oppose action on COVID-19 and climate change and citizens with a right-wing ideology tend to find it more acceptable for politicians to spread misinformation on these issues. Ideological differences exist no matter the purpose of the misinformation and are more substantially important than differences based on issue positions. While climate change and COVID-19 could be considered left-wing issues – i.e., those with a left-wing ideology are more

likely to support stronger action on COVID-19 and climate change³³ – ideology matters after controlling for issue positions (and vice versa). Other studies have also reported similar ideological differences in the acceptability of spreading misinformation on economic issues (De Keersmaecker & Roets, 2019).

Study 2: Ideological differences in attitudes towards misinformation

Study 2 aims to document further and better understand the ideological differences observed in Study 1. It examines whether consistent ideological differences are found when using abstract statements to measure the acceptability of misinformation and uses a prompt experiment to test whether perceived biases in public discourses around misinformation can explain right-wing citizens' lower levels of concern and support for measures to counter misinformation.

Methods

Data

The prompt survey experiment and an extensive survey battery measuring perceptions of misinformation were administered in the post-election survey of the 2022 Quebec Election Misinformation Project. The survey was fielded between October 14 and October 16 to 1,545 eligible voters of the Canadian province of Quebec who had previously answered the pre-election survey. Previous studies have found attitudes towards misinformation to be comparable in Quebec and the rest of Canada (Bridgman et al., 2022; Lavigne et al., 2023). The sample was provided by Léger. As pre-registered, respondents answering in less than 1/3 the median completion time or failing an attention check are excluded from the analysis, yielding 1,482 valid responses.³⁴

Design

Respondents were either exposed to (1) a prompt suggesting that combatting misinformation would be particularly detrimental to the right, (2) a prompt suggesting that it would be particularly detrimental to the left, or (3) no prompt. Between 491 and 497 respondents were assigned to each treatment condition. The prompt was designed assuming that citizens would feel attacked or perceive biases in public discourses around misinformation (or content moderation) when told that

³³ Opposition to more action on COVID-19 and climate change is moderately correlated with ideology. The correlation coefficients are respectively 0.14 and 0.27 (significant at $p < .001$).

³⁴ The results are consistent when including these respondents, see Appendix 2C.

their side is spreading more misinformation and that politicians from their in-group have had content removed by platforms. The prompt is as follows:

“A review of the most viral news – true and false – over a six-month period shows that individuals on the right/left are more likely to believe misinformation than individuals on the left/right, mainly because the most shared falsehoods tend to promote right/left-wing positions. In recent years, several right/left-wing politicians have had content they posted online removed by social media platforms.”

The first series of dependent variables measure perceptions that public discourses about misinformation are biased against the right/left and that content moderation on social media is biased against one’s views using five-point agreement scales. Using the same scale, respondents were asked about three types of attitudes that could be influenced by the treatment and explain ideological differences in perceptions of misinformation: (1) There usually are no impartial ways of determining who is telling the truth in political debates about facts (epistemological post-factualism); (2) The leader of my preferred party should always tell the truth, even if it significantly reduces their chances of being elected (motivated post-factualism); and (3) Politicians should be given the opportunity to freely express themselves even when what they say is considered to be false (importance of free speech versus curbing misinformation). The battery also measured concerns about misinformation using a 0-10 scale. Finally, the last dependent variables evaluate support for anti-misinformation measures based on agreement with the following statements: (1) Social media platforms should remove content that contains misinformation; (2) Governments should put stronger measures in place to fight misinformation.

The main independent variables are exposure to each treatment and ideology, the latter of which is measured on a 0-10 left-right scale. Models that do not use the experimental treatment as the main independent variable control for age (18-34, 35-54, 55+), gender (male = 0, female = 1), education (high school or less, some college or university, university diploma), and frequency of news consumption in general (5-point scale) and on social media (6-point scale) during the election campaign.

Method

I test each hypothesis using the following linear regression models with robust (HC2) standard errors. $\mathbf{X}\boldsymbol{\beta}$ is a vector of the covariates listed above.

H3:
$$\text{Outcomes}_i = \alpha_i + \beta_1 \text{Ideology}_i + \mathbf{X}_i \boldsymbol{\beta} + \varepsilon_i$$

I expect that moving to the right on the ideology scale will be positively associated with the following outcomes: (1) perceived bias against the right, (2) perceived bias in content moderation, (3) perceptions that there are no impartial ways of determining the truth, and (4) the perceived importance of free speech. Conversely, I expect that having a right-wing ideology will decrease (5) perceived bias against the left, (6) the perceived importance of telling the truth versus being elected, (7) concerns about misinformation, (8) support for content moderation, and (9) support for stronger government measures against misinformation.

H4:
$$\text{Perceived bias against the left/right}_i = \alpha_i + \beta_1 \text{Prompt about the left/right}_i + \varepsilon_i$$

I expect a positive coefficient on β_1 .

H5:
$$\text{Outcomes}_i = \alpha_i + \beta_1 \text{Prompt about the right}_i + \beta_2 \text{Prompt about the left}_i + \beta_3 \text{Ideology}_i + \beta_4 (\text{Prompt about the right}_i * \text{Ideology}_i) + \beta_5 (\text{Prompt about the left}_i * \text{Ideology}_i) + \varepsilon_i$$

I expect that receiving a prompt aligned with one's ideology will increase respondents' perceptions of bias against their ideology, perceptions that there are no impartial ways of determining the truth in political debates about facts, and the perceived importance of free speech over curbing misinformation. Conversely, being exposed to an ideologically-aligned prompt should make respondents less likely to believe that the leader of their party should tell the truth if it reduces their chance of being elected, less concerned about misinformation, and less supportive of content moderation and government measures against misinformation.

H6:
$$\text{Outcomes}_i = \alpha_i + \beta_1 \text{Perceive bias against one's ideology}_i + \mathbf{X}_i \boldsymbol{\beta} + \varepsilon_i$$

I expect perceptions of bias to be positively associated with (1) perceptions that there are no impartial ways of determining the truth and (2) the perceived importance of free speech, and negatively associated with (3) the perceived importance of telling the truth versus being elected,

(4) concerns about misinformation, (5) support for content moderation, and (6) support for government initiatives against misinformation.

Results

Baseline ideological differences

The first models examine baseline ideological differences in attitudes towards misinformation. As shown in Figure 2.6, I find evidence that right-wing individuals are more likely to perceive misinformation-related discussions and practices as biased (H3a), are less critical of and concerned about misinformation (H3b) and are less supportive of measures to counter misinformation (H3c).

In line with H3a, right-wing respondents are more likely than left-wing respondents to believe that public discourses around misinformation are biased against their ideology³⁵ and that content moderation is biased against their views. Indeed, a change from being at the far left (0) to being at the far right (10) of the ideology scale respectively yields a 1.6 and 0.8-point increase in perceived bias on a five-point scale.

Consistent with H3b, right-wing citizens are also significantly more likely to favor free speech or electoral gains over combatting misinformation, less likely to believe in our ability to impartially determine the truth in political debates about facts, and less concerned about misinformation in general. These effects are substantially important. For example, a change from placing oneself at the extreme left to placing oneself at the extreme right is associated with a 1.2-point increase in agreement with the statement about politicians being given the opportunity to express themselves when what they say is false on a five-point scale and 1.6-point decrease in concerns about misinformation on a 0-10 scale.

Finally, having a right-wing ideology is associated with lower support for misinformation interventions. Placing oneself at the far right (10) of the ideology scale yields a 1.2-point and 1.0-point decrease in support for content moderation and stronger government actions against misinformation on a 5-point scale.

³⁵ A supplemental T-test analysis shows that right-wing respondents are significantly more likely to believe that public discourses about misinformation are biased against the right (average of 3.31 on the 1-5 scale) than left wing respondents are to believe that public discourses are biased against the left (average of 2.95). The difference is significant at $p < .001$.

These results are consistent when using an economic conservatism index rather than the traditional ideology scale, see Figure 2C.8 in the Appendix. Overall, they provide strong evidence that right-wing individuals are more indifferent to misinformation than left-wing individuals.

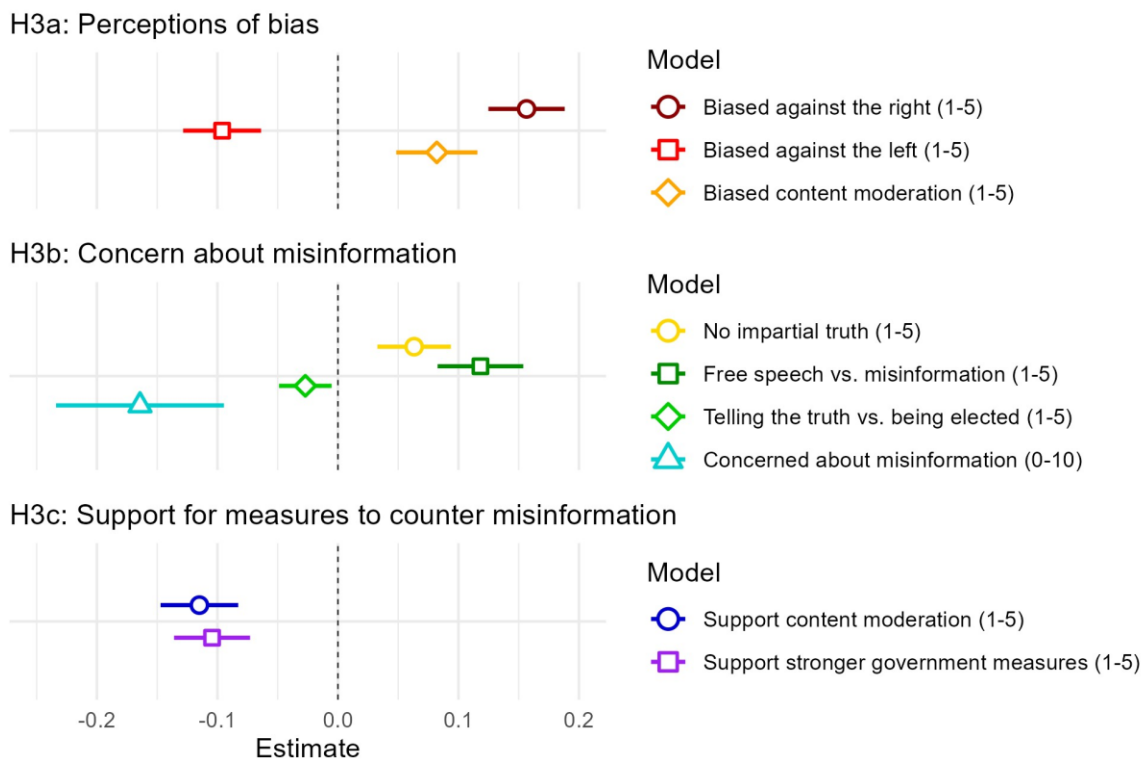


Figure 2.6. Baseline ideological differences in attitudes towards misinformation. OLS regression coefficients corresponding to a 1-point change on the 0-10 left-right ideology scale reported with 95% confidence intervals.

Effects of the treatment on perceived ideological bias and attitudes towards misinformation

Next, I use OLS models to examine whether being exposed to a prompt suggesting that the fight against misinformation would mostly have detrimental effects on a specific ideology (left or right) increases perceptions that public discourses about misinformation are biased against that ideology (H4). I find no support for that hypothesis since the coefficients are negative and non-significant (*Right*: $\beta = -.02$, 95% CI = $[-.17, .13]$, $p = .82$; *Left*: $\beta = -.09$, 95% CI = $[-.24, .05]$, $p = .21$). A non-pre-registered analysis further shows that being treated with either of the prompts did not make respondents more likely to believe that content moderation is biased against their views.

I also find no support for the hypothesis that being exposed to the right-wing or left-wing prompts has a different effect based on the respondent's ideology (H5), with all the coefficients related to the treatment and interactions being non-significant.³⁶ The full regression table is included in Appendix 2B. The fact that ideology does not moderate the effect of the treatment on bias perceptions suggests that respondents might not have noticed or been influenced by the subtle randomization (the effect on bias perceptions could be considered a manipulation check given that the prompts were aimed at increasing perceptions of bias). While the results are non-significant, there is weak evidence that being primed about biases in discourses around misinformation, no matter the direction of the prompt, can make left-wing citizens more critical of misinformation and supportive of actions against it and right-wing citizens less critical and supportive. A stronger treatment or a larger sample size would be necessary to validate these findings.

Bias perceptions and attitudes towards misinformation

Lastly, I use linear regression to examine how perceptions that public discourses about misinformation are biased against one's ideology influence attitudes towards misinformation, see Figure 2.7. The coefficients show the effect of a 1-point change in bias perceptions on the 5-point scale. As expected, respondents who consider that public discourses on misinformation are biased against their ideology are more likely to believe that there are no impartial ways of determining the truth in political debates about facts ($\beta = .21$, 95% CI = [.13, .29], $p < .001$) and that politicians should be given the opportunity to freely express themselves even when what they say is false ($\beta = .15$, 95% CI = [.06, .24], $p < .01$). Believing that public discourses about misinformation are biased also lowers support for content moderation ($\beta = -.10$, 95% CI = [-.18, -.03], $p < .01$) and for stronger government measures against misinformation ($\beta = -.13$, 95% CI = [-.21, -.06], $p < .001$). However, contrary to expectations, perceptions of bias do not have a significant influence on citizens' concerns about misinformation ($\beta = -.04$, 95% CI = [-.20, .11], $p = .56$) and make them more likely to believe that the leader of their preferred party should always tell the truth, even if it significantly reduces their chances of being elected ($\beta = .07$, 95% CI = [.02, .12], $p < .01$). Non-registered analyses, included in Appendix 2C, indicate that the results are consistent, although no longer significant at $p < .05$ in the model about the importance of telling the truth versus being

³⁶ Another possibility is that the effect could be dependent on one's political knowledge. Measuring knowledge based on the name of the minister of Finance, the unemployment rate, and the method used to count ballots in the election, I found no evidence for that theory.

elected ($p = .10$) when also controlling for populist attitudes³⁷ and political knowledge. Supplementary analyses further show that the effects of bias perceptions on attitudes towards misinformation tend to be stronger among right-wing citizens than left-wing citizens and that controlling for bias perceptions decreases (although does not eliminate) ideological differences in attitudes towards misinformation.

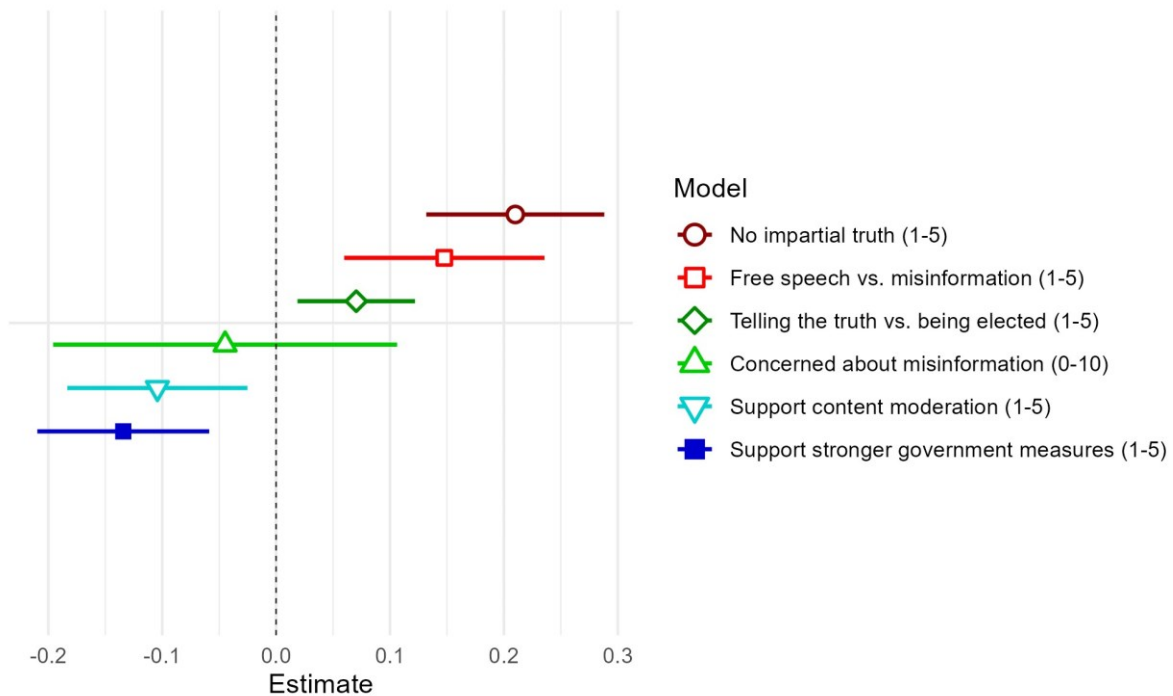


Figure 2.7. Correlation between perceived bias against one’s ideology and attitudes towards misinformation. OLS regression coefficients correspond to a 1-point change in bias perceptions on the 5-point scale, with 95% confidence intervals.

Discussion

Study 2 aimed to document and explain ideological differences in attitudes towards misinformation. I find substantially important differences, with right-wing citizens being more likely to believe that public discourses around misinformation and content moderation are biased against them, more indifferent to misinformation, and less likely to support platforms’ and governments’ actions against misinformation than left-wing citizens. The experimental prompt did

³⁷ The scale I use to measure populist attitudes is consistent with the one proposed by Akkerman et al. (2014), see Appendix 2C.

not substantially move attitudes towards misinformation, potentially because citizens were already pre-treated or because the treatment was too soft. The treatment could have been made stronger by directly telling respondents that the left or right is disproportionately censored compared to their share of misinformation or providing them with elite cues about how they are discriminated against on social media. With that aside, I found observational evidence that perceptions of bias are more common among right-wing citizens and are associated with tolerance for misinformation and decreased support for actions to curb misinformation. However, the fact that they do not completely eliminate ideological differences suggests that other mechanisms are at play.

Conclusion

This paper focuses on the demand side of misinformation, providing experimental and observational insights into the circumstances in which spreading misinformation is considered acceptable and why right-wing citizens are less critical of misinformation and less supportive of interventions to counter it. The findings have important implications since democratic societies are more vulnerable to misinformation if citizens become less concerned about facts or tolerate politicians spreading misinformation.

This paper first examined whether there exists a hierarchy of acceptability of misinformation and whether citizens' issue preferences and ideology shape the perceived acceptability of misinformation on two salient policy issues, climate change and COVID-19. The results are somewhat comforting, showing that most Canadian citizens do not find it acceptable for a politician to spread misinformation, even when it is consistent with their issue preferences. As such, the results support the argument that epistemic polarization might not principally be caused by citizens being no longer concerned about facts, but perhaps rather by their different understanding of what the facts are (Marietta & Barker, 2019).

Nevertheless, the results should not be taken as meaning that there exists no hierarchy of acceptability of misinformation from a public opinion perspective. While the treatment is akin to a face-saving experiment (Daoust et al., 2021), given that presenting respondents with a positive outcome could make them feel less guilty to report that spreading misinformation is acceptable, I may underestimate differences in the perceived acceptability of misinformation because of social desirability bias and the fact that the treatment is relatively weak. First, averages are low for all

types of misinformation, which could reflect citizens' unwillingness to admit that they find misinformation acceptable in some instances. Second, the effect sizes would likely be bigger if the focus was not put on individual actions (e.g., complying with public health measures) but on the social benefits resulting from such actions, such as if the misinformation was described as saving lives. Future research could validate the current findings using implicit association tests or sensitive survey techniques (e.g., question prefacing, see Berinsky, 2017).

Regarding the influence of issue preferences, the results suggest that citizens who want more action on COVID-19 and climate change do not support the spread of misinformation to achieve outcomes consistent with their issue preferences. However, those who oppose COVID-19 and climate change initiatives find misinformation on these issues slightly more acceptable. Moreover, the data show that "protecting the economy" could be an acceptable reason for spreading misinformation on climate change among people on the right.

Finally, I find that left-wing citizens have more negative attitudes towards misinformation and more positive attitudes towards actions to curb it than right-wing citizens. These ideological differences are consistent on a large number of indicators (as presented in Figure 2.6) and with ideological differences observed in other contexts (Haimson et al., 2021; Kozyreva et al., 2023). Specifically, while both left-wing and right-wing citizens tend to perceive misinformation as unacceptable, right-wingers are somewhat less critical of misinformation being spread and less concerned about misinformation. Individuals on the right are also more likely to believe that there are no impartial ways of determining the truth in political debates about facts (epistemological post-factualism), more likely to prioritize free speech over combatting misinformation, and less likely to state that the leader of their preferred party should always tell the truth, even if it reduces their chances of being elected (motivated post-factualism). In a context where research shows that high-profile misinformation is principally spread by populist right-wing elites who are also more likely to accuse misinformation interventions of bias (Garrett & Bond, 2021; Haimson et al., 2021), I hypothesized that ideological differences in perceptions could be explained by right-wing citizens believing that the public response to misinformation is disproportionately affecting them. While the experimental prompt was unable to prime bias perceptions, I find evidence that these bias perceptions already exist, are more salient among people on the right, and are associated with tolerance for misinformation and lower support for anti-misinformation actions.

As we are entering an era in which defining what is true and false is perceived as political and is central to discursive struggles (Farkas & Schou, 2018), the observed ideological differences suggest that it will be difficult to get everyone on board and adequately address the misinformation challenge without depoliticizing and de-weaponizing labels like “disinformation” and “fake news”. Future research should examine whether these bias perceptions can be corrected and the impacts of perceptions of misinformation on citizens’ trust in fact-checkers and ability to distinguish between accurate and false information.

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Section 2: Citizens' Vulnerability to Misinformation

Chapters 1 and 2 illustrate how the politicization of misinformation debates might have lowered our resilience to misinformation by making some segments of the electorate more indifferent to its spread. Chapter 3 focuses on the more traditional understanding of resilience, that is, what influences citizens' likelihood of believing and sharing misinformation. It illustrates how incorporating both cross-national and intranational factors is necessary to comprehend national resilience to misinformation. Chapter 3 demonstrates how the polarization and high volumes of misinformation circulating about COVID-19 in the United States contributed to making Canadians exposed to that information environment more vulnerable to misinformation. Taking advantage of the coexistence of a French- and English-language information environment in Canada, we show that Francophones insulated from the English-language information environment (and U.S.-based information in particular) were comparatively less likely to hold COVID-19 misperceptions. Chapter 3 further investigates how exposure to information in both French and English might influence citizens' vulnerability to misinformation, something that has not received attention in the political science literature. The results indicate that Francophones exposed to both information environments, especially those who are heavy social media users, were slightly more likely to hold misperceptions and share misinformation during the pandemic, potentially because of their exposure to misinformation in both languages and their greater likelihood of suffering from information overload.

Chapter 3. Une Barrière Linguistique? How language influences the spread of U.S.-based COVID-19 misinformation³⁸

Abstract

During the COVID-19 pandemic, misinformation pervaded the United States' information environment. We use the saturation of COVID-19 misinformation in the United States to shed light on how misinformation circulates and produces misperceptions globally. We evaluate its impact in Canada, a geographic and cultural neighbor of the United States with two official languages (French and English). Differential exposure to English-language U.S.-based information among the English- and French-speaking populations allows us to evaluate whether language creates a barrier to the spread of misinformation. Using a survey of around 40,000 Canadians, we find that exposure to U.S.-based information on social media was a significant predictor of COVID-19 misperceptions. As a result, Francophones insulated from the English-language information environment were less likely to hold COVID-19 misperceptions than exposed Francophones and Anglophones. We also find that exposed Francophones had slightly higher levels of misperceptions than exposed Anglophones, especially among those with high social media usage. We further investigate this result using a large-scale dataset of approximately 100,000 highly active Canadian Twitter users who produced about 100 million tweets in 2020. We find that exposed Francophones were also more likely to share COVID-19 misinformation than exposed Anglophones. While following more U.S. accounts on Twitter is associated with producing more misinformation-related tweets and retweets among both Francophones and Anglophones, the effect is stronger among Anglophones, potentially because exposed Francophones are exposed to and share misinformation from a greater diversity of sources. The findings have implications for the reach of misinformation and contentious politics in other multilingual countries, as well as between countries with porous information environments.

Keywords: social media, language, misinformation, COVID-19, information ecosystem

³⁸ This chapter is co-authored with Aengus Bridgman. Mathieu Lavigne is the first author. A previous version of this chapter was presented at the 2023 annual conference of the Canadian Political Science Association.

Introduction

The COVID-19 pandemic has been accompanied by an overabundance of false and harmful information about the virus – a global infodemic. This situation has led researchers to try to identify the factors influencing beliefs in misinformation – information that is not consistent with the best available evidence (Vraga & Bode, 2020) – showing how social media (Bridgman et al., 2020) and alternative right-wing media usage (Motta et al., 2020), ideology (Garrett & Bond, 2021), anti-intellectualism (Merkley & Loewen, 2021), and lazy thinking (Pennycook, McPhetres, et al., 2021) can contribute to misperceptions. In this paper, we demonstrate that language can also help explain misperceptions by impeding the spread of misinformation from other-language sources. We take advantage of the high concentration of COVID-19 misinformation in the United States (Lenti et al., 2023) alongside the cultural and geographic proximity of Canada to show how spoken language can limit the cross-national spread of misinformation.

In Study 1, we use a multi-wave survey of around 40,000 Canadians to examine how linguistic differences impact citizens' likelihood of *believing in* COVID-19 misinformation. We show that monolingual Francophones had lower levels of misperceptions, in part because of their lack of exposure to English-language (and especially U.S.-based) misinformation. The findings also reveal that Francophones exposed to the English-language information environment, especially those frequently using social media for information, were slightly more likely to hold misperceptions than exposed Anglophones, a situation that had not previously been documented.

Building on that finding, Study 2 investigates whether exposed Francophones were also more likely than Anglophones to *share* COVID-19 misinformation online. Using Twitter's API, we collected all the tweets, retweets, and follows of approximately 100,000 highly active Canadian Twitter users from January to December 2020. This allows us to examine language differences in the actual (rather than self-reported) behaviors of a population described as particularly likely to spread misinformation, namely highly active political social media users (Valenzuela et al., 2019). We find that exposed Francophones were, indeed, more likely to produce misinformation-related tweets and retweets than exposed Anglophones. However, exposure to information from the U.S. was a stronger predictor of sharing misinformation-related tweets among Anglophones, suggesting that Francophones were exposed to and sharing misinformation from more diverse sources.

This study makes four important contributions. First, we provide further evidence of how the high volumes of misinformation and high levels of political polarization in the United States can impact citizens' attitudes and behaviors in other developed democracies. Second, we show how linguistic barriers can influence beliefs in misinformation, even when studying porous information environments with high exposure to other-language information. Third, we shed light on how the national origin of misinformation circulating in multilingual countries differs across linguistic groups. Fourth, we provide evidence that bilinguals might be differently impacted by misinformation than monolinguals.

While this paper focuses on the contagion of U.S. misinformation in Canada, the U.S. political information environment has been shown to influence citizens' attitudes and behaviors in other parts of the world (Turnbull-Dugarte & Rama, 2022). For example, U.S.-based conspiracy theories were an essential feature of anti-vaccine misinformation circulating in West Africa during the COVID-19 pandemic (Dotto & Cubbon, 2021). Similar dynamics to the ones uncovered in this paper are also likely to apply to other country pairs with cultural, geographical, and linguistic commonalities. The findings have important implications for the fight against misinformation: researchers and public actors should pay attention to how, given today's globalized and porous information environments, vulnerabilities in the information environment of one country and within one language can impact resilience to misinformation in other contexts.

COVID-19 misinformation from a comparative perspective

Crisis situations like a pandemic provide fertile ground for misinformation to take root in part because of the uncertainty and need for information that they create (van Prooijen & Douglas, 2017). The COVID-19 pandemic is no exception. The emergence of the virus has led to the rapid and widespread propagation of misinformation concerning its origins, severity, treatment, and prevention. Some of that misinformation has gained global salience, while other falsehoods were more local or regional (Nsoesie et al., 2020; Singh et al., 2022).

Politics was a significant cause of misinformation across the globe, with some leaders denying the severity of COVID-19 and the science around it (Evanega et al., 2020; Gramacho et al., 2021). Here, we focus on the United States, where Republican elites tended to downplay the seriousness of the virus and focus on business interests and China (Green et al., 2020; Madraki et

al., 2021). Then-President Donald Trump and conservative elites and media were significant drivers of the infodemic, as they themselves propagated misinformation (Gruzd & Mai, 2020; Jamieson & Albarracin, 2020; Motta et al., 2020). This elite-level polarization contributed to media coverage of COVID-19 being significantly more politicized in the United States than in other English-speaking countries (Pickup et al., 2021; Sommer & Rappel-Kroyzer, 2022), and perceptions of COVID-19 being divided along partisan lines (Kerr et al., 2021). As a result, misinformation was both more prevalent and more likely to be shared uncritically. For example, a global study of 316 million vaccine-related tweets in 11 languages suggests that 68% of all low-credible URLs retweeted worldwide during COVID-19 originated from the United States (Lenti et al., 2023). Moreover, Americans were four to five times more likely to share misinformation upon exposure, significantly more likely to share misinformation to promote or demonstrate their support for it, and significantly less likely to share misinformation to criticize it than residents of Canada, the United Kingdom, Australia, and New Zealand (Pickup et al., 2022; also, see Morosoli et al., 2020).

U.S.-based misinformation across borders: the Canadian case

Because of geographical and cultural proximity, Canadians are heavy consumers of U.S.-based information and media (F. J. Fletcher, 1998; Newman et al., 2023; Taras, 2015). Studies examining global networks of communications find that information flows are still largely driven by size, distance, and language, with Canada and the United States being in the same cluster in global community detection analysis (García-Gavilanes et al., 2014; Hedayatifar et al., 2020). As such, a large proportion of Canadians' follows on Twitter are from the United States (Bridgman et al., 2021). Consequently, U.S. cultural and political struggles have often been mirrored north of the border: social movements originating in the United States tend to find echoes in Canada (e.g., Ware et al., 2020), and current Trumpism, culture wars and polarization are spilling over into Canadian politics (Blatchford, 2022; Johnston, 2023; Perry & Scrivens, 2019).

Canada and the United States had very different information environments during COVID-19. In Canada, there was elite-level consensus in the first stages of the pandemic on the severity of COVID-19 and the necessity of adopting strong measures to limit its spread (Merkley et al.,

2020).³⁹ Media coverage was also not very politicized and tended to focus on policy (Sommer & Rappel-Kroyzer, 2022). Still, a significant portion of Canadians, slightly smaller than that in the U.S., held misperceptions about the virus (Pennycook, McPhetres, et al., 2021). Given the higher concentration of misinformation in the United States (Lenti et al., 2023), Canadians exposed to U.S.-based information were found to be more likely to hold COVID-19 misperceptions and retweet COVID-19 misinformation (Bridgman et al., 2021).

Study 1: Language differences in COVID-19 misperceptions

Language as a barrier to the spread of misinformation

We expect Francophones insulated from the English-language information environment to be less likely to be exposed to and believe in COVID-19 misinformation. Individuals' information consumption is strongly dependent on information costs (Downs, 1957). The decrease in information costs brought by the internet and social media has made even small increases in the cost of distribution and access to information (what is known as friction) more impactful, considering the overabundance of information (Roberts, 2018). Language creates 'natural friction,' given that it takes less time and effort to consume information in one's native language (Roberts, 2018). This partly explains why, even in today's globalized information environment where tools like the translate button on Twitter facilitate the spread of information across languages, language remains a significant predictor of information flows on social media (García-Gavilanes et al., 2014; Hedayatifar et al., 2020).⁴⁰ This is true in the Canadian context. French-speaking Canadians are significantly less likely than English-speaking Canadians to expose themselves to U.S.-based information (Newman et al., 2023; Taras, 2015), which, as indicated, was a significant predictor of COVID-19 misperceptions (Bridgman et al., 2021).

False content is often produced for financial incentives (Humprecht et al., 2020), which can take the form of advertising revenue or donations.⁴¹ The new advertising ecosystem, which focuses on clicks and views, contributes to the spread of disinformation by enabling "smaller publishers to thrive outside the ethical and self-regulatory constraints which in the past tightly reinforced an ethics of truth-seeking" (Tambini, 2017). As such, a large ad market size encourages

³⁹ There was also consensus across provinces (healthcare is an area of provincial jurisdiction in Canada), with many measures being implemented by all provinces (Breton et al., 2020).

⁴⁰ Other factors like interpersonal relations, identity, and local relevance are also at play (F. J. Fletcher, 1998).

⁴¹ Obviously, disinformation can also be produced for ideological reasons, status seeking, etc.

the production of disinformation (Humprecht et al., 2020). French is a minority language in North America, making it less profitable to produce disinformation targeting Francophones (Yates, 2018). As a result, French-language misinformation in Quebec mostly comes from local influencers or opinion leaders, alternative media with very small audiences, and social media pages and groups, and is usually inspired by conspiracy theories circulating in the United States and France (Yates, 2018). While bilinguals can spread English-language misinformation among French-speaking communities, the rate at which they can propagate U.S. misinformation in French will necessarily be lower than the rate at which U.S. misinformation is produced. Relatedly, misinformation from France (and other French-speaking countries) is unlikely to entirely substitute for misinformation from the United States, given that, even among Francophone Canadians, exposure to information from France remains comparatively low compared to exposure to U.S.-based information.⁴² Overall, misinformation is more likely to spread from English to French than the reverse since Francophones are more likely to understand the other language and have higher levels of exposure to English-language media and accounts than the reverse (Kim et al., 2014). Consequently, we hypothesize that:

H1: Insulated Francophones are less likely to hold COVID-19 misperceptions than Anglophones and Francophones exposed to the English-language information environment.

Active social media users are more likely to believe in and spread misinformation, especially if they have high degrees of conspiratorial thinking (Enders et al., 2021). As a result, social media usage was an important driver of misperceptions during the COVID-19 pandemic (Bridgman et al., 2020). We thus expect that:

H2: Using social media for information increases COVID-19 misperceptions.

Assuming that there was more misinformation circulating in English because of the polarization of COVID-19 in the United States, social media users exposed to U.S. news content are more likely to be subjected to – and consequently, believe in – COVID-19 misinformation than those

⁴² Canadian data from the Citizens' attitudes under the COVID-19 pandemic project (Dassonneville et al., 2021) indicate that the averaged perceived truthfulness of the statement 'Hydroxychloroquine is an effective treatment against COVID-19' – a treatment aggressively promoted by French Dr. Didier Raoult but which effectiveness has not been proven – is significantly higher among native Francophones (3.24 on a five-point scale) than native Anglophones (2.57). However, as shown in Figure 3.3, approximately 24 and 35% of exposed Francophones and Anglophones' follows are from the United States. Comparatively, less than 10% of insulated Francophones' follows are from other French-speaking countries (France, Belgium, Monaco, Algeria, Benin, French Guiana).

who do not consume such content.⁴³ Conversely, insulated Francophones, i.e., Francophones not exposed to U.S.-based information, should be less likely to (incidentally) be exposed to COVID-19 misinformation when using social media. This is consistent with research showing that French-speaking Canadians are less likely than English-speaking Canadians to report exposure to misinformation on social media and that language differences in exposure almost doubled during the pandemic (Boulianne, Belland, Tenove, et al., 2021). Given that prior exposure is an important determinant of beliefs in misinformation (something referred to as the illusory truth effect, see Fazio et al., 2015), we hypothesize that:

H3: Using social media for information has a smaller positive effect on COVID-19 misperceptions among insulated Francophones than among Anglophones and Francophones exposed to English-language information.

H4: Exposure to information from the United States reinforces the relationship between social media usage and COVID-19 misperceptions.

Insulated Francophones are likely to be less exposed to misinformation, but there is uncertainty regarding the effect of language on beliefs in misinformation *upon exposure*. Naturally, bilinguals can be exposed to misinformation in both languages. Studies conducted in Spain and Poland suggest that bilinguals are *as likely or even more likely* to believe in misinformation in their less proficient language (English) than in their more proficient language (Fernández-López & Perea, 2020; Muda et al., 2023). While foreign language effect theory suggests that bilinguals make better, less biased decisions in their second language than in their first language, potentially because of the reduced influence of emotionality (Costa et al., 2014), studies show that using a foreign language does not necessarily increase cognitive reflection (which reduces susceptibility to misinformation, see Pennycook, McPhetres, et al., 2021). In fact, it might lower people's ability to realize that their intuition is wrong and that they should engage in more reflection when processing a piece of information (Białek et al., 2020).⁴⁴ Bilinguals also tend to suffer from

⁴³ Technology facilitates the spread of information across languages, for example with the translate button on Twitter or automatic translation on Facebook. However, monolinguals tend to almost exclusively follow accounts from the same language group (Kim et al., 2014), which minimizes their exposure to posts in other languages. Moreover, based on friction theory (Roberts, 2018), the small increase in time and effort to click the translate button on Twitter might prevent many of the incidentally exposed from frequently using this feature.

⁴⁴ These conclusions might differ when the misinformation has a strong political or ethnic dimension. For example, linguistic minorities (Russian-speaking citizens in Ukraine) are less likely to believe in political misinformation written in the majority language (Aslett et al., 2022). However, we focus on pieces of misinformation that circulated

information overload sooner when exposed to information in their non-native language (Dolinsky & Feinberg, 1986). Information overload and social media fatigue were particularly important during the early stages of the pandemic and have been associated with a greater likelihood of believing misinformation (Tandoc & Kim, 2022). These considerations imply that exposed Francophones could be more likely to hold COVID-19 misperceptions and be more strongly impacted by their social media usage than exposed Anglophones. Hence, we ask:

RQ1: Do exposed Francophones have a different level of COVID-19 misperceptions than exposed Anglophones?

RQ2: Does using social media for information have the same influence on COVID-19 misperceptions among exposed Francophones as exposed Anglophones?

Table 3.1. Hypotheses and questions of Study 1.

Variable	Likelihood of believing in COVID-19 misinformation
Language	<ul style="list-style-type: none"> • Insulated Francophones are less likely to hold COVID-19 misperceptions than exposed Francophones and Anglophones (H1). • Do exposed Francophones have different levels of COVID-19 misperceptions than exposed Anglophones (RQ1)?
Social media	<ul style="list-style-type: none"> • Social media usage is associated with COVID-19 misperceptions (H2). • Social media usage has a smaller positive effect on COVID-19 misperceptions among insulated Francophones than among exposed Francophones and Anglophones (H3). • Exposure to information from the United States reinforces the relationship between social media usage and COVID-19 misperceptions (H4). • Does social media usage for information have the same influence on COVID-19 misperceptions among exposed Francophones as exposed Anglophones? (RQ2)

globally and did not have strong political or ethnic implications from the perspective of Francophones and Anglophones in Canada (the stories focus on the origins of the virus, its severity, and fake remedies).

Materials and methods

To analyze linguistic differences in COVID-19 misperceptions, we use a survey of 37,770 Canadians collected by the Media Ecosystem Observatory between April 2 and August 12, 2020. The survey was designed in Qualtrics and administered by Dynata, using weekly quota-based online samples (age, gender, region) of approximately 2,500 respondents. All analyses use post-stratification weights on age, gender, and region, as provided by the Canadian Census. More information about the samples is provided in Appendix 3A.

We distinguish between three groups – insulated Francophones, exposed Francophones, and exposed Anglophones⁴⁵ – based on the language in which they answered the survey and whether they have consumed French-language or (Canadian or U.S.) English-language news outlets over the past week. *Insulated Francophones* (n = 5,247) are those who answered the survey in French and have consumed at least one French-language media but no English-language media for political news. *Exposed Francophones* (n = 1,907) correspond to those who answered the survey in French and have used English-language media for political information, while *Exposed Anglophones* (n = 26,449) answered the survey in English and have used English-language news media. This operationalization is an imperfect proxy for individuals' information environment. Nonetheless, it provides the best opportunity to isolate respondents not exposed to the English-language information environment from those who are and examine how those who are exposed are affected by it. As shown in Figure 3A.1, 84% of English-speaking respondents only consumed English-language media over the past week, while 73% of French-speaking respondents only consumed French-language media. A non-marginal percentage (15%) of French-speaking respondents were exposed to Canadian English-language news media. Finally, 66% of English-speaking respondents but only 31% of French-speaking respondents have consumed U.S. news outlets. Respondents who were not exposed to any media outlets (n = 4,071) are coded as “News avoiders,” given their avoidance of both mainstream and alternative media (Schulz, 2019). The complete list of outlets that respondents could choose from is provided in Appendix 3B.⁴⁶

⁴⁵ This paper focuses on exposure to the English-language COVID-19 misinformation environment and thus we do not anticipate differences between monolingual and bilingual Anglophones. As shown in Table 3D.4, monolingual and bilingual Anglophones have similar levels of misperceptions and their social media usage are similarly correlated to their misperceptions.

⁴⁶ We can expect selection into these linguistic groups to be influenced by respondents' socio-demographic characteristics, political interest, or ideology. For example, younger, more educated Canadians are significantly more

We first use weighted means to visualize language differences in the perceived truthfulness of each false statement. Using linear regression, we then examine whether insulated Francophones are less likely than Canadians who use English media to hold COVID-19 misperceptions. We test whether social media use has a stronger effect on misperceptions among those exposed to the English-language information environment by interacting linguistic groups with the frequency of social media usage for political news. Finally, we demonstrate how exposure to U.S.-based information on social media contributes to higher levels of misperceptions among exposed Canadians by interacting social media usage with U.S. media usage. Insulated Francophones are excluded from this model given that, by definition, they are not exposed to U.S. media. We use the following specifications, where i indexes respondents and k indexes the different statements used to measure misperceptions:

$$\text{Misperceptions}_{ik} = \beta_0 + \beta_1 \text{Linguistic group}_i + \mathbf{X}_i \boldsymbol{\beta} + \alpha_i + \delta_{ik} + \lambda_k + \varepsilon_{ik} \quad 1$$

$$\begin{aligned} \text{Misperceptions}_{ik} = & \beta_0 + \beta_1 \text{Linguistic group}_i + \beta_2 \text{Social media usage}_i + \\ & \beta_3 \text{Linguistic group} * \text{Social media usage}_i + \mathbf{X}_i \boldsymbol{\beta} + \alpha_i + \delta_{ik} + \lambda_k + \varepsilon_{ik} \quad 2 \end{aligned}$$

$$\begin{aligned} \text{Misperceptions}_{ik} = & \beta_0 + \beta_1 \text{U.S. media}_i + \beta_2 \text{Social media usage}_i + \beta_3 \text{U.S. media} * \\ & \text{Social media usage}_i + \mathbf{X}_i \boldsymbol{\beta} + \alpha_i + \delta_{ik} + \lambda_k + \varepsilon_{ik} \quad 3 \end{aligned}$$

Misperceptions are measured based on the perceived truthfulness of eight false statements about COVID-19 (see Figure 3.1) using five-point scales ranging from *definitely false* to *definitely true*.⁴⁷ The false statements are internally consistent (alpha = 0.81). These statements (as well as the keywords included in our misinformation dictionary) cannot be considered English- or U.S.-specific, given that they spread globally and across languages. For example, false statements about alternative preventive measures and treatments were more likely to be seen and believed in countries with a lower GDP (Singh et al., 2022). We claim that, even when considering misinformation that spreads globally, exposure to the U.S. information environment increases the likelihood of believing and sharing such misinformation because of the higher prevalence of and

likely to be bilingual and thus fall into the “Exposed Francophone” category. As shown in Appendix 3D, the results are consistent when using entropy balancing to achieve covariate balance.

⁴⁷ Statements were presented in a random order. Respondents were only exposed to false statements. We do not believe respondents were more likely to provide uniform answers, given that only 7.9% of the sample gave the same answer to each of the eight statements, including 5.3% who rated the eight statements as ‘Completely false’.

susceptibility to misinformation in that country. The effects of language would likely be bigger for U.S.-specific or English-specific misinformation.

Social media news exposure is measured as the frequency of exposure to political news on social media over the past week on a six-point scale ranging from ‘Never’ to ‘Several times a day’. Exposure to U.S. media is a binary variable coded as 1 if respondents have used at least one U.S. media outlet for political news over the past week (respondents could select among a list of 15 outlets). $X\beta$ refers to the following vector of covariates: socio-demographics (age, gender, education), ideology (0-10), political interest (0-10), frequency of news exposure (five-point scale), and trust in the federal and provincial governments (four-point scales). The models include fixed effects for regions (Atlantic, Quebec, Ontario, Prairies, British Columbia) (α_i), survey waves (δ_{ik}), and misinformation statements (λ_k). We cluster standard errors by respondents to account for potential correlations between their ratings across statements. Appendix 3A and 3B present the descriptive statistics and question wordings for all variables, respectively.

Results

We start by visually representing the average perceived truthfulness of each false statement by language group. Figure 3.1 shows the weighted percentage of respondents who believe that each false statement is probably or definitely true. The results indicate that insulated Francophones (respondents who answered the survey in French and only consume French-language media) are systematically less likely than Canadians exposed to English-language media to believe in COVID-19 misinformation. The percentage of respondents who believe a false statement is true is, on average, five and nine percentage points lower among insulated Francophones than among exposed Anglophones and exposed Francophones, respectively.

