MISINFORMATION AND DISINFORMATION

An international effort using behavioural science to tackle the spread of misinformation

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KEY POLICY MESSAGES

- Global policy challenges such as misinformation overwhelmingly rely on individual behaviours and social factors to drive group-level action and change both on and offline.
- Understanding how cognitive, emotional, and social factors influence the way individuals navigate information ecosystems, and conversely, how information ecosystems influence individual-level behaviours, can allow governments to better design and deliver policies, programs and communications.
- The OECD convened a first-of-its kind international partnership on behavioural science and misinformation between the Canadian and the French governments to develop and disseminate behaviourally-informed and evidence-based solutions that can guide government response to misinformation.
- The study tested 1,872 Canadians' intentions to share false COVID-related headlines online with two behavioural interventions: an accuracy evaluation prompt and digital media literacy prompt.
- The data generated by this partnership show that the digital media literacy tips reduced intentions to share fake news online by 21% compared to the control group – having the greatest impact on online users.
- These insights can enable policy makers to enact measures that defend and empower online users against environments designed to exploit certain natural but maladaptive tendencies and place the control back into the hands of online users.
- Relying solely on traditional top-down approaches that aim to regulate content are insufficient at limiting the immediate dangers of misinformation.
- Innovative policy-making tools such as behavioural science can help provide immediate and long-term solutions to misinformation and should be considered as part of a holistic and comprehensive strategy to offset the threats of misinformation.
- Governments should conduct rigorous policy experiments in collaboration with other countries, like the one presented here, before enacting policy that affects a larger population to address the cross-border nature of misinformation.

EXECUTIVE SUMMARY

Mis- and disinformation can have profound effects on the ability of democratically-elected governments to serve and deliver to the public by disrupting policy implementation and hindering trust in institutions.

Driven by a joint objective to better understand and reduce the spread of misinformation with insights and tools from behavioural science, the OECD, in partnership with behavioural science experts from Impact Canada (IIU) and from the French Direction interministérielle de la transformation publique (DITP), launched a first-of-its-kind international collaboration. This exercise in knowledge sharing of best practices between governments and academics initiated a study conducted in Canada using a randomised controlled trial – embedded within the longitudinal COVID-19 Snapshot Monitoring Study COSMO Canada.

This study tested the impact of two behaviourally-informed interventions on intentions to share true and false news headlines about COVID-19 on social media: an attention accuracy prompt and a set of digital media literacy tips. While both behaviourally-informed interventions were found to be effective, the digital literacy tips were significantly more effective than the accuracy evaluation prompt at improving the quality of news sharing, reducing intentions to share false headlines about COVID-19 by 21%.

Overall, results from this experiment suggest that user-end, scalable, behavioural interventions can reduce sharing of false news headlines in online settings. These results offer compelling avenues for empowering individuals to make active choices about information quality while preserving citizen autonomy as a priority.

These tools can provide pre-emptive and complementary approaches that can be deployed alongside system-level approaches that regulate, set standards, or otherwise address false information online. The results of this study are an important step in bolstering our understanding of the impact of mis- and disinformation and testing feasible, effective, and collaborative solutions.

The key insights generated from the results of this study can be summarised as follows:

- Behavioural interventions are effective, scalable tools for tackling the spread of misinformation and they can enhance system-level policies aimed at empowering users.
- A comprehensive policy response to mis- and disinformation should include an expanded understanding of human behaviour.
- International and collaborative experimentation is vital for tackling global policy challenges with a sustainable response to the spread of mis- and disinformation.

The paper concludes by outlining additional opportunities for research and urging governments to increase efforts to conduct policy experimentation in collaboration with other countries before enacting policy.

1

WHY? DRIVERS AND OBJECTIVES

INTRODUCTION

Advancements in digital technologies and information ecosystems – which here, refers to all relevant regulation, actors, digital platforms, and information itself – have fundamentally reshaped the way information is shared and consumed. On the one hand, this interconnected network of information has facilitated greater civic participation in political, economic and social life while also enhancing governments' capacity to communicate and respond to the evolving needs of the public they serve (OECD, 2014[1]). On the other hand, instantaneous and continuous exposure to conflicting and rapidly changing information further complicates an already overwhelming landscape of information and knowledge exchange (OECD, 2021c[2]). Although this increase in accessibility facilitates an unprecedented conduit to knowledge and opportunities, it also provides the optimal environment for circulating false and harmful information at a rapidly accelerated pace. The rise in the circulation and exposure of inaccurate information has trickled into all aspects of public life, including health, education, market activity, financial literacy, and political and social affairs (Greifeneder et al., 2021[3]).

Inaccurate information is often presented in common formats such as junk science, fake news, and gossip tabloids, among others, but is best understood as either misinformation, which is the unintentional spread of inaccurate information, or disinformation, which is the intentional spread of inaccurate information for political, financial, or otherwise self-serving ends (Carrasco-Farré, 2022[4]; OECD, 2021c[2]).