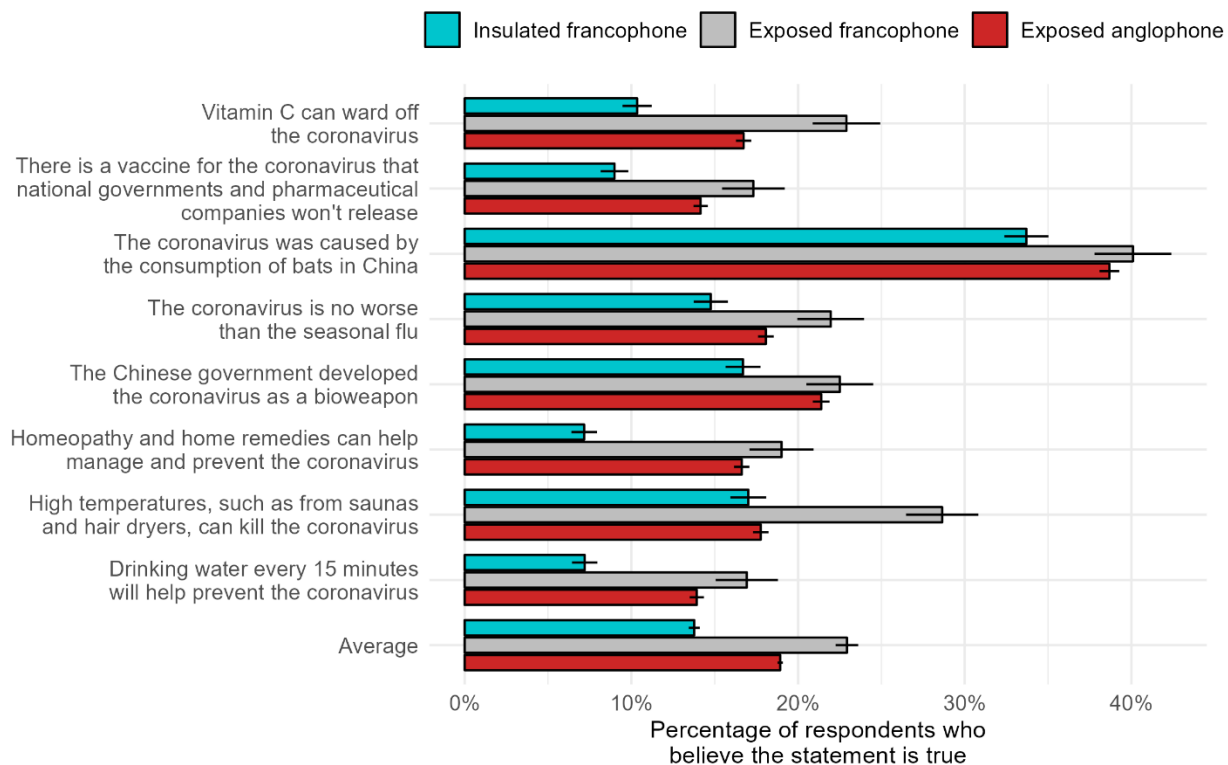


Figure 3.1. Perceived truthfulness of COVID-19 false statements by language group. Weighted percentages of respondents who believe each statement is true are shown with 95% confidence intervals.

We estimate three OLS models examining the relationship between language grouping (reference category is exposed Anglophones, except for Model 1B) and the perceived truthfulness of COVID-19 false statements. The results are displayed in Table 3.2. We find evidence for all our hypotheses. First, the results of Model 1 indicate that Francophones insulated from English-language media are significantly less likely to believe in COVID-19 misinformation than exposed Anglophones and Francophones (H1). The effects, however, are relatively small. The difference between insulated Francophones and exposed Anglophones is -0.02 (95% CI = $[-.04, -.01]$, $p < .001$) (-0.07 standard deviations) on the 0-1 truthfulness scale, while the difference between insulated Francophones and exposed Francophones is -0.03 (95% CI = $[-.04, -.02]$, $p < .001$) (-0.11 standard deviations). Regarding RQ1, exposed Francophones have slightly higher levels of misperceptions than exposed Anglophones, but the difference fails to reach statistical significance ($\beta = .01$, 95% CI = $[-.004, .03]$, $p = .16$).

Table 3.2. OLS models examining the relationship between language (ref = exposed Anglophone) and the average perceived truthfulness of COVID-19 false statements. Regression coefficients are shown with clustered standard errors in parentheses.⁴⁸

	Model 1A	Model 1B	Model 2	Model 3
Insulated Francophone	-0.023*** (0.007)	-0.034*** (0.005)	-0.004 (0.007)	
Exposed Francophone (ref in Model 2)	0.011 (0.008)		-0.006 (0.009)	
Exposed Anglophone (ref in Model 1, 3, 4)		-0.011 (0.008)		
Francophone news avoiders	0.015 (0.012)	0.005 (0.011)	-0.002 (0.013)	
Anglophone news avoiders	-0.004 (0.004)	-0.015 (0.009)	0.007 (0.005)	
Freq news social media	0.081*** (0.003)	0.081*** (0.003)	0.087*** (0.003)	0.043*** (0.009)
Insulated Francophone × Freq news social media			-0.046*** (0.008)	
Exposed Francophone × Freq news social media			0.030* (0.012)	
Francophone news avoiders × Freq news social media			0.082* (0.035)	
Anglophone news avoiders × Freq news social media			-0.038** (0.013)	
U.S. media				0.001 (0.005)
Freq news social media × U.S. media				0.045*** (0.010)
Controls	Yes	Yes	Yes	Yes
Fixed effects	Yes	Yes	Yes	Yes
Observations	256,904	256,904	256,904	97,704
R ²	0.171	0.171	0.172	0.176
Adjusted R ²	0.171	0.171	0.172	0.175
RMSE	0.29	0.29	0.29	0.28

* p < 0.05, ** p < 0.01, *** p < 0.001

⁴⁸ The complete regression table is included in Appendix 3C.

Figure 3.2 visually represents how language groups (Panel A) and U.S. media use (Panel B) moderate the effect of social media usage on misperceptions. Predicted outcomes are marginalized over the levels of the fixed effect variables (region, survey wave, and statement)⁴⁹, holding other variables at their mean. The results of Model 2, displayed in Panel A, support the hypothesis that social media usage increases misperceptions among all language groups (H2). However, higher social media use for information yields a smaller increase in misperceptions among insulated Francophones than among those exposed to English media (in line with H3) and produces a bigger increase in misperceptions among exposed Francophones than exposed Anglophones (RQ2). The results are consistent when allowing for non-linear effects, with language differences in misperceptions being particularly strong among those who use social media at least every day (Appendix 3D).

Finally, Model 3 in Table 3.2 supports the hypothesis that social media usage has a stronger influence on COVID-19 misperceptions among those who consume U.S. content (H4). As shown in Panel B of Figure 3.2, the effect of exposure to political information on social media is more than twice as large among those who consume U.S. media as compared to those who do not.⁵⁰ We also estimated a model with a triple interaction between language, social media usage, and U.S. media consumption and found that the effect of exposure to U.S. information on social media is not moderated by language (see Appendix 3C).

⁴⁹ This approach is recommended to make the predicted values more representative of the population, rather than having to choose a specific region, survey wave, and statement.

⁵⁰ When allowing for non-linear effects, the interaction effect is positive across all levels of social media usage but is only significant among those using social media almost every day or more.

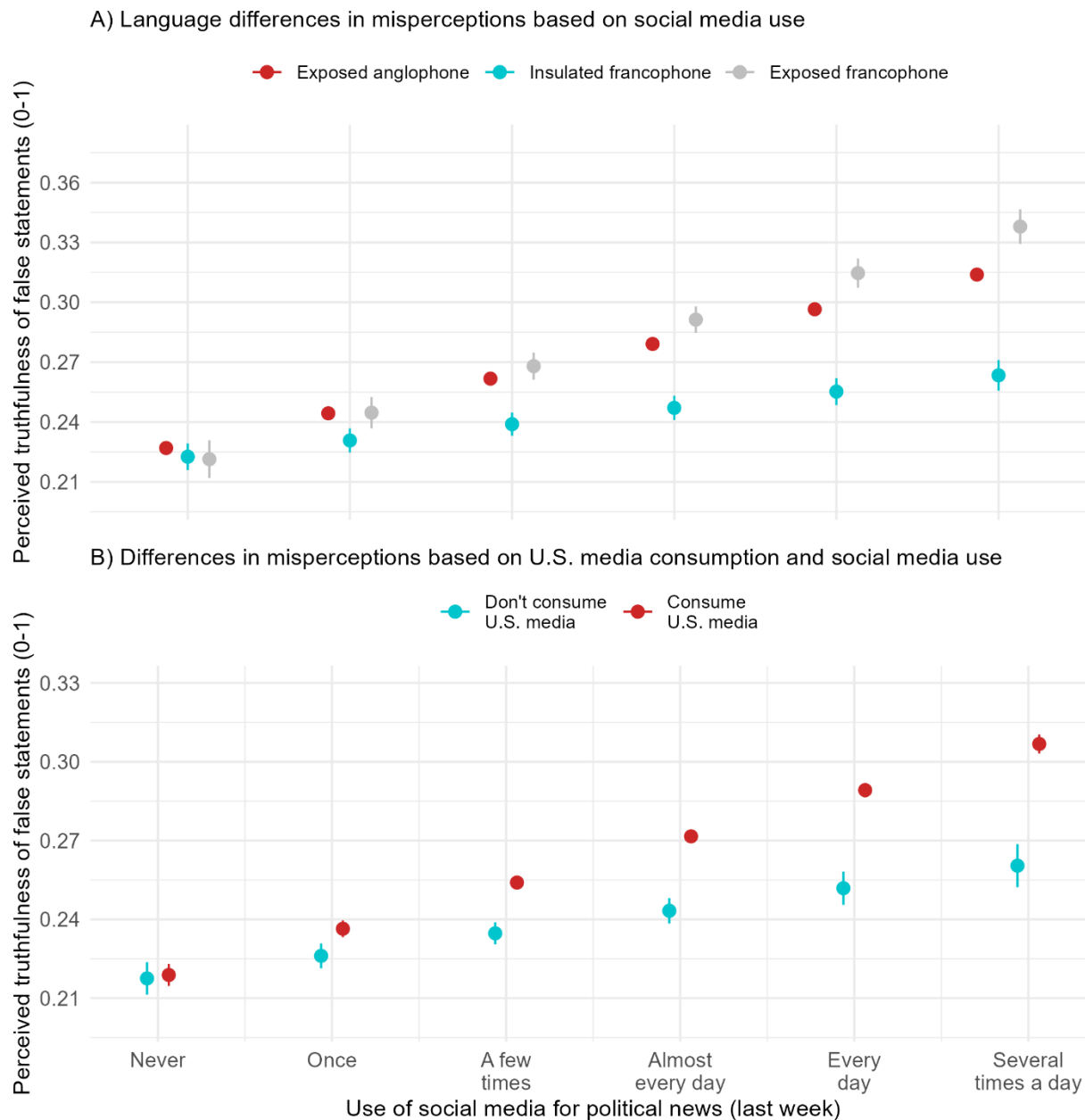


Figure 3.2. Perceived truthfulness of COVID-19 false statements based on social media use, language grouping (panel A) and U.S. media consumption (panel B). Predicted values based on OLS regression are plotted with 95% confidence intervals, marginalizing over the fixed effects (region, survey wave, statement) and keeping other variables at their mean.

Overall, we find robust evidence that exposure to English-language content on social media, especially from the United States, contributes to slightly higher levels of misperceptions among those exposed to the English information environment than among insulated Francophones.

We also find that social media has a greater effect on misperceptions among exposed Francophones (who are bilingual by definition) than exposed Anglophones.

Study 2: Language differences in COVID-19 misinformation sharing behaviors

Study 1 shows that French-speaking Canadians exposed to the English-language information environment on social media were more likely to hold COVID-19 misperceptions than English-speaking Canadians exposed to that environment. This phenomenon has not previously been documented and carries implications for other bilingual populations across the world. Study 2 examines whether similar language differences exist in the likelihood of *spreading* misinformation online, focusing on highly active and political social media users, that is, users who follow politicians or media outlets and play an active role by sharing content on social media.

Language differences in the likelihood of sharing misinformation among highly active users

Active political social media users, the object of Study 2, tend to be different from the general population, which was the focus of Study 1. If more than 90% of the Canadian population uses social media platforms, only about 60% report that they sometimes share news-related content on these platforms (Carignan et al., 2022). Active political users are distinctive with regard to important political attitudes and behaviors, most notably political knowledge, interest, and internal efficacy (Bode & Dalrymple, 2016; Boulianne et al., 2023; Oser et al., 2022). Social media users who are more active and politically engaged are more likely to spread misinformation (Humprecht et al., 2023; Morosoli, Van Aelst, Humprecht, et al., 2022; Valenzuela et al., 2019). Individuals with high levels of conspiratorial beliefs also tend to be more active online than the general population (Carignan et al., 2022).

Language is likely to play out differently in that active online community. First, insulation from English-language misinformation is lower on Twitter than in the general population. For example, English is the preferred language among Montreal Twitter users despite most of the population being Francophone (Mocanu et al., 2013), and studies have found a correlation between multilingualism and activity on Twitter (Hale, 2016). As such, very few highly active French-speaking Canadian political Twitter users can be considered entirely insulated from the English-language and U.S. information environments.

Second, bilinguals, especially non-native English speakers, play an important role in cross-lingual information transfers, given that they tend to bridge language communities (Chen et al., 2023; Jin, 2017; Kim et al., 2014; Mendelsohn et al., 2023). That bridging role is greater on topics related to politics, COVID-19, and health than on other topics (Chen et al., 2023; Mendelsohn et al., 2023). Notably, Chen et al. (2023) demonstrate that the information shared by multilingual users on Twitter during the COVID-19 pandemic tended to be more negative than that shared by monolingual users, potentially because of the former's increased likelihood of excessive exposure to COVID-19 information (Holmes et al., 2020). Other research finds that information overload, which is arguably higher among bilinguals (Dolinsky & Feinberg, 1986), increases the probability of sharing unverified information (Laato et al., 2020). Consequently, we hypothesize that:

H5: Among highly active social media users, exposed Francophones are significantly more likely to share misinformation online than exposed Anglophones.

Third, given the small market size, French-language mis- and disinformation mostly originates from local influencers and opinion leaders who share their content on social media, with a lot of this mis- and disinformation being influenced by content circulating in the United States (Lavigne et al., 2023; Yates, 2018). While some obscure alternative right-wing news sites exist in Quebec (the only predominantly French-speaking province), their audience is nowhere close to that of Fox News in the United States or Rebel News in the rest of Canada (Yates, 2018). Given the role played by local influencers and opinion leaders in translating misinformation from the U.S., and the additional exposure to misinformation from other French-speaking countries (Yates, 2018), direct exposure to U.S.-based information is likely to have a smaller impact on misinformation-sharing behaviors among exposed Francophones than exposed Anglophones, considering the greater diversity of sources of misinformation.

H6: Exposure to U.S.-based content has a stronger effect on the likelihood of sharing misinformation among exposed Anglophones than exposed Francophones.

Materials and methods

We use Twitter data to examine how language influences the actual observed likelihood of *spreading and discussing* misinformation online. We build on a multi-faceted Twitter dataset that provides insights into the tweets, retweets, and follow behaviors of approximately 100,000

Canadian Twitter users from January to December 2020. In October 2019, we used Twitter’s API (Application Programming Interface) to collect information on all follows and followers of every Canadian Member of Parliament and Senator with a Twitter account, as well as a representative list of 799 journalists and media organizations. We then pulled the location and biography information of all of these follows and followers. Using GoogleMaps API, we identified 856,601 accounts with Canadian locations. In early 2021, we drew 20,000 active accounts (at least 50 tweets between January and August 2020) from each region (Atlantic, Quebec, Ontario, Prairies, British Columbia), as well as 25,000 French-language (at least 50 tweets and 33% of their tweets written in French) and English-language (at least 50 tweets in English) accounts. This gave us 133,727 accounts active as of mid-2020. In May and June 2021, we collected data on all tweets, retweets, and follows of these users, yielding a final complete dataset of 104,771 users where we have full follower and tweet data from 2020. These highly active Canadian Twitter users collectively produced 96,257,496 tweets and retweets in 2020. See Appendix 3A for additional sample details.

We decompose this sample into three groups. First, “insulated” Francophones ($n = 5,047$) are those with minimal exposure to the English-language environment. We operationalize this by identifying those who have an account description written in French⁵¹ and have produced at least 95% of their tweets in French (allowing 5% for those who use automated translate functionality). Second, exposed Francophones ($n = 18,855$) are those who speak French but who are more heavily exposed to the English-language environment on Twitter. These users either (1) have their description written in French and at least 5% of their tweets and retweets are written in English or (2) have their description written in English but at least 33% of their tweets and retweets are written in French (as explained earlier, English is the preferred language among Montreal Twitter users despite a majority of the population being Francophone, see Mocanu et al., 2013). Finally, exposed Anglophones ($n = 80,809$) have their description in English and have at least 67% of their tweets and retweets written in English.

Figure 3.3 shows the percentage of follows from Canada, the United States, and other French- and English-speaking countries for each linguistic group and provides additional

⁵¹ Descriptions were classified using the franc package (Csardi et al., 2021), with probabilities computed for both French and English and the higher percentage likelihood selected. If likelihood of both languages was equal, the description was classified as English.

verification of the three categories described above. The majority of follows of our Canadian users are from Canada across all linguistic groups. However, the percentage of follows from Canada (and the Francophone province of Quebec) is significantly higher among “insulated” Francophones (79%) than exposed Francophones (58%) and Anglophones (only 52%). “Insulated” Francophones’ information environments are thus less susceptible to direct foreign influence. Canadians are highly exposed to U.S. accounts, which represent 35% of exposed Anglophones’ follows and 24% of exposed Francophones’ follows. As outlined above, it is basically impossible for highly active French-speaking Twitter users to be entirely insulated from U.S.-based information, with U.S. follows representing 8% of their total number of follows. Other French-speaking countries (France, Belgium, Monaco, Algeria, Benin, and French Guiana) play a non-trivial role in insulated and exposed Francophones’ information environment, accounting for respectively 9 and 7% of their follows. Still, even among insulated Francophones, the percentage of U.S. follows is comparable to that of other French-speaking countries.

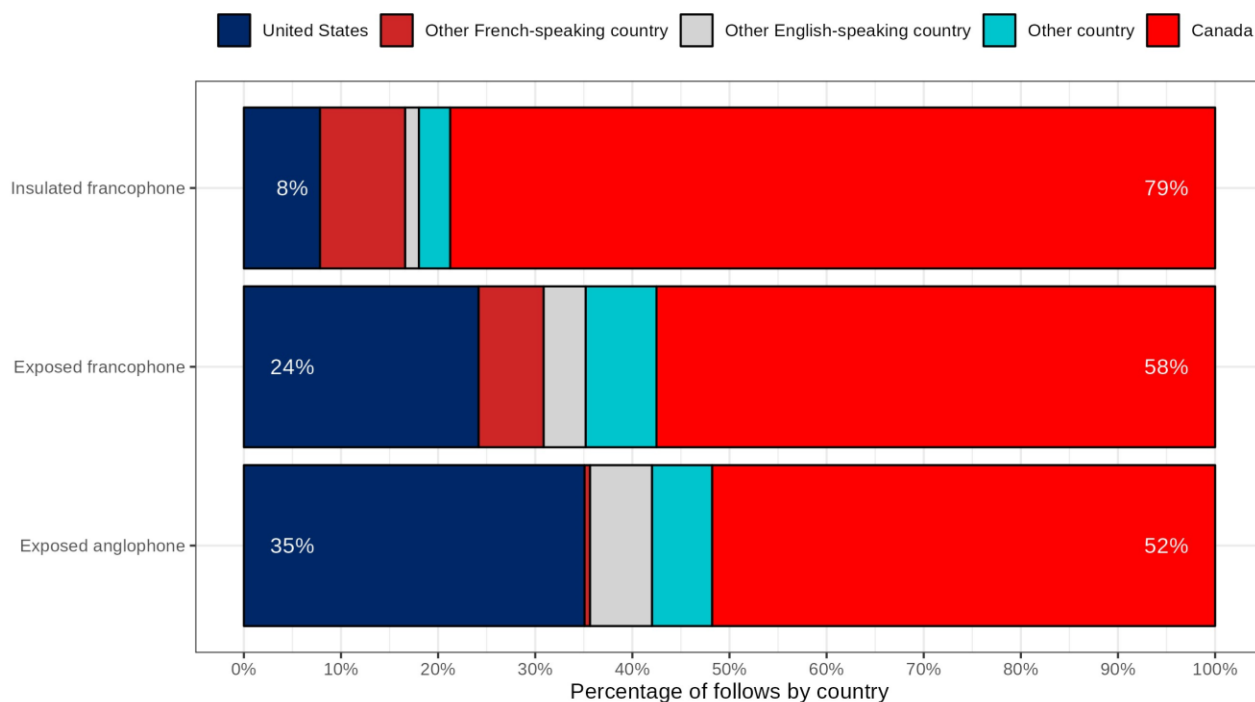


Figure 3.3. Percentages of follows by country by linguistic group. The Other French-country category includes France, Belgium, Monaco, Algeria, Benin, and French Guiana. The Other English-speaking country category includes United Kingdom, Ireland, Australia, and Nigeria.

We identify misinformation-related tweets and retweets using an extended and translated version of Evanega et al.’s (2020) COVID-19 misinformation dictionary. We expanded the dictionary to

include more recent and Canada-specific misinformation, based on various fact-checking websites.⁵² We combine the French and English keywords into a single dictionary given that multilingual users, especially those having English as their second language, tend to alternate languages in communicating misinformation online (Zhou et al., 2020).

To validate the dictionary, two coders manually classified a random sample of 600 misinformation tweets (300 in each language). 200 tweets were classified by both coders to assess intercoder reliability for a total of 1,000 hand-coded tweets (800 single-classified, 200 double-classified). Tweets were classified into three categories: misinformation tweets, tweets that discuss or debunk misinformation, and unrelated tweets. The manual coding suggests that 47% of the sampled tweets picked up by our dictionary are misinformation, 39% discuss it, and 14% are unrelated. Tweets that discuss misinformation are conceived as also reflecting the place of misinformation in the information environment (misinformation is unlikely to be discussed or debunked if it is not prevalent). The intercoder reliability is high, with a Cohen's Kappa of 0.84 indicating almost perfect agreement (90% labeled identically by both coders).⁵³ The full misinformation dictionary and details about how we implemented it are included in Appendix 3E.

We use three indicators of the likelihood of producing tweets containing misinformation as our dependent variables: 1) the raw number of tweets and retweets containing misinformation keywords; 2) the percentage of a user's tweets and retweets containing misinformation keywords; and 3) a dichotomous variable indicating whether the user has produced at least one misinformation-related tweet. The models are estimated at the user (*i*) level, as follows⁵⁴:

⁵² We examined all COVID-19 misinformation debunked on AFP Fact Check, Les Décrypteurs (Radio-Canada), CBC, and Google Fact Check, and included keywords related to all COVID-19 misinformation not related to a specific country, as well as Canada-specific misinformation. We then used the Twitter search engine to identify the misinformation strings that allowed us to capture the greatest volume of misinformation, while minimizing false positives.

⁵³ We find some linguistic differences, with French-language tweets being more likely to contain misinformation (52% versus 41%, $p < .001$) and English-language tweets being more likely to discuss it (46% versus 32%, $p < .001$).

⁵⁴ We do not empirically examine the role that Canadian opinion leaders play in propagating U.S. pieces of misinformation among French-language communities. We believe that differences between Francophones and Anglophones would be larger without these French-speaking opinion leaders. The very small number of respondents who, in the survey, did not select any media outlet but reported that they are frequently exposed to news on social media are, indeed, significantly more likely to hold misperceptions (see Table 3.2).

$$\text{Misinformation tweets}_i = \beta_0 + \beta_1 \text{Linguistic group}_i + \varepsilon_i \quad 4$$

$$\begin{aligned} \text{Misinformation tweets}_i = \beta_0 + \beta_1 \text{U.S. follows}_i + \beta_2 \text{Linguistic group}_i + \\ \beta_3 \text{U.S. follows} * \text{Linguistic group}_i + \varepsilon_i \quad 5 \end{aligned}$$

Results

Using the dictionary approach, we identify 88,664 tweets or retweets from our users that contain keywords associated with misinformation. While a large number of tweets in absolute terms, this represents less than 0.1% of all tweets and retweets collected and an average of 0.85 tweets per user. These numbers are consistent with previous studies on the prevalence of misinformation online (Allcott & Gentzkow, 2017; Guess et al., 2019). Of those tweets concerning misinformation, 56.4% come from the top 1% misinformation-discussing individuals.

Figure 3.4 shows the coefficient estimates for three models where these outcomes are regressed on linguistic group (reference category is exposed Anglophones). Consistent with H5, we find slightly higher misinformation-related content among exposed Francophones than exposed Anglophones for the number, percentage, and whether any misinformation-related keywords were shared. Given that most users did not share any tweet containing misinformation-related keywords, the effects are quite small, representing 0.03 to 0.08 standard deviation changes in the dependent variables. We find comparable misinformation-related tweets among “insulated” Francophones and exposed Anglophones, with no significant differences observed in two models out of three. This could partly be explained by the fact that, as demonstrated earlier, these users are not really “insulated.”

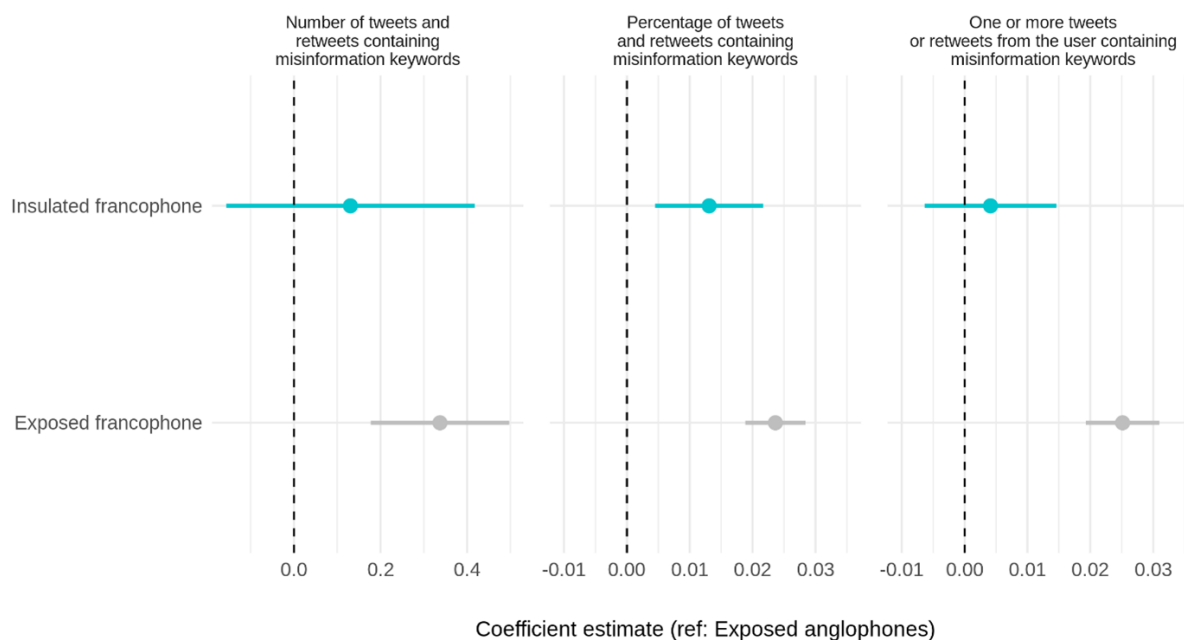


Figure 3.4. Measures of misinformation propagation on Twitter by language grouping.

Coefficient plot based on OLS regression with 95% confidence intervals.

Next, we evaluate whether the likelihood of retweeting misinformation from the United States is different depending on linguistic grouping, and whether following U.S.-based accounts is correlated with our misinformation measures. Figure 3.5 shows the country-origin of the COVID-19 misinformation-related content retweeted by Canadians. The results suggest that misinformation from the United States was the largest driver of the infodemic among Anglophone Canadians (52%) and represented a significant, but smaller proportion (31%) of misinformation-related retweets by Francophones heavily exposed to the English-language environment. It also constituted a non-marginal portion of COVID-19 misinformation shared by “insulated” Francophones (13%).⁵⁵ Overall, exposed Francophones and Anglophones shared a similar proportion of foreign-based misinformation, with misinformation from other French-speaking countries partly compensating for lower percentages of U.S.-based misinformation among exposed Francophones. Across all linguistic groups, Canadians are more likely to retweet misinformation-related content from the United States than to retweet U.S. content in general (for example, 44% of all Anglophones’ retweets are from the United States, compared to 52% of COVID-19

⁵⁵ Insulated Francophones were significantly more likely to retweet misinformation originating from Canada (59%) and from other French-speaking countries (25%) than other language groups.

misinformation retweets). A similar dynamic applies, at a smaller scale and among Francophones, to misinformation-related content produced in other French-speaking countries (these results are partially driven by mentions of Dr. Raoult and his hydroxychloroquine treatment).

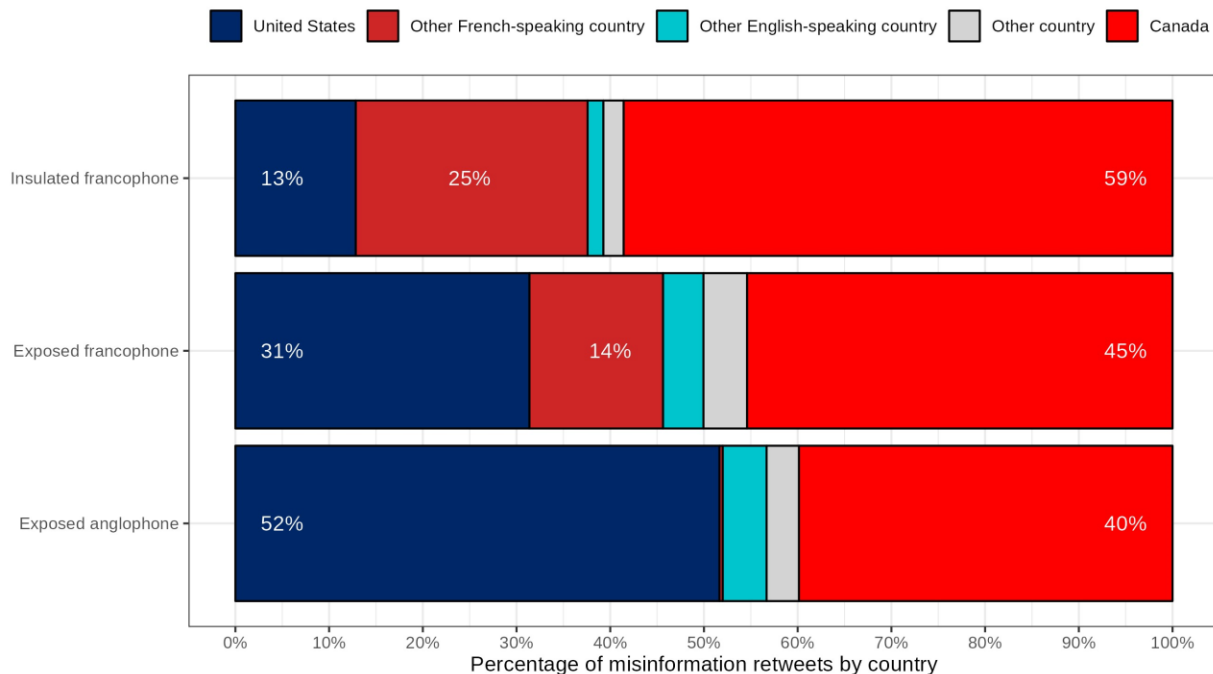


Figure 3.5. Percentages of misinformation retweets by country by linguistic group. French-speaking includes France, Belgium, Monaco, Algeria, Benin, and French Guiana. Other English-speaking includes United Kingdom, Ireland, Australia, and Nigeria.

Table 3.3 shows OLS regression results for the three measures of misinformation where the linguistic group is interacted with a continuous variable measuring follows of U.S.-based accounts. We use a logit transformation of the proportion of all geolocated follows identified as being in the United States (transformed to 0-1 for readability).⁵⁶ Among exposed Francophones and Anglophones, following more U.S.-based accounts is correlated with an increasing number and proportion of tweets containing misinformation, as well as a greater likelihood of having produced at least one misinformation-related tweet, although the relationship is only significant in two models out of three among exposed Francophones. As hypothesized (H6), while exposed

⁵⁶ These results are robust to a count of U.S.-based follows as well as the untransformed proportion of all geolocated follows that are identified as being in the United States. A logit transformation is well suited here as the measure is a percentage and we anticipate that exposure to U.S.-based accounts will have diminishing returns. In other words, moving from 0% to 10% of U.S.-based follows will increase the likelihood of sharing misinformation more than moving from 50% to 60%.

Francophones are more likely to share COVID-19 misinformation than exposed Anglophones, following U.S. accounts has a smaller influence on their likelihood of sharing misinformation (the interaction coefficient is negative in all models and significantly so in two models out of three).

Table 3.3. The relationship between following U.S.-based accounts and propagating misinformation conditioned by language grouping. OLS regression coefficients shown with standard errors in parentheses.

	Count of misinformation	Proportion misinformation (0-1)	Any misinformation (0/1)
Follows of U.S. accounts (logit proportion)	2.57*** (0.30)	0.09*** (0.01)	0.31*** (0.01)
Insulated Francophone	0.12 (0.37)	0.01 (0.01)	0.09*** (0.01)
Exposed Francophone	0.92** (0.31)	0.07*** (0.01)	0.14*** (0.01)
Follows of U.S. accounts X Insulated Francophone	2.03 (1.15)	0.07 (0.03)	-0.06 (0.04)
Follows of U.S. accounts X Exposed Francophone	-1.02 (0.68)	-0.08*** (0.02)	-0.22*** (0.02)
Observations	103,648	103,648	103,648
R ²	0.00	0.00	0.01
Adjusted R ²	0.00	0.00	0.01

* p < 0.05, ** p < 0.01, *** p < 0.001

Conclusion

The COVID-19 pandemic provides a window into how misinformation can spread globally and hinder effective communication in the age of social media. Global crises like a pandemic require political parties, the media, and scientists to cooperate to provide citizens with the clearest information possible and improve the overall public health response. Yet, the response to the pandemic was politicized in some countries, with political leaders and partisan media spreading misinformation about the virus, contributing to differing partisan responses and attitudes towards COVID-19 among the public. This polarization of the information environment, especially when accompanied by high volumes of misinformation, can have spillover effects in other countries, depending on cross-national information flows. In this paper, we examined how language might have influenced exposure to U.S.-based information and, consequently, limited the spread of and

beliefs in COVID-19 misinformation among French Canadians insulated from the English-language information environment.

In Study 1, we use a survey of nearly 40,000 Canadians to examine language differences in COVID-19 misperceptions. We find that insulated Francophones were less likely than Francophones and Anglophones exposed to the English-language information environment to believe in COVID-19 misinformation. While using social media for information tends to increase misperceptions, we find that the effect of social media partly depends on the information environment, with social media usage being more strongly associated with misperceptions among those exposed to the English-language information environment than among insulated Francophones. The observed linguistic differences in COVID-19 misperceptions can partly be explained by insulated Francophones' lower exposure to U.S.-based misinformation, with the association between social media usage and misperceptions being about twice as large among those exposed to information from the United States.

The survey results also reveal that Francophones exposed to the English-language information environment, especially heavy social media users, were somewhat more likely to hold COVID-19 misperceptions than Anglophones. In Study 2, we use a dataset of more than 100,000 highly active Canadian Twitter users who collectively produced approximately 100 million tweets in 2020 to examine whether Francophones exposed to the English-language information environment were also more likely to *spread or discuss* misinformation online than Anglophones. The results support that hypothesis. We also demonstrate that exposure to U.S.-based content is associated with a greater likelihood of spreading COVID-19 misinformation among both exposed Francophones and Anglophones, but that direct exposure to U.S.-based content is a weaker determinant of misinformation-sharing behaviors among exposed Francophones, given that they are more likely to be exposed to and share (translated versions of that) misinformation from national sources or other French-speaking countries. Finally, our data suggest that very few French-speaking highly active political Twitter users can be considered “insulated” from the U.S. information environment, which can explain why the lower likelihood of believing in COVID-19 misinformation among insulated Francophones in the general population does not translate into a lower likelihood of sharing COVID-19 misinformation among Francophones in the highly active social media population.

This paper suffers from some limitations. First, the study is correlational, and we cannot completely exclude the possibility that unobserved factors can account for the results. Second, we only examine the spread of misinformation on Twitter, a platform used by a smaller percentage of Francophones than Anglophones in Canada (the reverse is true for Facebook), and that, as explained, is different from the general population. Third, most of the misinformation examined is high-profile misinformation that received attention and spread across the world. This misinformation is more likely to have been translated and shared across languages. Linguistic differences could be bigger for more local, fringe misinformation (Bridgman et al., 2022). Finally, we have drawn upon a single country that represents a most-likely case where close cultural and geographic proximity, along with a shared language, has meant the free flow of ideas and politics across the border. The extent to which these same dynamics will travel to other country pairs is likely to be a function of cultural, geographic, and linguistic commonalities. However, many such country pairs exist (e.g., Ukraine-Russia, United Kingdom-Ireland, Saudi Arabia and surrounding Arabic-speaking countries) and are likely to experience similar dynamics. U.S. sources also represent a large proportion of cross-border news consumption across the world (PwC UK, 2016) and there is evidence that the political and information environments of the United States can also influence public opinion and politics in other countries (Dotto & Cubbon, 2021; Turnbull-Dugarte & Rama, 2022).

We make a significant contribution by showing how language impacts information flows and influences the likelihood of being exposed to, believing, and sharing misinformation. We also demonstrate how polarization and high volumes of misinformation in one country can, given the globalized and interconnected nature of information environments, have consequences for other countries. Polarization, high levels of politically salient misinformation, disinformation campaigns, and heightened issue salience are simply not constrained to national borders. This has important implications for the study of national political environments and will likely continue to be influential given ongoing activity on communication platforms that tend towards geographic agnosticism. Future research should examine which actors contribute to disseminating misinformation across languages and what could make bilingual individuals more (or less) vulnerable to misinformation in different contexts.

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Section 3: The Polarizing Effect of Misinformation

While perceptions of misinformation and vulnerability to misinformation are essential for evaluating the threat of misinformation, we cannot have a complete understanding without measuring its effects. Chapter 4 focuses on the relationship between misinformation and affective polarization, which has surprisingly not been studied extensively in the political science literature (Druckman & Levy, 2022). We argue that public debates and misinformation on COVID-19 vaccines and climate change have contributed to what we call issue-based affective polarization, i.e., the gap between individuals' positive feelings towards those who hold the same issue preferences and negative feelings towards those who do not. We find high levels of affective polarization on these two issues and show that misinformation can contribute to issue-based affective polarization by making citizens more divided on salient political questions. We also demonstrate that affective polarization on COVID-19 vaccines remained high after vaccine passports were abandoned and COVID-19 decreased in salience. Overall, this chapter calls for a broadening of our understanding of affective polarization.

Chapter 4. The Case for Issue-Based Affective Polarization: Examining COVID-19 and Climate Change Affects⁵⁷

Over the past years, scholars have become increasingly concerned about affective polarization. The literature suggests that holding significantly different beliefs about issues can make citizens more hostile toward one another, yet affective polarization has almost exclusively been studied from a partisan perspective. In this paper, we make the case for issue-based affective polarization by using the standard questions that are used to study partisan affective polarization and applying them to groups with divergent opinions on two issues, namely COVID-19 and climate change. We show with Canadian survey data that citizens very much dislike those with different views on COVID-19 vaccines and climate change and believe that they are a threat to their way of life. Observing this kind of affective polarization in a context (Canada) where elite polarization was relatively low is telling. We demonstrate that affective polarization on these two issues is strongly determined by citizens' issue preferences, which are influenced by beliefs in COVID-19 and climate change misinformation. Finally, we find that affective polarization on COVID-19 vaccines has only marginally declined with the lifting of government restrictions and vaccine mandates. The findings have important implications, showing that affective polarization can go beyond partisan identities, can exist even in the absence of strong partisan divisions at the elite level, and can be fuelled by misinformation.

Keywords: affective polarization, COVID-19, vaccines, climate change, misinformation

Introduction

Affective polarization – the gap between individuals' positive feelings towards their in-group and negative feelings towards the out-group – is almost always studied based on partisan identities, with many researchers even including political parties in their definition of affective polarization (e.g., Druckman et al., 2021; Gidron et al., 2020). There seems to be a consensus that the American public has become more affectively polarized along partisan lines, with Democrats and Republicans increasingly disliking and distrusting each other (Iyengar et al., 2012; Mason, 2018). Other Western democracies, including Canada, have been experiencing similar, although smaller,

⁵⁷ This chapter is co-authored with Éric Bélanger. Mathieu Lavigne is the first author. A previous version of this chapter were presented at the 2023 C-Dem/CSDC Forum on Democratic Citizenship.

increases in affective polarization, depending on their level of elite polarization, economic inequalities, or their electoral system (Boxell et al., 2022; Gidron et al., 2020).

While recognizing the importance of partisan affective polarization, we argue that affective polarization should not be understood as being necessarily based on partisanship and that scholars should pay more attention to issue-based affective polarization, i.e., the divergence in feelings toward those who share and those who do not share one's issue positions. Drawing from the literature on opinion-based group membership, which suggests that social identities can be based on shared opinions on salient issues (Bliuc et al., 2007; McGarty et al., 2009), we evaluate affective polarization on COVID-19 vaccines and climate change and the role of issue divisions and misinformation in polarizing citizens. A better understanding of this type of affective polarization is essential given its potential negative consequences for political information seeking and processing (Merkley, 2021), perceived government legitimacy (Gillies et al., 2023), democratic deliberation and accommodation (MacKuen et al., 2010), and tolerance of non-democratic behaviors (Orhan, 2022).

Building on surveys conducted during the 2021 Canadian federal election and the 2022 Quebec provincial election, this paper makes a significant contribution by (1) showing that issue-based affective polarization can exist even when elite-level polarization is relatively low; (2) demonstrating that affective polarization on COVID-19 vaccines and climate change is mainly driven by diverging policy preferences, rather than simply reflecting citizens' partisan preferences; (3) showing how misinformation can both directly and indirectly contribute to issue-based affective polarization; and (4) evaluating whether affective polarization on COVID-19 vaccines has declined as the issue became less salient and vaccine passports were removed.

Understanding (issue-based) affective polarization

The public opinion literature distinguishes between four types of polarization: (1) ideological consistency (whether citizens consistently align themselves with one side or another), (2) ideological divergence (increased bimodality in the distribution of citizens' ideology); (3) perceived polarization (citizens' perceptions that politicians, parties, and the mass public are polarized); and (4) affective polarization (increasing animosity towards the out-group) (Lelkes, 2016). Ideological consistency and ideological divergence can increase affective polarization. Their role in affectively polarizing the electorate has almost exclusively been studied from a

partisan perspective, by showing that citizens feel more warmly about parties that share their ideology or policy preferences and more negatively about parties that do not (Dias & Lelkes, 2022; Webster & Abramowitz, 2017). As such, increasing policy differences between candidates lead to more polarized evaluations from citizens (Rogowski & Sutherland, 2016). Still, individuals can identify with those who share their issue preferences and feel animosity towards those who do not in and of itself, independently of partisanship. Partisanship is not always the most salient identity, especially in multiparty systems (Comellas & Torcal, 2023). Moreover, catch-all (or brokerage) parties often have conflicting opinions on issues (Puhle, 2002), which means that issue-based affective polarization can exist within partisan groups. Studies demonstrate that when evaluating co-partisans and out-partisans, individuals care much more about policy agreement than partisan loyalty or identity (Orr et al., 2023). Looking at affective polarization at the issue level thus offers a more fine-grained and complementary way of understanding social antagonisms.

The concept of affective polarization is largely based on social identity theory (Iyengar et al., 2012; West & Iyengar, 2022). According to this theory, individuals define themselves based on their membership in various groups and, in doing so, tend to divide the world into their in-group and the out-group (Tajfel & Turner, 1986). These identities are related to affects and intergroup conflicts: individuals tend to evaluate their in-group more positively and to hold prejudice and discriminate against those belonging to the out-group (Tajfel & Turner, 1986).

Contrasting opinions on salient issues can provide the basis of social identities and lead to the formation of opinion-based groups (Bliuc et al., 2007; McGarty et al., 2009). Individuals can identify with these opinion-based groups just like they identify with a political party, distinguish between their in-group and the out-group, and behave differently in relation to these two groups. The very few studies that apply this framework to the study of affective polarization have mainly focused on secessionist-like movements. Specifically, Hobolt et al. (2021) examine affective polarization based on opinions about Brexit and show that U.K. residents had an emotional attachment to their Brexit identities (i.e., their identification as Leavers or Remainers), were significantly more likely to attribute positive characteristics to their in-group and negative attributes to the out-group, and tended to discriminate against the out-group when asked to choose the future BBC director-general or a lodger at their home in a conjoint experiment. Balcells and Kuo (2023) similarly demonstrate the existence of affective polarization based on views about the

independence of Catalonia. Here, we propose to focus on a broader set of issues, namely COVID-19 vaccines and climate change.