> *Exposure to false or misleading statements can cast doubt on official and factual information, and can erode the integrity and credibility of democratic institutions and their ability to enhance public welfare through policy measures.*

The threats posed by the spread of mis- and disinformation have profound effects on the ability of democratically-elected governments to serve their public, disrupting policy implementation and hindering trust in institutions. Exposure to false or misleading statements can cast doubt on official and factual information, and can erode the integrity and credibility of democratic institutions and their ability to enhance public welfare through policy measures (Brezzi et al., 2020[5]; Colomina et al., 2021[55]; Lesher et al., 2022[6]). Fears relating to the increased circulation of false information

were abundant when reports broke of the Cambridge Analytica Scandal in 2018, and its influence in political affairs such as the 2016 United States Presidential Election and the 2016 UK referendum to withdraw from the European Union (BBC, 2018[7]; Bovet & Makse, 2019[8]; Marshall & Drieschova, 2018[9]). Although we are unable to accurately assess the full impact of misinformation, risk perceptions associated with the spread of misinformation among online users remain high. A recent survey conducted across 142 countries found that 58.5% of regular Internet users reported concerns over the spread of misinformation with the highest concern concentrated in liberal democratic governments (Knuutila et al., 2022[10]). Despite growing worries over the manipulation of digital technologies for interfering in political and social affairs, the implications of mis- and disinformation on the dynamics between government and the public became most apparent during the COVID-19 pandemic when accessibility to accurate, timely, and reliable information became crucial in all efforts to control the spread of the virus (Posetti & Bontchva, 2020[11]).

BEHAVIOURAL SCIENCE FOR INFORMATION ECOSYSTEMS

The rapid advancements in online informational platforms have created a sophisticated environment of triggers, cues, and choices that have broadened the scope of influence that digital technologies have on individual-level behaviour. Unlike traditional informational mediums, digital hubs engage users in active behaviours and decision-making, presenting opportunities for even small digital modifications to amount to large-scale changes in collective-behaviours (Lorenz-Spreen et al., 2020[13]). Elevated by the rise of digital environments designed to compete for user engagement and attention, there has been an alarming increase in the use of proprietary, non-transparent, and often unregulated measures, such as sophisticated AI algorithms, that are designed to extract and exploit user patterns and behaviours (Lorenz-Spreen et al. 2020[13]; Matasick, et al., 2020[14]). These sophisticated information spaces, which are increasingly used as primary sources for news information, can intentionally or unintentionally destabilize a shared sense of truth and undermine trust in public institutions and authoritative sources of information about all aspects of public life.

Behavioural science is a multidisciplinary approach to the study of human behaviour and decision-making, combining findings and methods from cognitive science, decision science, social science, as well as psychology, anthropology, and economics, to integrate a human-centred perspective towards today's policy goals. Within the realm of misinformation, behavioural science draws on knowledge of human behaviour and current, as well as past contextual factors, to understand how individuals consume and interact with information, what attracts them to certain information sources or mediums, and why some may be more easily targeted by false or unsubstantiated claims than others (Van der Linden et al., 2021[15]).

As a discipline, behavioural science provides an empirical framework that supports researchers and practitioners in performing deeper analyses that explore the social, emotional, and cognitive conditions – such as trust bonds or openness to information – that influence how individuals interact with the information around them (for examples, see, Roozenbeek et al., 2020[16]; Van der Linden et al., 2020[17]; Zimmermann & Kohring,

2020[18]). In doing so, behavioural science can also allow researchers, policy makers, and Big Tech to disentangle information ecosystems specifically – including their design, functions, and objectives – to better understand how to carefully manage online platforms to optimise their potential to serve, rather than exploit, users.

Understanding how complex cognitive, emotional, and social processes influence the way individuals navigate information ecosystems, and conversely, how information ecosystems influence individual-level behaviours, can allow governments, communicators, and behavioural science practitioners to better understand the landscape in which they design and deliver policies, programs and communications.

Cognitive and contextual factors have a particularly strong influence over how people exchange and consume information. Cognitive overload, for example, can cause individuals to reject true information because of negative emotions, such as stress, anxiety, confusion, fear, or fatigue, that are felt when they are subjected to high volumes of information (Sweller, 1988[19]). The most recent Digital News Report, published by Reuters Institute at the University of Oxford, finds an increase in news fatigue, not only for COVID-related news, but also around a variety of topics, instigating readers' selective avoidance to reduce their consumption of specific information (Newman et al., 2022[20]). Conversely, confirmation bias and anchoring bias can influence the way individuals are prone to accepting misinformation. Confirmation bias describes the tendency to reject information that does not confirm or support predetermined beliefs or ideas. This bias is worsened by the presence of anchoring bias, which occurs when individuals anchor their beliefs and opinions to outdated or irrelevant information rather than updating their perspectives according to recent or new information (Furnham & Boo, 2011[21]).

Behavioural science can also provide frameworks for analysing the underlying systems of choice and decision making to establish how these relate to individuals' information-seeking and sharing behaviours. For example, understanding the core elements that influence how individuals form trust and what social and contextual factors can strengthen and weaken that trust can provide useful insights into how individuals decide where to seek out information, their willingness to accept or reject that information, and can even help predict their susceptibility to believing and sharing misinformation (Agley & Xiao, 2021[12]; Ognyanova et al., 2020[22]).

Broadening our collective understanding on the determinants of trust also provides insights into the ways social, emotional, and cognitive factors influence the dynamics between government institutions and the public they serve.

For instance, individuals' willingness to comply with COVID-containment measures in Europe were found to be associated with their trust towards policy makers prior to the pandemic (Brezzi et al., 2021[23]). Through this, and similar insights, behavioural science, when embedded throughout the policy cycle, can provide practical and empirically-tested advice to help inform problem-identification, as well as contribute to the design and implementation of sustainable and targeted policy solutions that serve the needs of the people they are enacted to benefit.

Cognitive and contextual factors have a particularly strong influence over how people exchange and consume information.

In addition to helping identify factors that are common to individuals everywhere, behavioural science also provides a scientific basis for better understanding the factors that make individuals unique. Collecting data on the diversity in people's preferences, perspectives, concerns, and motivations – as well as the factors that contribute to variations in these – can allow policy makers to propose human-centred solutions that reflect the unique composition of their audience. Classic socio-economic indicators, such as sex, income, or education-level, can be enhanced with relevant data about the diverse preferences and needs of the public and ideally, inform decisions that are targeted and tailored to the preferences of those they aim to serve. As such, failure to employ a behavioural lens can be detrimental to the uptake and overall success of such policy solutions.

> *Failure to employ a behavioural lens can be detrimental to the uptake and overall success of such policy solutions.*

BEHAVIOURAL EXPERIMENTATION FOR SUSTAINABLE POLICY SOLUTIONS

During the pandemic, governments began exploring opportunities to leverage behavioural science and experimentation in their COVID-response measures (OECD, 2020[24]). Frameworks, toolkits, and additional resources aimed at providing governments with guidance for combatting the spread of COVID -19 frequently pointed to the advantages of applying behavioural functions to reinforce health and safety and to better understand how citizens were experiencing a novel situation without a clear precedent. COVID-19 containment measures rely overwhelmingly on individual behaviours and people's willingness to increase practices such as handwashing, mask-wearing, and social distancing. As such, initiatives employing a behavioural lens to understand the barriers and enablers that influence individuals' willingness to engage in such practices became imperative to the design and implementation of far-reaching and typically all-encompassing measures (European Centre for Disease Prevention and Control, 2021[25]; Office of Evaluation Sciences, 2021[26]; WHO, 2020[27]).

Subsequent reports for more targeted applications of behavioural science emerged with recommendations for addressing misinformation relating to COVID-19 specifically, including the World Health Organisation (WHO) behavioural science survey tool which was used to inform the design of the featured case study (WHO, 2020[27]) (for additional examples see, OECD, 2020[24]; Office of the U.S. Surgeon General, 2021[28]).

Governments and BI teams began conducting their own research to understand the effects of behaviourally-informed policy within their jurisdictions and to scale successful interventions as part of their own COVID-19 response. This included gathering insights on how citizens were coping with the effects of the pandemic, trends in attitudes and behaviours relating to the COVID-19 virus, and whether response measures and communications were serving the public as intended.

For example, the US' Office of Evaluation Sciences launched a five-year project, encompassing eight randomised controlled trials, to test the effects of seven different behaviourally-informed communications for increasing vaccination uptake among Americans, which concluded that behavioural interventions to be effective for boosting vaccination rates (Office of Evaluation Sciences, 2021[26]). Similarly, the Irish Department of Health used empirical research on the use of cognitive levers such as salience, accessibility, and informational provisions to inform public communications on handwashing in public and workplaces (Murphy, 2020[29]). They used randomised controlled trials to test the effects of behaviourally-informed methods, such as goal-framing, on Ireland's contact-tracing application COVID Tracker, finding benefits for increasing uptake, trust, and participation for contract-tracing apps (Julienne et al., 2020[30]).

Contrary to beliefs that research and rigorous evaluation is always time and cost-intensive, experimentation designed with a behavioural lens can provide valuable evidence-based insights even when time and budget are limited. These examples, including the featured case study, represent only some of the many successful behaviourally-informed tests conducted during a time of crisis where time and resources were scarce.