Partisanship can be used as a heuristic to infer policy preferences (Rothschild et al., 2019; but see Merolla et al., 2008 on the limited usefulness of Canadian political parties as information cues), just like issue preferences can signal one's partisanship (Goggin et al., 2020). Partisan loyalties can also color how citizens think about issues (Achen & Bartels, 2017). As such, issue-based affective polarization can only be considered a valid construct if it is driven by issue positions (or identification with opinion-based groups) rather than being the reflection of other group identities (i.e., partisanship). This is likely to be the case with vaccines and climate change in Canada given the relatively high level of elite agreement on these issues during the 2021 Canadian federal election, as further detailed in the *Methods* section. In the next section, we theorize about why the extremity of one's issue positions on COVID-19 vaccines and carbon pricing is likely to entail affective polarization.

Affective polarization on COVID-19 and climate change

Highly salient and threatening issues like COVID-19 and climate change are likely to trigger group-based identities and affective polarization, especially in contexts where ideological divergence is high (Dunlap et al., 2016; Kerr et al., 2021). Indeed, research shows that individuals do identify as vaccinated/unvaccinated or climate believers/skeptics, and differentiate between their in-group and the out-group (Bliuc et al., 2015; Henkel et al., 2023; Maciuszek et al., 2021). The current paper adds to these studies by directly measuring affective polarization on these issues using standard questions utilized in the affective polarization literature, discussing how misinformation can increase affective polarization, and examining the evolution of affective polarization on COVID-19 vaccines as the issue became less salient.

Beyond forming the basis of social identities, COVID-19 and climate change are likely to lead to affective polarization given how threatening these issues are perceived to be, with risk perceptions being closely related to policy preferences and individual behaviors on these issues (Haltinner et al., 2021; Kerr et al., 2021; R. E. O'Connor et al., 1999). Threatening issues create social norms or expected attitudes and behaviors. In this context, perceiving the out-group as rejecting a realistic threat is associated with increased moral condemnation and dehumanization (Kubin et al., 2023). Those who refuse to get vaccinated, do not comply with public health

measures, or deny the existence of climate change being perceived as a risk to themselves or others, which can lead to intergroup conflicts (Toribio-Flórez et al., 2023) and to citizens dehumanizing, wanting to punish or exercise social control over those with deviant behaviors (Brauer & Chekroun, 2005; Kasper et al., 2022; also see Martherus et al., 2021 for a discussion of the relationship between partisan affective polarization and dehumanization). For example, Shanaah et al. (2023) demonstrate that those identifying with environmentalists are significantly more likely to support extreme actions targeting the biggest industrial emitters and their managers. We thus expect that vaccine mandates and carbon pricing supporters will have negative feelings about those who refuse to get vaccinated or deny the existence of climate change.

In contrast, climate change skeptics and individuals who refuse to get vaccinated could perceive those holding the opposite position as a threat, expressing fears that these issues open the door to excessive government intrusion, population control, and reduced individual liberties and life conditions (Antonio & Brulle, 2011; Carignan et al., 2022). Indeed, governments' response to the COVID-19 pandemic involved balancing civil liberties against the exigencies of public health (Flood et al., 2020). Vaccine mandates and other public health measures were considered significant government overreach by some segments of the population and perceived as a threat to individual liberties, with those with low levels of trust in government or not experiencing fear about the coronavirus being significantly less likely to accept restrictions on civil liberties (Vasilopoulos et al., 2023). Shortly after the September 2021 Canadian federal election, in early 2022, truck drivers and other sympathizers from across Canada headed toward and occupied Ottawa for several weeks, calling for the end of vaccine mandates, vaccine passports, and contact tracing programs (Freedom Convoy, 2022). Some factions within this movement wanted to remove democratically elected Prime Minister Justin Trudeau from office, describing him as a dictator and a traitor to the nation (Gillies et al., 2023). Thus, vaccine passports supporters were likely perceived negatively and disliked by those strongly opposing their implementation when this policy was discussed during the 2021 election.⁵⁸ The use of terms like “sheep” or “covidiot” by citizens (and even some journalists) reflects the high level of animosity surrounding COVID-19 and the perceived superiority of one's opinion-based group over the other (Bhasin et al., 2020).

⁵⁸ During the election campaign, crowds of angry protesters followed and threw small rocks at incumbent prime minister Justin Trudeau, forcing events to be canceled or postponed (Boynton & Bimman, 2021).

Likewise, (anthropogenic) climate change deniers often perceive climate action as contributing to higher energy prices and taxes, killing jobs, limiting consumer choice and property rights, and threatening individual liberties (Antonio & Brulle, 2011). The pandemic has influenced recent discourses on this issue. Indeed, a small minority of citizens apprehend the imposition of climate lockdowns, climate passports, and restrictions on citizens' movements (e.g., with the 15-minute cities) (Bridgman et al., 2022; Lavigne et al., 2023). These perceptions could lead to negative evaluations of climate believers, as they are more likely to support more decisive action on climate change. For these reasons, we expect that:

H1: There is a high level of issue-based affective polarization on COVID-19 vaccines and climate change.

H2: Issue positions strongly determine of issue-based affective polarization (beyond partisanship).

How misinformation increases issue-based affective polarization

A significant percentage of citizens around the world believe in misinformation and conspiracy theories about COVID-19 and climate change (McCright et al., 2016; Singh et al., 2022). For example, 29% of Americans believe that the dangers of vaccines are hidden by the medical establishment and 19% consider that climate change is a hoax (Uscinski et al., 2022).

Despite the rapid growth of the misinformation and polarization literatures, the relationship between misinformation and affective polarization has surprisingly not received much attention. Indeed, in their entry on affective polarization in the *2022 Handbook on Politics and Public Opinion*, Druckman and Levy (2022, p. 267) indicate: “We omit discussion of motivated reasoning and misinformation as a cause and/or a consequence of affective polarization. These literatures are certainly pertinent to discussions of affective polarization, but only a small number of studies have directly linked motivated reasoning or misinformation to affective polarization”.

The few studies that do examine the relationship between misinformation and affective polarization tend to focus more on how polarization increases vulnerability to misinformation than on the reverse relationship. For instance, polarization can encourage motivated reasoning, making citizens more vulnerable to in-party-congruent misinformation (Broockman et al., 2022; Jenke, 2023). Political polarization can also increase citizens' likelihood of consuming ideologically

slanted or unreliable news sources online (Robertson et al., 2023), further increasing affective polarization (Lelkes et al., 2017; Levendusky, 2013) and misperceptions about political opponents (Garrett et al., 2019).

There are reasons to believe that misinformation can also polarize citizens. First, misinformation that becomes viral tends to provoke strong negative emotions or generate outrage (Carrasco-Farré, 2022; Vosoughi et al., 2018), which can affectively polarize viewers (Serrano-Puche, 2021). Second, misinformation can contribute to the formation of opinion-based group identities by fostering divisions on issues. Indeed, one of the reasons why conspiracy theories erode interpersonal relationships is because they tend to be associated with attitudinal changes, which increases the distance between the opinions of those who believe them and those who do not (Carignan & Morin, 2022; Toribio-Flórez et al., 2023). Misperceptions about COVID-19 and climate change have been shown to significantly lower individuals' support for government action on these issues and the likelihood of complying with public health measures or reducing one's carbon footprint (Bridgman et al., 2020; Cook, 2014; Meppelink et al., 2022). This greater attitudinal distance can decrease likability and trust and contribute to interpersonal or intergroup conflicts (Bliuc et al., 2015; Carignan & Morin, 2022; Toribio-Flórez et al., 2023). That argument, while compelling, has not been demonstrated empirically. We thus hypothesize that:

H3: Misinformation fosters affective polarization by increasing disagreement on issues.

Has affective polarization on COVID-19 vaccines declined as the issue became less salient?

As the pandemic unfolded, the perceived risks of COVID-19 fell and societal fatigue increased, leading to lower demand for public health restrictions (Jørgensen et al., 2022). In Canada, most provincial governments had abandoned vaccine requirements by March 2022 (Harris, 2022) and reported that they did not plan to bring them back (98.5 FM, 2022).

We could expect a decrease in affective polarization as the salience of a particular social categorization decreases, that is, as the distinction between the in-group and out-group comes to mind less often and becomes less important to individuals' self-definition (Cameron, 2004; McGarty, 2018). West and Iyengar (2022) find that while the salience of *partisan* social identity fluctuates based on the political context, affective polarization does not necessarily decrease when

the salience is lower, which suggests that partisan animus has been internalized. We can expect more variation when focusing a new issue like COVID-19. For example, Kasper et al. (2022) show that dehumanization and willingness to punish those with deviant behaviors were significantly greater during the first lockdown than during the second lockdown in France. Consequently, we expect that:

H4: Affective polarization on COVID-19 vaccines declined between 2021 and 2022.

Methods

Data

To test these hypotheses, we rely on data from two election surveys conducted during the 2021 Canadian federal election and the 2022 Quebec provincial election. Specifically, we use the Canadian Election Misinformation Project's panel survey, which was administered online to a quota-based (age, gender, region) sample of 7,302 Canadian citizens aged 18 or older during the 2021 election campaign and to 2,799 recontacts from the pre-election wave after the election. The pre-election survey was administered from August 23 to September 20 and the post-election survey was administered from September 30 to October 14 (97% of answers were recorded between September 30 and October 4). The sample was provided by Dynata. The Quebec Election Misinformation Project's survey is used to examine whether affective polarization on COVID-19 vaccines decreased over time.⁵⁹ It was administered to an online sample of 3,707 respondents during the pre-election period (from August 29 to October 2) and 1,545 recontacted respondents during the post-election period (from October 14 to October 16). Léger provided the sample. The questions about affective polarization were included in the post-election surveys. Post-stratification weights on age and gender within each region are used to better approximate the Canadian and Quebec populations. More details about each sample are provided in Appendix 4A.

Context

While there is little evidence that Canadians are becoming more ideologically polarized (Merkley, 2023), affective polarization has been increasing at the partisan level, with Liberals and New Democrats increasingly disliking Conservatives and vice-versa (Cochrane, 2015; Johnston, 2023).

⁵⁹ These datasets cannot be combined for all analyses given that they did not include the exact same questions about issue preferences.

That said, Canada provides an interesting opportunity to investigate issue-based affective polarization in a context where elites are (or used to be) only moderately polarized on the two issues of interest to this research.

During the early stage of the COVID-19 pandemic in Canada, there was a high level of consensus at the elite level on the severity of COVID-19 and the necessity of adopting strong measures to limit its spread (Merkley et al., 2020). Media coverage of the pandemic was also not very politicized and tended to principally inform citizens about the virus and policies (Champagne-Poirier et al., 2023; Sommer & Rappel-Kroyzer, 2022). This stands in sharp contrast with the politicization of the pandemic in the United States, where then-president Donald Trump, other Republican elites, and conservative media tended to downplay the seriousness of the virus and even themselves propagated COVID-19 misinformation (Green et al., 2020; Gruzd & Mai, 2020; Jamieson & Albarracin, 2020; Madraki et al., 2021; Motta et al., 2020).

Vaccine mandates were an important issue during the 2021 Canadian federal election. The incumbent Liberal Party promised to make COVID-19 vaccines mandatory for federal public servants and for air, interprovincial train, and cruise ship passengers. The Conservative Party indicated that they would use an alternative approach and ask unvaccinated Canadians to provide a recent negative test to work (federal employees) or travel rather than making vaccination mandatory. Still, they had a similar desire to dramatically increase vaccination rates, with then-leader Erin O'Toole pledging during the campaign to have more than 90% of Canadians vaccinated within two months (Jones, 2021).

With regard to climate change, the Conservative Party has historically been less likely to propose wide-ranging pro-climate policies than the Liberal Party or New Democratic Party.⁶⁰ Still, their leadership has recognized the existence of climate change over the last election cycles and their recent election platforms included more pro-climate content than anti-climate content (Kießling, 2022). Canada's approach to climate change is based on the Pan-Canadian Framework for Clean Growth and Climate Change, which includes a minimum national price on carbon pollution that provinces must adhere to. While the Conservative Party campaigned against carbon

⁶⁰ Those highly concerned about climate change are, accordingly, more likely to vote for these parties than for the Conservative Party, see Boulianne et al. (2021).

pricing during the 2019 federal election, the party shifted its policy stance in late spring 2021, and incorporated carbon pricing into its climate plan in the run-up to the 2021 federal election.

Methods

We first provide descriptive evidence of affective polarization on COVID-19 vaccines and climate change using two measures: citizens' perceptions that those with opposing positions on the issue represent a threat to their way of life (this question is only available for COVID-19 vaccines) and feeling thermometers. This approach is consistent with the literature on affective polarization (Kubin & von Sikorski, 2021). We then use OLS regression with robust (HC2) standard errors to evaluate the role of issue extremity in explaining affective polarization on these two issues. The model is as follows:

$$\text{Affective polarization}_i = \beta_0 + \beta_1 \text{Issue extremity}_i + \mathbf{X}_i \boldsymbol{\beta} + \varepsilon_i$$

Affective polarization is measured as the absolute distance (0-100) between feelings (1) about those who support COVID-19 vaccine passports and those who refuse to get vaccinated⁶¹; and (2) about those who believe that humans are causing climate change and climate skeptics. Issue extremity is coded as 1 when respondents strongly support or strongly oppose vaccine passports or carbon pricing and 0 when they have weaker issue preferences (somewhat support or oppose, neither support nor oppose). A larger percentage of respondents in our sample support vaccine passports (70%) than carbon pricing (40%).⁶² $\mathbf{X}\boldsymbol{\beta}$ is a vector of covariates that includes ideology (0-10 left-right scale), partisan identification, trust in government (average trust in the federal and provincial government using 4-point scales), frequency of political news consumption in general (5-point scale from never to every day) and on social media (6-point scale from never to several times a day)⁶³, political interest (0-10 scale), age (18-34, 35-44, 45-54, 55-64, 65+ years old),

⁶¹ These categories were chosen given that they were the two main groups that opposed each other in public debates about COVID-19 vaccines. As shown in Appendix 4C, affective polarization is somewhat lower when considering those who are vaccinated instead of those supporting vaccine passports, which is not surprising given that this group can be perceived as less threatening to the unvaccinated.

⁶² A large percentage of respondents, 27%, neither agree nor disagree with the statement used to measure support for carbon pricing: "To help reduce greenhouse gas emissions, the federal government should continue carbon pricing (commonly referred to as the carbon tax)".

⁶³ See Kubin and von Sikorski (2021) for a review of the literature on the role of (social) media in polarization. Media consumption is likely to influence issue-based affective polarization based on how the media portray certain groups and by influencing threat perceptions, policy preferences, and misperceptions (Bridgman et al., 2020; Kubin & von Sikorski, 2021; Motta et al., 2020).

gender (female = 1, male = 0), education (high school or less, more than high school but no university degree, university degree), and region (Atlantic, Quebec, Ontario, Prairies, British Columbia). All variables were recoded on 0-1 scales for greater comparability.

We argue that misinformation can foster affective polarization by increasing disagreement on issues (H3). We test the direct and indirect effects of COVID-19 and climate change misperceptions using causal mediation analysis (Imai et al., 2011), where issue preferences are expected to mediate the relationship between misperceptions and affective polarization. COVID-19 misperceptions are measured based on the perceived truthfulness (five-point scale from definitely false to definitely true) of five statements about COVID-19: (1) The Chinese government developed the coronavirus as a bioweapon; (2) A group funded by Bill Gates patented the coronavirus that causes COVID-19; (3) The current pandemic is part of a global effort to force everyone to be vaccinated whether they want it or not; (4) Homeopathy and home remedies can help manage and prevent the coronavirus; (5) The coronavirus pandemic is the result of an accidental animal-human transmission that occurred in China (reversed). Climate change misperceptions are measured based on whether respondents are certain that climate change is happening (four-point scale ranging from *not at all sure* to *extremely sure*). Details about the perceived truthfulness of these statements are provided in Appendix 4A. The causal mediation models include the same set of covariates as the ones listed above.

Finally, we use OLS regression to evaluate the extent to which affective polarization on COVID-19 vaccines has decreased with the lifting of government restrictions and vaccine mandates. After making the case that levels of affective polarization in Quebec were not statistically different from those in the rest of Canada during the 2021 federal election, we examine changes over time by comparing this Quebec subsample to the sample collected during the 2022 Quebec provincial election, using entropy balancing (a technique similar to matching, see Hainmueller, 2012) to ensure that the two samples are balanced on relevant covariates (socio-demographics, political interest, ideology, trust in governments, and frequency of political news consumption in general and on social media).

Results

Descriptive evidence of issue-based affective polarization

We start by providing descriptive evidence of affective polarization on COVID-19 vaccines and climate change. Figure 4.1 shows the extent to which citizens believe that those with opposing views on COVID-19 represent a threat to their way of life or are just people they disagree with as part of a regular political argument.⁶⁴ 58% of those who oppose vaccine passports consider vaccine passports supporters as a threat to their way of life, while 69% of those who support vaccine passports consider that those who refuse to get vaccinated against COVID-19 represent a threat to their way of life. To put these statistics in perspective, a 2018 poll revealed that about 40% of partisans and leaners in the United States perceive supporters of the other party as a threat to their way of life (The Economist/YouGov, 2018).

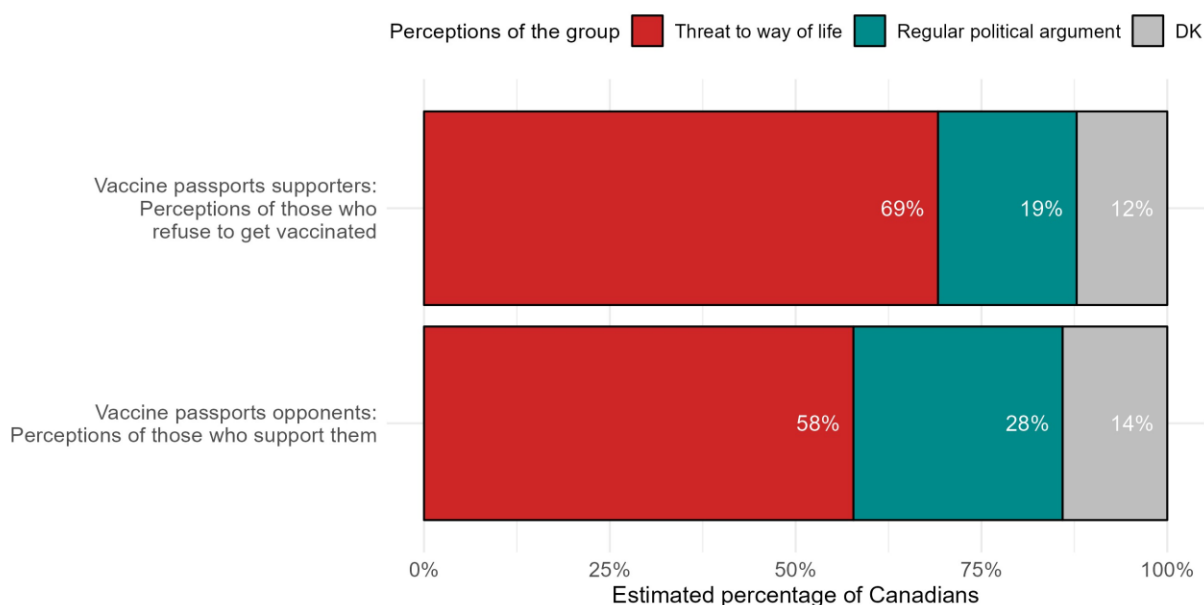


Figure 4.1. Estimated percentage of Canadians who believe that those with opposing views on COVID-19 vaccines are a threat to their way of life. Weighted percentages reported.

We further examine affective polarization on COVID-19 vaccines and climate change by assessing how citizens' issue positions influence their feelings towards opinion-based groups. Figure 4.2 shows that citizens who strongly oppose vaccine passports tend to have positive feelings (68/100

⁶⁴ This question was only asked for COVID-19 vaccines.

on average) about those who refuse to get vaccinated against COVID-19 and very negative feelings (22/100 on average) about those who support vaccine passports. Conversely, citizens who strongly support vaccine passports feel very positively about other Canadians who support vaccine passports (91/100 on average) and very negatively (13/100 on average) about those who refuse to get vaccinated against COVID-19. Levels of affective polarization are also high among those who somewhat support vaccine passports (average feeling of 72/100 for supporters of vaccine passports versus 39/100 for unvaccinated Canadians).

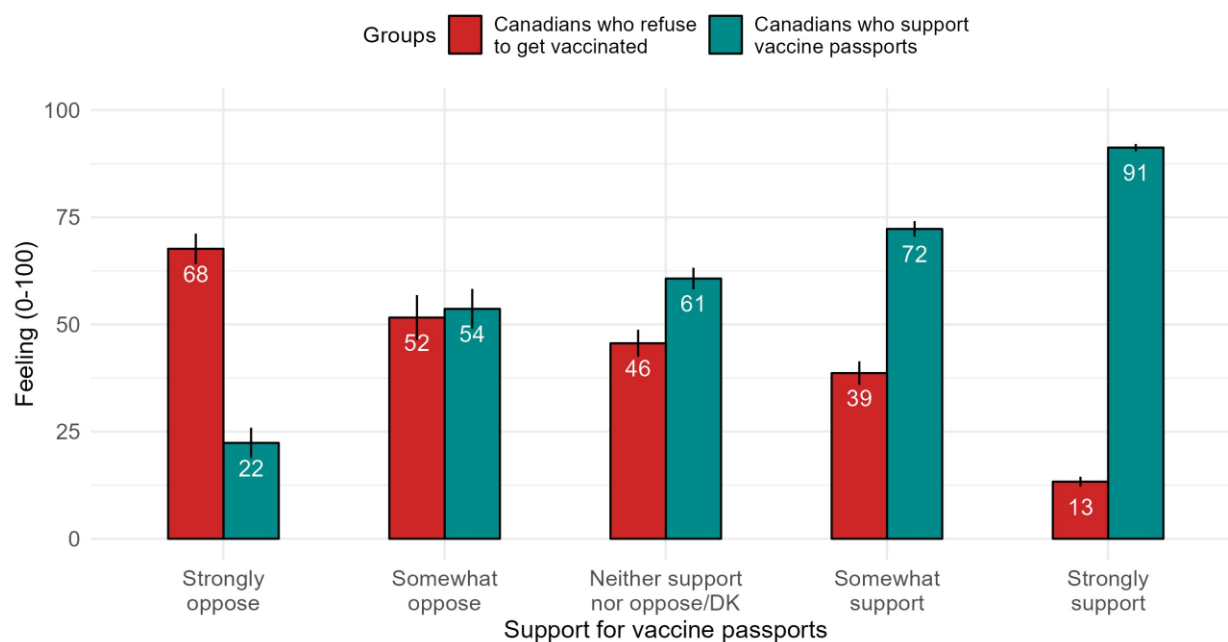


Figure 4.2. Feelings about Canadians who support vaccine passports and Canadians who refuse to get vaccinated based on issue positions on vaccine passports. Weighted means are shown with 95% confidence intervals.

Figure 4.3 illustrates how citizens' feelings about those who believe that humans are causing climate change and climate change skeptics vary based on their support for carbon pricing. The results suggest that citizens who strongly oppose carbon pricing have relatively similar feelings towards climate change skeptics (52/100 on average) and those who believe that humans are causing climate change (45/100 on average). This low level of polarization could partly be a measurement artifact, since individuals who believe in human-made climate change are likely to be perceived as less threatening as an out-group than those supporting vaccine passports. Affective polarization is more bilateral when examining affects based on climate skepticism rather than

support for carbon pricing, see Appendix 4C. Affective polarization gradually increases as citizens become more supportive of carbon pricing, with respondents feeling increasingly positive about those who believe in human-caused climate change (82/100 on average among those who strongly support carbon pricing) and increasingly negatively about climate change skeptics (22/100 among those who strongly support carbon pricing). Overall, the results provide evidence of affective polarization on COVID-19 and climate change (H1).

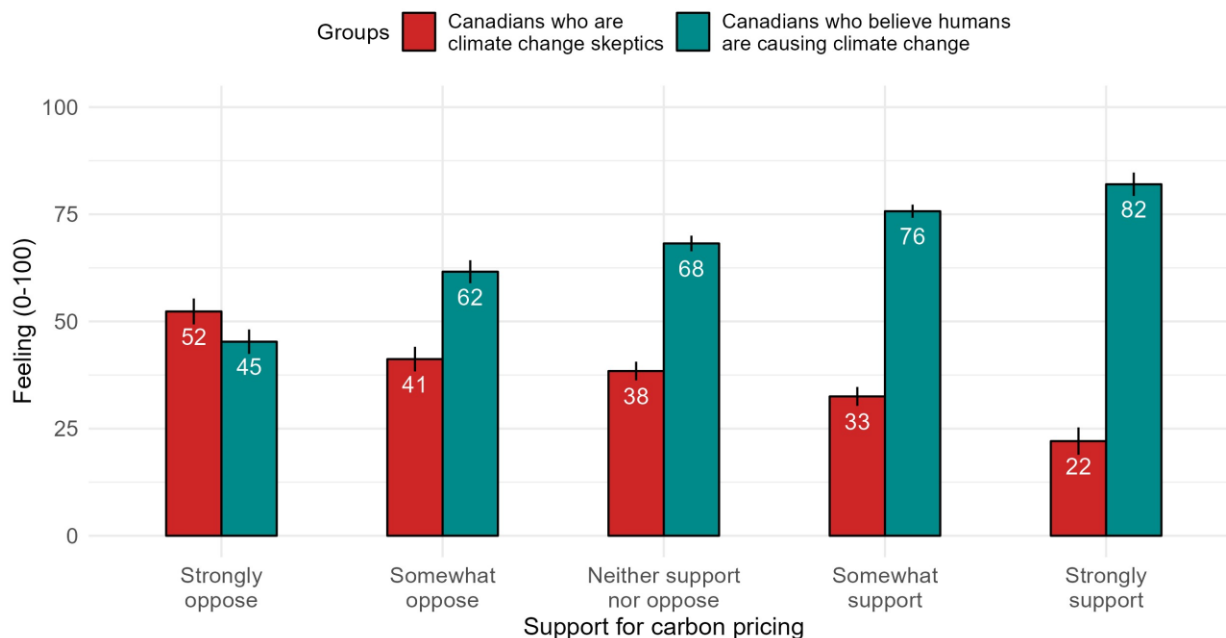


Figure 4.3. Feelings about Canadians who believe humans are causing climate change and Canadians who are climate change skeptics based on support for carbon pricing. Weighted means are shown with 95% confidence intervals.

Explaining issue-based affective polarization

Figure 4.4 shows the results of OLS regression models looking at individual-level factors correlated with affective polarization on COVID-19 vaccines and climate change, the primary variable of interest being issue position extremity. As expected (H2), issue extremity is a very strong determinant of affective polarization on COVID-19 vaccines. Indeed, the results show that the distance between citizens' feelings towards those who support vaccine passports and those who refuse to get vaccinated is close to 40 points higher on the 0-100 scale among those who strongly support/oppose vaccine passports than among those with more moderate positions ($\beta = 37.95$,

95% CI = [34.84, 41.07], $p < .001$). Issue extremity has a significant but smaller positive effect on affective polarization on climate change: strongly supporting or opposing carbon pricing is associated with a 10-point increase in affective polarization ($\beta = 9.59$, 95% CI = [6.42, 12.76], $p < .001$). This smaller effect stems from the fact that strongly opposing carbon pricing is not associated with high levels of affective polarization on climate change, at least based on how we measure it, as shown in Figure 4.3.

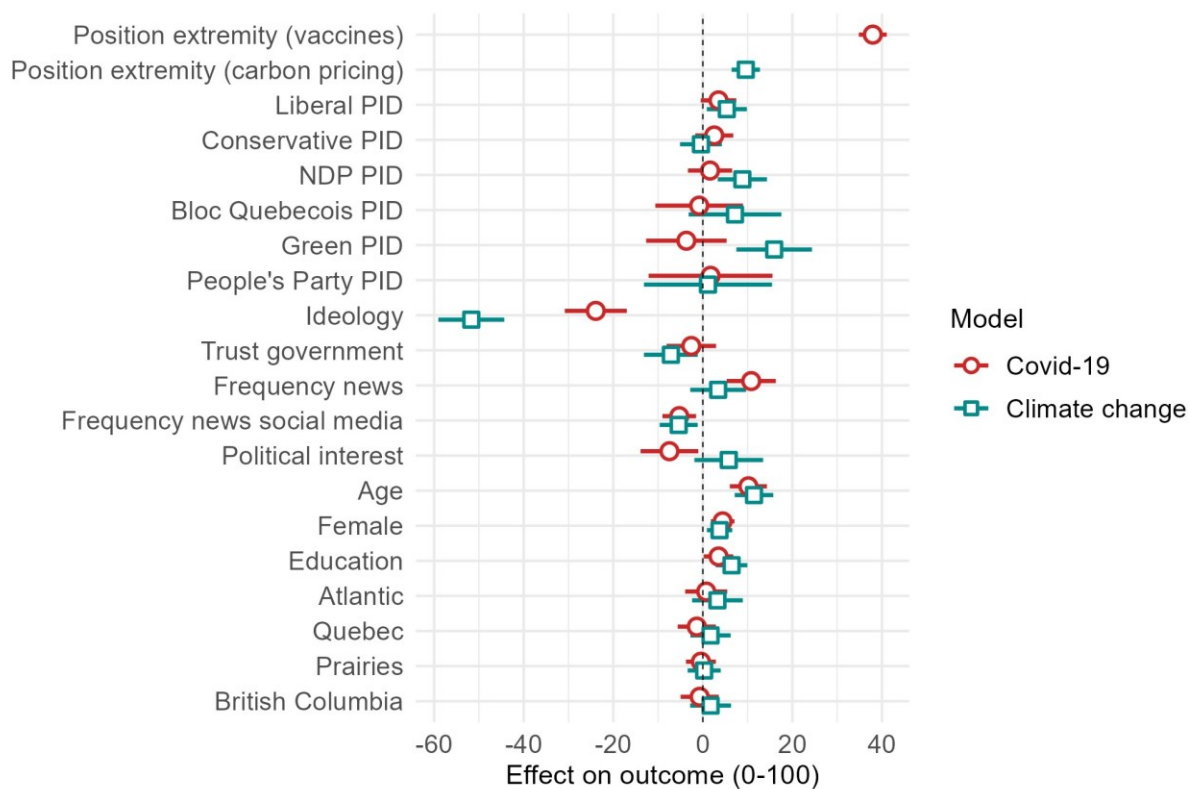


Figure 4.4. Factors explaining affective polarization on COVID-19 vaccines and climate change. OLS regression coefficients are shown with 95% confidence intervals. All independent variables are coded on a 0 to 1 scale. The full regression table is included in Appendix 4B.

As illustrated in Figure 4.4, issue preferences matter even when controlling for partisan identification. To further validate the distinctive importance of issue-based affective polarization, we present the distribution of feelings towards opinion-based groups and affective polarization (the absolute difference in feelings) on COVID-19 vaccines and climate change by partisan identification in Figure 4.5 below. In Appendix 4C, we also demonstrate, using OLS interaction

models, that issue preferences have consistent effects on affective polarization among partisans of each party, especially on COVID-19 vaccines.

Panel A (the left panel) of Figure 4.5 shows that the distribution of feelings towards those who support vaccine passports and those who refuse to get vaccinated against COVID-19 is relatively similar across all major parties, as well as those who identify with no party. A majority of partisans have positive feelings towards vaccine passports supporters and negative feelings towards the unvaccinated, leading to relatively high levels of affective polarization among partisans of all major parties. The distribution of feelings is very different among partisans of the People's Party, a new populist right-wing party that did not manage to secure any seat in the House of Commons (accordingly, the number of People's Party identifiers in our sample is quite small, $N = 51$). Overall, these distributions illustrate that we must look beyond partisanship to understand affective polarization on COVID-19 vaccines.

There are larger partisan differences in the distribution of feelings and affective polarization on climate change. As shown in Panel B (the right panel), partisans of the Conservative Party tend to feel somewhat less favorable towards those who believe that humans are causing climate change and less negative towards climate skeptics than partisans of other major parties, leading to lower levels of affective polarization among Conservatives. However, whether looking at attitudes towards climate believers, attitudes towards climate skeptics, or affective polarization, we find a relatively large number of Conservative partisans across the entire 0-100 scale, suggesting that issue-based affective polarization measures something that partisan affective polarization cannot capture.

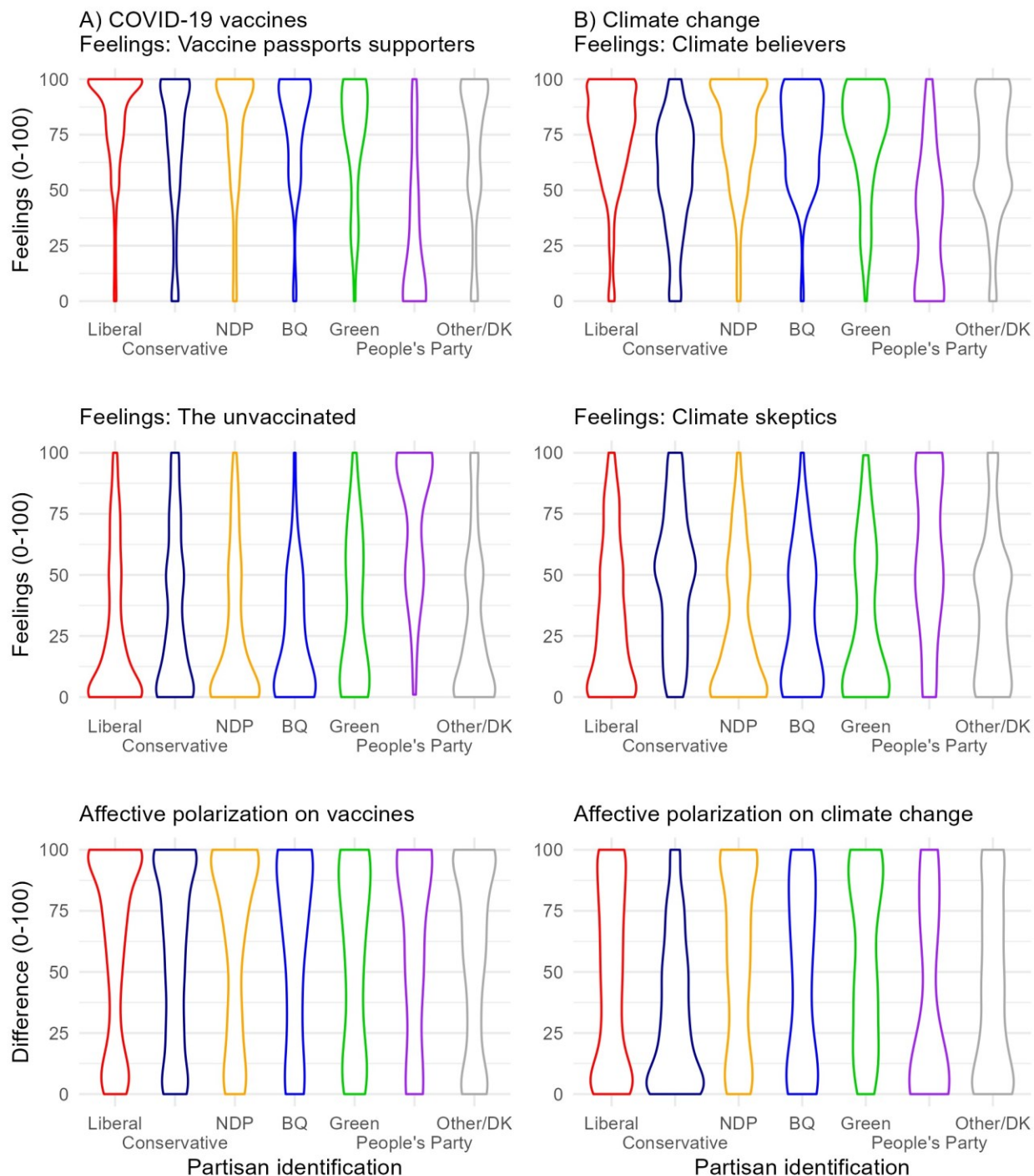


Figure 4.5. Violin plots displaying the weighted distributions of feelings towards opinion-based groups and issue-based affective polarization (the absolute difference in feelings) on A) COVID-19 vaccines and B) climate change by partisan identification.

Misperceptions and affective polarization

Building on the technique developed by Imai et al. (2011), we use causal mediation analysis to estimate the direct and indirect (via policy preferences) effects of COVID-19 and climate change misperceptions on affective polarization. We use feelings towards opinion-based groups rather than the affective polarization scales as our main outcomes given that our argument is not that those who hold misperceptions are more polarized. Instead, we argue that misinformation increase polarization because those who hold misperceptions and those who do not hold misperceptions feel positively and negatively about different groups. All models control for ideology, partisan identification, trust in governments, the frequency of political news consumption in general and on social media, political interest, age, gender, education, and region. The direct (ADE), indirect (ACME, i.e., through support for vaccine passports and carbon pricing), and total effects of COVID-19 misperceptions and climate skepticism are reported in Figure 4.6.

Panels A and B show that policy preferences on vaccine passports partially moderate the effect of COVID-19 misperceptions on feelings towards those who support vaccine passports and those who refuse to get vaccinated against COVID-19. Put otherwise, misperceptions decrease support for vaccine passports. In turn, opposing vaccine passports is associated with negative feelings towards vaccine passports supporters and positive feelings towards the unvaccinated. Policy preferences on vaccine passports mediate 64% of the effect of COVID-19 misperceptions when the outcome measures feelings towards vaccine passports supporters and 33% when the outcome concerns feelings towards those who refuse to get vaccinated. Belief in COVID-19 misinformation thus informs feelings about the unvaccinated both indirectly, by influencing policy preferences about vaccination, and directly (for example, individuals who do not believe in COVID-19 misinformation can feel negatively about the unvaccinated even if they are not strong vaccine passport supporters because they prefer less constraining measures).

The effect of climate skepticism on affective polarization on climate change is more direct, as shown in Panels C and D. Indeed, only 12% of the relationship is mediated for perceptions of those who believe humans are causing climate change, while the AMCE is not statistically distinct from 0 for climate skeptics. These results are unsurprising given that the measure of misperceptions (not believing in climate change) is directly related to the opinion-based groups for which feelings are measured (climate skeptics and those who believe humans are causing

climate change). Conversely, the misinformation is more general (only one of the five statements concerns vaccination) and the groups are more closely related to the issue preferences used as a mediator (support for vaccine passports) when analyzing polarization on COVID-19 vaccines.

To summarize, in line with H3, the results show that misperceptions about COVID-19 and climate change can be important drivers of issue-based polarization. The effect can be both direct, as denying that climate change is occurring influences feelings about those who believe that humans are causing climate change and climate skeptics, and indirect, as COVID-19 misperceptions influence support for vaccine passports, which predicts feelings towards vaccine passports supporters and those who refuse to get vaccinated.

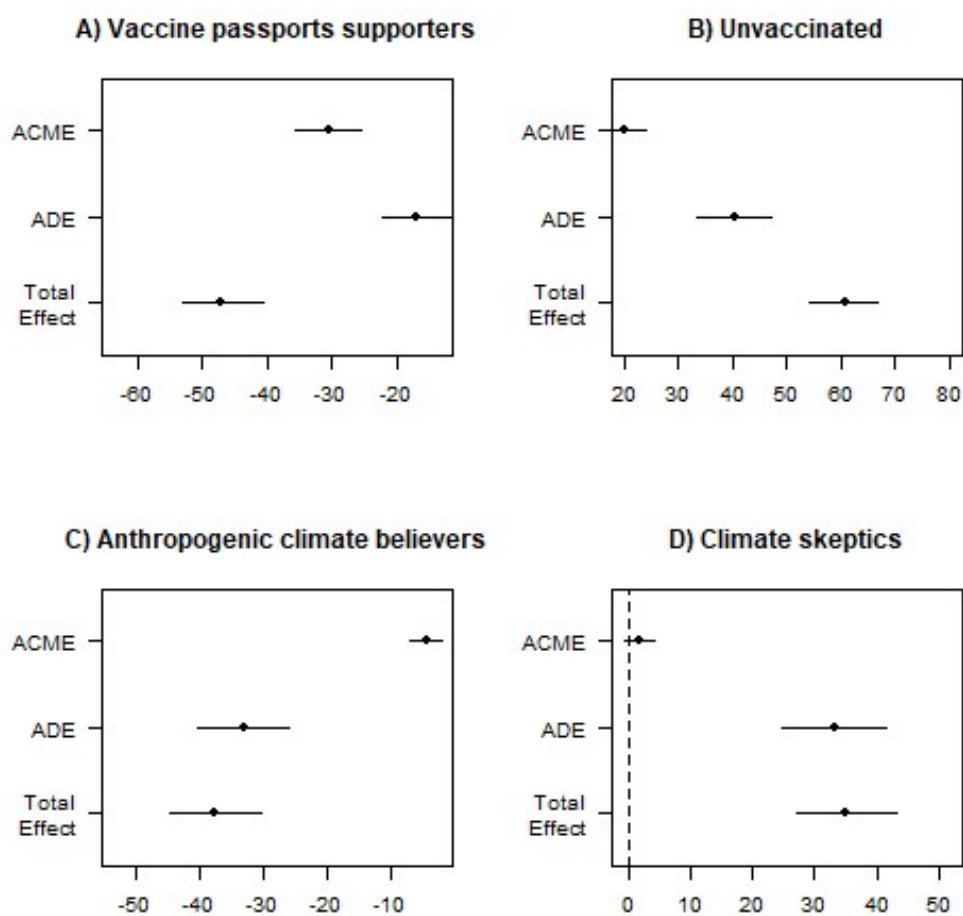


Figure 4.6. Causal mediation analysis. Direct (ADE), Indirect (ACME, via policy preferences), and Total effects of COVID-19 misperceptions and climate skepticism on feelings towards opinion-based groups with 95% confidence intervals.

Is affective polarization on COVID-19 declining?

To examine whether affective polarization on COVID-19 vaccines declined over time⁶⁵, we use entropy balancing to ensure that the Quebec samples collected during the 2021 Canadian federal election and the 2022 Quebec provincial election are balanced on relevant covariates (age, gender, education, ideology, political interest, trust in governments, and frequency of political news consumption in general and on social media). We then regress our affective polarization variables on election year, controlling for the same variables we balanced on. Figure 4.7 shows the predicted values, keeping all other variables at their (balanced) mean. It should be noted that there were no significant differences in affective polarization between Quebec and the rest of Canada during the 2021 election and that the results are very similar when simply calculating weighted means in each sample (using the post-stratification weights) rather than balancing the samples with entropy balancing, see Appendix 4C.

The results provide some support for H4, showing that affective polarization on COVID-19 vaccines slightly declined between 2021 and 2022. The average distance in feelings between those who support vaccine passports and those who refuse to get vaccinated dropped from 59.4 to 53.0 ($\beta = -6.41$, 95% CI = [-11.0, -1.79], $p < .01$). However, that decrease in affective polarization does not stem from the average citizen feeling less negatively about those who refuse to get vaccinated, with feelings only marginally increasing ($\beta = 2.54$, 95% CI = [-1.08, 6.15], $p = .17$). Given the lower perceived threat of COVID-19 and lower support for health restrictions, we instead observe more negative feelings towards those who support vaccine passports (62.9 in 2022 as compared to 77.3 in 2021, $\beta = -14.36$, 95% CI = [-17.65, -11.07], $p < .001$). Finally, the data show a slight decline, from 62.5 to 55.2, in the probability of citizens perceiving those with opposing views on COVID-19 vaccines as a threat to their way of life ($\beta = -7.33$, 95% CI = [-14.34, -.32], $p < .05$). Overall, the results suggest that despite the decreasing salience of COVID-19, affective polarization on COVID-19 vaccines only marginally declined between 2021 and 2022. The average absolute distance between feelings towards vaccine passports supporters and the unvaccinated remained more than 50 points on the 0-100 scale and a majority of citizens continued to perceive those with opposing views on vaccines as a threat to their way of life.

⁶⁵ Questions about affective polarization on climate change were not asked in 2022. Consequently, we cannot examine whether affective polarization on this issue has changed over time.

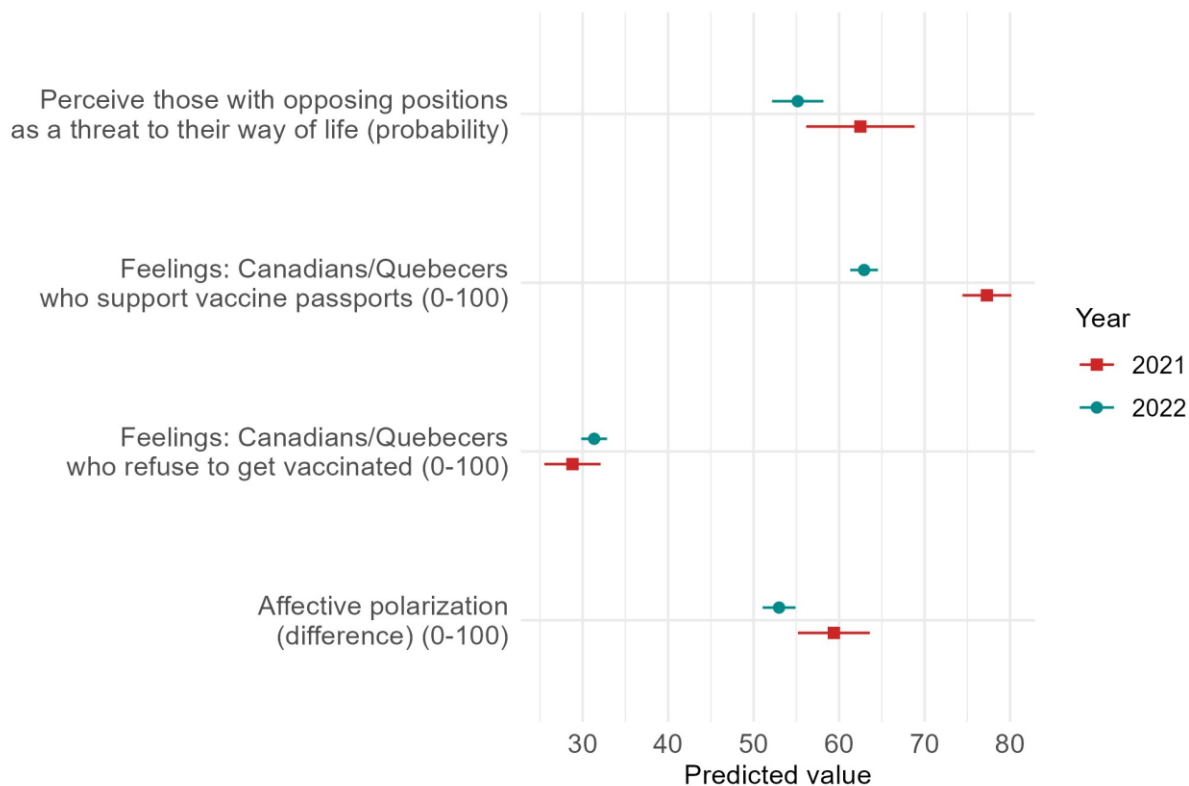


Figure 4.7. Change in affective polarization between September 2021 and October 2022.

Predicted values with 95% confidence intervals based on OLS models. Quebec samples are balanced on political interest, ideology, trust in governments, frequency of news consumption in general and on social media, and socio-demographics using entropy balancing, see Appendix 4B.

Conclusion

With a few rare exceptions (Balcells & Kuo, 2023; Hobolt et al., 2021), the literature on affective polarization has focused on partisan-based polarization. Yet, salient and threatening issues like COVID-19 and climate change can create animosity between those supporting a strong response and those who – because they do not take the issue as seriously or give precedence to other objectives – do not. This type of animosity can exist even in the absence of strong divisions between political parties and leaders. This simple fact calls for broadening our understanding of affective polarization and further examining what we label issue-based affective polarization.

Using data from the 2021 Canadian federal election, we find that citizens who support vaccine passports tend to have very negative feelings about those who refuse to get vaccinated against COVID-19 and perceive them as a threat to their way of life, whereas citizens who oppose

vaccine passports feel similarly negative about vaccine passports supporters. Affective polarization on climate change appears to be more unidirectional (concentrated among those who support carbon pricing), although this asymmetry represents, in part, a measurement artifact.⁶⁶

We further demonstrate that issue preferences strongly predict affective polarization on these issues and have a similar effect among partisans of each party, especially in the case of COVID-19 vaccines. These results, in combination with our analysis of the distribution of affective polarization by party, clearly establish that affective polarization is not simply a reflection of partisan identities. Moreover, among those with clear issue preferences, the observed level of affective polarization is greater than the one observed based on partisanship (Owen et al., 2020; The Economist/YouGov, 2018).

Affective polarization can be considered both a cause and consequence of misperceptions: those who are affectively polarized are more likely to believe in-group-affirming misinformation and less likely to believe out-group-affirming misinformation (Jenke, 2023), but the false narratives that become viral are often divisive and can consequently make citizens more polarized (Au et al., 2022). Misinformation can also distance people's opinions and, therefore, lead to interpersonal or intergroup animosity (Toribio-Flórez et al., 2023). To this day, very few studies had directly evaluated the relationship between misinformation and affective polarization (Druckman & Levy, 2022). We start filling this gap by showing that misperceptions about COVID-19 and climate change both directly and indirectly (by contributing to diverging policy preferences) increase affective polarization on these issues. The results illustrate how misinformation can undermine social cohesion and provide support to the proposition that fighting misinformation could decrease polarization (Hameleers & van der Meer, 2020).

Finally, affective polarization on COVID-19 vaccines only slightly declined between 2021 and 2022, as the issue became less salient. Furthermore, the decline in affective polarization mostly came from the less positive feelings expressed towards those supporting vaccine passports in 2022, given lower support for that type of policy among the public, rather than from the fact that feelings towards the unvaccinated had become more positive. Even though vaccine passports were

⁶⁶ Overall, the results are also consistent with previous studies showing that group identities and discrimination against the out-group are greater among the vaccinated and climate believers than among the unvaccinated and climate skeptics (Bliuc et al., 2015; Henkel et al., 2023).

abandoned and COVID-19 came to be perceived as less threatening, social antagonisms caused by diverging opinions on this issue remains well entrenched. Future research should further investigate how issue-based affective polarization is influenced by the evolving salience of political issues.

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Discussion

The political information environment of Western democracies has experienced important changes over the past decade. On the information dimension, social media have enabled nearly every citizen to become content producers, significantly reduced the traditional gatekeeping role of the media, contributed to algorithms determining what information citizens are exposed to, and allowed all types of information to spread faster and farther than ever before (Blanchett et al., 2022; Trudel & Thibault, 2018; Vos & Thomas, 2019). On the political side, declining trust in governments, the rise of right-wing populism, and political polarization have afflicted many Western democracies (Dalton, 2017; Gidron et al., 2020; Mudde, 2007; Norris & Inglehart, 2019). These changes have eventually made it harder for citizens to distinguish between true and false information and contributed to citizens developing different perceptions of reality and facts. From that perspective, the current dissertation was interested in how this new political information environment shapes perceptions of and vulnerability to misinformation and, as a result, can be conducive to a more divided society. Through the four empirical chapters of this dissertation, I shed light on how citizens perceive misinformation and what influences these perceptions (Chapters 1 and 2); how language influences the spread of misinformation in multilingual countries (Chapter 3); and how misinformation can increase societal polarization (Chapter 4). The findings, limitations, and avenues for future research are discussed below.

Citizens' perceptions of misinformation

Despite the large amount of attention devoted to better understanding misinformation over the past years, citizens' perceptions of misinformation, let alone the sources of these perceptions, remain an understudied area of research (Hameleers & Brosius, 2022; Lecheler & Egelhofer, 2022). Moreover, studies that do examine perceptions of misinformation tend to examine perceptions of misinformation as a whole or focus on a limited set of misinformation situations (F. L. F. Lee, 2022; Newman et al., 2018). To improve our understanding of citizens' perceptions of misinformation, Chapter 1 builds on a survey battery in which respondents were asked about the extent to which they believe that a comprehensive list of scenarios constitute misinformation, are occurring frequently in Canada, and are harmful to democracy. The results suggest that citizens have a broad understanding of misinformation, as they consider very different situations, including some that do not necessarily involve false information (e.g., trolling, hate speech), as constituting

misinformation. Citizens also perceive most forms of potential misinformation as occurring frequently in Canada and as being harmful to democracy, showing how the current political information environment has contributed to high levels of concern over misinformation. That being said, citizens do have distinct evaluations of different types of potential misinformation. While citizens are concerned about all types of misinformation, more disruptive forms of misinformation or misinformation that involves greater intentionality and resources (e.g., foreign interference, astroturfing, news fabrication) are comparatively more likely to be defined as misinformation and are perceived as less frequent, but more harmful to democracy.

Chapter 1 demonstrates that whether citizens perceive specific forms of misinformation as prevalent and harmful to democracy is colored by their ideology and the type of information they are exposed to. In the current political information environment, populist right-wing elites like Donald Trump have been labeling mainstream media as “fake news” and accusing them of having an anti-conservative bias (Egelhofer & Lecheler, 2019; Farkas & Schou, 2018; see Bellavance, 2023 for a recent Canadian example). While a majority of citizens continue to be exposed to and primarily consume mainstream media (Guess, 2021; Owen et al., 2020), audience fragmentation has also increased in many Western democracies, with alternative right-wing media often claiming authority as media critics (Figenschou & Ihlebæk, 2019). In this context, the results of Chapter 1 show that right-wing individuals and those who consume alternative right-wing media tend to perceive misinformation related to the media as being more prevalent (although not necessarily more harmful to democracy) than those with a left-wing ideology and those not exposed to these alternative outlets. The results thus complement previous studies showing that right-wing individuals are more likely to accuse mainstream media of fake news (van der Linden et al., 2020) by revealing how these discourses also damage more specific evaluations of media performance, including perceptions that the media regularly report on events that did not occur, favor the perspectives of elites over citizens’ concerns, publish opinion pieces as if they were factual reporting, or publish stories that they later need to retract. The findings also demonstrate that the greater tendency to associate mainstream media with misinformation on the right does not stem from right-wing individuals being more concerned about the impacts of media misinformation. In fact, the results show that left-wing citizens are more likely than right-wing citizens to perceive news fabrication and reporting opinion pieces as news as harmful to democracy.

I also expected the political information environment to influence perceptions of misinformation involving social media users. Indeed, given (1) accusations by right-wing elites that social media platforms are censoring conservative speech, (2) the fact that salient right-wing figures like Donald Trump, Rep. Marjorie Taylor Greene, or Andrew Tate were banned from mainstream platforms like Facebook and Twitter, or (3) the fact that right-wing individuals have been more likely to see content they posted online removed because of platform violations (Barrett & Sims, 2021; Haimson et al., 2021; Jiang et al., 2019, 2020), we can anticipate that individuals on the left are more likely to believe that misinformation is frequent on social media and harmful to democracy, whereas, as an identity-protecting mechanism (Kahan, 2017; Van Bavel & Pereira, 2018), those on the right would be somewhat less likely to do so. We find support for that argument, with the results showing that right-wing citizens and those who consume alternative right-wing media perceive misinformation scenarios involving social media users as less frequently occurring and less harmful to democracy than those with a left-wing ideology and those not exposed to these media.⁶⁷

Despite perceptions of specific types of misinformation being influenced by one's ideology and media consumption behaviors, Chapter 1 reveals that perceptions of misinformation nevertheless form a relatively coherent belief system. First, the results demonstrate that individuals who believe that they were recently exposed to misinformation tend to perceive all potential forms of misinformation as more frequent and harmful to democracy. Second, perceptions of misinformation are highly correlated, such that one of the strongest predictors of individuals' perceptions that a given situation constitutes misinformation, occurs frequently in Canada, and is harmful to democracy is whether they believe that the other scenarios they were asked about also constitute misinformation, occur frequently in Canada, and are harmful to democracy.

Chapter 2 further investigates citizens' perceptions of misinformation by looking at the extent to which they condemn or are indifferent to the spread of misinformation. Indeed, despite claims that we are living in a post-truth era, very few studies have evaluated how citizens balance the truth with other political objectives. Using a question-wording experiment that varies the stated

⁶⁷ I also evaluated how ideology and media consumption are associated with perceptions of misinformation from politicians, the expectation being that those with a right-wing ideology or consuming alternative right-wing media would perceive misinformation from political elites as more frequent, in part because of the centre-left ideology of the party currently in government in Canada. I did not find convincing evidence for that theory.

objective of spreading misinformation on COVID-19 and climate change, I find that citizens tend to find it largely unacceptable for politicians to spread misinformation, no matter the stated purpose. Moreover, citizens who support more action on COVID-19 and climate change do not perceive it as more acceptable for politicians to spread misinformation that would help achieve this goal, with the results suggesting that they are more concerned about misinformation being spread on these issues in general. Overall, the perceived acceptability of spreading misinformation is more consistently influenced by citizens' ideological self-placement than by their issue positions. Right-wing citizens find it less unacceptable for politicians to spread misinformation than centrist and left-wing citizens across all purposes, including when the stated objective is to encourage citizens to act on COVID-19 and climate change.

The previously described study suffers from some limitations, including the fact that COVID-19 and climate change can be considered left-wing issues and that it did not test mechanisms for why right-wing individuals might be more tolerant of misinformation. Consequently, Chapter 2 includes a follow-up study that investigates ideological differences in perceptions of misinformation using more ideologically neutral measures of perceptions and tests whether perceived biases in public discourses around misinformation partly account for the observed ideological asymmetry. Measuring perceptions of misinformation with an extensive survey battery, I find consistent ideological differences. Specifically, right-wing individuals are significantly (1) more likely to believe that public discourses around misinformation and content moderation on social media are biased against them; (2) less concerned about misinformation; (3) more likely to believe that there are no impartial ways of determining the truth in political debates about facts (something referred to as epistemic post-factualism, see MacMullen, 2020); (4) more likely to tolerate the spread of misinformation if it increases one's chances of winning the election (motivated post-factualism); and (5) more likely to prioritize free speech over combatting misinformation. Additionally, right-wing individuals are less supportive of stronger government measures to fight misinformation and of content moderation on social media. The prompt experiment used to prime perceptions of bias in public discourses around misinformation and in content moderation – one of the posited mechanisms to explain the relationship between ideology and perceptions of misinformation – did not manage to significantly influence perceptions of misinformation. This could partly be explained by the fact that the treatment was too weak or not direct enough, as further explained in the *Limitations* subsection. However, the pre-registered

observational analyses demonstrate that bias perceptions are more prevalent on the right and are correlated with some measures of perceptions, including epistemic post-factualism, the prioritization of free speech over combatting misinformation, and support for content moderation on social media. These observations provide suggestive evidence that bias perceptions can help explain (while not being the sole explanation for) why right-wing individuals tend to be less critical of misinformation and less supportive of content moderation on social media.

Citizens' vulnerability to misinformation

Despite the fact that the information environment is now globalized, research on societal resilience to misinformation tends to focus on national factors, such as the level of political polarization, support for populist parties, trust in the media, or audience fragmentation (Humprecht et al., 2020). Chapter 3 proposed to incorporate both interstate and intrastate considerations by examining how, in multilingual Canada, differential exposure to the misinformation-saturated U.S. information environment among Francophones and Anglophones influenced their likelihood of holding misperceptions during the COVID-19 pandemic.⁶⁸ The results support that argument, showing that Francophones insulated from the English-language information environment were somewhat less likely than Francophones and Anglophones exposed to it to hold COVID-19 misperceptions. The results further demonstrate that the effect of social media use on misperceptions was lower among those insulated from the English-language information environment in general and from U.S.-based information in particular.⁶⁹

An additional question, which has received little attention in the literature (Aslett et al., 2022; Muda et al., 2023), especially in Canada, pertains to whether bilinguals are more or less vulnerable to misinformation than monolinguals (or whether individuals are more vulnerable to misinformation when using a foreign language). Bilinguals are found to be either equally (Fernández-López & Perea, 2020) or more likely (Muda et al., 2023) to believe in misinformation in their less proficient language. While bilinguals usually have a higher level of education (Statistics Canada, 2023)⁷⁰, they can be exposed to misinformation in both languages and are

⁶⁸ Bridgman et al. (2021) had previously documented an association between exposure to U.S.-based information and vulnerability to misinformation in Canada but did not investigate language differences.

⁶⁹ As discussed in Chapter 3, these results hold when balancing language groups on other relevant characteristics, including ideology, political interest, age, education, and gender.

⁷⁰ Education has a conflicting relationship with misperceptions. In general, those with a higher level of education tend to be more knowledgeable, and, consequently, less likely to hold misperceptions (Johansen & Joslyn, 2008; Meirick,

potentially more likely to suffer from information overload⁷¹, which increases vulnerability to misinformation (Andrejevic, 2013; Laato et al., 2020; Tandoc & Kim, 2022). I start examining the relationship between bilingualism and resilience to misinformation in Chapter 3 and find that those consuming information in both French and English, especially those with high social media usage, were slightly more likely than those consuming information in only one language to hold COVID-19 misperceptions, a phenomenon that had not been previously documented. I further investigate this question in a follow-up study, by examining whether bilinguals were also more likely than monolinguals to share misinformation on social media during the pandemic. Using a sample of around 100,000 highly active political social media users, I find that bilinguals were slightly more likely to share misinformation-related tweets. They also tended to share misinformation in both French and English. As a result, following more U.S. accounts was a weaker determinant of their likelihood of sharing misinformation than among monolingual Anglophones.

Misinformation and societal polarization

Crisis situations like COVID-19 and climate change, because they involve important societal changes, uncertainty, and a perceived loss of control, have been shown to encourage the spread of misinformation and conspiracy theories (Miller, 2020b; van Prooijen, 2018; van Prooijen & Acker, 2015; van Prooijen & Douglas, 2017). They can also be an important source of animosity when some groups are perceived as hampering societal efforts by not complying with expected behaviors (Kasper et al., 2022; Toribio-Flórez et al., 2023), among other things. In a context where affective polarization has almost exclusively been studied from a partisan perspective, Chapter 4 introduces the concept of issue-based affective polarization – the distance between positive feelings towards individuals who share one’s issue positions and negative feelings towards those who do not. Drawing on the literature on opinion-based groups, which suggests that opinions on salient political issues can form the basis of social identities, Chapter 4 shows that individuals who supported COVID-19 vaccine passports tended to feel very positively about those sharing their

2023; van Prooijen, 2017). Educational attainment is also strongly related to cognitive reflection (as opposed to intuitive thinking) (Stieger & Reips, 2016), which has been shown to decrease vulnerability to misinformation (Erlach et al., 2023; Pennycook & Rand, 2019b; Stecula & Pickup, 2021b). However, motivated reasoning and selective exposure to congruent information tend to be stronger among those with a high level of political knowledge (Taber & Lodge, 2006). As such, more politically sophisticated citizens are better able to resist incongruent information and to defend their mistaken beliefs (Meirick, 2023; Nyhan, 2010; Taber & Lodge, 2006; Zaller, 1992).

⁷¹ The relationship between bilingualism and information overload is mentioned in multiple studies (Chen et al., 2023; Dolinsky & Feinberg, 1986) but more research is needed to empirically validate that claim.

issue position and very negatively about those refusing the vaccine. In contrast, individuals who did not support vaccine passports tended to feel positively about the unvaccinated and very negatively about vaccine passport supporters. Similarly, carbon pricing supporters had positive feelings towards those who believe in anthropogenic climate change and very negative ones about climate skeptics. I show that issue-based affective polarization is not solely or primarily determined by partisan identities, as (1) issue preferences have a strong effect after controlling for partisan identification; (2) the distribution of affective polarization on COVID-19 vaccines was relatively similar across major parties; (3) while the distribution of affective polarization on climate was somewhat different among Conservative partisans than partisans of other major parties, there were important intraparty differences such that feelings towards climate believers and climate skeptics were well distributed over the 0-100 scales; (4) issue preferences had a similar influence on affective polarization within partisan groups.

After establishing the value of issue-based affective polarization as a concept, I demonstrate how misinformation can both directly and indirectly – via their influence on policy preferences – contribute to affective polarization. I find the effect to be more direct in the case of climate change and more indirect in the case of COVID-19 vaccines, although this difference is likely a measurement artifact. Indeed, opinion-based groups used to measure affective polarization on climate change were defined based on whether people believed in human-made climate change, which was also how climate misperceptions were measured. Conversely, opinion-based groups used to measure affective polarization on COVID-19 distinguished between those supporting vaccine passports and those refusing to get vaccinated, which was more closely aligned with how issue preferences were measured (i.e., support for vaccine passports) than how COVID-19 misperceptions were measured (only one of the false statements was about vaccination). Independent of whether the effects are direct or indirect, the results make it clear that misinformation can be an important source of issue-based affective polarization.

Finally, I examine whether affective polarization on COVID-19 vaccines has decreased as the issue became less salient and, consequently, less central to citizens' social identities. Comparing polarization in the province of Quebec during the 2021 Canadian federal election and the 2022 Quebec provincial election, I only find a slight decline in affective polarization. Moreover, this decrease is caused mainly by citizens feeling less warmly towards vaccine passports

supporters in a context where passports had been removed. Feelings towards the unvaccinated remained similarly negative over time.

Limitations

Causal identification

This dissertation certainly suffers from some limitations. First, many of the results are based on observational data. Despite the careful inclusion of control variables and fixed effects in the regression models, the use of techniques like entropy balancing to increase comparability between groups of interest, and the numerous robustness checks, I cannot rule out the possibility that unobserved factors can account for the results. Moreover, the relationship between some of the variables is likely to be mutually reinforcing. For example, because alternative right-wing media are usually very critical of mainstream media, consuming these alternative outlets is expected to reinforce perceptions that the media are spreading misinformation, as suggested in Chapter 1. However, distrusting mainstream media and believing that they are spreading misinformation could also increase citizens' likelihood of getting informed via alternative sources (Hameleers et al., 2022).

Social desirability and expressive responding

While surveys are commonly used to measure perceptions of misinformation and vulnerability to misinformation in the mass public, one question that arises is whether citizens always express their sincere opinion when answering more contentious questions. One such challenge, in Chapter 2, is social desirability bias, which is defined as “the tendency of research subjects to choose responses they believe are more socially desirable or acceptable rather than choosing responses that are reflective of their true thoughts or feelings” (Grimm, 2010). Indeed, respondents are likely to feel compelled, given existing social norms, to indicate that it is highly unacceptable to spread misinformation. Consequently, responses are concentrated at the bottom end of the scale (low acceptability), limiting our ability to identify forms of misinformation that are considered more socially acceptable. In real-life situations, citizens would potentially be more indifferent than what they reported. That said, I do not have strong reasons to believe that social desirability can account for the observed differences in acceptability based on issue positions or ideology.

Another issue that has been discussed in the misinformation literature is the question of expressive responding, which, in the current context, refers to the idea that respondents could insincerely report that they believe in politically congenial misinformation (or that they believe that public discussions around misinformation are biased against them) to express support for their party or ideological group (Schaffner & Luks, 2018). While there is no consensus on the extent to which expressive responding contributes to surveys overestimating the prevalence of political misperceptions (Altay, Berriche, et al., 2023; Graham, 2023), experiments providing incentives for accurate responses only marginally decrease reported beliefs in misinformation, which suggests that surveys can provide sufficiently reliable measures of misperceptions (Berinsky, 2017; Fahey, 2022; Nyhan, 2020; Peterson & Iyengar, 2021).

Strength of experimental treatments

The null experimental results in Chapter 2 can partly be explained by the fact that the treatments were too weak to alter respondents' opinions. In Study 1, respondents would have expectedly been more likely to report that they perceive it as acceptable to spread misinformation if the experiment had brought respondents' attention to the actual consequences of citizens' behaviors. In other words, misinformation spread for "socially desirable" purposes could have been described as saving lives (COVID-19) or preventing major natural catastrophes (climate change), rather than simply mentioning that it would encourage citizens to comply with public health measures or reduce their ecological footprint. Similarly, in Study 2, the treatment could have directly stated that content moderation is biased against a given ideology (one could have included a quote by a political leader on that matter, for example) rather than implying it by saying that people on the left/right are more likely to see content they posted removed by social media platforms.

Of course, these experiments were part of broader projects, and for this reason, I did not have full control over the sample size. Hence, these soft treatments pose a challenge in a context where our experiments are likely underpowered because of the relatively limited sample sizes. This is particularly the case for analyses that involve interaction effects, which require greater statistical power. This lack of statistical power is a problem that has been shown to affect most of the quantitative political science literature (Arel-Bundock et al., 2022). Increasing the sample size tends to increase the precision of the estimated effects and, consequently, reduces the probability

of committing a type II error, that is, mistakenly failing to reject the null hypothesis (Arel-Bundock et al., 2022).

Measurement of (perceptions of) misinformation

There also are some limitations to how I, and the misinformation literature in general, measure misinformation. As previously indicated, conceptual definitions of what constitutes misinformation are based on what is considered the best available scientific evidence at the time (Vraga & Bode, 2020). Given that science is an evolutionary process, the amount of evidence and level of expert consensus can vary significantly across issues (Vraga & Bode, 2020). However, scholars have not found a good way to reflect that uncertainty when measuring misperceptions, as they usually simply distinguish between true and false statements. This conceptual-empirical disconnect remains a challenge for the field and for this dissertation. One example is the lab leak theory about the origin of COVID-19, which was perceived as a conspiracy theory at the beginning of the pandemic and is more debated now, although the theory that COVID-19 was the result of an accidental animal-to-human transmission is still considered as more credible by the scholarly community (Gordon & Strobel, 2023; Lewis et al., 2023). Consequently, the statement that COVID-19 is the result of an accidental animal-human transmission that occurred in China is considered true in Chapter 4, although there is some uncertainty on that conclusion. Chapter 3 partly avoids this problem, at least on the question of the origin of COVID-19, by asking respondents whether COVID-19 is a *bioweapon* developed by the Chinese government, which is not considered a credible theory for how the pandemic began (Lewis et al., 2023).

Relatedly, one challenge to using a dictionary to identify misinformation on social media (Chapter 3) is the inability to distinguish between posts that spread misinformation (because the user believes in the claim made in the post) and posts that discuss, debunk or make fun of misinformation. The manual classification of a sample of misinformation-related tweets shows that the dictionary used in Chapter 3 identifies more tweets propagating misinformation than tweets discussing or debunking it. However, a substantial number of misinformation-related tweets still fell in the latter category. The chapter would benefit from the precision of only including tweets that propagate misinformation. Still, we believe that the amount of discussion and attempts to debunk misinformation are also reflective of the extent to which misinformation is prevalent in

a given information environment, since there is no incentive to debunk or discuss misinformation when it is not circulating (Vraga et al., 2023).

Also, while the descriptive analysis presented in Chapter 1 represents an innovative way of measuring perceptions of a broad range of scenarios that could be considered misinformation, also introducing scenarios that more clearly do not constitute misinformation (beyond trolling or hate speech) would have enhanced my ability to uncover whether citizens can distinguish between what constitutes misinformation and what does not, and to better contextualize the perceived frequency and harmfulness of scenarios that do involve misinformation. Chapter 1 nevertheless provides informative evidence about the broadness of citizens' understanding of misinformation and the perceived prevalence and harmfulness of different forms of misinformation.

Generalizability

An additional limitation of the current dissertation is that all the empirical results are based on Canadian data. There are grounds to believe that the results are generalizable to other developed democracies. Generally, predictors of susceptibility to misinformation are similar across countries (Arechar et al., 2023; Roozenbeek et al., 2020). Recent studies have also found left-right differences in perceptions of misinformation and support for measures to counter misinformation in the United States and Germany (Kozyreva et al., 2023; Reuter et al., 2019). Research also shows that discourses around misinformation and fake news by the populist right are not limited to the North American context (Hameleers, 2020a; Hameleers & Minihold, 2022; Schulz et al., 2020). When considering the influence of U.S. misinformation across language groups, Canada is certainly not the only country that is highly exposed to the U.S. information environment, and previous studies have shown that the political context in the United States can have social and political consequences outside of Canada (e.g., Turnbull-Dugarte & Rama, 2022). For instance, Dotto and Cubbon (2021) document how vaccine misinformation flowed from the United States to West Africa during the COVID-19 pandemic. Finally, given the global spread of misinformation and policy debates on COVID-19 and climate change (Lewandowsky, 2021; Madraki et al., 2021; Roozenbeek et al., 2020; Singh et al., 2022), affective polarization on these issues is likely to exist in other Western democracies and to also be fuelled by misinformation.

Still, a comparative approach would help better contextualize the findings and enhance our understanding of how the political information environment influences citizens' perceptions of and

resilience to misinformation. For example, survey findings from 2017 illustrate that right-wing voters were more likely than left-wing and centrist voters to believe that they were exposed to misinformation in the news in the United States, but not in France or the United Kingdom (Koc-Michalska et al., 2020), which indicates that some of the results could vary based on the political information environment. While perceptions of misinformation are not necessarily influenced by the volume of misinformation circulating in a given country (Knuutila et al., 2022), perceptions could vary based on the *volume of discussions* of misinformation (priming effect) or *how exactly misinformation is discussed* (framing effect) by political elites and the media.

Beyond the focus on the Canadian case, the fact that Study 1 in Chapter 2 examines the perceived acceptability of spreading misinformation on only two issues, namely COVID-19 and climate change, also limits our ability to generalize the findings. That being said, previous studies also found right-wing individuals to be more tolerant of misinformation about the economy (De Keersmaecker & Roets, 2019) and Study 2 finds consistent results when using general, ideologically-neutral measures of perceptions of misinformation. Chapter 4 also focuses on the same two issues. A broader set of issues would help identify the type of issues likely to trigger higher levels of affective polarization.

Finally, when examining language differences in the likelihood of producing misinformation-related tweets, Chapter 3 relies on a sample of highly active Twitter users, one of the rationales being that those who only passively consume information are of lower research interest because they do not play a major role in shaping the conversation. Future research could validate that the results are generalizable to less active social media users, as well as other social media platforms.

What is left out of the dissertation

A dissertation is necessarily limited in scope and cannot cover every theme and answer every question on a given topic. First, I did not examine the relationship between misperceptions and perceptions of misinformation. The literature on this topic is only emerging, but preliminary evidence suggests that those with high vulnerability to misinformation are more likely to believe that they are exposed to misinformation, although they have a different understanding of what constitutes misinformation. They also are less likely to support initiatives against misinformation

(Bridgman et al., 2022; Lavigne et al., 2023). Combatting misinformation could prove harder in a context where those who are the most vulnerable to it repudiate measures to combat it.

The dissertation examines the sources of citizens' perceptions of misinformation, but it focuses on a limited number of variables, including ideology, issue preferences, and media consumption behaviors. Other variables like parental socialization (Fitzgerald & Bacovsky, 2022) and personality (Morosoli, Van Aelst, & van Erkel, 2022) could also be relevant for understanding citizens' tolerance for misinformation.

In addition, while I find clear and consistent evidence that right-wing citizens are more indifferent to misinformation and demonstrate that bilinguals are more likely to believe in and share misinformation online, more research is needed to better understand the causal mechanisms behind these phenomena.

The reader can notice that the dissertation is more focused on improving our understanding of given societal problems, considering the limited literature on these topics, than on testing the effectiveness of solutions to these problems (e.g., measures to depoliticize perceptions of misinformation or reduce the spread of misinformation across languages). More generally, the dissertation does not directly engage with the many solutions that have been proposed to combat misinformation. The best-known solution is misinformation correction or debunking. Despite initial claims that misinformation correction could have a backfire effect (Nyhan & Reifler, 2010), there seems to be a growing consensus that correction increases belief accuracy even when the misinformation is consistent with one's political predispositions (Carey et al., 2022; Nyhan, 2021; Wood & Porter, 2019; but see Chan & Albarracín, 2023)⁷². However, recent studies suggest that the effect of correction might not be long-lasting, with individuals starting to believe in the misinformation again over time (Carey et al., 2022). There also are debates about when and how to correct misinformation, given that repetition and familiarity can increase the believability of misinformation (Pennycook et al., 2018; Pennycook & Rand, 2020). The general advice is to correct misinformation when it becomes salient and is likely to have significant negative consequences (Vraga et al., 2023). That being said, it is impossible to verify, let alone correct all (false) pieces of information. Because of the scope of the misinformation problem, only a holistic

⁷² Reinero et al. (2023) nevertheless find that correction can have a backfire effect when performed by members of the political out-group.

approach targeting different actors (individuals, politicians, social media companies, etc.) and increasing resilience both before and after misinformation is spread can prove effective (Nyhan, 2020; Vraga et al., 2023).

For example, measures can be taken to increase individual resilience before exposure to misinformation, by increasing citizens' ability to evaluate the credibility of a piece of information and to identify manipulation techniques used by disinformation-producing actors. These measures include digital/media literacy (Guess, Lerner, et al., 2020; Muñoz-Velázquez, 2023; Sirlin et al., 2021; van der Meer & Hameleers, 2021) and prebunking/inoculation (Maertens et al., 2021; Roozenbeek et al., 2022; van der Linden, 2023). Different measures implemented by social media platforms can also help individuals identify misinformation, including accuracy prompts (Pennycook, Epstein, et al., 2021), misinformation labels (Mena, 2020; Morrow et al., 2022; Nassetta & Gross, 2020; but see Oeldorf-Hirsch et al., 2020), or crowdsource judgment (Allen et al., 2021; Pennycook & Rand, 2019a). As further detailed in the next section, the influence of citizens' perceptions of misinformation (e.g., their indifference towards misinformation, the left-right divide in perceptions) on the effectiveness of these solutions would merit further investigation.

Avenues for future research

The previous discussion has outlined numerous avenues for future research. First, we would benefit from comparative studies of perceptions of misinformation that involve different countries with different information environments. These comparative studies could use multi-level modeling to identify both macro- and micro-level determinants of perceptions of misinformation (see Boulianne & Humprecht, 2023 for a similar suggestion). At the macro-level, comparative studies could help uncover how public discussions around misinformation, including the amount of discussion (priming effect) and how exactly politicians and the media discuss misinformation (framing effect), influence citizens' perceptions of misinformation and their ability to distinguish what is true from what is false. Researchers could also use comparative discourse analysis or elite cues experiment to document and test the origin of perceptions of misinformation.

Future studies should also examine what exactly we are measuring when reporting the perceived prevalence of different types of misinformation. In other words, do citizens perceive different misinformation situations as prevalent because they believe that they encounter them

when consuming political information or because they are made aware of them in the news or via other sources? To what extent is the perceived prevalence of these different situations related to their actual prevalence? Better understanding these perceptions is essential given the implications for resilience to misinformation: high perceived prevalence can make individuals more vulnerable to misinformation – by increasing distrust in reliable sources of information – if based on unfounded attacks (Van Duyn & Collier, 2019), while it can improve resilience if founded on people’s awareness of what does constitute misinformation (Boulianne & Humprecht, 2023).

Given the findings of this dissertation, we should also start paying more attention to how perceptions of misinformation, vulnerability to misinformation, and the effectiveness of initiatives to counter misinformation influence one another. Specifically, we can expect misinformation correction, misinformation labels or other similar initiatives to be less effective among those who are less concerned about misinformation, more indifferent to it or those who reject fact checkers’ ability to independently identify misinformation. Future research should empirically validate these assumptions. If they prove correct, researchers should also examine whether increasing science or fact-checking literacy would help depoliticize misinformation debates and increase the effectiveness of different interventions to combat misinformation.

As outlined in Chapter 3, more research should be conducted on how exactly misinformation spreads across languages. To better understand the source of this problem and find appropriate solutions to it, we would benefit from assessing the respective role of politicians (Bridgman et al., 2022), alternative media outlets, local opinion leaders (Yates, 2018), and bilingual individuals (Chapter 3, see also Chen et al., 2023; Jin, 2017; Kim et al., 2014; Mendelsohn et al., 2023) in translating and propagating misinformation across languages.

Finally, future research should examine what types of issues or discourses are the most likely to foster issue-based affective polarization and whether solutions developed to depolarize the electorate – such as favoring discussions with the other side, correcting misperceptions about the out-group, and promoting common identities (Voelkel et al., 2023) – are similarly effective at reducing issue-based affective polarization.⁷³

⁷³ This is not to say that some level of polarization is always bad for democracy, since social antagonism can also reflect struggles for justice in the face of inequalities (Kreiss & McGregor, 2023).

Conclusion

Misinformation poses a serious threat to the functioning of democracies (Bennett & Livingston, 2018; Kuklinski et al., 2000; Tenove, 2020). By eroding trust in institutions, manipulating public opinion, and increasing polarization, misinformation can make it significantly harder for both citizens and politicians to make informed political decisions and engage in constructive democratic dialogue. As such, misinformation can seriously hamper democratic representation, accountability, and deliberation (Flynn et al., 2017; Tenove, 2020). To fully recognize the scope of that threat, we need to pay attention to different dimensions of the misinformation challenge, from whether citizens are critical of misinformation to how misinformation spreads, what makes citizens more or less resilient to it, and what its impacts are on society and democracy. This dissertation examined each of these dimensions and illustrated how they can be understood in light of the current political information environment.

This dissertation first aimed to improve our understanding of citizens' perceptions of misinformation and the source of these perceptions. Chapter 1 makes a key contribution by evaluating citizens' perceptions of a broad range of potential forms of misinformation and showing that citizens' perceptions form a relatively coherent belief system, something that had not been documented or empirically validated. Chapter 1 also contributes to the literature on the determinants of perceptions of misinformation, which tends to focus on fake news or a very limited number of types of misinformation, by showing how citizens' perceptions vary based on their ideology and exposure to alternative right-wing media. While citizens' ideology and media consumption behavior have a greater influence on perceptions of some types of misinformation than others, the general picture is that individuals with a right-wing ideology and those who consume alternative right-wing media tend to perceive misinformation from the media as more frequent and misinformation from social media users as less frequent and less harmful to democracy than those who have a left-wing ideology or do not consume these outlets. As such, the results illustrate the consequences of current discourses around misinformation, where right-wing elites and media have used the "fake news" label to discredit mainstream media and accused social

media platforms of censoring conservative speech (Egelhofer & Lecheler, 2019; Haimson et al., 2021).

The dissertation also helps us better understand the demand side of misinformation. An important question, given claims that we are living in a post-truth era, is whether citizens have indeed become more indifferent to misinformation. Chapter 2 sheds light on that question by showing that most citizens continue to perceive misinformation as objectionable, no matter what the disseminator intends to achieve when spreading it. Those who wish for more action to be undertaken on COVID-19 and climate change do not find it more acceptable for politicians to spread misinformation when it seeks to encourage citizens to comply with public health measures or reduce their ecological footprint.

Chapter 2 further documents the ideological asymmetry in perceptions of misinformation, showing that those with a right-wing ideology find it more acceptable for politicians to spread misinformation on COVID-19 and climate change, no matter what the purpose is. They also are more likely to accept misinformation when it increases their preferred party's chance of winning the election, and more likely to favor free speech over combatting misinformation. Further, right-wing-leaning individuals tend to be less concerned about misinformation, less likely to believe that it is possible to impartially determine the truth in political debates about facts, less likely to support social media and government initiatives to counter misinformation, and more likely to believe that public discourses around misinformation and content moderation on social media are biased against them. I find mixed evidence that these perceptions of bias can, in turn, influence citizens' tolerance for misinformation and support for measures against misinformation. Overall, the results convincingly demonstrate that those with a right-wing ideology are more indifferent to misinformation than other citizens. The results lend strong credence to the idea that the ideological differences that researchers are starting to document in the United States (especially lower support for content moderation, see Kozyreva et al., 2023; Saltz et al., 2021) are generalizable to a broad range of measures of perceptions of misinformation and to other national contexts.

In addition to improving our understanding of citizens' perceptions of misinformation, this dissertation also provides original insights on how language can influence resilience to misinformation by shaping the cross-national spread of misinformation. In a context where frameworks to understand national resilience to misinformation tend to focus on national factors

(Humprecht et al., 2020), Chapter 3 shows that French-speaking Canadians' lower exposure to the U.S. misinformation-saturated information environment contributed to making them somewhat less likely to hold misperceptions during the COVID-19 pandemic. Chapter 3 also provides evidence that those consuming information in both French and English, especially those who are heavy social media users, are more likely to believe in and spread misinformation. This pattern had not previously been documented and would merit further investigation. We theorize that this higher vulnerability to misinformation among bilinguals could stem from their exposure to misinformation in the two languages and their greater likelihood of suffering from information overload (Andrejevic, 2013; Chen et al., 2023; Dolinsky & Feinberg, 1986; Laato et al., 2020; Tandoc & Kim, 2022).

Finally, despite the growing attention paid to both misinformation and polarization over the past decade, very few studies have directly investigated the relationship between the two (Druckman & Levy, 2022). With most of the affective polarization literature focusing on partisanship, Chapter 4 calls for broadening our understanding of affective polarization. Building on the literature on social identity theory (Tajfel & Turner, 1986) and opinion-based groups (Bliuc et al., 2007), I introduce the concept of issue-based affective polarization, which is defined as the distance between individuals' positive feelings towards those who share their issue positions and negative feelings towards those who do not. After establishing that this concept is applicable to the issues of COVID-19 vaccines and climate change and that it measures something distinct from partisan affective polarization or partisan identities, I demonstrate that misinformation has the potential to affectively polarize citizens by increasing social disagreement and antagonism on salient political issues.

Theoretical and practical implications

The findings have important implications for misinformation and polarization research and for how we respond to misinformation. First, the findings of Chapter 1 highlight the empirical value of distinguishing between different actors or sources when measuring perceptions of misinformation, with the results showing that individuals have different perceptions of misinformation involving the media and social media users based on their ideology and media consumption behaviors.

Second, the observed left-right differences in the perceived prevalence of misinformation from the media speak to the important decline in – and politicization of – media trust in Canada and other Western democracies (Brin et al., 2023; Newman et al., 2023). The findings have important implications given that perceived media mis- and disinformation has been associated with a higher probability of rejecting information as false, no matter its actual level of truthfulness (Hameleers, 2023). While there is always room to improve media performance (Brin et al., 2021; McQuail, 2016), the results suggest that measures will need to be undertaken to restore public trust in the honesty and independence of the media and to enhance citizens' ability to critically evaluate attacks on mainstream media by populist actors (Hameleers et al., 2022).

Third, the results presented in Chapter 2 indicate that most citizens perceive the spread of misinformation by politicians as highly unacceptable, no matter what their objective is and even when the misinformation is aligned with their policy preferences. Given that claims that we are living in a post-truth era where citizens are less concerned about the truth have become common (e.g., Kakutani, 2019), these results – while not providing a definitive answer in part because of the question of social desirability – suggest that the idea that citizens are less concerned about the truth would, at least, require more investigation.

As Farkas and Schou (2018) argue, the problem is probably not that citizens have become less concerned about the truth, but rather that determining what counts as true or not has become part of opposing hegemonic projects. This inability to agree on basic facts can make democratic deliberation more difficult (Marietta & Barker, 2019; C. O'Connor & Weatherall, 2019). Political struggles to determine the truth might also help explain the left-right divide in perceptions of misinformation observed in Chapters 1 and 2. This ideological divide, combined with the politicization and weaponization of labels like “fake news” and “disinformation,” could hamper the effectiveness of initiatives to combat misinformation. Trying to depoliticize these debates (via science literacy, for example) could be a promising avenue, as suggested in the *Discussion* section.

Despite the observed language differences in the likelihood of believing and sharing misinformation, one should not exaggerate these differences, with the effect sizes being relatively small. The fact that misinformation manages to spread at the global scale and across languages once again illustrates the porousness of information environments on pressing global issues like

COVID-19 and climate change.⁷⁴ The findings of Chapter 3 also illustrate the influence of U.S.-based misinformation in Canada during the COVID-19 pandemic. These findings make it clear that, in today's globalized information environments, we cannot entirely appreciate national resilience to misinformation without considering the political information environment of other countries. In other words, resilience in one country is likely to influence resilience in other countries. This has implications for how we think about and measure resilience to misinformation. It also means that, given the social and democratic consequences of mis- and disinformation (Tenove, 2020), there is an incentive to improve the health of the information environment at the global level, by addressing the vulnerabilities that facilitate the spread of misinformation. These vulnerabilities include the general lack of transparency and accountability of social media platforms, which limit our ability to assess and remediate their negative effects on society and democracy (Public Policy Forum, 2022).⁷⁵ Vulnerabilities also include a regulatory framework that does not discourage the spread of harmful content as much as it could (Garnett & Pal, 2022; Tenove, 2020), citizens' relatively low levels of media and digital literacy (Guess, Lerner, et al., 2020), and the crisis of journalism, which is not without consequences for the provision of information (Public Policy Forum, 2017).⁷⁶ As Wardle and AbdAllah (2023) put it: "disinformation flows across borders seamlessly, whereas responses are too often organised by nation states". Countries can both directly and indirectly profit from strengthening international cooperation to limit the spread and impacts of mis- and disinformation.

Chapter 4 proposes a new concept – issue-based affective polarization – and demonstrates its validity in the context of COVID-19 vaccines and climate change. The demonstration emphasizes that this concept measures something different from partisan-based loyalties. Given that the affective polarization literature almost exclusively focuses on partisanship and many researchers even include partisanship in their definition of affective polarization, this chapter illustrates what could be gained in terms of our understanding of social antagonisms by broadening

⁷⁴ This remark can also apply to international conspiracy theories about global elites and their hidden agenda (for example, conspiracy theories about the World Economic Forum or the Great Reset).

⁷⁵ As demonstrated in Chapter 3 and elsewhere, social media usage is associated with a higher likelihood of being exposed to, believing, and sharing misinformation (Boulianne et al., 2022; Bridgman et al., 2020; Humprecht et al., 2023; Jamieson & Albarracin, 2020; Morosoli, Van Aelst, Humprecht, et al., 2022; Pickup et al., 2022; Romer & Jamieson, 2021).

⁷⁶ See Altay et al. (2023) for more information on how news consumption can influence citizens' political knowledge, awareness of misinformation, and resilience to misinformation.

our understanding of affective polarization. The results also demonstrate that misinformation contributes to affective polarization by fostering disagreement on issues. Consequently, increasing citizens' resilience to misinformation can be expected to lower societal polarization and improve social cohesion.

While historically there have always been cases of misinformation having a significant impact on the politics of human affairs, the current political times have become increasingly associated with, and defined by, misinformation. This situation is due mainly to the easiness with which misinformation can be shared and can circulate in today's political information environment, thanks to recent advances in communication technologies. As such, advancing scientific knowledge about this phenomenon has become more pressing. This dissertation has been able to do so in multiple ways that should help better understand the sources of misinformation and its potential influence on the politics and society of Western democracies.

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Appendices

Methodological note: Software and packages

All the analyses were performed in R version 4.1.3, using the following packages:

- **Regression models:** estimatr (Blair et al., 2022), lfe (Gaure, 2013), miceadds (Robitzsch & Grund, 2023)
- **Marginal effects / predictions:**ggeffects (Lüdecke, 2018), emmeans (Lenth, 2022), effects (Fox & Weisberg, 2019)
- **Figures:** ggplot2 (Wickham, 2016), sjPlot (Lüdecke, 2021), ggpubr (Kassambara, 2020), patchwork (Pedersen, 2020)
- **Tables:** modelsummary (Arel-Bundock, 2022), kableExtra (Zhu, 2021), stargazer (Hlavac, 2022)
- **Weights:** survey (Lumley, 2020), weights (Pasek, 2021)
- **Standard errors and p-values:** stats, sandwich (Zeileis et al., 2020)
- **Entropy balancing:** WeightIt (Greifer, 2021), ebal (Hainmueller, 2022)
- **Causal mediation analysis:** mediation (Tingley et al., 2014)

Appendices of Chapter 1

1A. Sample

The survey was administered by Dynata to an online quota-based sample (on age, gender, and region) of 7,302 Canadian citizens during the campaign period, with 2,799 respondents also answering the post-election survey. The post-election survey was conducted between September 30 and October 14 (97% of answers were recorded between September 30 and October 4). The technology used by the sample provider does not allow them to know exactly how many panelists were invited to complete the survey, which means that the response rate cannot be calculated. Among the 10,199 panelists that started the campaign-period survey, 181 did not answer any question, 521 were screened out of the survey because they were less than 18 years old or were noncitizens, 916 were filtered out because a quota was already full, 1,229 dropped out before completing it and 51 were removed because they were duplicates (same identifying number). Among the 3,796 panelists who started the post-election survey, 74% completed the entire survey. The post-election sample, which is the main sample used in this study, is composed of 54% of men and 46% of women. The mean age of respondents is 51 years old ($SD = 15.33$). The sample is slightly more educated than the national population: 43% of respondents have completed a university degree (compared to about 30% in the general population), while 27% of respondents reported a high school education or less (compared to 35% in the general population). The regional distribution of respondents includes a slight overrepresentation of Ontario (43% as compared to 38% in the 2021 Census) and underrepresentation of Quebec residents (15% as compared to 23% in the 2021 census).

1B. Main results

Table 1 B.1. T-tests comparing perceptions of the most disruptive scenarios (news fabrication, astroturfing, foreign propaganda) to perceptions of the other scenarios.

Variable	Scenarios	Average	Other	t-statistic	p-value
Constitutes misinformation	Fabrication	3.59	3.27	9.07	0.000
	Astroturfing	3.55	3.30	7.69	0.000
	Foreign propaganda	3.40	3.29	3.12	0.002
Occurs frequently	Fabrication	2.56	3.03	-10.63	0.000
	Astroturfing	2.75	3.02	-5.99	0.000
	Foreign propaganda	2.74	2.97	-5.46	0.000
Is harmful to democracy	Fabrication	3.44	3.19	7.18	0.000
	Astroturfing	3.35	3.20	4.33	0.000
	Foreign propaganda	3.31	3.22	2.64	0.008

Table 1B.2. Factors associated with the perceived frequency of misinformation scenarios involving political actors. OLS regression coefficients reported with standard errors in parentheses.

	Promises	Mischaracterizing	Rumors	Omit	Astroturfing
	(1)	(2)	(3)	(4)	(5)
Exposure misinformation	0.31*** (0.08)	0.51*** (0.08)	0.46*** (0.09)	0.34*** (0.08)	0.51*** (0.11)
Ideology	0.11 (0.12)	0.23+ (0.12)	0.32* (0.14)	-0.06 (0.12)	0.52** (0.17)
Freq news	-0.06 (0.10)	0.18 (0.11)	-0.17 (0.13)	0.002 (0.10)	0.06 (0.15)
Freq news social media	-0.15+ (0.08)	0.09 (0.08)	0.25** (0.09)	-0.04 (0.08)	0.16 (0.12)
Right-wing media	0.19 (0.14)	-0.02 (0.13)	0.04 (0.15)	0.16 (0.12)	0.21 (0.17)
Age	0.23* (0.09)	-0.12 (0.10)	-0.05 (0.11)	0.42*** (0.10)	-0.13 (0.13)
Female	-0.02 (0.05)	0.08 (0.06)	0.08 (0.06)	0.06 (0.05)	0.07 (0.08)
Education	0.002 (0.10)	0.06 (0.09)	-0.09 (0.11)	0.12 (0.09)	-0.28* (0.13)
Constant	3.20*** (0.14)	2.57*** (0.14)	2.59*** (0.16)	2.83*** (0.14)	2.18*** (0.19)
Observations	680	638	629	677	520
R ²	0.06	0.09	0.08	0.08	0.11
Adjusted R ²	0.04	0.07	0.06	0.07	0.09
RMSE	0.69	0.69	0.78	0.68	0.83

+ p<0.1; * p<0.05; ** p<0.01; *** p<0.001

Table 1B.3. Factors associated with the perceived frequency of misinformation scenarios involving the media. OLS regression coefficients reported with standard errors in parentheses.

	Clickbait	Ideological bias	Elite bias	Opinion as news	Retract	Fabrication
	(1)	(2)	(3)	(4)	(5)	(6)
Exposure misinformation	0.36*** (0.09)	0.44*** (0.08)	0.34*** (0.09)	0.29*** (0.08)	0.28** (0.09)	0.26* (0.10)
Ideology	-0.14 (0.13)	0.01 (0.13)	0.36* (0.15)	0.25+ (0.13)	0.59*** (0.14)	0.73*** (0.16)
Freq news	0.01 (0.12)	-0.18 (0.13)	-0.40** (0.12)	-0.27* (0.12)	-0.17 (0.13)	-0.32* (0.15)
Freq news social media	0.0001 (0.09)	0.13 (0.09)	0.19* (0.09)	0.13 (0.09)	0.32*** (0.09)	0.60*** (0.10)
Right-wing media	0.10 (0.15)	0.19 (0.12)	0.25 (0.15)	0.62*** (0.14)	0.26+ (0.14)	0.41** (0.16)
Age	-0.04 (0.10)	0.06 (0.12)	-0.25* (0.11)	-0.17+ (0.10)	-0.27* (0.11)	-0.37** (0.12)
Female	0.17** (0.06)	0.07 (0.06)	0.04 (0.06)	0.18** (0.06)	-0.07 (0.06)	-0.05 (0.07)
Education	0.10 (0.10)	0.05 (0.11)	-0.22+ (0.12)	0.05 (0.11)	-0.11 (0.11)	-0.24+ (0.13)
Constant	2.94*** (0.15)	2.76*** (0.17)	2.98*** (0.17)	2.68*** (0.15)	2.37*** (0.16)	2.39*** (0.19)
Observations	662	622	588	614	645	581
R ²	0.05	0.07	0.09	0.10	0.11	0.20
Adjusted R ²	0.04	0.05	0.07	0.09	0.09	0.18
RMSE	0.74	0.75	0.76	0.73	0.75	0.84

+ p<0.1; * p<0.05; ** p<0.01; *** p<0.001

Table 1B.4. Factors associated with the perceived frequency of misinformation scenarios involving social media users. OLS regression coefficients reported with standard errors in parentheses.

	False information (1)	Manipulated content (2)	Hate speech (3)	Trolls (4)
Exposure misinformation	0.59*** (0.09)	0.54*** (0.09)	0.31*** (0.09)	0.28** (0.09)
Ideology	-0.30* (0.13)	-0.33* (0.14)	0.09 (0.13)	-0.25+ (0.14)
Freq news	0.07 (0.12)	-0.04 (0.13)	0.32* (0.13)	0.19 (0.12)
Freq news social media	-0.07 (0.09)	-0.14 (0.09)	0.04 (0.09)	-0.16+ (0.09)
Right-wing media	-0.29* (0.13)	-0.15 (0.13)	-0.47*** (0.13)	0.19 (0.14)
Age	0.11 (0.10)	-0.44*** (0.11)	-0.24* (0.11)	-0.14 (0.10)
Female	0.08 (0.06)	0.08 (0.06)	0.11+ (0.06)	0.12* (0.06)
Education	0.16 (0.10)	0.06 (0.12)	0.02 (0.11)	0.03 (0.10)
Constant	2.85*** (0.15)	3.00*** (0.16)	2.53*** (0.16)	3.02*** (0.15)
Observations	632	596	620	630
R ²	0.10	0.10	0.06	0.05
Adjusted R ²	0.08	0.08	0.05	0.03
RMSE	0.73	0.77	0.75	0.73

+ p<0.1; * p<0.05; ** p<0.01; *** p<0.001

Table 1B.5. Factors associated with the perceived harmfulness of misinformation scenarios involving political actors. OLS regression coefficients reported with standard errors in parentheses.

	Promises	Mischaracterizing	Rumors	Omit	Astroturfing
	(1)	(2)	(3)	(4)	(5)
Exposure misinformation	0.16 ⁺ (0.09)	0.23 ^{**} (0.08)	0.16 ⁺ (0.08)	0.13 (0.08)	0.11 (0.08)
Ideology	0.02 (0.13)	-0.20 (0.13)	-0.03 (0.13)	0.36 ^{**} (0.13)	-0.34 ^{**} (0.13)
Freq news	-0.14 (0.11)	0.07 (0.11)	0.11 (0.11)	-0.14 (0.11)	0.06 (0.11)
Freq news social media	0.19 [*] (0.09)	0.20 [*] (0.08)	0.01 (0.08)	0.23 ^{**} (0.08)	-0.01 (0.08)
Right-wing media	0.12 (0.15)	0.26 ⁺ (0.14)	-0.19 (0.14)	0.11 (0.13)	-0.12 (0.13)
Age	0.12 (0.10)	0.18 ⁺ (0.10)	0.09 (0.10)	0.04 (0.10)	0.48 ^{***} (0.10)
Female	0.14 [*] (0.06)	0.13 [*] (0.06)	0.10 ⁺ (0.06)	0.15 [*] (0.06)	0.22 ^{***} (0.06)
Education	-0.35 ^{**} (0.11)	-0.24 [*] (0.10)	-0.17 ⁺ (0.10)	-0.07 (0.10)	-0.09 (0.10)
Constant	3.25 ^{***} (0.15)	3.02 ^{***} (0.14)	3.11 ^{***} (0.14)	2.84 ^{***} (0.14)	3.19 ^{***} (0.14)
Observations	685	663	655	683	663
R ²	0.05	0.06	0.03	0.05	0.08
Adjusted R ²	0.03	0.04	0.01	0.03	0.07
RMSE	0.75	0.71	0.71	0.73	0.70

+ p<0.1; * p<0.05; ** p<0.01; *** p<0.001

Table 1B.6. Factors associated with the perceived harmfulness of misinformation scenarios involving the media. OLS regression coefficients reported with standard errors in parentheses.

	Clickbait	Ideological bias	Elite bias	Opinion as news	Retract	Fabrication
	(1)	(2)	(3)	(4)	(5)	(6)
Exposure misinformation	0.18* (0.09)	0.21* (0.08)	0.30*** (0.09)	0.13 (0.08)	0.12 (0.09)	0.21* (0.08)
Ideology	-0.08 (0.14)	0.19 (0.14)	-0.07 (0.14)	-0.30* (0.13)	0.10 (0.13)	-0.37** (0.13)
Freq news	-0.11 (0.12)	-0.12 (0.12)	-0.21+ (0.11)	-0.12 (0.11)	0.12 (0.12)	0.35** (0.11)
Freq news social media	0.15 (0.09)	0.09 (0.09)	0.12 (0.09)	-0.05 (0.08)	0.11 (0.09)	-0.11 (0.08)
Right-wing media	-0.09 (0.16)	-0.002 (0.13)	0.04 (0.15)	0.19 (0.14)	0.26+ (0.14)	-0.12 (0.13)
Age	0.12 (0.11)	0.15 (0.11)	0.09 (0.10)	0.40*** (0.09)	0.14 (0.10)	0.27** (0.10)
Female	0.04 (0.06)	0.11+ (0.06)	0.17** (0.06)	0.05 (0.06)	0.18** (0.06)	0.11+ (0.06)
Education	-0.13 (0.11)	-0.23* (0.11)	-0.26* (0.11)	0.08 (0.10)	-0.07 (0.10)	0.15 (0.10)
Constant	2.97*** (0.16)	2.89*** (0.17)	3.18*** (0.15)	3.20*** (0.15)	2.74*** (0.16)	3.00*** (0.15)
Observations	688	671	640	663	674	663
R ²	0.02	0.04	0.05	0.05	0.04	0.08
Adjusted R ²	-0.0001	0.03	0.03	0.03	0.02	0.06
RMSE	0.79	0.78	0.74	0.72	0.75	0.71

+ p<0.1; * p<0.05; ** p<0.01; *** p<0.001

Table 1B.7. Factors associated with the perceived harmfulness of misinformation scenarios involving social media users. OLS regression coefficients reported with standard errors in parentheses.

	False information	Manipulated content	Hate speech	Trolls
	(1)	(2)	(3)	(4)
Exposure misinformation	0.29*** (0.08)	0.21* (0.09)	0.16+ (0.09)	0.27** (0.09)
Ideology	-0.38** (0.12)	-0.06 (0.13)	-0.46*** (0.13)	-0.19 (0.14)
Freq news	0.18+ (0.11)	0.05 (0.12)	0.27* (0.12)	-0.11 (0.12)
Freq news social media	-0.11 (0.08)	0.08 (0.09)	0.15+ (0.09)	0.10 (0.09)
Right-wing media	-0.80*** (0.12)	-0.26+ (0.13)	-0.35** (0.13)	-0.56*** (0.15)
Age	0.24** (0.09)	0.21+ (0.11)	0.30** (0.11)	0.20+ (0.11)
Female	0.08 (0.06)	0.10+ (0.06)	0.05 (0.06)	0.25*** (0.06)
Education	0.05 (0.10)	0.09 (0.11)	-0.07 (0.10)	0.01 (0.10)
Constant	3.10*** (0.14)	2.75*** (0.16)	3.03*** (0.15)	3.00*** (0.15)
Observations	674	650	661	670
R ²	0.13	0.04	0.09	0.07
Adjusted R ²	0.12	0.02	0.07	0.05
RMSE	0.69	0.77	0.73	0.78

+ p<0.1; * p<0.05; ** p<0.01; *** p<0.001

Table 1B.8. Perceptions that a given scenario constitutes misinformation, occurs frequently, and is harmful for democracy based on perceptions of the other scenarios. OLS regression coefficients reported with clustered standard errors in parentheses. Coefficients correspond to the effect of a one-point change in average perceptions of misinformation on the four-point scale.

	Constitutes misinformation (1)	Frequency (2)	Harmfulness to democracy (3)
Constitutes misinformation (other scenarios)	0.68*** (0.02)		
Frequency (other scenarios)		0.75*** (0.01)	
Harmfulness to democracy (other scenarios)			0.74*** (0.01)
Constant	1.05*** (0.05)	0.76*** (0.04)	0.83*** (0.04)
Observations	10,800	9,235	11,130
R ²	0.24	0.32	0.31
Adjusted R ²	0.24	0.32	0.31
RMSE	0.71	0.68	0.63

+ p<0.1; * p<0.05; ** p<0.01; *** p<0.001

1C. Robustness checks

This appendix reproduces all the analyses included in the body of the paper removing respondents who completed the survey in less than 5 minutes (the median completion time is 21 minutes) or failed an attention check. The attention check was included among other matrix questions and simply asked respondents to select “Neither agree, nor disagree”. Removing these inattentive respondents does not change the main conclusions of the paper.

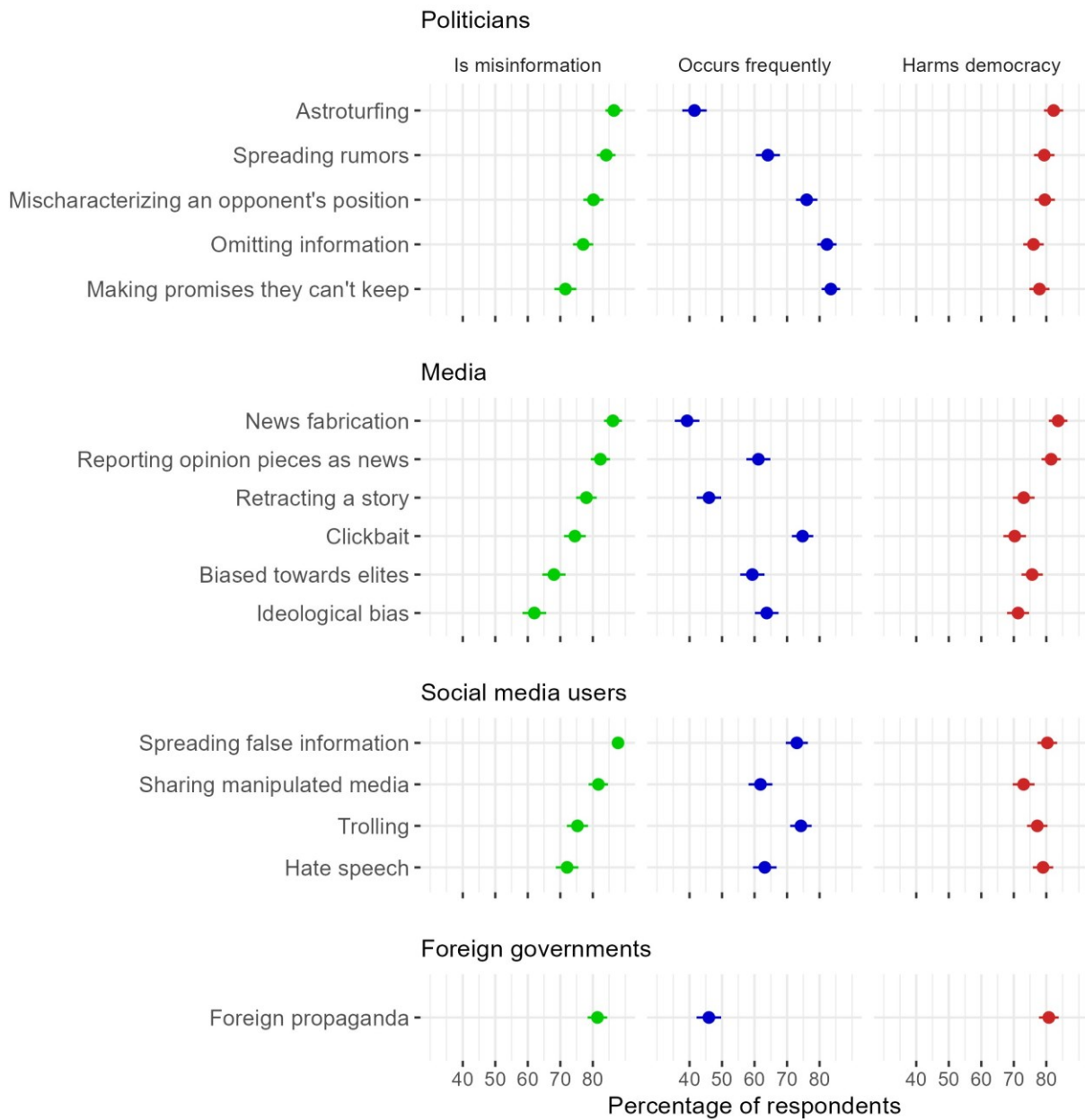


Figure 1C.1. Weighted percentage of attentive respondents who believe that each scenario constitutes misinformation, occurs frequently, and is harmful to democracy, with 95% confidence intervals.

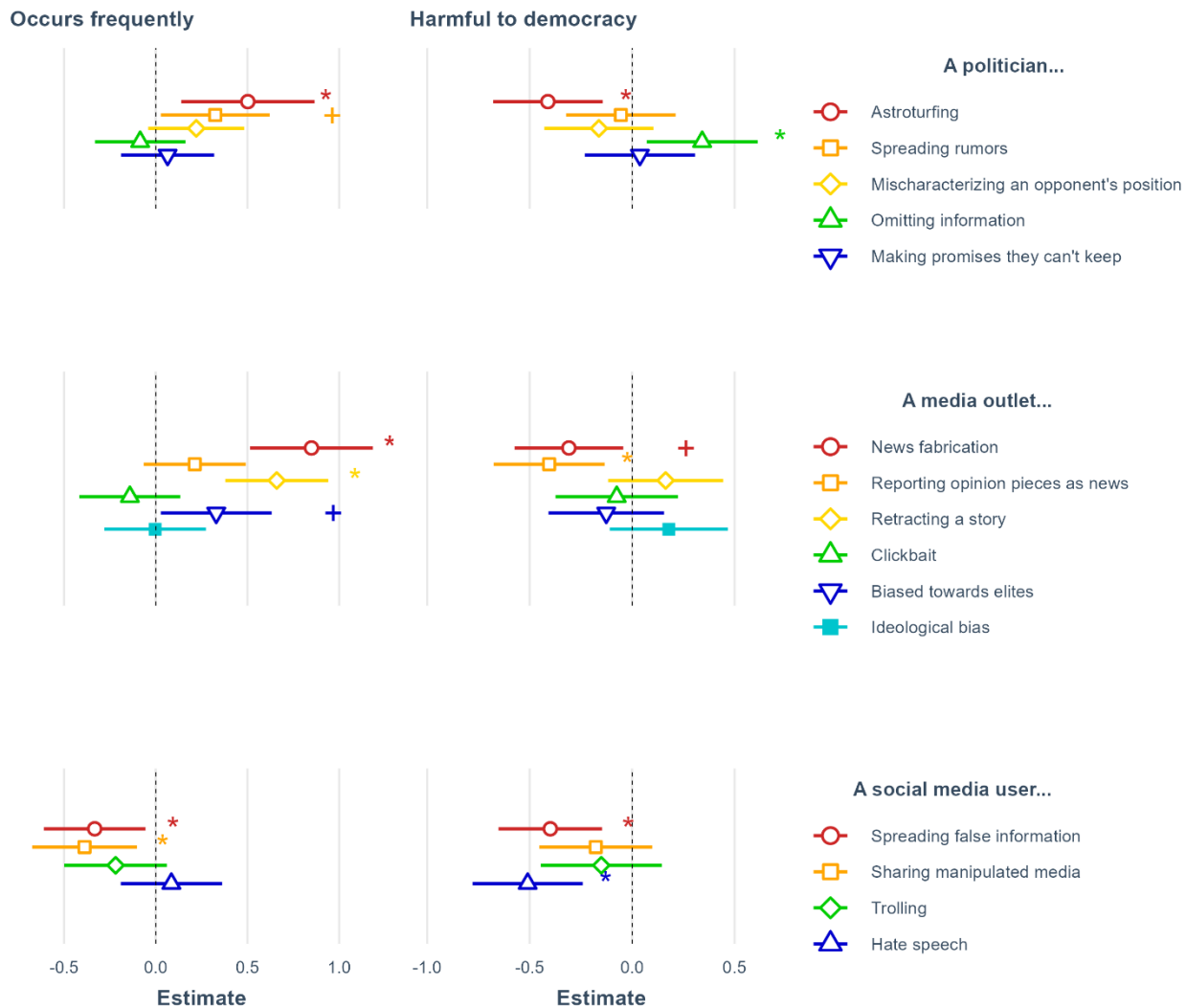


Figure 1C.2. Association between ideology and perceptions that the scenarios occur frequently and are harmful to democracy. OLS regression coefficients reported with 95% confidence intervals. Attentive respondents only.

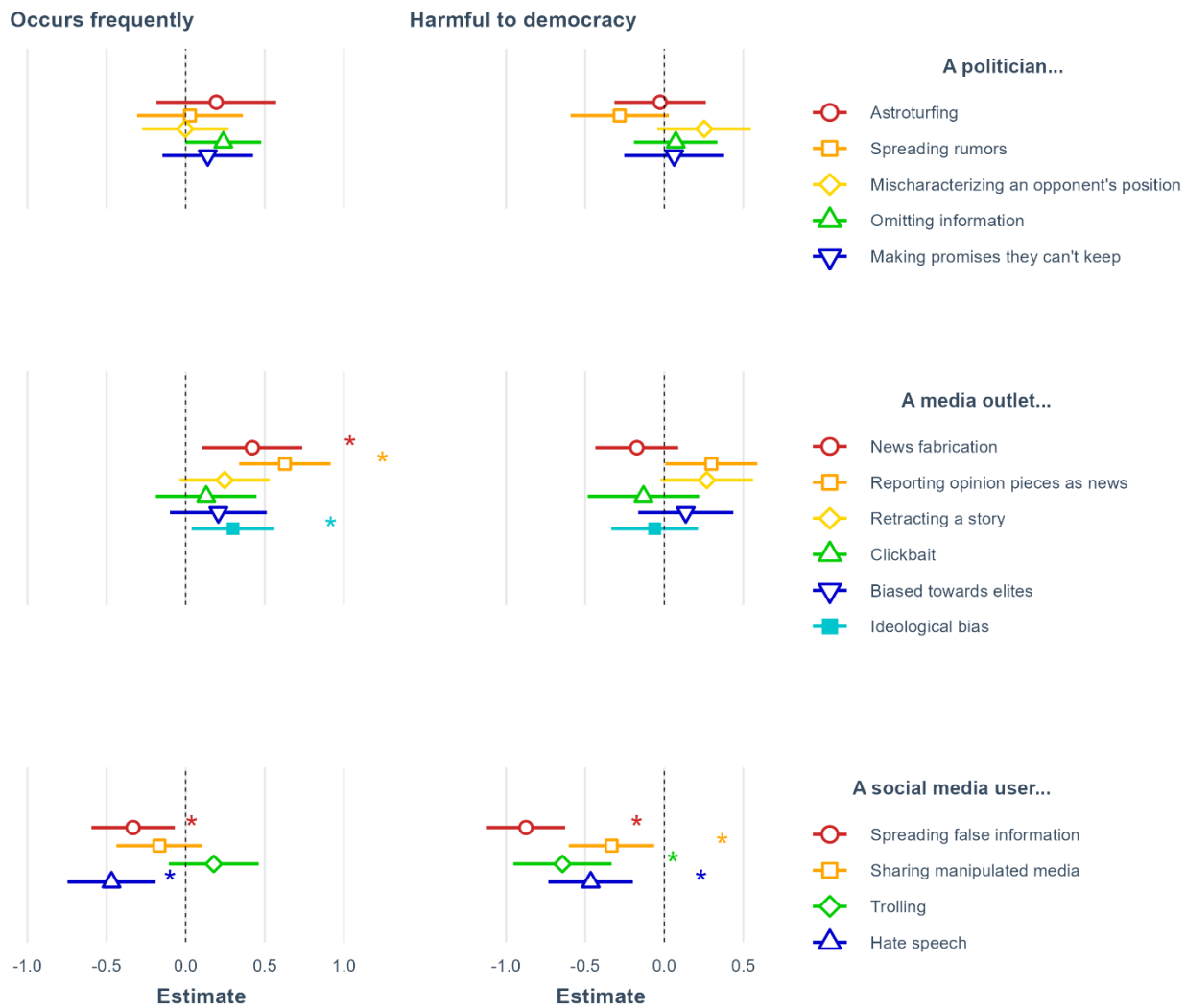


Figure 1C.3. Association between exposure to alternative right-wing media and perceptions that the scenarios occur frequently and are harmful to democracy. OLS regression coefficients reported with 95% confidence intervals. Attentive respondents only.

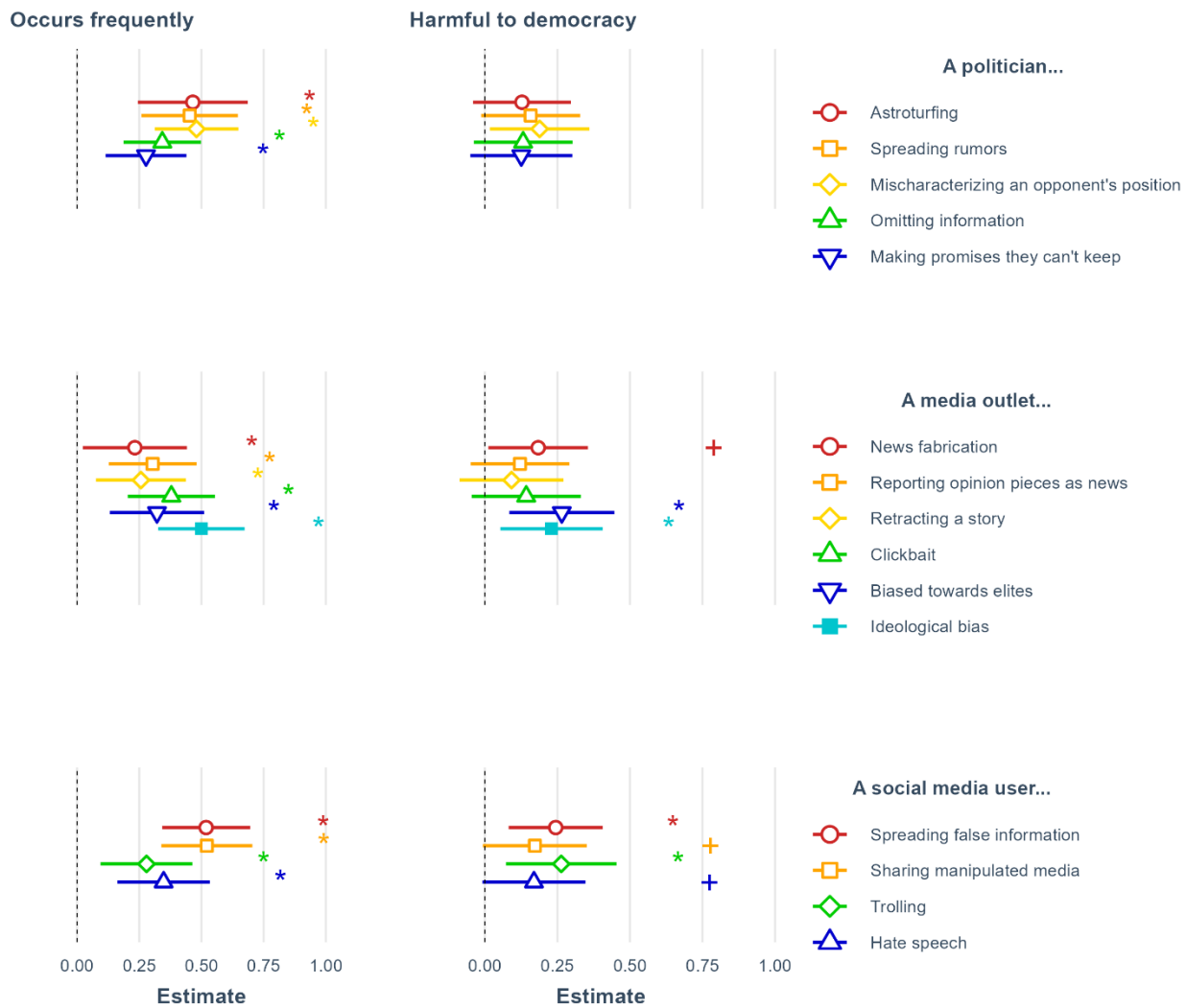


Figure 1C.4. Association between self-reported exposure to misinformation and perceptions that the scenarios occur frequently and are harmful to democracy. OLS regression coefficients reported with 95% confidence intervals. Attentive respondents only.

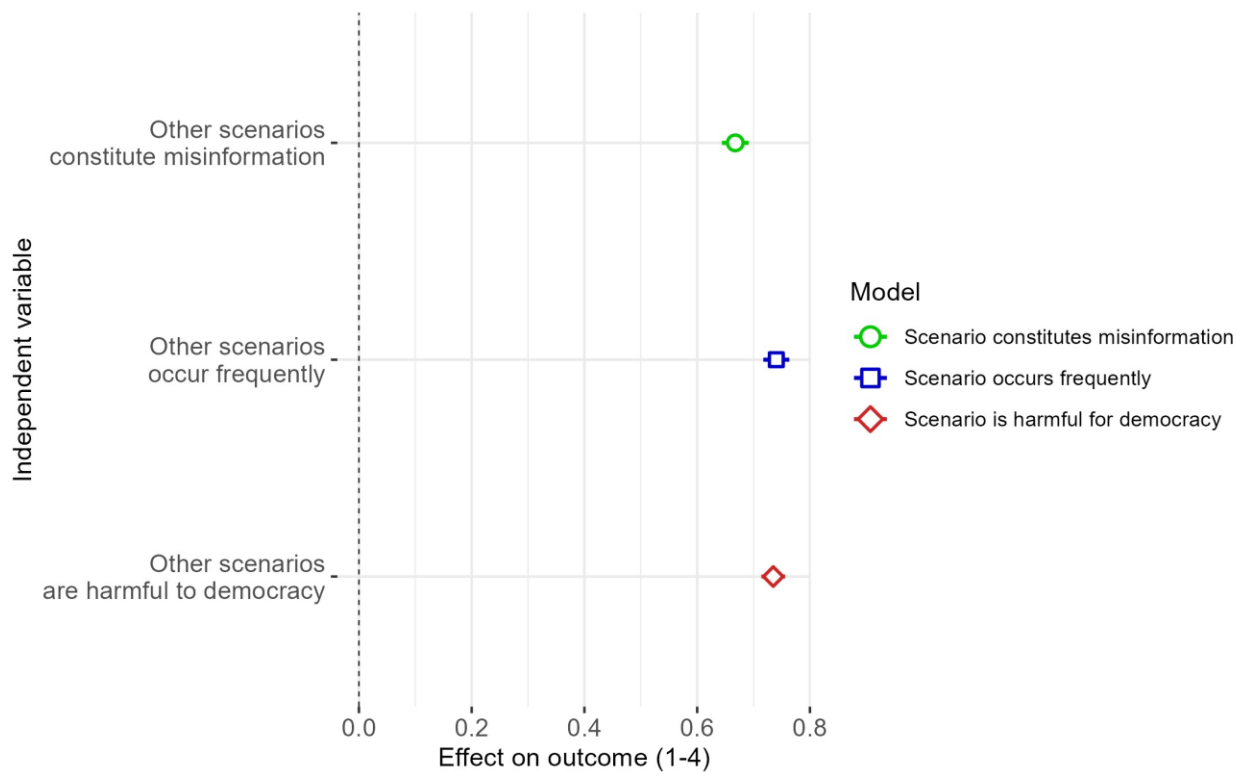


Figure 1C.5. Perceptions that a given scenario constitutes misinformation, occurs frequently, and is harmful to democracy based on perceptions of the other scenarios. OLS regression coefficients reported with 95% confidence intervals. Coefficients represent the effect of a one-point change in perceptions of misinformation on the four-point scale. Attentive respondents only.

1D. Survey questions and variable coding

Table 1D.1. Survey questions and variable coding.

Variable	Question(s)	Coding
Constitutes misinformation	In your opinion, do the following constitute a form of misinformation? <i>(See Table 1.1 for the list of scenarios)</i>	<ol style="list-style-type: none"> 1. Definitely not 2. Probably not 3. Probably 4. Definitely 5. Don't know/Prefer not to answer (NA)
Occurs frequently	In your opinion, how frequently do the following occur in Canada? <i>(See Table 1.1 for the list of scenarios)</i>	<ol style="list-style-type: none"> 1. Not at all frequently 2. Not very frequently 3. Quite frequently 4. Very frequently 5. Don't know/Prefer not to answer (NA)
Is harmful to democracy	To what extent do you consider the following to be harmful for democracy? <i>(See Table 1.1 for the list of scenarios)</i>	<ol style="list-style-type: none"> 1. Not at all harmful 2. Not very harmful 3. Quite harmful 4. Very harmful 5. Don't know/Prefer not to answer (NA)
Exposure to misinformation	Now we would like to ask you some questions about misinformation, by which we mean false or misleading information. Throughout the election campaign, did you see, read, or hear any political misinformation related to the election?	<ol style="list-style-type: none"> 1. No 2. Unsure 3. Yes Rescaled on a 0-1 scale.
Ideology	In politics, people sometimes talk of left and right. Where would you place yourself on the scale below?	Measured on a 0-10 Left-Right scale. Rescaled on a 0-1 scale.
Alternative right-wing media	Over the past week, which of the following news media outlets did you watch, read, or listen to for news about politics? Please select all that apply.	Coded as 1 if respondents selected at least one of the following outlets: Rebel News, Post Millennial, True North
Frequency news (social)	How frequently did you watch, read, or listen to news about politics on social media over the past week?	<ol style="list-style-type: none"> 1. Never 2. Once 3. A few times 4. Almost every day 5. Every day

		6. Several times a day Rescaled on a 0-1 scale.
Frequency news	How frequently did you watch, read, or listen to news about politics over the past week?	1. Never 2. Once 3. A few times 4. Almost every day 5. Every day Rescaled on a 0-1 scale.
Age	What is your age?	Continuous variable recoded on a five-point scale: 1. 18-34 years old 2. 35-44 years old 3. 45-54 years old 4. 55-64 years old 5. 65+ years old Rescaled on a 0-1 scale.
Education	What is the highest level of education that you have completed?	Recoded into three categories: 1. High school or less 2. Some college, college degree, some university 3. University degree
Female	Are you...(1) A man; (2) A woman; (3) Non-binary; (4) Another gender (please specify)	Coded as 1 if respondents selected "A woman" and 0 if they selected "A man"
Region	Which province do you currently live in?	Coded into five categories: 1. Atlantic (Newfoundland and Labrador, Prince Edward Island, New Brunswick, Nova Scotia) 2. Quebec 3. Ontario 4. Prairies (Manitoba, Saskatchewan, Alberta) 5. British Columbia

Appendices of Chapter 2

2A. Sample and descriptive statistics

This appendix presents more details about the samples and descriptive statistics for the dependent, independent, and control variables used in the paper. Table 2A.1 shows the descriptive statistics for Study 1, while Table 2A.2 shows the descriptive statistics for Study 2. The statistics in Table 2A.1 are reported for the experiment sample (as opposed to the entire campaign-period survey sample).

Study 1

The technology used by the sample provider to distribute the survey does not allow them to know exactly how many panelists were invited to complete the survey, which means that the response rate cannot be calculated. Among the 10,199 panelists that started the campaign-period survey, 181 did not answer any question, 521 were screened out of the survey because they were less than 18 years old or were noncitizens, 916 were filtered out because a quota was already full, 1,229 dropped out before completing it and 51 were removed because they were duplicates (same identifying number). The experiment described in Study 1 was fielded during the first week of the campaign-period survey. The sample used in the current study is composed of 50.2% of women and has a median age of 48 years old ($SD = 16.2$). The sample is slightly more educated than the national population: 40% of respondents have completed a university degree (compared to about 30% in the general population), while 31% of respondents reported a high school education or less (compared to 35% in the general population). The regional distribution of respondents is similar to the Canadian census, with 39% of respondents from Ontario, 28% from the West, 26% from Quebec, and 7% from Atlantic provinces.

Study 2

The campaign-period survey was available to 26,952 respondents randomly selected among Léger's Québec panel in their portal. 24,406 of these respondents were also sent an email invite, of which 14 bounced back. The completion rate of the campaign period survey was 63%. 5,878 panelists started the survey, 288 were not eligible (e.g., did not agree to the consent form, non-citizen, less than 18 years old), and 1,880 dropped out before completing it. The experiment in

Study 2 was fielded during the recontact study, which was available to all respondents who had previously answered the campaign-period survey. 2,413 of them were also sent an email invite, of which 4 bounced back. The target number of respondents was 1,500. The completion rate of the post-election survey was 57%. 2,728 panelists started the survey and 1,545 completed it. The sample is 49% female, has a median age of 50 (sd = 16.0) and is slightly more educated than the Quebec population (39% have a university degree compared to approximately 30% of the general population).

Table 2A.1. Descriptive statistics of Study 1.

	n	mean	sd	min	max
Acceptability misinformation COVID-19	1794	2.15	3.04	0	10
Acceptability misinformation climate change	1759	2.25	3.02	0	10
Issue position COVID-19 (5-point scale)	1751	0.75	0.28	0	1
Issue position climate change (5-point scale)	1750	0.72	0.30	0	1
Ideology	1584	5.34	2.38	0	10
Political interest	1770	6.35	2.59	0	10
Trust information from politicians (4-point scale)	1716	0.43	0.28	0	1
Age	1794	48.56	16.18	18	94
Female	1789	0.49	0.50	0	1
Education (3 categories)	1790	0.55	0.42	0	1

Note: All independent and control variables were recoded on 0-1 scales for analysis.

Table 2A.2. Descriptive statistics of Study 2.

	n	mean	sd	min	max
Biased against the right	1164	2.94	1.06	1	5
Biased against the left	1158	2.83	1.05	1	5
Content moderation biased	1169	2.83	1.09	1	5
No impartial truth	1338	2.95	1.11	1	5
Free speech vs. truth	1348	2.54	1.31	1	5
Truth vs. election	1394	4.32	0.85	1	5
Concern about misinformation	1422	6.87	2.28	0	10
Support content moderation	1395	4.13	1.10	1	5
Support government action	1399	4.07	1.08	1	5
Ideology	1237	4.83	2.15	0	10
Freq news	1482	3.72	1.28	1	5
Freq news (social media)	1482	2.81	1.82	1	6
Age	1482	2.22	0.76	1	3
Female	1473	0.49	0.50	0	1
Education (3 categories)	1477	2.10	0.81	1	3

2B. Pre-registered hypotheses and results

Pre-registered hypotheses

Some of the hypotheses were simplified in the main document to make them more digestible. The pre-registered hypotheses were as follows:

Hierarchy of acceptability of misinformation:

H1: There is a hierarchy of acceptability of misinformation, where the perceived acceptability of politicians spreading misinformation is the lowest when used to achieve personal or electoral gains and the highest when used to achieve socially desirable goals (protecting the economy or urging people to take action):

- a. The perceived acceptability of politicians spreading misinformation is lower when employed for personal or electoral gains (as compared to the baseline condition).
- b. The perceived acceptability of politicians spreading misinformation is higher when employed to pursue socially desirable goals (i.e., protecting the economy, encouraging individual action) (as compared to the baseline condition).
- c. The perceived acceptability of politicians spreading misinformation is higher when caused by a lack of knowledge (as compared to the baseline condition).

Influence of issue positions:

H2: The perceived acceptability of politicians spreading misinformation is influenced by individuals' issue positions:

- a. Individuals who care about an issue are more likely to consider it acceptable for politicians to spread false or misleading information to encourage individual action on this issue and less likely to consider it acceptable to spread false or misleading information for other purposes.
- b. Individuals who do not care about an issue are more likely to consider it acceptable for politicians to spread false or misleading information about that issue to protect the economy.

Baseline ideological differences:

H3a. Right-wing individuals have higher baseline perceptions that public discourses on misinformation and content moderation on social media are biased against them.

H3b. Right-wing individuals are more likely to believe that there are no impartial ways of determining who is telling the truth in political debates about facts.

H3c. Right-wing individuals are less critical of and concerned about misinformation.

H3d. Right-wing individuals are less likely to support actions by social media platforms and governments against misinformation.

Main treatment effect:

H4. Individuals exposed to a cue suggesting that the fight against misinformation might principally have detrimental effects on the right/left will be more likely to believe that public discourses on misinformation are biased against the right/left.

Ideology as a moderator:

H5. Being exposed to a cue suggesting that the fight against misinformation might principally have detrimental effects on the right/left will make right/left-wing individuals...

- a. more likely to believe that public discourses on misinformation and content moderation on social media are biased against them;
- b. more skeptical about our ability to impartially determine who is telling the truth in political debates about facts;
- c. less critical of and concerned about misinformation;
- d. less likely to support actions by social media platforms and governments against misinformation.

I expect reverse effects when respondents are exposed to a cue suggesting that the fight against misinformation might principally have detrimental effects on people who do not share their ideology.

Perceived bias as a predictor:

H6. Individuals who believe that public discourses on misinformation are biased against their ideology are more skeptical about our ability to impartially determine the truth, less critical of and concerned about misinformation, and express lower support for initiatives against misinformation.

Pre-registered analyses

Next, this appendix presents the detailed results of the pre-registered analyses on which the Figures in the main paper are based. Tables 2B.1 to 2B.6 are related to Study 1. In these tables, the dependent variable is the perceived acceptability of spreading misinformation on a scale from 0 (totally unacceptable) to 10 (totally acceptable). All other variables are coded on a 0-1 scale.

Tables 2B.7 to 2B.10 are related to Study 2. Outcome variables are all measured using 5-point agreement scales except for citizens' concerns about misinformation, which is measured on a 0-10 scale. Ideology is also measured on a 0-10 scale, with the coefficients representing the effect of a 1-point change on the scale.

In all regression tables (Table 2B.2 to Table 2B.10), OLS regression coefficients are reported with robust (HC2) standard errors in parentheses.

Table 2B.1. Two-sided T-tests comparing the perceived acceptability of a politician spreading misinformation on COVID-19 and climate change for different purposes (comparisons are made with the control condition).

Issue	Treatment	Mean	t-statistic	p-value	Bonferroni corr. p-value
COVID-19	Control	2.21			
COVID-19	For personal or electoral gains	1.96	1.06	0.29	1.00
COVID-19	Because they don't know any better	2.03	0.81	0.42	1.00
COVID-19	To protect the economy	2.05	0.71	0.48	1.00
COVID-19	To urge people to comply with public health measures	2.51	-1.23	0.22	1.00
Climate change	Control	2.08			
Climate change	For personal or electoral gains	2.06	0.08	0.43	1.00
Climate change	Because they don't know any better	2.25	-0.79	0.93	1.00
Climate change	To protect the economy	2.45	-1.57	0.12	0.93
Climate change	To urge people to reduce their ecological footprint	2.47	-1.73	0.08	0.68

Note: Table 2B.2 and Figure 2B.1 were not included in the body of the paper given that they are statistically equivalent to the results obtained when interacting issue positions with the purpose of the misinformation (the trend reported in Figure 2.2 is the same as the one reported in Figure 2B.1).

Table 2B.2. Influence of issue positions on the perceived acceptability of spreading misinformation among those exposed to the treatment “to urge people to comply with public health measures/reduce their ecological footprint”. OLS regression coefficients reported with HC2 standard errors in parentheses.

	COVID-19 (1)	Climate change (2)
Support more action COVID-19	0.287 (0.639)	
Support more action climate change		-0.953 (0.632)
(Intercept)	2.271*** (0.504)	3.173*** (0.496)
Observations	332	366
R ²	0.001	0.01
Adjusted R ²	-0.002	0.005
RMSE	3.31	3.08

p<0.1; * p<0.05; ** p<0.01; *** p<0.001

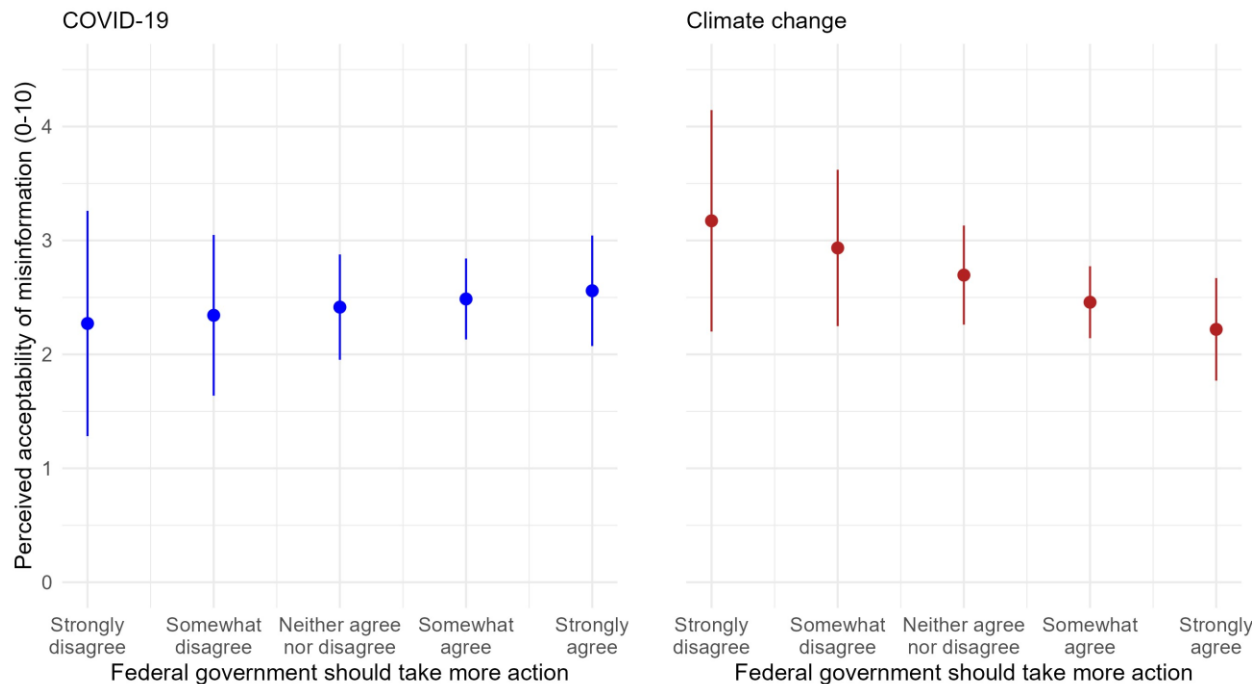


Figure 2B.1. Influence of issue positions on the perceived acceptability of spreading misinformation “to urge people to comply with public health measures/reduce their ecological footprint”. Predicted probabilities based on OLS regression with 95% confidence intervals.

Table 2B.3. OLS regression results showing how issue positions influence the perceived acceptability of spreading misinformation to encourage individual action on COVID-19 and climate change and for other purposes. HC2 standard errors in parentheses.

	COVID-19 (1)	Climate change (2)
Support more action COVID-19	-2.175*** (0.292)	
Purpose: Comply with public health measures	-1.398* (0.559)	
Support more action * Purpose	2.462*** (0.703)	0.607 (0.693)
Support more action climate change		-1.560*** (0.284)
Purpose: Reduce their ecological footprint		-0.136 (0.544)
(Intercept)	3.669*** (0.240)	3.308*** (0.225)
Observations	1,751	1,736
R ²	0.04	0.02
Adjusted R ²	0.03	0.02
RMSE	2.98	2.98

p<0.1; * p<0.05; ** p<0.01; *** p<0.001

Table 2B.4. Influence of issue positions on the perceived acceptability of spreading misinformation on COVID-19 and climate change among those exposed to the treatment “to protect the economy”. OLS regression coefficients reported with HC2 standard errors in parentheses.

	COVID-19 (1)	Climate change (2)
Oppose more action COVID-19	1.829** (0.577)	
Oppose more action climate		1.706** (0.616)
(Intercept)	1.616*** (0.181)	1.954*** (0.243)
Observations	376	314
R ²	0.03	0.03
Adjusted R ²	0.03	0.02
RMSE	2.84	3.07

+ p<0.1; * p<0.05; ** p<0.01; *** p<0.001

Table 2B.5. OLS regression results showing how ideology moderates the effect of the purpose of the misinformation on the perceived acceptability of spreading misinformation on COVID-19 and climate change, using a categorical measure of ideology. HC2 standard errors in parentheses.

	COVID-19 (1)	Climate change (2)
Right-wing (ref = Left-wing)	2.502*** (0.511)	3.067*** (0.459)
Moderate (ref = Left-wing)	0.397 (0.421)	0.442 (0.299)
Personal/electoral gains	-0.156 (0.446)	0.050 (0.361)
Don't know any better	-0.589 (0.390)	0.274 (0.381)
Protect the economy	-0.317 (0.437)	-0.382 (0.278)
Comply with public health measures	-0.072 (0.497)	
Reduce their ecological footprint		0.014 (0.375)
Right-wing * Personal/electoral gains	-0.124 (0.691)	-0.162 (0.664)
Moderate * Personal/electoral gains	-0.020 (0.537)	-0.008 (0.442)
Right-wing * Don't know any better	0.890 (0.651)	-0.456 (0.645)
Moderate * Don't know any better	0.262 (0.476)	0.023 (0.466)
Right-wing * Protect the economy	0.431 (0.674)	1.217* (0.607)
Moderate * Protect the economy	0.170 (0.522)	0.444 (0.377)
Right-wing * Comply with public health measures	0.998 (0.736)	
Moderate * Comply with public health measures	0.222 (0.583)	
Right-wing * Reduce their ecological footprint		-0.181 (0.650)
		0.754

Moderate * Reduce their ecological footprint

		(0.461)
(Intercept)	1.317***	1.055***
	(0.356)	(0.242)
Observations	1,584	1,578
R ²	0.16	0.18
Adjusted R ²	0.16	0.17
RMSE	2.83	2.79

+ p<0.1; * p<0.05; ** p<0.01; *** p<0.001

Table 2B.6. OLS regression results showing how ideology moderates the effect of the purpose of the misinformation on the perceived acceptability of spreading misinformation on COVID-19 and climate change (using a continuous measure of ideology). HC2 standard errors in parentheses.

	COVID-19 (1)	Climate change (2)
Ideology (0-10, recoded on a 0-1 scale)	4.606*** (0.815)	4.997*** (0.784)
Personal/electoral gains	0.216 (0.607)	0.254 (0.526)
Don't know any better	-0.594 (0.524)	0.648 (0.544)
Protect the economy	-0.116 (0.536)	-1.081* (0.512)
Comply with public health measures	-0.608 (0.673)	
Reduce their ecological footprint		0.551 (0.519)
Ideology * Personal/electoral gains	-0.748 (1.174)	-0.382 (1.108)
Ideology * Don't know any better	0.836 (1.066)	-0.849 (1.099)
Ideology * Protect the economy	0.158 (1.065)	2.421* (1.076)
Ideology * Comply with public health measures	1.635 (1.268)	
Ideology * Reduce their ecological footprint		-0.328 (1.079)
(Intercept)	-0.184 (0.433)	-0.474 (0.372)
Observations	1,584	1,578
R ²	0.15	0.17
Adjusted R ²	0.15	0.16
RMSE	2.85	2.81

+ p<0.1; * p<0.05; ** p<0.01; *** p<0.001

Table 2B.7. Baseline ideological differences in attitudes towards misinformation. OLS regression coefficients reported with HC2 standard errors in parentheses.

	Bias right (1)	Bias left (2)	Moderation biased (3)	No impartial truth (4)	Free speech (5)	Truth vs. election (6)	Concerned misinfo (7)	Support moderation (8)	Support gov. action (9)
Ideology	0.157*** (0.016)	-0.096*** (0.016)	0.082*** (0.017)	0.063*** (0.016)	0.118*** (0.018)	-0.027* (0.011)	-0.164*** (0.035)	-0.115*** (0.016)	-0.104*** (0.016)
Treatment left	0.175* (0.078)	-0.067 (0.079)	0.070 (0.083)	0.017 (0.079)	-0.045 (0.093)	0.076 (0.060)	-0.382* (0.149)	-0.141+ (0.078)	-0.131+ (0.078)
Treatment right	-0.041 (0.078)	0.048 (0.082)	-0.023 (0.083)	-0.084 (0.078)	-0.116 (0.094)	0.046 (0.061)	-0.268+ (0.155)	-0.037 (0.074)	-0.030 (0.072)
Frequency news	-0.063* (0.030)	-0.122*** (0.031)	-0.145*** (0.032)	-0.146*** (0.029)	-0.094** (0.036)	0.032 (0.023)	0.160* (0.064)	0.062* (0.031)	0.069* (0.030)
News social media	0.058** (0.019)	0.041* (0.020)	0.069*** (0.020)	-0.003 (0.019)	0.046* (0.022)	-0.013 (0.014)	0.039 (0.039)	-0.079*** (0.019)	-0.074*** (0.019)
Age	0.021 (0.048)	0.065 (0.049)	0.160** (0.050)	0.189*** (0.047)	0.010 (0.054)	0.028 (0.036)	0.412*** (0.089)	0.251*** (0.046)	0.228*** (0.045)
Education	-0.051 (0.041)	-0.136** (0.042)	-0.159*** (0.042)	-0.185*** (0.040)	-0.177*** (0.049)	0.045 (0.033)	0.167* (0.082)	0.053 (0.041)	-0.028 (0.041)
Female	-0.039 (0.065)	0.025 (0.067)	-0.089 (0.067)	0.150* (0.066)	-0.153* (0.077)	0.060 (0.049)	0.344** (0.126)	0.269*** (0.062)	0.255*** (0.061)
(Intercept)	2.288*** (0.196)	3.785*** (0.196)	2.782*** (0.203)	3.109*** (0.191)	2.644*** (0.224)	4.168*** (0.154)	5.737*** (0.374)	3.928*** (0.190)	3.993*** (0.182)
Observations	1042	1032	1008	1145	1151	1173	1197	1172	1176
R ²	0.13	0.06	0.08	0.08	0.07	0.01	0.07	0.12	0.10
Adjusted R ²	0.12	0.06	0.08	0.07	0.06	0.01	0.06	0.11	0.10
RMSE	1.02	1.04	1.06	1.08	1.27	0.82	2.18	1.06	1.05

+ p<0.1; * p<0.05; ** p<0.01; *** p<0.001

Table 2B.8. Effect of exposure to the experimental prompts on respondents' perceptions that public discussions about misinformation are biased against the right/left and that content moderation on social media is biased against their views. OLS regression coefficients reported with HC2 standard errors in parentheses.

	Bias right (1)	Bias left (2)	Moderation biased ¹ (3)
Treatment left	-0.017 (0.076)		
Treatment right		-0.094 (0.075)	
Treatment (left or right)			0.048 (0.068)
(Intercept)	2.882*** (0.054)	2.863*** (0.056)	2.799*** (0.056)
Observations	782	773	1169
R ²	0.0000	0.002	0.0004
Adjusted R ²	-0.001	0.001	-0.0004
RMSE	1.06	1.04	1.09

+ p<0.1; * p<0.05; ** p<0.01; *** p<0.001

¹Model 3 is a non-preregistered complementary analysis.

Table 2B.9. OLS regression results showing how ideology mitigates the effects of the treatments. HC2 standard errors in parentheses.

	Bias right	Bias left	Moderation biased	No impartial truth	Free speech	Truth vs. election	Concerned misinfo	Support moderation	Gov action
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Treatment left	0.237 (0.192)	-0.314 (0.213)	0.054 (0.219)	0.017 (0.206)	-0.417+ (0.223)	0.256+ (0.146)	-0.064 (0.389)	0.231 (0.192)	0.115 (0.185)
Treatment right	-0.117 (0.195)	0.075 (0.210)	-0.038 (0.208)	0.148 (0.207)	-0.222 (0.226)	0.226 (0.143)	-0.183 (0.420)	0.250 (0.186)	0.170 (0.183)
Ideology	0.160*** (0.026)	-0.101*** (0.028)	0.093*** (0.026)	0.087** (0.026)	0.099** (0.032)	-0.003 (0.020)	-0.132* (0.057)	-0.077** (0.028)	-0.074** (0.027)
Treatment left * Ideology	-0.014 (0.037)	0.048 (0.042)	0.002 (0.041)	-0.002 (0.038)	0.072+ (0.044)	-0.036 (0.027)	-0.056 (0.084)	-0.071+ (0.041)	-0.047 (0.040)
Treatment right * Ideology	0.015 (0.038)	-0.005 (0.039)	0.000 (0.039)	-0.046 (0.038)	0.021 (0.044)	-0.038 (0.027)	-0.018 (0.085)	-0.057 (0.040)	-0.040 (0.039)
(Intercept)	2.121*** (0.131)	3.310*** (0.147)	2.350*** (0.141)	2.494*** (0.143)	2.074*** (0.163)	4.324*** (0.107)	7.740*** (0.263)	4.544*** (0.129)	4.460*** (0.124)
Observations	1051	1041	1016	1154	1160	1182	1208	1181	1186
R ²	0.11	0.04	0.04	0.02	0.05	0.01	0.03	0.06	0.04
Adjusted R ²	0.11	0.03	0.03	0.02	0.04	0.004	0.02	0.05	0.04
RMSE	1.02	1.06	1.08	1.11	1.29	0.83	2.22	1.10	1.08

+ p<0.1; * p<0.05; ** p<0.01; *** p<0.001

Table 2B.10. OLS regression results showing how bias perceptions correlate with attitudes towards misinformation. HC2 standard errors in parentheses.

	No impartial truth	Free speech	Truth vs. election	Concerned misinfo	Support content moderation	Support gov. action
	(1)	(2)	(3)	(4)	(5)	(6)
Biased against ideology	0.210*** (0.040)	0.148** (0.045)	0.070** (0.026)	-0.045 (0.077)	-0.104** (0.040)	-0.134*** (0.038)
Ideology	0.052** (0.017)	0.110*** (0.019)	-0.034** (0.012)	-0.180*** (0.038)	-0.123*** (0.017)	-0.107*** (0.017)
Treatment left	0.036 (0.094)	-0.050 (0.113)	0.134+ (0.076)	-0.308+ (0.184)	-0.105 (0.099)	-0.121 (0.098)
Treatment right	-0.168+ (0.094)	-0.101 (0.114)	0.111 (0.076)	-0.107 (0.194)	0.039 (0.092)	-0.017 (0.091)
Frequency news	-0.155*** (0.036)	-0.088+ (0.046)	0.020 (0.029)	0.028 (0.078)	0.068 (0.041)	0.078+ (0.040)
News social media	-0.019 (0.022)	0.034 (0.026)	-0.016 (0.018)	0.077 (0.047)	-0.063** (0.023)	-0.059** (0.022)
Age	0.186*** (0.056)	0.021 (0.066)	0.020 (0.045)	0.495*** (0.106)	0.262*** (0.057)	0.214*** (0.055)
Education	-0.193*** (0.049)	-0.139* (0.063)	0.047 (0.044)	0.041 (0.104)	0.019 (0.053)	-0.082 (0.053)
Female	0.197* (0.081)	-0.087 (0.096)	0.084 (0.063)	0.527*** (0.159)	0.326*** (0.080)	0.311*** (0.078)
(Intercept)	2.575*** (0.255)	2.103*** (0.315)	3.997*** (0.216)	6.389*** (0.528)	4.150*** (0.288)	4.426*** (0.280)
Observations	774	778	782	778	772	770
R ²	0.13	0.09	0.03	0.08	0.16	0.14
Adjusted R ²	0.12	0.08	0.01	0.07	0.15	0.13
RMSE	1.07	1.29	0.84	2.18	1.09	1.08

+ p<0.1; * p<0.05; ** p<0.01; *** p<0.001

2C. Robustness checks and complementary analyses

In this appendix, I first show that the results of all pre-registered analyses are consistent when not removing speeders, those who straight lined matrix questions, or failed an attention check from the analysis. These analyses are presented in Table 2C.1 to 2C.3 and Figures 2C.1 to 2C.6.

I then reassess the influence of issue positions on the perceived acceptability of misinformation (Study 1) with the following control variables: ideology, trust in politicians and political parties as a source of political information, political interest, age, education, gender, and region, see Tables 2C.4 to 2C.6. OLS regression coefficients are reported, with HC2 standard errors in parentheses. Table 2C.7 shows that ideological differences in the perceived acceptability of spreading misinformation are consistent when measuring ideology in terms of support for government action to reduce social and economic inequalities.

Figure 2C.7 tests whether the correlations between citizens' perceptions of bias and attitudes towards misinformation stand when controlling for populist attitudes and political knowledge. Populist attitudes could influence bias perceptions and attitudes toward misinformation, given that those with populist attitudes are potentially more likely to consider public discourses around misinformation as being elite driven or actions against misinformation as being an attempt by elites to control what citizens can or can't say (Hameleers, 2020). Political knowledge could influence perceptions of misinformation given that it is associated with truth discernment, among other things (Allen et al., 2021). Populist attitudes are measured based on the perceived truthfulness of the following statements (1) I would rather be represented by a citizen than by a career politician; (2) The government is pretty much run by a few big interests looking out for themselves; (3) The system is stacked against people like me; (4) The Quebec National Assembly doesn't care much about what people like me think. These statements all load on the same index ($\alpha = 0.78$). Political knowledge is measured using the following three questions: (1) Do you happen to recall the name of the provincial Minister of Finance? (five choices provided); (2) As far as you know, how will ballots be counted in the Quebec provincial election? (by hand, by automatic ballot-counting machines, a combination of both, don't know); and (3) What is the current unemployment rate in Quebec? (5 options using 3-percentage points brackets).

Table 2C.8 examines whether the effect of bias perceptions on perceptions of misinformation is influenced by respondents' ideology, while Figure 2C.8 shows that ideological

differences in perceptions of misinformation are consistent when measuring ideology with an economic conservatism index. Figure 2C.9 shows how perceptions of bias in public discourses on misinformation mitigate the relationship between ideology and attitudes towards misinformation.

Table 2C.1. Two-sided T-tests comparing the perceived acceptability of a politician spreading misinformation on COVID-19 and climate change for different purposes (comparison made with the control condition) using the full data.

Issue	Treatment	Mean	t-statistic	p-value	Bonferroni corr. p-value
COVID-19	Control	2.22			
COVID-19	For personal or electoral gains	1.99	1.00	0.32	1.00
COVID-19	Because they don't know any better	2.07	0.66	0.51	1.00
COVID-19	To protect the economy	2.08	0.61	0.54	1.00
COVID-19	To urge people to comply with public health measures	2.58	-1.45	0.15	1.00
Climate change	Control	2.10			
Climate change	For personal or electoral gains	2.10	-0.02	0.43	1.00
Climate change	Because they don't know any better	2.27	-0.79	0.98	1.00
Climate change	To protect the economy	2.50	-1.71	0.09	0.70
Climate change	To urge people to reduce their ecological footprint	2.51	-1.85	0.06	0.51

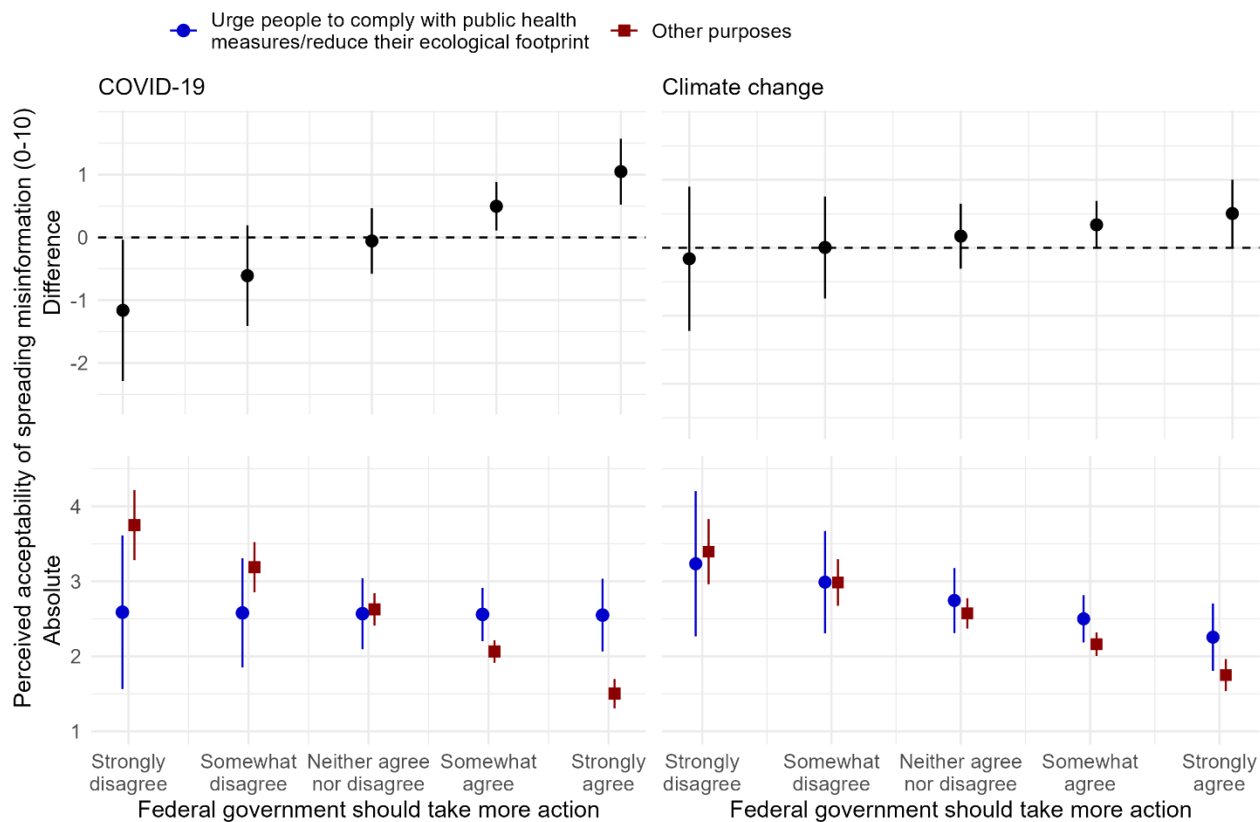


Figure 2C.1. Influence of issue positions on the perceived acceptability of spreading misinformation to urge people to comply with public health measures/reduce their ecological footprint and for other purposes. Results based on OLS interaction models using the full data. Marginal effects (top panels) and predicted probabilities (bottom panels) plotted with 95% confidence intervals.

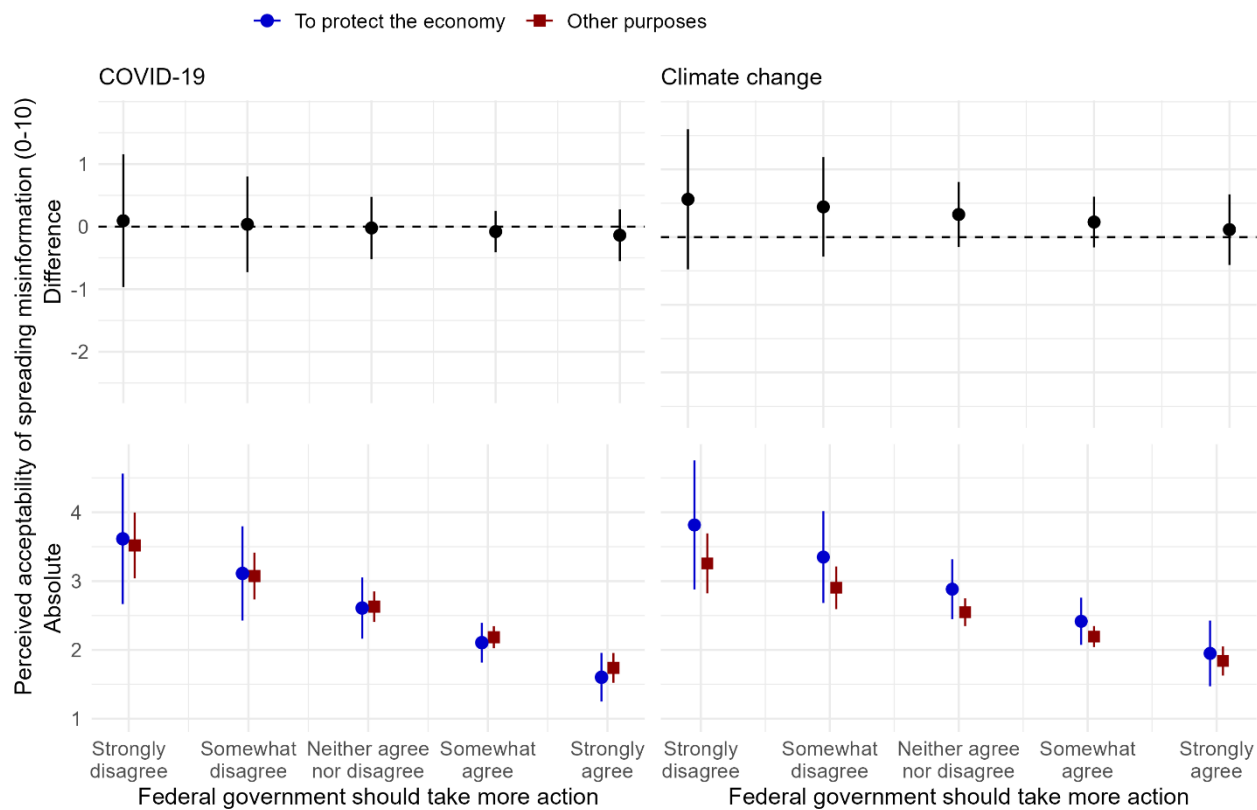


Figure 2C.2. Influence of issue positions on the perceived acceptability of spreading misinformation to protect the economy and for other purposes. Results based on OLS interaction models using the full data. Marginal effects (top panels) and predicted probabilities (bottom panels) plotted with 95% confidence intervals.

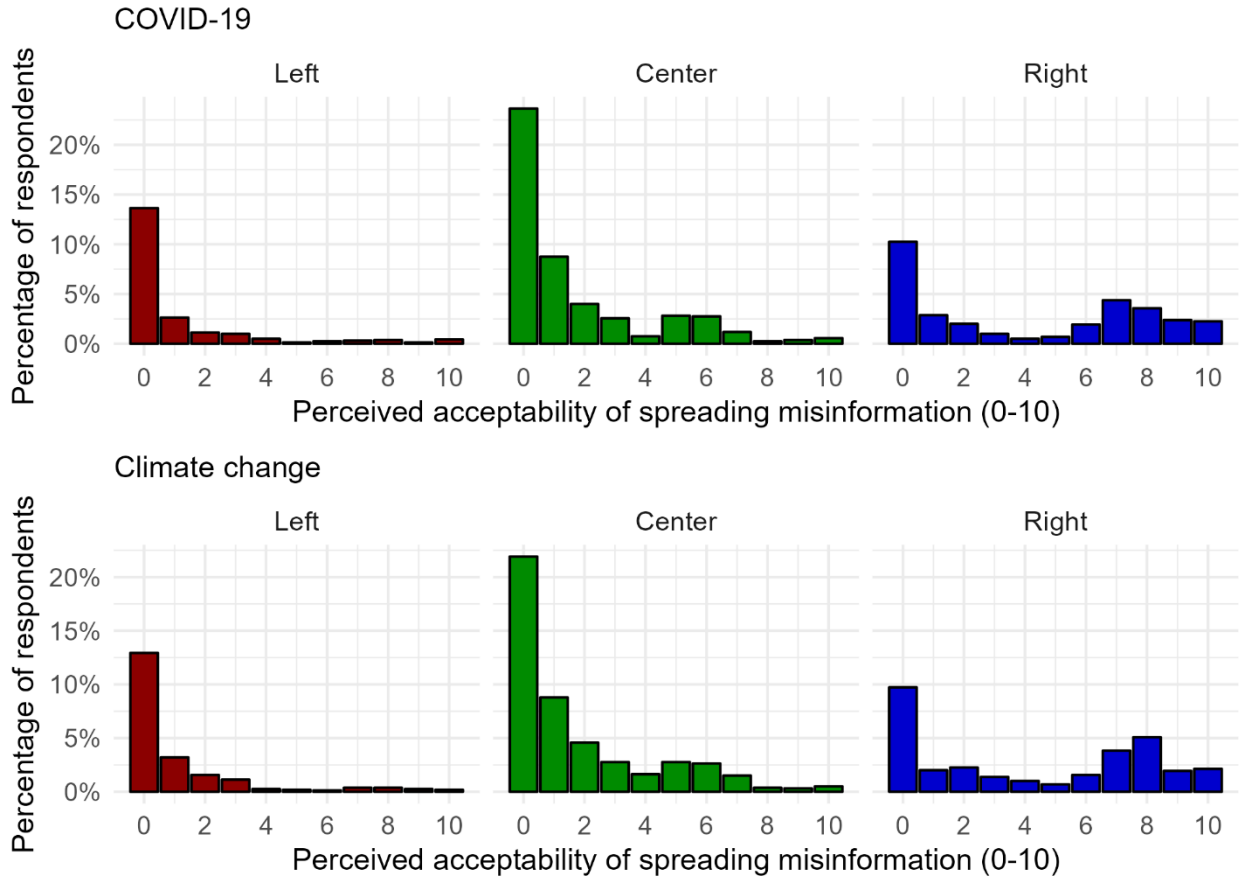


Figure 2C.3. Distribution of the perceived acceptability of spreading misinformation on COVID-19 and climate change by ideology (full data).

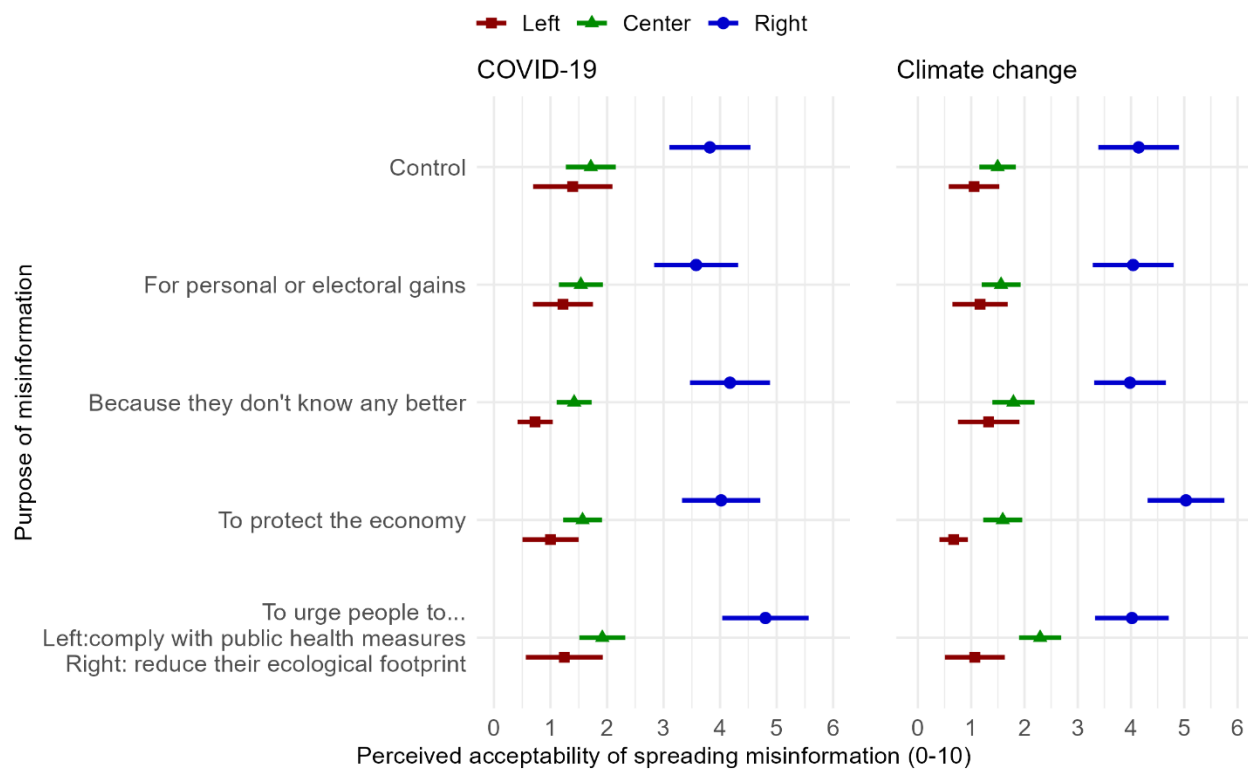


Figure 2C.4. Perceived acceptability of spreading misinformation based on the purpose of the misinformation and respondents' ideology. Predicted probabilities based on OLS interaction models with 95% confidence intervals (full data).

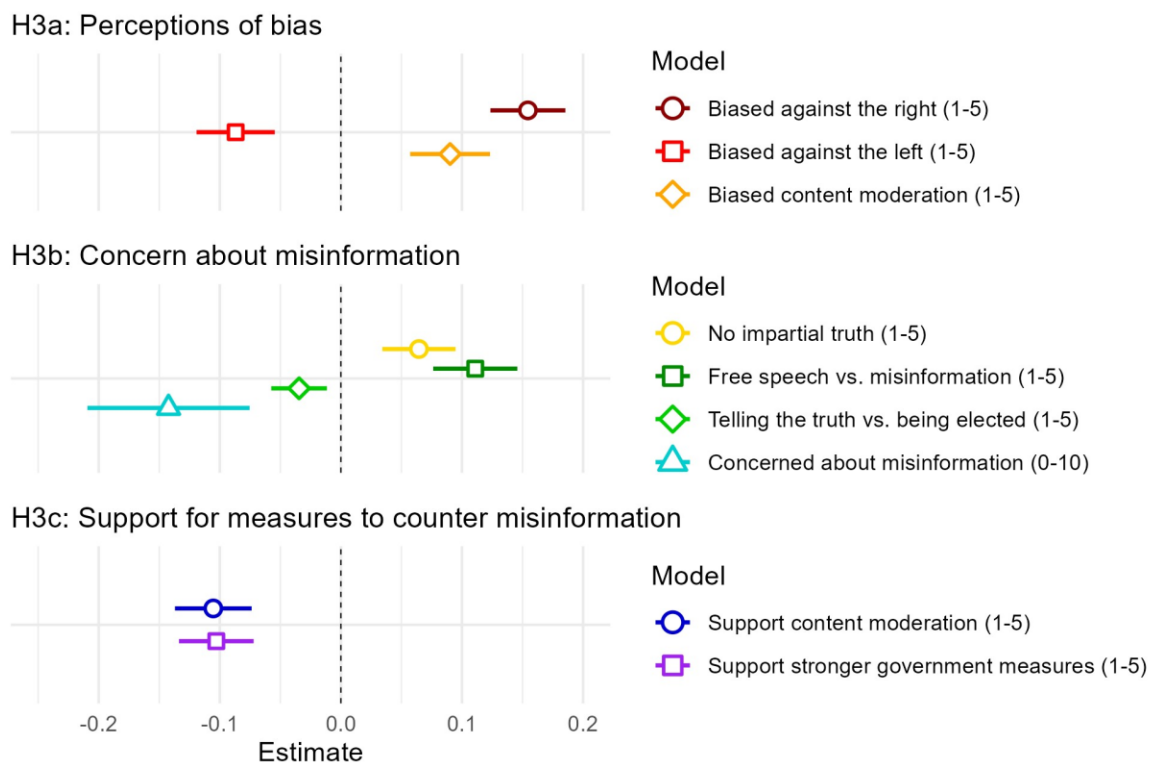


Figure 2C.5. Baseline ideological differences in attitudes towards misinformation. OLS regression coefficients are estimated using the full data and correspond to a 1-point change on the 0-10 left-right ideology scale. 95% confidence intervals included.

Table 2C.2. Effect of exposure to the prompts on respondents' perceptions that public discussions about misinformation are biased against the right/left and that content moderation on social media is biased against their views (full data). OLS regression coefficients reported with HC2 standard errors in parentheses.

	Bias right (1)	Bias left (2)	Moderation biased (3)
Treatment left	-0.053 (0.075)		
Treatment right		-0.101 (0.074)	
Treatment (left or right)			0.027 (0.067)
(Intercept)	2.909*** (0.053)	2.869*** (0.055)	2.828*** (0.055)
Observations	816	806	1222
R ²	0.001	0.002	0.0001
Adjusted R ²	-0.001	0.001	-0.001
RMSE	1.07	1.05	1.09

+ p<0.1; * p<0.05; ** p<0.01; *** p<0.001

Table 2C.3. OLS regression results showing how ideology mitigates the effects of the treatments (full data). HC2 standard errors in parentheses.

	Bias right	Bias left	Moderation biased	No impartial truth	Free speech	Truth vs. election	Concerned misinfo	Support moderation	Gov action
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Treatment left	0.263 (0.191)	-0.327 (0.210)	0.006 (0.216)	0.036 (0.203)	-0.433* (0.220)	0.322* (0.154)	-0.141 (0.378)	0.253 (0.191)	0.134 (0.183)
Treatment right	-0.121 (0.191)	0.044 (0.208)	-0.105 (0.206)	0.088 (0.204)	-0.244 (0.222)	0.198 (0.147)	-0.237 (0.408)	0.289 (0.184)	0.154 (0.180)
Ideology	0.164*** (0.025)	-0.092*** (0.028)	0.098*** (0.026)	0.088*** (0.026)	0.091** (0.031)	-0.009 (0.021)	-0.123* (0.053)	-0.065* (0.028)	-0.074** (0.026)
Treatment left * Ideology	-0.027 (0.037)	0.047 (0.041)	0.007 (0.040)	-0.010 (0.037)	0.076+ (0.042)	-0.052+ (0.029)	-0.038 (0.079)	-0.075+ (0.040)	-0.053 (0.039)
Treatment right * Ideology	0.009 (0.037)	-0.002 (0.039)	0.009 (0.038)	-0.039 (0.038)	0.028 (0.043)	-0.031 (0.028)	-0.005 (0.081)	-0.066+ (0.039)	-0.039 (0.038)
(Intercept)	2.115*** (0.128)	3.282*** (0.144)	2.348*** (0.140)	2.505*** (0.141)	2.121*** (0.159)	4.326*** (0.111)	7.696*** (0.252)	4.468*** (0.131)	4.448*** (0.122)
Observations	1096	1087	1063	1200	1207	1226	1255	1228	1232
R ²	0.11	0.03	0.04	0.02	0.04	0.01	0.02	0.05	0.05
Adjusted R ²	0.11	0.03	0.04	0.02	0.04	0.01	0.02	0.05	0.04
RMSE	1.02	1.07	1.09	1.11	1.29	0.87	2.21	1.11	1.09

+ p<0.1; * p<0.05; ** p<0.01; *** p<0.001

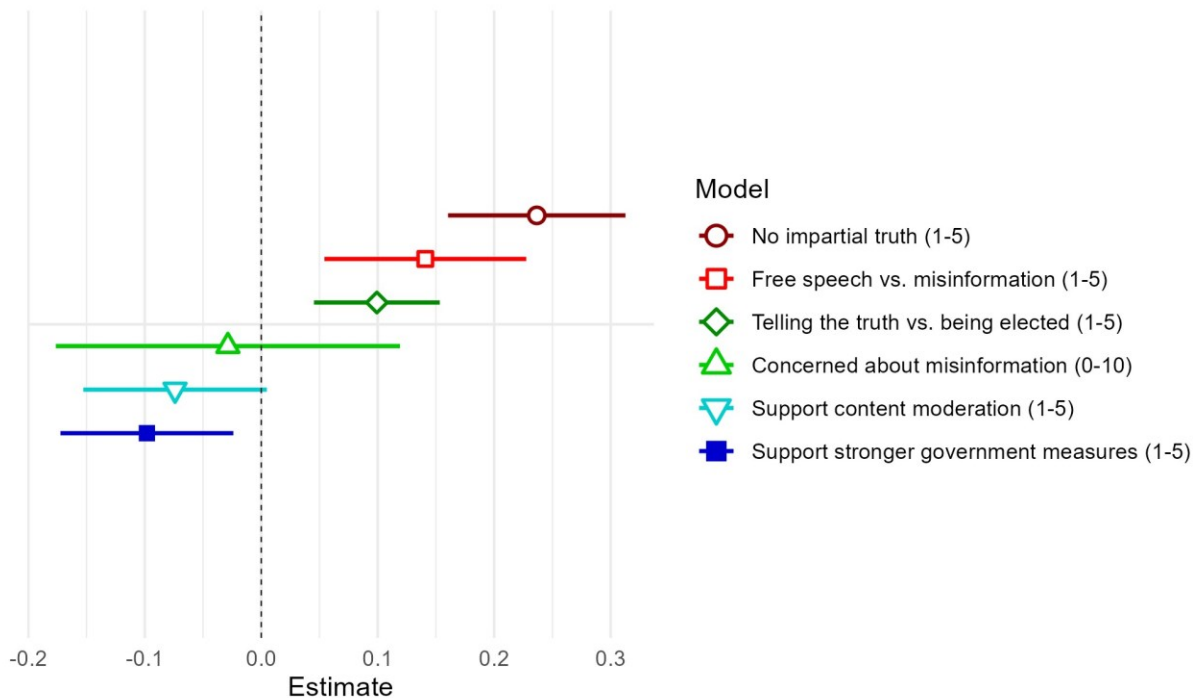


Figure 2C.6. Correlation between perceived bias against one's ideology and attitudes towards misinformation. OLS regression coefficients are estimated using the full data and correspond to a 1-point change in bias perceptions on the 5-point scale, with 95% confidence intervals.

Table 2C.4. Influence of issue positions on the perceived acceptability of spreading misinformation among those exposed to the treatment “to urge people to comply with public health measures/reduce their ecological footprint”, with controls. OLS regression coefficients reported with HC2 standard errors in parentheses.

	COVID-19 (1)	Climate change (2)
Support more action COVID-19	0.734 (0.601)	
Support more action climate change		0.133 (0.623)
Ideology	4.897*** (0.817)	3.723*** (0.701)
Trust politicians	1.750* (0.691)	2.906*** (0.655)
Political interest	1.863** (0.636)	0.575 (0.633)
Age	-2.947*** (0.449)	-2.242*** (0.394)
Education	-0.162 (0.417)	0.367 (0.366)
Female	-0.764* (0.343)	-0.334 (0.318)
Ontario	-0.822 (0.646)	0.745 (0.538)
Quebec	-0.356 (0.704)	0.241 (0.556)
West	-0.605 (0.681)	1.228* (0.541)
(Intercept)	0.038 (1.102)	-0.674 (0.971)
Observations	283	316
R ²	0.35	0.30
Adjusted R ²	0.32	0.27
RMSE	2.73	2.67

+ p<0.1; * p<0.05; ** p<0.01; *** p<0.001

Table 2C.5. OLS regression results showing how issue positions influence the perceived acceptability of spreading misinformation to encourage individual action and for other purposes, with controls. HC2 standard errors in parentheses.

	COVID-19 (1)	Climate change (2)
Support more action COVID-19	-1.443*** (0.280)	
Purpose: Comply with public health measures	-1.108* (0.545)	
Support more action * Purpose	1.962** (0.669)	0.744 (0.689)
Support more action climate change		-0.766** (0.281)
Purpose: Reduce their ecological footprint		-0.245 (0.546)
Ideology	3.863*** (0.324)	4.122*** (0.338)
Trust politicians	2.396*** (0.274)	2.089*** (0.282)
Political interest	1.352*** (0.275)	1.418*** (0.287)
Age	-2.095*** (0.177)	-2.122*** (0.176)
Education	-0.048 (0.168)	0.002 (0.166)
Female	-0.503*** (0.139)	-0.475*** (0.141)
Ontario	0.198 (0.259)	0.237 (0.254)
Quebec	0.191 (0.274)	0.233 (0.268)
West	0.233 (0.269)	0.167 (0.262)
(Intercept)	0.476 (0.421)	-0.015 (0.425)
Observations	1,495	1,485
R ²	0.31	0.30
Adjusted R ²	0.30	0.29

RMSE

2.59

2.59

+ p<0.1; * p<0.05; ** p<0.01; *** p<0.001

Table 2C.6. Influence of issue positions on the perceived acceptability of spreading misinformation on COVID-19 and climate change among those exposed to the treatment “to protect the economy”, with controls. OLS regression coefficients reported with HC2 standard errors in parentheses.

	COVID-19 (1)	Climate change (2)
Oppose more action COVID-19	0.883 (0.578)	
Oppose more action climate		1.067+ (0.579)
Ideology	3.834*** (0.630)	6.136*** (0.750)
Trust politicians	2.633*** (0.637)	0.907 (0.685)
Political interest	1.126+ (0.579)	1.808** (0.631)
Age	-2.222*** (0.362)	-1.762*** (0.359)
Education	-0.413 (0.328)	0.022 (0.364)
Female	-0.624* (0.295)	-0.308 (0.301)
Ontario	0.758 (0.519)	1.011+ (0.535)
Quebec	0.589 (0.556)	0.727 (0.591)
West	1.210* (0.548)	0.776 (0.569)
(Intercept)	-0.941 (0.700)	-2.473** (0.839)
Observations	317	265
R ²	0.36	0.43
Adjusted R ²	0.34	0.40
RMSE	2.42	2.36

+ p<0.1; * p<0.05; ** p<0.01; *** p<0.001

Table 2C.7. OLS regression results showing whether ideological differences in the perceived acceptability of spreading misinformation are consistent when measuring ideology in terms of support for government action to reduce social and economic inequalities (5-point scale, reversed and rescaled from 0-1). HC2 standard errors in parentheses.

	COVID-19 (1)	COVID-19 (2)	Climate change (3)	Climate change (4)
Ideology	4.971*** (0.352)		5.142*** (0.344)	
Support actions to reduce inequalities (reversed)		1.391*** (0.287)		1.538*** (0.295)
(Intercept)	-0.394* (0.173)	1.749*** (0.107)	-0.377* (0.167)	1.825*** (0.109)
Observations	1,584	1,746	1,578	1,734
R ²	0.15	0.01	0.16	0.02
Adjusted R ²	0.15	0.01	0.16	0.02
RMSE	2.86	3.01	2.82	2.99

+ p<0.1; * p<0.05; ** p<0.01; *** p<0.001

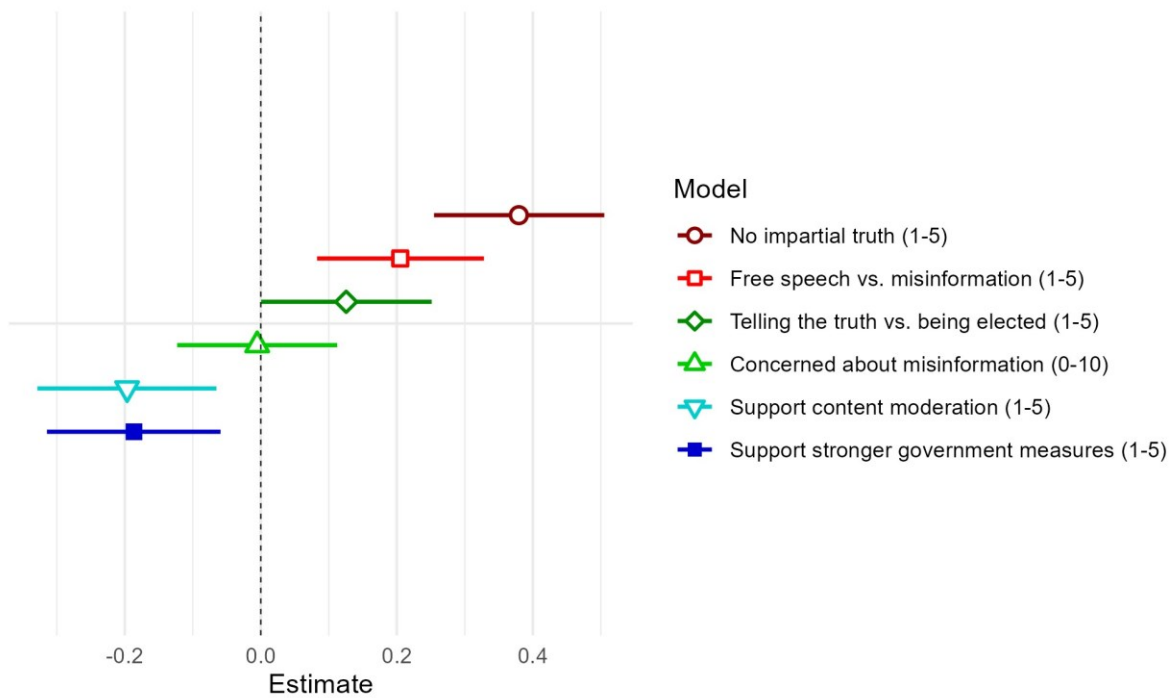


Figure 2C.7. Correlation between perceived bias against one's ideology and attitudes towards misinformation, adding controls for populist attitudes and political knowledge. OLS regression coefficients reported with 95% confidence intervals.

Table 2C.8. OLS regression results showing how ideology mitigates the relationship between bias perceptions and attitudes towards misinformation. HC2 standard errors in parentheses.

	No impartial truth	Free speech vs. truth	Truth vs. election	Concerned	Support content moderation	Support gov. action
	(1)	(2)	(3)	(4)	(5)	(6)
Biased against ideology	0.185* (0.085)	-0.066 (0.092)	0.011 (0.053)	0.629*** (0.155)	0.266*** (0.073)	0.239** (0.074)
Ideology	0.049 (0.054)	-0.011 (0.059)	-0.057 (0.038)	0.253* (0.109)	0.113* (0.053)	0.133** (0.049)
Biased * Ideology	-0.002 (0.016)	0.034* (0.017)	0.007 (0.010)	-0.129*** (0.032)	-0.069*** (0.015)	-0.070*** (0.015)
Treatment left	0.047 (0.096)	0.006 (0.114)	0.117 (0.078)	-0.287 (0.187)	-0.114 (0.098)	-0.110 (0.098)
Treatment right	-0.135 (0.096)	-0.030 (0.116)	0.074 (0.078)	-0.112 (0.197)	0.002 (0.092)	-0.055 (0.090)
Frequency news	-0.099* (0.040)	-0.037 (0.051)	0.033 (0.033)	0.065 (0.086)	0.072 (0.044)	0.093* (0.041)
News social media	-0.021 (0.022)	0.026 (0.026)	-0.017 (0.018)	0.077 (0.047)	-0.056* (0.022)	-0.056* (0.022)
Age	0.228*** (0.059)	0.050 (0.069)	0.030 (0.047)	0.474*** (0.112)	0.257*** (0.059)	0.227*** (0.058)
Education	-0.165** (0.050)	-0.133* (0.064)	0.050 (0.046)	0.049 (0.107)	0.039 (0.052)	-0.063 (0.054)
Female	0.133 (0.086)	-0.078 (0.101)	0.123+ (0.070)	0.512** (0.170)	0.286*** (0.080)	0.254** (0.080)
(Intercept)	2.029*** (0.419)	1.767*** (0.472)	3.558*** (0.314)	4.689*** (0.769)	3.643*** (0.362)	3.880*** (0.388)
Observations	737	741	743	739	734	731
R ²	0.15	0.13	0.05	0.12	0.22	0.21
Adjusted R ²	0.13	0.11	0.03	0.10	0.21	0.20
RMSE	1.06	1.26	0.84	2.15	1.05	1.04

+ p<0.1; * p<0.05; ** p<0.01; *** p<0.001

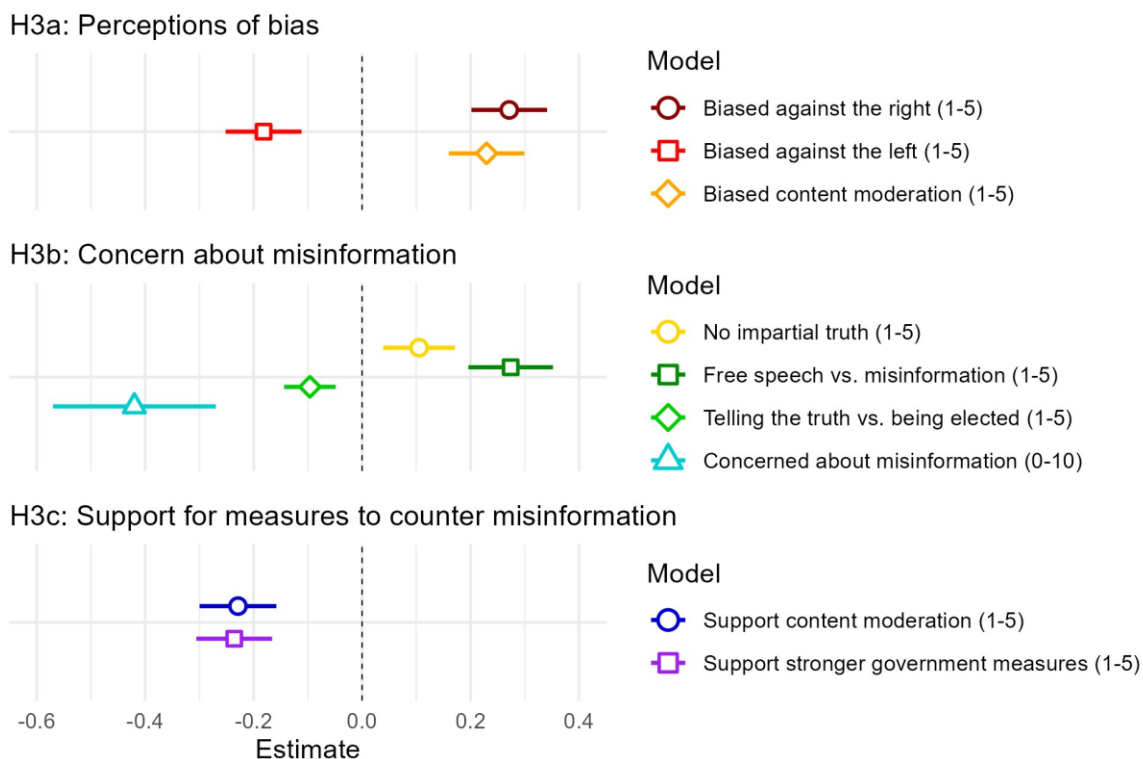


Figure 2C.8. Effects of economic conservatism on attitudes towards misinformation. Economic conservatism is measured as the average level of agreement (5-point scale) with the following two statements: “The provincial government should take more action to address social and economic inequalities in Quebec” (reversed) and “People who are willing to pay should be allowed to get medical treatment sooner”. OLS regression coefficients reported with 95% confidence intervals.

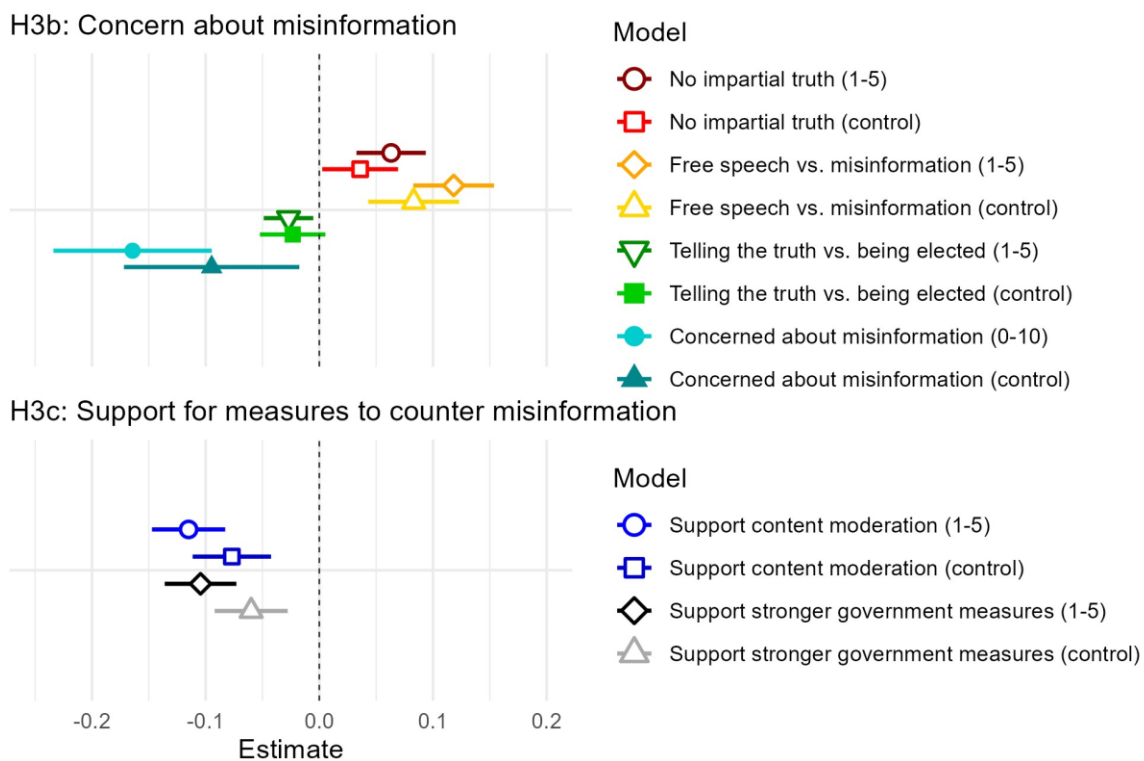


Figure 2C.9. Effects of ideology on attitudes towards misinformation with and without controls for perceptions of bias. OLS regression coefficients reported with 95% confidence intervals.

Appendices of Chapter 3

3A. Samples and descriptive statistics

Survey data

The technology used by the sample provider to distribute the survey does not allow them to know exactly how many panelists were invited to complete it, which means that the response rate cannot be calculated. Table 3A.1 below provides statistics about the representativeness of each survey wave, while Table 3A.2 shows the descriptive statistics in the entire sample.

Table 3A.1. Description of the weekly samples.

Wave	n	Start	End	Franco	Age	Female	Atlantic	Quebec	Ontario	Prairies	BC
1	2489	04-02	04-06	0.20	47.68	0.51	0.07	0.23	0.38	0.18	0.14
2	2493	04-09	04-11	0.21	48.20	0.51	0.07	0.24	0.38	0.19	0.12
3	2489	04-16	04-19	0.21	48.16	0.51	0.07	0.23	0.38	0.18	0.14
4	2515	04-24	04-29	0.21	47.87	0.52	0.07	0.23	0.38	0.18	0.14
5	2512	05-01	05-05	0.21	47.63	0.52	0.07	0.24	0.38	0.18	0.14
6	2514	05-08	05-12	0.20	48.82	0.52	0.07	0.23	0.39	0.18	0.14
7	2527	05-21	05-27	0.21	48.71	0.48	0.07	0.23	0.38	0.17	0.14
8	2552	06-15	06-18	0.20	48.92	0.51	0.07	0.23	0.39	0.19	0.13
9	2548	06-22	06-29	0.21	48.02	0.51	0.07	0.23	0.38	0.17	0.14
10	2495	06-29	07-06	0.20	47.93	0.51	0.07	0.23	0.38	0.19	0.12
11	2539	07-07	07-13	0.21	49.50	0.52	0.07	0.23	0.38	0.18	0.13
12	2526	07-14	07-21	0.20	48.82	0.53	0.07	0.23	0.38	0.20	0.11
13	2536	07-22	07-29	0.21	47.85	0.50	0.07	0.24	0.38	0.17	0.14
14	2535	07-30	08-09	0.20	50.95	0.51	0.07	0.23	0.38	0.19	0.13
15	2500	08-10	08-12	0.20	48.20	0.51	0.07	0.23	0.38	0.18	0.13

Table 3A.2. Descriptive statistics.

	n	mean	sd	min	max
Language survey (French)	37770	0.205	0.404	0	1
Insulated francophone	37674	0.139	0.346	0	1
Exposed francophone	37674	0.051	0.219	0	1
Exposed anglophone	37674	0.702	0.457	0	1
Francophone news avoiders	37674	0.016	0.125	0	1
Anglophone news avoiders	37674	0.092	0.289	0	1
Misperceptions	37770	0.273	0.197	0	1
Frequency news	37770	0.717	0.314	0	1
Frequency news (social)	37770	0.477	0.374	0	1
U.S. media	17731	0.583	0.493	0	1
Ideology	32425	0.525	0.218	0	1
Trust federal government	37770	0.587	0.295	0	1
Trust provincial government	37770	0.647	0.276	0	1
Political interest	37278	0.639	0.249	0	1
Age	37768	48.487	16.553	18	99
Education	37659	0.583	0.382	0	1
Female	37770	0.512	0.500	0	1
Atlantic	37770	0.069	0.254	0	1
Quebec	37770	0.233	0.423	0	1
Ontario	37770	0.382	0.486	0	1
Prairies	37770	0.183	0.387	0	1
British Columbia	37770	0.132	0.339	0	1

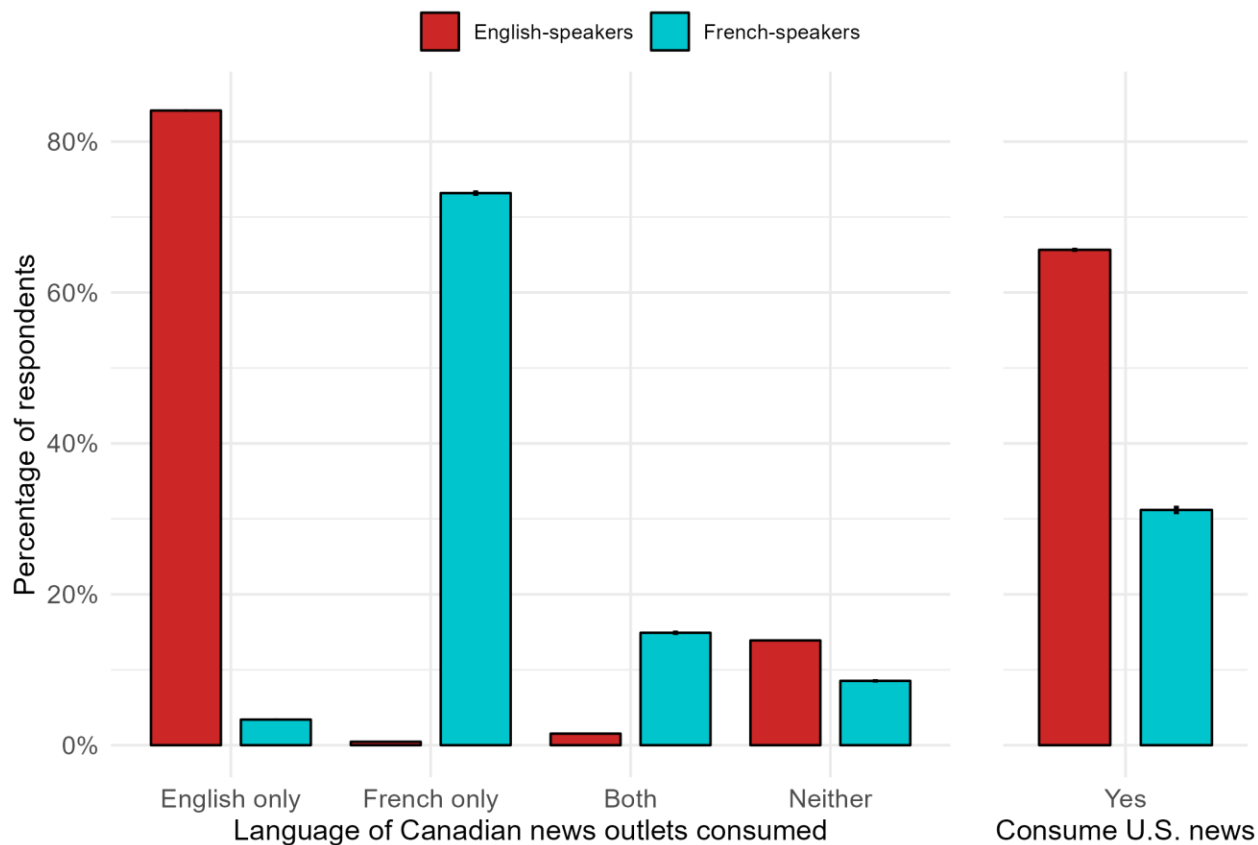


Figure 3A.1. Weighted percentage of respondents consuming French- and English-language Canadian media outlets and U.S. media outlets based on the language in which they answered the survey, with 95% confidence intervals.

Social media data

Our Twitter dataset contains all tweets, retweets, and follows of 104,771 highly active Canadian Twitter users for 2020. The average number of tweets produced by a user in the sample is 919, with a standard deviation of 2397 (many users produce an enormous volume of tweets and retweets). The average number of follows for the user sample is 396, with a standard deviation of 496. Users are distributed across Canada, with 25,464 users geolocated into Ontario, 23,593 users into Quebec, 18,360 users into the Prairies provinces, 17,367 users into British Columbia and 15,950 users into the Maritime provinces.

3B. Survey questions and variable coding

Table 3B.1. Survey questions and variable coding.

Variable	Question(s)	Coding
Misperceptions	<p>Please rate the truthfulness of the following claims:</p> <ol style="list-style-type: none"> 1. The coronavirus was caused by the consumption of bats in China. 2. The Chinese government developed the coronavirus as a bioweapon. [Bioweapon] 3. The coronavirus is no worse than the seasonal flu. 4. High temperatures, such as from saunas and hair dryers can kill the coronavirus. 5. Homeopathy and home remedies can help manage and prevent the coronavirus. 6. There is a vaccine for the coronavirus that national governments and pharmaceutical companies won't release. 7. The coronavirus will go away by the summer. 8. Vitamin C can ward off the coronavirus. 9. Drinking water every 15 minutes will help prevent the coronavirus. 	<ol style="list-style-type: none"> 1. Definitely false 2. Probably false 3. Unsure 4. Probably true 5. Definitely true <p>Averaged on a 0-1 scale.</p>
French-language media	<p>Over the past week, which of the following news media outlets did you watch, read, or listen to for news about politics? Please select all that apply.</p>	<p>Coded as 1 if respondents selected at least one of the following outlets: TVA, TV5, La Presse, Journal de Montreal, Journal de Quebec, Le Devoir, Radio-Canada</p>
English-language media	Idem.	<p>Coded as 1 if respondents selected at least one of the following outlets: CBC, CTV, Global, CityNews, Globe and Mail, National Post, Toronto Star, Rebel Media, National Observer, Toronto Sun, The Tyee, Post Millennial, APTN, True North News, Press Progress</p>
U.S. media (waves 9-15)	Idem.	<p>Coded as 1 if respondents selected at least one of the following outlets: New York Times, Washington</p>

		Post, Wall Street Journal, ABC, NBC, CBS, Fox News, CNN, MSNBC, Breitbart News, Daily Kos, NPR, Politico, The Atlantic, Bloomberg
Language groups		Coded as 'Insulated Francophone' if respondents answered the survey in French and only consumed French-language media. Coded as 'Exposed' if respondents consumed Canadian or U.S. English-language media.
Frequency news (social)	How frequently did you watch, read, or listen to news about politics on social media over the past week?	<ol style="list-style-type: none"> 1. Never 2. Once 3. A few times 4. Almost every day 5. Every day 6. Several times a day Rescaled on a 0-1 scale.
Frequency news	How frequently did you watch, read, or listen to news about politics over the past week?	<ol style="list-style-type: none"> 1. Never 2. Once 3. A few times 4. Almost every day 5. Every day Rescaled on a 0-1 scale.
Ideology	In politics, people sometimes talk of left and right. Where would you place yourself on the scale below?	Measured on a 0-1 Left-Right scale. Rescaled on a 0-1 scale.
Trust federal government	Below is a list of groups and institutions in society. Please tell us the degree to which you trust or distrust members of these groups or institutions.	<ol style="list-style-type: none"> 1. Distrust a lot 2. Distrust somewhat 3. Neither trust, nor distrust 4. Trust somewhat 5. Trust a lot Rescaled on a 0-1 scale.
Trust provincial government	Idem.	Idem.
Political interest	How interested are you in politics generally? Use a scale from 0 to 10, where zero means no interest at all, and ten means a great deal of interest.	Rescaled on a 0-1 scale.

Age	What is your age?	<p>Continuous variable recoded on a five-point scale:</p> <ol style="list-style-type: none"> 1. 18-34 years old 2. 35-44 years old 3. 45-54 years old 4. 55-64 years old 5. 65+ years old <p>Rescaled on a 0-1 scale.</p>
Education	What is the highest level of education that you have completed?	<p>Recoded into three categories:</p> <ol style="list-style-type: none"> 1. High school or less 2. Some college, college degree, some university 3. University degree
Female	Are you...(1) A man; (2) a woman; (3) Other (e.g., trans, non-binary, two-spirit, gender-queer)	Coded as 1 if respondents selected 'A woman'
Region	Which province do you currently live in?	<p>Coded into five categories:</p> <ol style="list-style-type: none"> 1. Atlantic (Newfoundland and Labrador, Prince Edward Island, New Brunswick, Nova Scotia) 2. Quebec 3. Ontario 4. Prairies (Manitoba, Saskatchewan, Alberta) 5. British Columbia

3C. Main models

Table 3C.1. OLS models examining the relationship between language and the average perceived truthfulness of COVID-19 false statements. Regression coefficients shown with clustered standard errors in parentheses.

	Model 1	Model 2	Model 3	Model 4
Insulated Francophone	-0.023*** (0.007)	-0.004 (0.007)		
Exposed Francophone	0.011 (0.008)	-0.006 (0.009)		-0.019 (0.026)
Francophone news avoiders	0.015 (0.012)	-0.002 (0.013)		
Anglophone news avoiders	-0.004 (0.004)	0.007 (0.005)		
Freq news social media	0.081*** (0.003)	0.087*** (0.003)	0.043*** (0.009)	0.042*** (0.009)
Insulated Francophone × Freq news social media		-0.046*** (0.008)		
Exposed Francophone × Freq news social media		0.030* (0.012)		0.013 (0.070)
Francophone news avoiders × Freq news social media		0.082* (0.035)		
Anglophone news avoiders × Freq news social media		-0.038** (0.013)		
U.S. media			0.001 (0.005)	0.002 (0.005)
Freq news social media × U.S. media			0.045*** (0.010)	0.041*** (0.010)
Exposed Francophone × Freq news social media × U.S. media				0.026 (0.072)
Freq news	-0.064*** (0.005)	-0.064*** (0.005)	-0.062*** (0.008)	-0.062*** (0.008)
Ideology	0.279*** (0.005)	0.278*** (0.005)	0.278*** (0.009)	0.278*** (0.009)
Trust federal government	-0.019*** (0.004)	-0.019*** (0.004)	-0.019** (0.006)	-0.019** (0.006)
Trust provincial government	-0.037*** (0.004)	-0.037*** (0.004)	-0.041*** (0.007)	-0.040*** (0.007)
Political interest	-0.007 (0.005)	-0.007 (0.005)	-0.026** (0.010)	-0.025** (0.010)
Age	-0.141***	-0.140***	-0.143***	-0.143***

	Model 1	Model 2	Model 3	Model 4
	(0.003)	(0.003)	(0.005)	(0.005)
Female	-0.012***	-0.012***	-0.004	-0.004
	(0.002)	(0.002)	(0.003)	(0.003)
Fixed effects	Yes	Yes	Yes	Yes
Observations	256,904	256,904	97,704	97,704
R2	0.171	0.172	0.176	0.176
R2 Adj.	0.171	0.172	0.175	0.176
RMSE	0.29	0.29	0.28	0.28

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

3D. Robustness checks

Table 3D.1. Covariate balance. The first columns show the raw mean for each linguistic group and the last column shows the mean after entropy balancing adjustment (balanced was achieved; the mean is the same for each linguistic group).

Variable	Exposed Anglophone	Insulated Francophone	Exposed Francophone	Francophone news avoiders	Anglophone news avoiders	Mean after e-bal (same for all groups)
Female	0.465	0.504	0.412	0.592	0.579	0.476
Age 18-34	0.268	0.124	0.228	0.234	0.321	0.251
Age 35-44	0.160	0.138	0.157	0.228	0.199	0.161
Age 45-54	0.173	0.188	0.163	0.204	0.205	0.177
Age 55-64	0.186	0.268	0.206	0.228	0.169	0.197
Age 65+	0.213	0.283	0.246	0.107	0.106	0.215
Highschool diploma	0.186	0.272	0.227	0.284	0.251	0.205
College/CEGEP diploma	0.368	0.435	0.378	0.462	0.388	0.379
University diploma	0.447	0.293	0.395	0.254	0.361	0.416
Political interest	0.700	0.658	0.740	0.421	0.451	0.676
Ideology	0.531	0.499	0.548	0.493	0.498	0.525

Table 3D.2. OLS models examining the relationship between language (ref = exposed Anglophone) and the average perceived truthfulness of COVID-19 false statements. Linguistic groups are balanced on age, gender, education, political interest, ideology, and media consumption using entropy balancing. Clustered standard errors in parentheses.

	Model 1	Model 2	Model 3	Model 4
Insulated francophone	-0.031*** (0.008)	-0.030*** (0.005)	-0.013+ (0.008)	
Exposed francophone	0.011 (0.008)		-0.003 (0.009)	
Exposed anglophone		-0.009 (0.007)		
Francophone news avoiders	0.057** (0.021)	0.013 (0.011)	0.024 (0.019)	
Anglophone news avoiders	0.009 (0.006)	-0.014+ (0.008)	0.012 (0.008)	
Freq news social media	0.079*** (0.003)	0.080*** (0.003)	0.084*** (0.003)	0.039*** (0.009)
Insulated francophone × Freq news social media			-0.041*** (0.010)	
Exposed francophone × Freq news social media			0.026* (0.012)	
Francophone news avoiders × Freq news social media			0.095 (0.063)	
Anglophone news avoiders × Freq news social media			-0.008 (0.019)	
U.S. media				-0.001 (0.005)
Freq news social media × U.S. media				0.048*** (0.010)
Observations	256,904	256,904	256,904	97,704
R2	0.167	0.172	0.168	0.169
R2 Adj.	0.167	0.172	0.168	0.169
RMSE	0.29	0.29	0.29	0.28

+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Table 3D.3. OLS models examining the relationship between language and the average perceived truthfulness of COVID-19 false statements using a factored measure of social media usage. Clustered standard errors in parentheses.

	Model 1	Model 2
Insulated Francophone	-0.005 (0.007)	
Exposed Francophone	-0.002 (0.009)	
Francophone news avoiders	0.009 (0.014)	
Anglophone news avoiders	0.014* (0.006)	
Social media (Once)	0.035*** (0.006)	0.025+ (0.014)
Social media (A few times)	0.035*** (0.003)	0.017+ (0.009)
Social media (Almost every day)	0.062*** (0.004)	0.033*** (0.010)
Social media (Every day)	0.081*** (0.003)	0.035*** (0.010)
Social media (Several times a day)	0.081*** (0.004)	0.041** (0.013)
Insulated Francophone × Social media (Once)	0.001 (0.016)	
Insulated Francophone × Social media (A few times)	-0.004 (0.009)	
Insulated Francophone × Social media (Almost every day)	-0.020* (0.010)	
Insulated Francophone × Social media (Every day)	-0.044*** (0.009)	
Insulated Francophone × Social media (Several times a day)	-0.047*** (0.010)	
Exposed Francophone × Social media (Once)	0.048* (0.020)	
Exposed Francophone × Social media (A few times)	-0.002 (0.014)	
Exposed Francophone × Social media (Almost every day)	0.010 (0.014)	
Exposed Francophone × Social media (Every day)	0.007 (0.013)	
Exposed Francophone × Social media (Several times a day)	0.042** (0.014)	
Francophone news avoiders × Social media (Once)	-0.039 (0.032)	
Francophone news avoiders × Social media (A few times)	0.016	

	Model 1	Model 2
	(0.033)	
Francophone news avoiders × Social media (Almost every day)	0.060+	
	(0.036)	
Francophone news avoiders × Social media (Every day)	0.053	
	(0.042)	
Francophone news avoiders × Social media (Several times a day)	0.075	
	(0.056)	
Anglophone news avoiders × Social media (Once)	-0.032*	
	(0.013)	
Anglophone news avoiders × Social media (A few times)	-0.019+	
	(0.010)	
Anglophone news avoiders × Social media (Almost every day)	-0.030*	
	(0.014)	
Anglophone news avoiders × Social media (Every day)	-0.029+	
	(0.015)	
Anglophone news avoiders × Social media (Several times a day)	-0.055**	
	(0.020)	
U.S. media		0.001
		(0.006)
Social media (Once) × U.S. media		0.003
		(0.017)
Social media (A few times) × U.S. media		0.014
		(0.010)
Social media (Almost every day) × U.S. media		0.029**
		(0.011)
Social media (Every day) × U.S. media		0.046***
		(0.011)
Social media (Several times a day) × U.S. media		0.039**
		(0.014)
Freq news	-0.061***	-0.061***
	(0.005)	(0.008)
Ideology	0.278***	0.277***
	(0.005)	(0.009)
Trust federal government	-0.019***	-0.019**
	(0.004)	(0.006)
Trust provincial government	-0.037***	-0.041***
	(0.004)	(0.007)
Political interest	-0.006	-0.024*
	(0.005)	(0.010)
Age	-0.139***	-0.142***
	(0.003)	(0.005)

	Model 1	Model 2
Female	-0.012*** (0.002)	-0.004 (0.003)
Fixed effects	Yes	Yes
Observations	256904	97704
R2	0.173	0.176
R2 Adj.	0.172	0.176
RMSE	0.29	0.28

+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

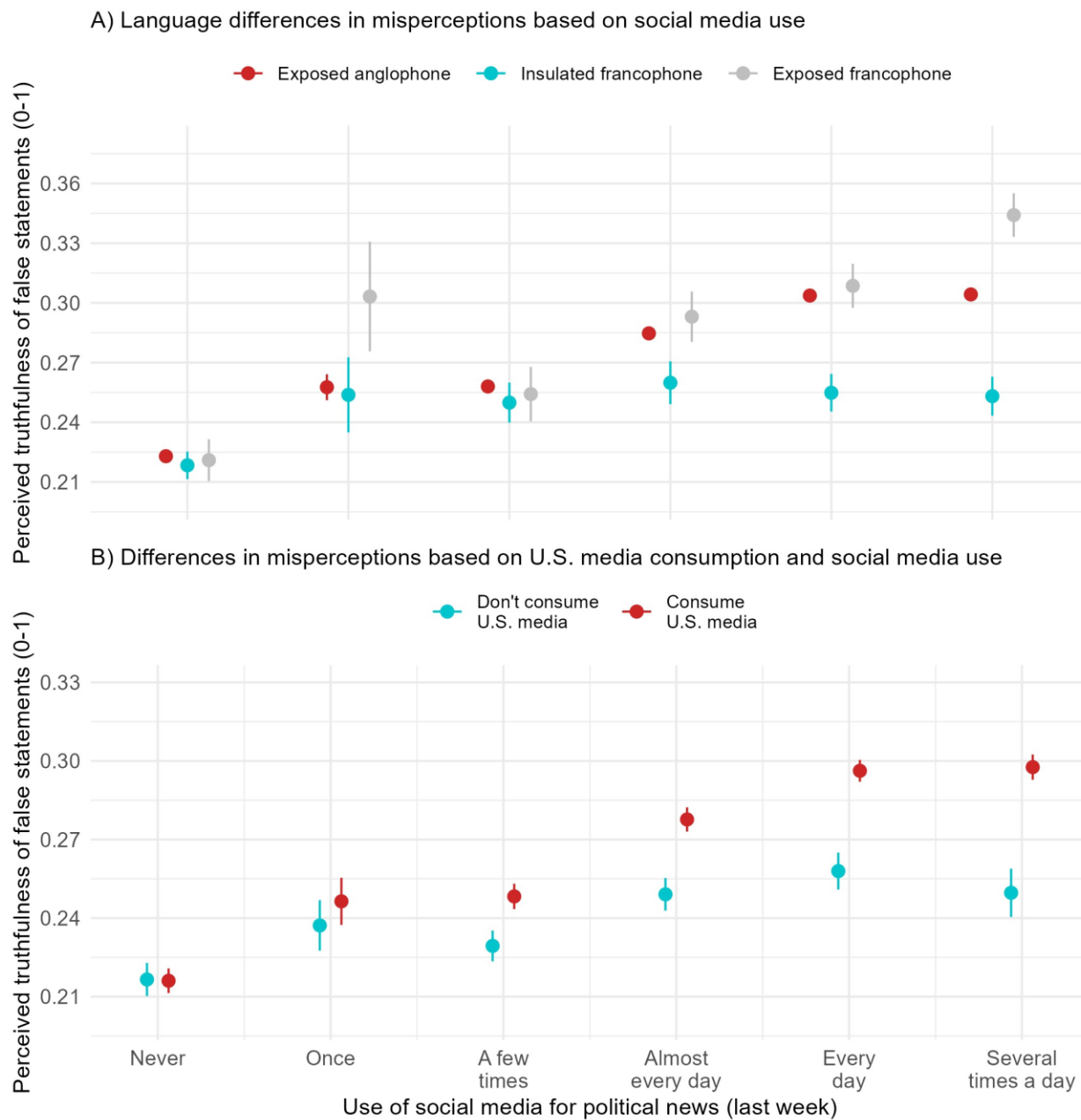


Figure 3D.1. Perceived truthfulness of COVID-19 false statements based on social media use (factored), language grouping (panel A) and U.S. media consumption (panel B). Predicted values based on OLS regression are plotted with 95% confidence intervals, marginalizing over the fixed effects (region, survey wave, statement) and keeping other variables at their mean.

Table 3D.4. OLS models showing that bilingual Anglophones have similar levels of misperceptions and are similarly influenced by their social media usage as monolingual Anglophones (ref. category). Clustered standard errors in parentheses.

	Model 1	Model 2
English bilingual	-0.001 (0.012)	-0.004 (0.018)
French monolingual	-0.020* (0.008)	-0.002 (0.009)
French bilingual	0.014 (0.009)	-0.003 (0.010)
French unknown	0.018 (0.013)	0.001 (0.014)
English unknown	-0.004 (0.004)	0.007 (0.005)
Freq news social media	0.081*** (0.003)	0.087*** (0.003)
English bilingual × Freq news social media		0.003 (0.027)
French monolingual × Freq news social media		-0.046*** (0.008)
French bilingual × Freq news social media		0.030* (0.012)
French unknown × Freq news social media		0.081* (0.035)
English unknown × Freq news social media		-0.038** (0.013)
Freq news	-0.065*** (0.005)	-0.064*** (0.005)
Ideology	0.279*** (0.005)	0.278*** (0.005)
Trust federal government	-0.019*** (0.004)	-0.019*** (0.004)
Trust provincial government	-0.038*** (0.004)	-0.037*** (0.004)
Political interest	-0.006 (0.005)	-0.007 (0.005)
Age	-0.140*** (0.003)	-0.140*** (0.003)
Female	-0.012*** (0.002)	-0.012*** (0.002)
Fixed effects	Yes	Yes
Observations	257,568	257,568
R2	0.171	0.172
R2 Adj.	0.171	0.172
RMSE	0.29	0.29

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

3E. Misinformation dictionary

COVID-19 tweets were identified using the following strings: ‘covid’, ‘coronavirus’, ‘sras-cov’, ‘sars-cov’, ‘pandemic’, ‘pandémi’, ‘ncov’. The full COVID-19 misinformation dictionary is provided in Table 3E.1. The logic for applying the dictionary is as follows:

- Self-sufficient strings (the name of the category in Table 3E.1 includes ‘alone’): Any tweet containing one of these strings is labeled as misinformation;
- COVID-specific strings (the name of the category includes ‘COVID’): Tweets also need to contain a COVID-19 string to be labeled as misinformation;
- Combination of strings (the name of the category includes a number): Tweets need to include a string from every category to be labeled as misinformation. For example, a tweet containing a COVID-19 string *and* Depopulation 1 string *and* Depopulation 2 string would be considered related to misinformation.

Table 3E.1. Misinformation dictionary.

Category	Strings
Origin (alone)	‘bat soup’, ‘sold the coronavirus’, ‘sold the covid’, ‘sold the virus’, ‘us2006257852’, ‘ep3172319B1’, ‘coronavirus is created’, ‘coronavirus was created’, ‘covid-19 is created’, ‘covid-19 was created’, ‘covid is created’, ‘covid was created’, ‘coronavirus was planned’, ‘covid-19 was planned’, ‘covid was planned’, ‘pandemic was planned’, ‘coronavirus is planned’, ‘covid-19 is planned’, ‘covid is planned’, ‘pandemic is planned’, ‘coronavirus was orchestrated’, ‘covid-19 was orchestrated’, ‘covid was orchestrated’, ‘pandemic was orchestrated’, ‘coronavirus is orchestrated’, ‘covid-19 is orchestrated’, ‘covid is orchestrated’, ‘pandemic is orchestrated’, ‘created coronavirus’, ‘created covid’, ‘created the virus’, ‘soupe de chauve-souris’, ‘vendu le coronavirus’, ‘vendu le covid’, ‘vendu le virus’, ‘créé le coronavirus’, ‘créé le covid’, ‘créé la covid’, ‘créé le virus’, ‘covid est créé’, ‘covid a été créé’, ‘coronavirus est créé’, ‘coronavirus a été créé’, ‘covid-19 est créé’, ‘covid-19 a été créé’, ‘virus est créé’, ‘virus a été créé’, ‘planifié la pandémie’, ‘pandémie planifiée’, ‘pandémie était planifiée’, ‘pandémie est planifiée’, ‘covid-19 était planifié’, ‘covid-19 est planifié’, ‘covid était planifié’, ‘covid est planifié’, ‘coronavirus était planifié’, ‘coronavirus est planifié’, ‘plandémi’, ‘orchestré la pandémie’, ‘pandémie orchestré’, ‘pandémie a été orchestré’, ‘pandémie est orchestré’, ‘covid-19 a été orchestré’, ‘covid-19 est orchestré’, ‘covid a été orchestré’, ‘covid est orchestré’, ‘coronavirus a été orchestré’, ‘coronavirus est orchestré’
Origin (COVID)	‘hazardous event’, ‘biowar’, ‘bioweapon’, ‘biological attack’, ‘biological war’, ‘chemical weapon’, ‘chemical war’, ‘virological weapon’, ‘bacteriological weapon’, ‘virological war’, ‘bacteriological war’, ‘chinese spies’, ‘chinese spy’, ‘charles lieber’, ‘lysol label’, ‘guerre biologique’, ‘bioguerre’, ‘arme biologique’, ‘bioarme’, ‘attaque biologique’, ‘arme chimique’, ‘guerre chimique’, ‘guerre virologique’, ‘guerre bactériologique’, ‘arme virologique’, ‘arme bactériologique’, ‘soupe de chauve-souris’, ‘espions chinois’, ‘espion chinois’, ‘emballage de lysol’, ‘hiv sequence’, ‘montagnier’, ‘à partir du vih’
Origin 1 (COVID)	‘test’, ‘testing patent’, ‘brevet’

Origin 2 (COVID)	'2015', '2018'
Depopulation (COVID)	'population control', 'depopulation', 'reduction of population', 'population reduction', 'contrôle des populations', 'dépopulation', 'dépeuplement', 'stérilisation', 'réduction des populations', 'eugenics agenda', 'eugenic agenda', 'eugenics plan', 'eugenic plan', 'plan eugéniste', 'agenda eugéniste'
Depopulation 1 (COVID)	'sterile', 'steriliz', 'sterilis', 'infertile', 'infertility', 'stérile', 'stérilis', 'infertile', 'infertilité'
Depopulation 2 (COVID)	'men', 'women', 'male', 'female', 'boy', 'girl', 'population', 'people', 'mass', 'hommes', 'femmes', 'garçon', 'fille', 'gens', 'peuple'
Vaccines (alone)	('weaponizedvaccine', 'weaponized vaccine', 'weaponisedvaccine', 'weaponised vaccine', 'vaccine weapons', 'tracking device', 'vaccine contains nanotechnology', 'fake needles', 'forced vaccination', 'covid from the flu shot', 'poisonous vaccine', 'vaccine gives you covid', 'shot gives you covid', 'vaccines give you covid', 'shots give you covid', 'vaccine gives you coronavirus', 'shot gives you coronavirus', 'vaccines give you coronavirus', 'shots give you coronavirus', 'digital tattoos', 'arme vaccinale', 'arme vaccin', 'vaccin contient des nanotechnologies', 'fausses aiguilles', 'vaccination forcée', 'vaccin contre la grippe augmente', 'vaccin poison', 'vaccin transmet le coronavirus', 'vaccin transmet la covid', 'vaccin transmet le covid', 'vaccins transmettent le coronavirus', 'vaccins transmettent la covid', 'vaccins transmettent le covid', 'tatouages numériques', 'v*ccin', 'v@xx', 'v ccin', 'v accin', 'v@ccin')
Vaccines (COVID)	'micro chip', 'microchip', 'tracking device', 'bio-chem therapeutic', 'mrc-5', 'mrc5', 'iatrogenic reactions', 'thalidomide', 'nuremberg code', 'digital tattoos', 'fetal cells', 'fetal tissues', 'micro puce', 'micropuce', 'puce de suivi', 'effets iatrogènes', 'réactions iatrogènes', 'code de nuremberg', 'cellules fœtales'
Vaccines 1 (COVID)	'vaccin', 'shot', 'vaxx', 'jab'
Vaccines 2 (COVID)	'alter', 'altèr', 'altér', 'change', 'changé', 'manipul', 'modif'
Vaccines 3 (COVID)	'dna', 'adn', 'd'adn', 'l'adn', 'genes', 'gènes', 'genome', 'génome', 'geneti', 'généti'
Masks 1 (alone)	'mask', 'masque', 'face-covering', 'face covering', 'couvre visage', 'couvre-visage'
Masks 2 (alone)	'unconstitutional', 'oxygen deficit', 'oxygen deprivation', 'oxygen level', 'co2 intoxication', 'co2 poisoning', 'trap co2', 'traps co2', 'carbon intoxication', 'carbon poisoning', 'trap carbon', 'traps carbon', 'weaken the immune system', 'weakens the immune system', 'compromise the immune system', 'compromises the immune system', 'weakening the immune system', 'compromising the immune system', 'weaken your immune system', 'compromise your immune system', 'weakens your immune system', 'compromises your immune system', 'weakening your immune system', 'compromising your immune system', 'cause lung cancer', 'contribute to advanced stage lung cancer', 'cause bacterial pneumonia', 'cause pleurisy', 'cause hypercapnia', 'causes lung cancer', 'contributes to advanced stage lung cancer', 'causes bacterial pneumonia', 'causes pleurisy', 'causes hypercapnia', 'hypoxia', 'neurological damage', 'legionnaires' disease', 'mask is dangerous', 'masks are dangerous', 'dangerous mask', 'masks does not work', 'masks don't work', 'masks do not work', 'mask is not effective', 'masks are not effective', 'mask is useless', 'masks are useless', 'drywall dust', 'inconstitutionnel', 'manque d'oxygène', 'niveau d'oxygène', 'intoxication au co2', 'empoisonnement au co2', 'emprisonne le co2', 'emprisonnent le co2', 'intoxication au carbone', 'empoisonnement au carbone', 'emprisonne le carbone', 'emprisonnent le carbone', 'affaiblit le système immunitaire', 'affaiblissent le système immunitaire', 'cause le cancer'

	<p>du poumon’, ‘contribue au cancer du poumon’, ‘causent le cancer du poumon’, ‘contribuent au cancer du poumon’, ‘risque de pneumonie bactérienne’, ‘pneumonie bactérienne due au masque’, ‘hypercapnie’, ‘hypoxie’, ‘cas de pleurésie’, ‘dommages neurologiques’, ‘maladie du légionnaire’, ‘masque est dangereux’, ‘masques sont dangereux’, ‘masques dangereux’, ‘masques ne marchent pas’, ‘masques ne fonctionnent pas’, ‘masque ne marche pas’, ‘masque ne fonctionne pas’, ‘masques ne sont pas efficaces’, ‘masque n’est pas efficace’, ‘masques sont inutiles’, ‘masque est inutile’, ‘laisse passer la poussière’, ‘laissent passer la poussière’, ‘la poussière passe’</p>
Numbers (alone)	<p>‘false positive rate of 90%’, ‘false positive rate of 50%’, ‘50% are false positive’, ‘90% are false positive’, ‘6% of all the 153,504 deaths’, ‘6% actually died from covid’, ‘6% died from covid’, ‘6% actually died from coronavirus’, ‘6% died from coronavirus’, ‘3% actually died from covid’, ‘3% died from covid’, ‘3% actually died from coronavirus’, ‘3% died from coronavirus’, ‘coca-cola tested positive’, ‘coca-cola has tested positive’, ‘coca-cola was tested positive’, ‘90% de faux positifs’, ‘50% de faux positifs’, ‘90% sont des faux positifs’, ‘50% sont des faux positifs’, ‘90% faux positifs’, ‘50% faux positifs’, ‘6% sont morts du covid’, ‘6% sont morts du coronavirus’, ‘3% sont morts du covid’, ‘3% sont morts du coronavirus’, ‘coca-cola testé positif’)</p>
Numbers (COVID)	<p>(‘forbid autopsies’, ‘autopsies are forbidden’, ‘flu cases are included’, ‘tests are fake’, ‘tests exaggerate’, ‘lot of false positive’, ‘many false positive’, ‘high false positive’, ‘huge false positive’, ‘large false positive’, ‘enormous false positive’, ‘astronomical false positive’, ‘false positive is high’, ‘false positive is huge’, ‘false positive is large’, ‘false positive is enormous’, ‘false positive is astronomical’, ‘high number of false positive’, ‘huge number of false positive’, ‘large number of false positive’, ‘enormous number of false positive’, ‘astronomical number of false positive’, ‘high rate of false positive’, ‘huge rate of false positive’, ‘large rate of false positive’, ‘enormous rate of false positive’, ‘astronomical rate of false positive’, ‘high percentage of false positive’, ‘huge percentage of false positive’, ‘large percentage of false positive’, ‘enormous percentage of false positive’, ‘astronomical percentage of false positive’, ‘high proportion of false positive’, ‘astronomical proportion of false positive’, ‘large proportion of false positive’, ‘enormous proportion of false positive’, ‘astronomical proportion of false positive’, ‘lower than the flu’, ‘add flu deaths’, ‘add pneumonia deaths’, ‘93% inaccurate’, ‘caused by other medical’, ‘tests infect’, ‘test infects’, ‘tests are infected’, ‘tests contaminate’, ‘test contaminates’, ‘tests are contaminated’, ‘tests in 2018’, ‘test in 2018’, ‘interdisent les autopsies’, ‘interdit les autopsies’, ‘interdire les autopsies’, ‘empêchent les autopsies’, ‘empêche les autopsies’, ‘empêcher les autopsies’, ‘autopsies sont interdites’, ‘grippe sont inclus’, ‘pneumonie sont inclus’, ‘morts d’autres’, ‘tests sont faux’, ‘tests exagèrent’, ‘élevé de faux positif’, ‘faux positifs élevé’, ‘important de faux positif’, ‘faux positifs important’, ‘énorme de faux positifs’, ‘faux positifs énorme’, ‘astronomique de faux positifs’, ‘faux positifs astronomique’, ‘faux positifs sont nombreux’, ‘faux positifs sont élevés’, ‘faux positifs sont énormes’, ‘faux positifs sont astronomiques’, ‘haut pourcentage de faux positif’, ‘haut nombre de faux positif’, ‘haut taux de faux positif’, ‘haute proportion de faux positifs’, ‘grand pourcentage de faux positif’, ‘grand nombre de faux positif’, ‘grand taux de faux positif’, ‘grande proportion de faux positifs’, ‘grande quantité de faux positifs’, ‘gros pourcentage de faux positif’, ‘gros nombre de faux positif’, ‘gros taux de faux positif’, ‘grosse proportion de faux positifs’, ‘grosse quantité de faux positifs’, ‘énorme pourcentage de faux positif’, ‘énorme nombre de faux positif’, ‘énorme taux de faux positif’, ‘énorme proportion de faux positifs’, ‘énorme quantité de faux positifs’, ‘beaucoup de faux positif’, ‘nombreux faux positif’, ‘faux positifs nombreux’, ‘93% inexacte’, ‘tests infectent’, ‘tests sont infectés’, ‘tests contaminent’, ‘tests sont contaminés’, ‘tests en 2018’)</p>
Numbers 1	<p>‘overstat’, ‘exagger’, ‘exaggrer’, ‘exaggrer’, ‘inflat’, ‘gonfl’, ‘surestim’, ‘invent’,</p>

(COVID)	'manipul', 'fake', 'false', 'falsif', 'faux', 'fausse', 'truqu', 'trafiqu'
Numbers 2 (COVID)	'number', 'data', 'statistics', 'case', 'death', 'nombre', 'chiffres', 'données', 'statistiques', 'cas', 'morts'
Remedies (COVID)	'bleach', 'colloidal silver', 'genesis ii church', 'miracle cure', 'miracle mineral', 'uv light', 'ultraviolet', 'raoult', 'azithromycin', 'dexamethasone', 'vitamin d', 'false cure', 'fake cure', 'snake oil', 'herbal cure', 'herbal remedy', 'madagascar cure', 'bogus remedies', 'bogus remedy', 'artemisia', 'oregano', 'garlic', 'chlorine dioxide', 'chemical exposure', 'alternative medicine', 'saline nose', 'quack medicine', 'healing microbes', 'hand dryers', 'silver colloid', 'fish tank cleaner', 'burning sage', 'vital silver', 'quinessence aromatherapy', 'xephyr', 'n-ergetics', 'gurunanda', 'vivify holistic clinic', 'herbal amy', 'biocharger', 'cow urine', 'inhaling steam', 'hydroxychloroquine cures', 'chloroquine cures', 'hydroxychloroquine prevents', 'chloroquine prevents', 'hydroxychloroquine works', 'chloroquine works', 'drinking water every', 'budesonide cures', 'baking soda', 'ingesting semen', 'alkaline food', 'jim bakker', 'mark grenon', 'jennings ryan staley', 'arsenicum album', 'covid-organics', 'shuanghuanglian', 'happy science', 'influenza complex', 'kyriakos velopoulos', 'abbas tabrizian', 'pete evans', 'holding your breath for 10 seconds', 'holding your breath can test', 'pineal gland', 'damage the blood-brain barrier', 'ivermectin is recommended', 'ivermectin is a recommended', 'ivermectin cures', 'ivermectin prevents', 'ivermectin works', 'fauci knew', 'javel', 'argent colloidal', 'église genesis', 'remède miracle', 'minéral miraculeux', 'lumière uv', 'vitamine d', 'faux remède', 'huile de serpent', 'plantes médicinales', 'herbes médicinales', 'remède de madagascar', 'armoise', 'organ', 'l'ail', 'd'ail', 'dioxyde de chlore', 'exposition chimique', 'médecine alternative', 'probiotiques', 'sèche-mains', 'nettoyant pour aquarium', 'saugé', 'argent vital', 'aromathérapie', 'plante miracle', 'urine de vache', 'inhaler de la vapeur', 'hydroxychloroquine guérit', 'hydroxychloroquine soigne', 'hydroxychloroquine fonctionne', 'chloroquine guérit', 'chloroquine soigne', 'chloroquine fonctionne', 'boire de l'eau toutes les', 'budésouide guérit', 'budésouide soigne', 'bicarbonate de soude', 'ingérer du sperme', 'aliments alcalins', 'covid-organique', 'retenir son souffle pendant 10 secondes', 'retenir son souffle pour détecter', 'prevoletta', 'glande pinéale', 'endommagement la barrière hémato-encéphalique', 'brise la barrière hémato-encéphalique', 'ivermectine est recommandée', 'ivermectine est un traitement recommandé', 'ivermectine guérit', 'ivermectine est efficace', 'ivermectine fonctionne', 'ivermectine soigne', 'fauci savait'
Health measures (alone)	'criminalized all covid measures', 'criminalized all covid restriction', 'criminalized all covid regulation', 'criminalized all covid-19 measures', 'criminalized all covid-19 restriction', 'criminalized all covid-19 regulation', 'criminalised all covid measures', 'criminalised all covid restriction', 'criminalised all covid regulation', 'criminalised all covid-19 measures', 'criminalised all covid-19 restriction', 'criminalised all covid-19 regulation', 'covid camps', 'unconstitutional lockdown', 'lockdown is unconstitutional', 'sanitaires sont inconstitutionnelles', 'sanitaires inconstitutionnelles', 'sanitaires sont illégales', 'sanitaires illégales', 'confinement est illégal', 'confinement sont illégales', 'confinement illégal', 'confinement est inconstitutionnel', 'confinement inconstitutionnel', 'camps covid'
Health measures (COVID)	'illegal measures', 'illegal restrictions', 'illegal regulation', 'illegal lockdown', 'measures are illegal', 'restrictions are illegal', 'regulation is illegal', 'lockdown is illegal', 'criminalized measures', 'criminalized restrictions', 'criminalized regulation', 'criminalised measures', 'criminalised restrictions', 'criminalised regulation', 'unconstitutional measures', 'measures are unconstitutional', 'unconstitutional regulation', 'regulation is unconstitutional', 'unconstitutional restrictions', 'restrictions are unconstitutional', 'confinement camps', 'concentration camps', 'quarantine camps',

	<p>'detention camps', 'modry', 'lynn channel', 'guillotine', 'lockdownlies', 'has reached heard immunity', 'children hospitalized alone', 'children are hospitalized alone', 'hospitalized without their parents', 'children hospitalised alone', 'children are hospitalised alone', 'hospitalised without their parents', 'mesures illégales', 'restrictions illégales', 'règles illégales', 'mesures sont illégales', 'restrictions sont illégales', 'règles sont illégales', 'mesures sont inconstitutionnelles', 'mesures inconstitutionnelles', 'restrictions sont inconstitutionnelles', 'restrictions inconstitutionnelles', 'règles sont inconstitutionnelles', 'règles inconstitutionnelles', 'camps de confinement', 'camps de concentration', 'camps de quarantaine', 'camps de détention', 'guillotine', 'a atteint l'immunité collective', 'à votre insu', 'enfants hospitalisés seuls', 'hospitalisés sans leurs parents'</p>
Health measures 1 (COVID)	'trudeau'
Health measures 2 (COVID)	'barbados', 'barbade'
Severity (alone)	<p>'casedemic', 'kids can't get coronavirus', 'kids can't get covid', 'children can't get coronavirus', 'children can't get covid', 'canada free of covid', 'canada is free of covid', 'canada free of coronavirus', 'canada is free of coronavirus', 'canada is covid-free', 'canada is coronavirus-free', 'viruses do not harm or kill', 'viruses do not kill', 'pandemic is a fraud', 'covid is a fraud', 'covid-19 is a fraud', 'coronavirus is a fraud', 'pandemic is a scam', 'covid is a scam', 'covid-19 is a scam', 'coronavirus is a scam', 'scamdemic', 'asymptomatic spread of covid-19 did not occur at all', 'cdc admits there is no covid', 'cdc admits there is no coronavirus', 'cdc admits there is no pandemic', 'coronavirus has not been isolated', 'covid has not been isolated', 'covid-19 has not been isolated', 'virus has not been isolated', 'casdémie', 'enfants ne peuvent pas avoir le covid', 'enfants ne peuvent pas avoir la covid', 'enfants ne peuvent pas avoir le coronavirus', 'n'y a plus de covid-19 au Canada', 'n'y a plus de covid au Canada', 'n'y a plus de coronavirus au Canada', 'virus ne tue pas', 'fraude sanitaire', 'pandémie est une fraude', 'covid est une fraude', 'covid-19 est une fraude', 'coronavirus est une fraude', 'pandémie est un scam', 'covid est un scam', 'covid-19 est un scam', 'coronavirus est un scam', 'scamdémie', 'asymptomatiques ne transmettent pas', 'cdc admet qu'il n'y a pas de covid', 'cdc admet qu'il n'y a pas de coronavirus', 'cdc admet qu'il n'y a pas de pandémie', 'cdc admet que le covid-19 n'existe pas', 'cdc admet que la covid-19 n'existe pas', 'cdc admet que le coronavirus n'existe pas', 'cdc admet que la pandémie n'existe pas', 'aucun document montrant que le virus sars-cov2 (qui produit la covid-19) ait été isolé', 'coronavirus n'a pas été isolé', 'covid n'a pas été isolé', 'covid-19 n'a pas été isolé', 'virus n'a pas été isolé'</p>
Severity (COVID)	'no more dangerous than the flu', 'not more dangerous than the flu', 'roger hodkinson', 'health fraud', 'hoax', 'pas plus dangereux que la grippe', 'enfants ne sont pas infectés', 'children can't get infected', 'canular'
Conspiracy (alone)	'plandemic', 'mikki willis', 'mikovits', 'see a sheep surrender'
Conspiracy (COVID)	<p>'new world order', 'world order', 'nwo', 'world domination', 'deep state', 'deep-state', 'clinton foundation', 'soros', 'globalist', 'freemason', 'illuminati', 'conspirac', 'great reset', 'greatreset', 'world debt reset', 'global reset', 'anubis', 'god of death', 'nouvel ordre mondial', 'nouvelle ordre mondial', 'ordre mondial', 'nouvelordremondial', 'domination mondiale', 'état profond', 'fondation clinton', 'globalisme', 'franc maçon', 'conspirat', 'grande réinitialisation', 'grand reset', 'réinitialisation mondiale', 'reset mondial', 'réinitialisation de la dette mondiale', 'dieu de la mort', 'q-anon', 'qanon'</p>
5G (COVID)	'5g', '5th gen', 'fifth gen', 'acute radiation syndrome', '5e génération', 'cinquième génération', 'syndrome d'irradiation aiguë'

Bill Gates (COVID)	'bill gates', 'melinda gates', 'gates foundation', 'event 201', 'pirbright', 'fondation gates', 'événement 201'
Anti-semitic (COVID)	'jew virus', 'jewish virus', 'jewish plot', 'jewish agenda', 'jew world order', 'jewish world order', 'globalist jews', 'jews spreading', 'zionism', 'zionist', 'kevin barrett', 'virus juif', 'sionisme', 'sioniste', 'sionniste', 'sionnisme', 'ordre mondial juif', 'globalisme juif', 'juifs globalistes', 'mondialisme juif', 'juifs mondialistes', 'juifs propagent', 'complot juif', 'agenda juif')

Appendices of Chapter 4

4A. Sample and descriptive statistics

Description of the samples

The post-election survey of the Canadian Election Misinformation Project was conducted between September 30 and October 14, 2021.⁷⁷ The sample comprises 54% of men and 46% of women. The median age of respondents is 52 years old (SD = 15.33). The sample is slightly more educated than the national population: 43% of respondents have completed a university degree (compared to about 30% in the general population), while 27% of respondents reported a high school education or less (compared to 35% in the general population). The regional distribution of respondents includes a slight overrepresentation of Ontario (43% compared to 38% in the 2021 Census) and an underrepresentation of Quebec residents (15% compared to 23% in the 2021 Census). Post-stratification weights on age and gender within each region are used to make the data more representative of the Canadian population.

The post-election survey of the Quebec Election Misinformation Project was fielded between October 14 and October 16, 2022. The recontact study was available to all respondents who had previously answered the campaign-period survey (3,707). 2,413 of them were also sent an email invite, of which 4 bounced back. The target number of respondents was 1,500. 2,728 panelists started the survey and 1,545 completed it, yielding a completion rate of 57%. The sample is 49% female, has a median age of 50 (sd = 16.1), and is slightly more educated than the Quebec population (38% have a university degree compared to approximately 30% of the general population).

⁷⁷ The technology used by the sample provider to distribute the survey does not allow them to know exactly how many panelists were invited to complete the survey, which means that the response rate cannot be calculated. Among the 10,199 panelists that started the campaign-period survey, 181 did not answer any question, 521 were screened out of the survey because they were less than 18 years old or were noncitizens, 916 were filtered out because a quota was already full, 1,229 dropped out before completing it and 51 were removed because they were duplicates (same identifying number). Among the 3,796 panelists who started the post-election survey, 2,799 (74%) completed the entire survey.

*Descriptive statistics***Table 4A.1.** Descriptive statistics.

	n	mean	sd	min	max
Threat to way of life	2363	0.68	0.47	0	1
Feelings: Canadians who refuse to get vaccinated	2547	28.47	30.43	0	100
Feelings: Canadians who support vaccine passports	2565	75.69	28.68	0	100
Affective polarization: COVID-19 vaccines	2522	61.48	36.12	0	100
Feelings: Climate change skeptics	2503	37.63	29.83	0	100
Feelings: Climate believers	2503	66.92	27.17	0	100
Affective polarization: Climate change	2459	44.11	34.96	0	100
Support for vaccine passports (5-point)	2799	0.74	0.33	0	1
Support for carbon pricing (5-point)	2799	0.50	0.32	0	1
Trust federal government (5-point)	2703	0.49	0.31	0	1
Trust provincial government (5-point)	2702	0.50	0.30	0	1
Trust governments	2695	0.49	0.26	0	1
Frequency political news (5-point)	2799	0.69	0.32	0	1
Frequency political news social media (6-point)	2799	0.42	0.37	0	1
Political interest (0-10)	2658	0.61	0.26	0	1
Ideology (0-10)	2394	0.53	0.22	0	1
Liberal PID	2799	0.31	0.46	0	1
Conservative PID	2799	0.27	0.44	0	1
NDP PID	2799	0.13	0.33	0	1
Bloc Quebecois PID	2799	0.03	0.17	0	1
Green PID	2799	0.03	0.16	0	1
People's Party PID	2799	0.02	0.13	0	1
Age	2799	51.28	15.33	18	95
Female	2784	0.46	0.50	0	1
Education (3 categories)	2786	0.58	0.41	0	1
Atlantic	2794	0.07	0.26	0	1
Quebec	2794	0.15	0.36	0	1
Ontario	2794	0.43	0.50	0	1
Prairies	2794	0.23	0.42	0	1
British Columbia	2794	0.12	0.32	0	1

Misperceptions

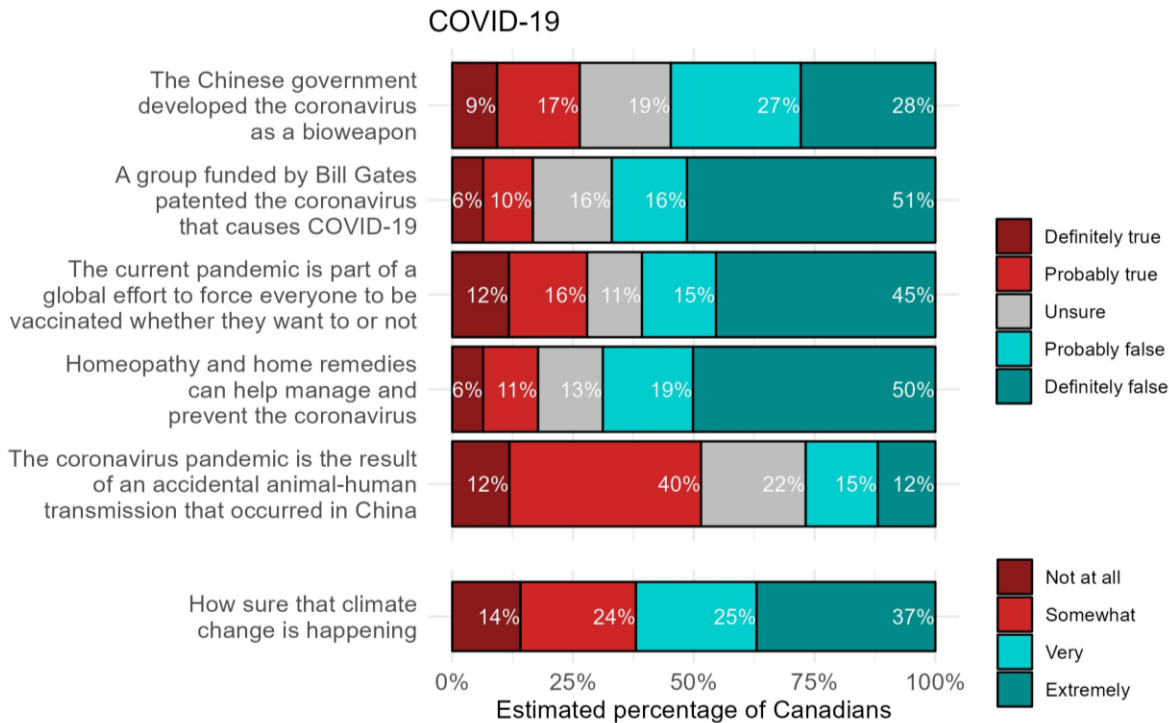


Figure 4A.1. Weighted percentage of respondents believing in misinformation about COVID-19 and climate change.

4B. Main analyses

Table 4B.1. Factors explaining affective polarization on COVID-19 vaccines and climate change. OLS regression coefficients shown with HC2 standard errors in parentheses. All independent variables are coded on a 0 to 1 scale.

	Vaccines	Carbon pricing
Position extremity (vaccines)	37.954*** (1.588)	
Position extremity (carbon pricing)		9.589*** (1.617)
Liberal PID	3.500+ (2.024)	5.351* (2.282)
Conservative PID	2.548 (2.160)	-0.424 (2.381)
NDP PID	1.608 (2.517)	8.829** (2.801)
Bloc Quebecois PID	-0.817 (4.994)	7.176 (5.279)
Green PID	-3.677 (4.579)	15.932*** (4.303)
People's Party PID	1.723 (7.051)	1.147 (7.291)
Ideology	-23.908*** (3.531)	-51.703*** (3.754)
Trust government	-2.577 (2.822)	-7.141* (3.065)
Freq political news	10.809*** (2.796)	3.421 (3.179)
Freq political news social media	-5.264** (1.917)	-5.392* (2.165)
Political interest	-7.453* (3.288)	5.787 (3.914)
Age	10.170*** (2.110)	11.424*** (2.197)
Female	4.423*** (1.339)	3.733** (1.447)
Education	3.502* (1.683)	6.421*** (1.797)
(Intercept)	37.877*** (3.826)	52.376*** (4.063)
Region fixed effects	Yes	Yes
Observations	2137	2111
R ²	0.38	0.20
Adjusted R ²	0.37	0.20

	Vaccines	Carbon pricing
RMSE	28.69	31.62

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4B.2. Mediation analysis. OLS regression coefficient reported with standard errors in parentheses.

	Feelings unvaccinated		Feelings passports supporters		Feelings climate skeptics		Feelings anthropogenic climate believers	
	Mediator	Outcome	Mediator	Outcome	Mediator	Outcome	Mediator	Outcome
COVID-19 misperceptions (T)	-0.573*** (0.031)	40.505*** (2.681)	-0.565*** (0.031)	-16.957*** (2.211)				
Support vaccine passports (M)		-35.319*** (1.737)		53.755*** (1.427)				
Climate skepticism (T)					-0.298*** (0.040)	33.343*** (3.516)	-0.293*** (0.039)	-33.194*** (3.193)
Support carbon pricing (M)						-5.619 (3.786)		15.219*** (3.448)
Liberal PID	0.068*** (0.019)	-0.810 (1.503)	0.061** (0.019)	4.386*** (1.239)	0.112** (0.040)	-5.740+ (3.383)	0.115** (0.040)	-1.247 (3.078)
Conservative PID	0.011 (0.020)	0.462 (1.591)	0.005 (0.020)	-1.048 (1.310)	-0.047 (0.042)	-10.372** (3.535)	-0.045 (0.042)	-2.513 (3.222)
NDP PID	0.061** (0.023)	-1.108 (1.813)	0.052* (0.023)	3.371* (1.493)	0.046 (0.048)	-9.435* (4.087)	0.055 (0.048)	2.336 (3.696)
Bloc Quebecois PID	0.092* (0.040)	4.055 (3.244)	0.092* (0.041)	-1.916 (2.710)	0.085 (0.088)	-14.916* (7.418)	0.088 (0.088)	3.509 (6.767)
Green PID	0.017 (0.038)	3.932 (3.026)	0.010 (0.038)	0.222 (2.508)	0.023 (0.076)	-10.114 (6.443)	0.027 (0.076)	2.772 (5.876)
People's Party PID	-0.215*** (0.049)	12.482** (3.935)	-0.223*** (0.049)	-7.202* (3.255)				
Ideology	-0.040 (0.032)	15.226*** (2.560)	-0.048 (0.032)	3.371 (2.112)	-0.105 (0.068)	40.406*** (5.760)	-0.108 (0.068)	-6.690 (5.270)
Trust government	0.212***	6.109**	0.209***	8.869***	0.274***	-6.164	0.268***	5.351

	Feelings unvaccinated		Feelings passports supporters		Feelings climate skeptics		Feelings anthropogenic climate believers	
	Mediator	Outcome	Mediator	Outcome	Mediator	Outcome	Mediator	Outcome
	(0.025)	(2.009)	(0.025)	(1.652)	(0.051)	(4.440)	(0.051)	(4.035)
Freq political news	0.141***	-6.434**	0.128***	-1.239	0.045	0.235	0.044	4.734
	(0.026)	(2.073)	(0.026)	(1.700)	(0.055)	(4.633)	(0.055)	(4.192)
Freq political news social media	-0.015	2.323	-0.017	-0.371	0.075*	5.727+	0.071+	2.906
	(0.018)	(1.468)	(0.018)	(1.206)	(0.038)	(3.183)	(0.038)	(2.898)
Political interest	-0.058+	9.955***	-0.056+	3.378+	-0.020	12.336*	-0.013	-10.345*
	(0.030)	(2.397)	(0.030)	(1.972)	(0.064)	(5.365)	(0.063)	(4.849)
Age	0.110***	-7.567***	0.115***	3.551**	-0.054	-7.919*	-0.060	3.358
	(0.018)	(1.475)	(0.018)	(1.213)	(0.037)	(3.163)	(0.037)	(2.877)
Female	-0.001	-0.283	0.004	2.323**	0.006	-2.523	0.005	0.416
	(0.012)	(0.976)	(0.012)	(0.805)	(0.026)	(2.185)	(0.026)	(1.999)
Education	0.044**	0.673	0.047**	0.432	0.042	0.249	0.043	3.560
	(0.015)	(1.225)	(0.015)	(1.010)	(0.033)	(2.750)	(0.033)	(2.512)
(Intercept)	0.662***	32.404***	0.676***	29.080***	0.468***	12.617*	0.469***	72.027***
	(0.033)	(2.901)	(0.033)	(2.399)	(0.072)	(6.308)	(0.072)	(5.773)
ACME	20.23***		-30.38***		1.67		-4.45***	
ADE	40.51***		-16.96***		33.34***		-33.19***	
Total effect	60.74***		-47.33***		35.02***		-37.65***	
Mediated (prop)	0.33***		0.64***		0.05		0.12***	
Observations	2154		2168		515		516	

+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Table 4B.3. Balance table. Description of the sample before and after entropy balancing.

Variable	2021	2022	Balanced mean (same for both groups)
Female ⁷⁸	0.445	0.440	0.441
Age 18-34	0.160	0.208	0.198
Age 35-44	0.246	0.200	0.210
Age 45-54	0.261	0.170	0.189
Age 55-64	0.208	0.200	0.202
Age 65+	0.125	0.223	0.202
Highschool diploma	0.323	0.270	0.281
College/CEGEP diploma	0.288	0.309	0.304
University diploma	0.386	0.421	0.413
Political interest	0.632	0.702	0.687
Ideology	0.524	0.494	0.501
Political trust	0.557	0.593	0.586
Freq political news	0.724	0.721	0.722
Freq political news social media	0.385	0.387	0.387

⁷⁸ The slight gender imbalance seems to be caused by the fact that women are more likely to answer “Don’t know” when asked about their ideology. Coding these answers as 5 on the 0-10 left-right scale does not change the results presented in Table B4.

Table 4B.4. Change in affective polarization between September 2021 and October 2022. OLS regression coefficients shown with HC2 standard errors in parentheses. The 2021 and 2022 Quebec samples are balanced on political interest, ideology, trust in government, and socio-demographics using entropy balancing.

	Affective polarization	Feelings unvaccinated	Feelings vaccine passports supporters	Threat to way of life
2022	-6.410** (2.358)	2.538 (1.843)	-14.363*** (1.678)	-7.325* (3.573)
Ideology	-10.203* (4.356)	23.089*** (3.544)	-10.637** (3.755)	0.242 (6.275)
Trust government	-4.458 (3.545)	-27.388*** (3.024)	40.237*** (3.029)	-10.932* (5.094)
Freq political news	11.624** (4.071)	-9.049** (3.254)	3.898 (3.302)	8.409 (6.026)
Freq political news social media	-4.860+ (2.659)	7.038*** (2.107)	-5.686** (2.188)	4.446 (4.023)
Political interest	2.933 (4.904)	2.364 (3.986)	3.674 (4.114)	-19.284** (7.180)
Age	21.345*** (2.738)	-17.683*** (2.211)	17.852*** (2.155)	30.939*** (4.286)
Female	2.519 (1.833)	-0.755 (1.434)	-0.293 (1.459)	-5.914* (2.871)
Education	3.914+ (2.250)	-5.220** (1.807)	3.497+ (1.914)	0.694 (3.487)
(Intercept)	44.582*** (4.917)	47.589*** (3.801)	45.144*** (4.014)	60.549*** (7.163)
Observations	1461	1477	1489	1297
R ²	0.09	0.22	0.26	0.06
Adjusted R ²	0.08	0.21	0.26	0.05
RMSE	33.48	25.98	27.24	47.99

+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

4C. Robustness checks

Figure 4C.1 illustrates how affective polarization based on support for vaccine passports differs when using “Canadians who are vaccinated against COVID-19” rather than “Canadians who support vaccine passports” as the opinion-based groups.

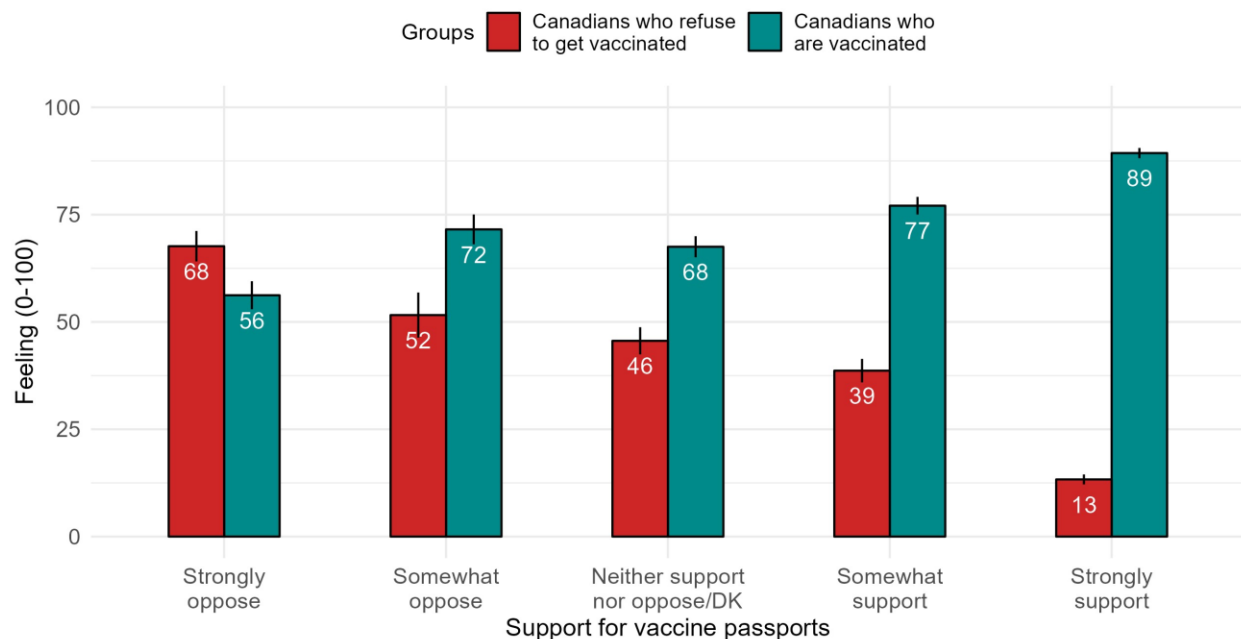


Figure 4C.1. Feelings about Canadians who are vaccinated against COVID-19 and Canadians who refuse to get vaccinated based on issue positions on vaccine passports. Weighted means shown with 95% confidence intervals.

Figure 4C.2 shows that affective polarization on climate change is bilateral when reported based on climate skepticism rather than opinions about carbon pricing.

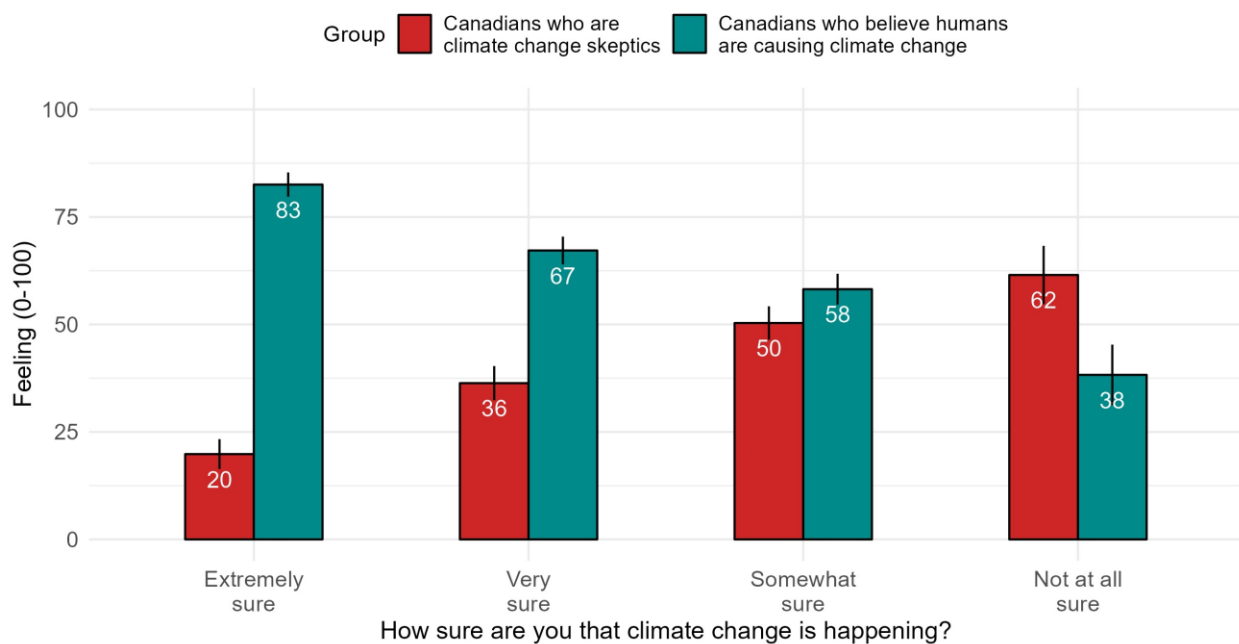


Figure 4C.2. Feelings about Canadians who believe humans are causing climate change and Canadians who are climate change skeptics based on belief in climate change. Weighted means shown with 95% confidence intervals.

To further illustrate that issue-based affective polarization exists beyond partisanship, we interact issue positions on COVID-19 passports and carbon pricing with partisan identification to test whether issue positions have similar effects on feelings towards opinion-based groups (using the feeling thermometers) among partisans of each party. The model is as follows, with the vector of covariates being the same as in the main analysis:

$$\begin{aligned} \text{Feelings towards opinion-based group}_i & \\ &= \alpha_i + \beta_1 \text{Issue position}_i + \beta_2 \text{Partisan identification}_i \\ &+ \beta_3 \text{Issue position} * \text{Partisan identification}_i + \mathbf{X}_i \boldsymbol{\beta} + \varepsilon_i \end{aligned}$$

Figure 4C.3 shows the marginal effect of supporting vaccine passports or carbon pricing on feelings towards those who support vaccine passports, those who refuse to get vaccinated, anthropogenic climate believers, and climate skeptics. As expected, supporting vaccine passports is associated with liking those who hold the same issue position and disliking those who refuse to get vaccinated within each partisan group. This provides evidence that issue positions matter beyond partisanship. Affective polarization on climate change seems more strongly associated with partisan identities, with support for carbon pricing being a weaker determinant of feelings towards anthropogenic climate believers and climate skeptics. Specifically, while all of the effects are in the expected direction, they sometimes fail to reach statistical significance, especially among Liberal identifiers (confidence intervals are particularly large, which suggests that the effect of support for carbon pricing on feelings towards climate believers and climate skeptics might be more variable among partisans of that party).

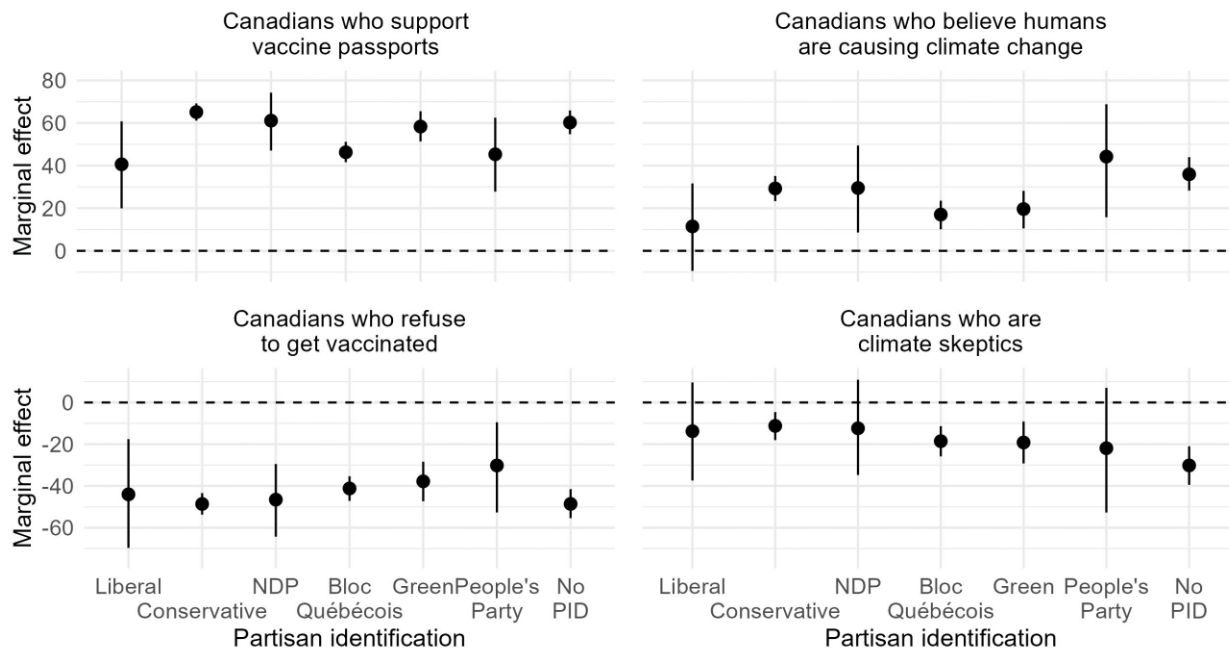


Figure 4C.3. Marginal effects of COVID-19 and climate change policy preferences on feelings towards opinion-based groups by partisan identification. Marginal effects based on OLS interaction model, with 95% confidence intervals.

Figure 4C.4 compares levels of affective polarization on COVID-19 vaccines in Quebec and the rest of Canada during the 2021 Canadian federal election and in Quebec during the 2022 Quebec provincial election. Weighted averages/proportions are reported with 95% confidence intervals, using post-stratification weights on age and gender within each region. The results first show that levels of affective polarization on COVID-19 vaccines were no different in Quebec and the rest of Canada during the 2021 Canadian federal election. Second, the results illustrate that affective polarization slightly declined between 2021 and 2022 in Quebec.

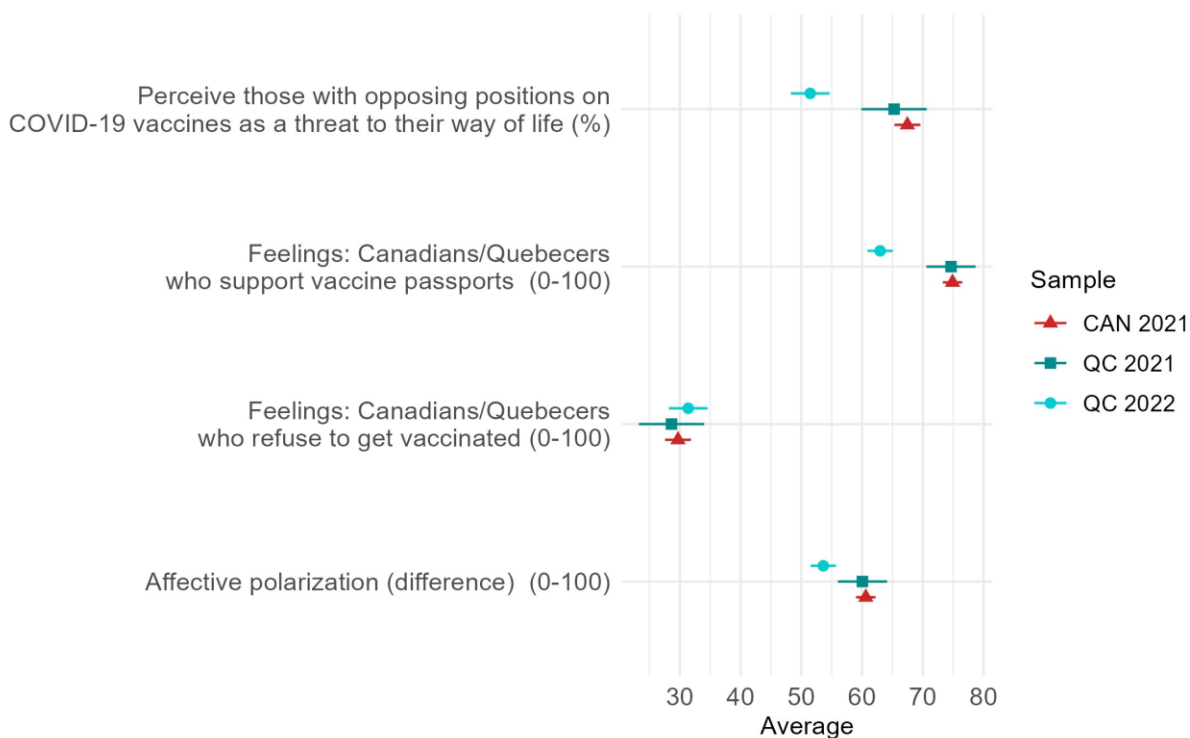


Figure 4C.4. Change in affective polarization between September 2021 and October 2022. Weighted averages with 95% confidence intervals are plotted for Quebec and the rest of Canada during the 2021 Canadian federal election and for Quebec during the 2022 Quebec provincial election. Post-stratification weights on age and gender within each region used.