These examples reinforce the observable trend towards mainstreaming behavioural science in the policy cycle, while also underscoring the importance of using quantitative and qualitative research methods to provide key insights at the earliest and most critical stages of the policy cycle. Holistic problem-diagnostics, coupled with empirical data about the unique preferences and needs of a population can be used to better anticipate policy outcomes and avoid unintended, negative or backfire effects by testing and/or comparing iterations of policy interventions on a subset of the population of interest in a controlled environment. Rigorous testing by BI practitioners is fundamental to understanding key policy areas like climate change, social inequality, policy reform, and mis- and disinformation, as well as individuals' attitudes and acceptance of specific policy interventions such as taxation, regulation, or social support proposals.

GLOBAL RESPONSES TO GLOBAL CHALLENGES

The insights produced by behaviourally-informed experimentation become even more powerful when tested and replicated in different environments and across diverse samples. Comparative analyses between different countries or along different demographic segmentations can provide significant insights on the influence of economic, social, political, and cultural preferences on shaping and shifting human behaviour. These insights can in turn help explain why certain policies are successful in some contexts and not in others, while also revealing additional social or economic trends that can help inform current and future policy objectives. Although these analyses are relevant for

local, regional, and national levels, their insights provide a unique benefit for the global community concerned with challenges that demand cross-border co-operation and co-ordination.

The global nature of the COVID-19 pandemic demands transnational responsiveness. This is a common characteristic of today's global challenges, such as climate change, and misinformation, which are united by their boundless influence and implications. Solidarity among and across governments is the first step in co-ordinating efforts to tackle global policy issues. The OECD continues to foster global dialogue on key challenges such as mis- and disinformation by convening governments with shared objectives of generating relevant and timely research that can protect the integrity of democratic institutions and their ability to maintain and enhance the well-being of the public. Examples of the OECD's contribution in this regard include publications such as the OECD Report on Public Communication the Global Context and the Way Forward (2021[2]) and Governance responses to disinformation: How open government principles can inform policy options (Matasick et al., 2020[14]). The impact of this work is enhanced through coordinated efforts across governments to achieve cross-border innovation and experimentation, and contribute to global knowledge on policy challenges and their solutions (OECD, n.d.[31], 2021a[32], 2021b[33], 2022[34]).

The OECD continues to foster global dialogue on key challenges such as mis- and disinformation by co-ordinating governments with shared objectives in order to protect the integrity of democratic institutions and their ability to maintain and enhance the well-being of the public.

2

HOW? A CASE STUDY FROM CANADA

BACKGROUND AND OBJECTIVES

In 2017, the Government of Canada established Impact Canada, a whole of government framework for scaling up and mainstreaming outcomes-based policy/program methods, such as the application of insights and methodologies from the behavioural sciences. This portfolio of work seeks to bridge the gap between policy development and effective implementation. With a Centre of Expertise housed in the Privy Council Office (a central agency in Canada's federal public service), Impact Canada is comprised of a multidisciplinary, specialised team with extensive experience in the development and execution of novel policy and program methods, and is home to Canada's Behavioural Science Team.

In March 2020, Impact Canada launched a program of applied research – grounded in behavioural science – to support the Government's COVID-19 response efforts in accurately and effectively promoting behaviours recommended by Canadian public health experts. This included a nationwide longitudinal study (COVID-19 Snapshot Monitoring Study - or 'COSMO' for short) which was adapted from a suite of resources released by the WHO (Privy Council Office of Canada, 2020[35]; WHO, 2020[27]). Between April 2020 and 2021, sixteen waves of data from roughly the same cohort of 2,000 Canadians were collected through COSMO. Over time, COSMO has amassed a rich and robust dataset reflecting Canadians' diverse pandemic experiences.

In continuing to monitor and analyse the pandemic through a behavioural lens, a series of troubling signals emerged from the data related to misinformation. For example, between April 2020 and 2021, Impact Canada identified pervasive knowledge gaps and high levels of belief in verifiably false information about COVID-19. Importantly, greater belief in misinformation was consistently associated with important health-related behaviours, such as intentions to get vaccinated (and boosted) against COVID-19; a finding later corroborated in the broader academic literature (for example, Loomba et al., 2021[36]). These findings – alongside data emerging from the international community – alerted the team to the threat of misinformation for COVID-19 response efforts, and prompted the development of a new scope of work focused on better understanding and mitigating the spread of misinformation in Canada.

To tackle this, the OECD convened a first-of-its kind partnership between Impact Canada, the French Behavioral Insights Team at the DITP, and academic experts. At its core, the partnership aims to develop and share behaviourally-informed best practices that can guide government response to this pressing policy challenge. To this end, Impact Canada led an inaugural, collaborative project amongst the partners: a randomised controlled trial embedded within COSMO Canada aimed at better understanding and improving the quality of information shared in the online social media ecosystem.

APPROACH AND STUDY DESIGN

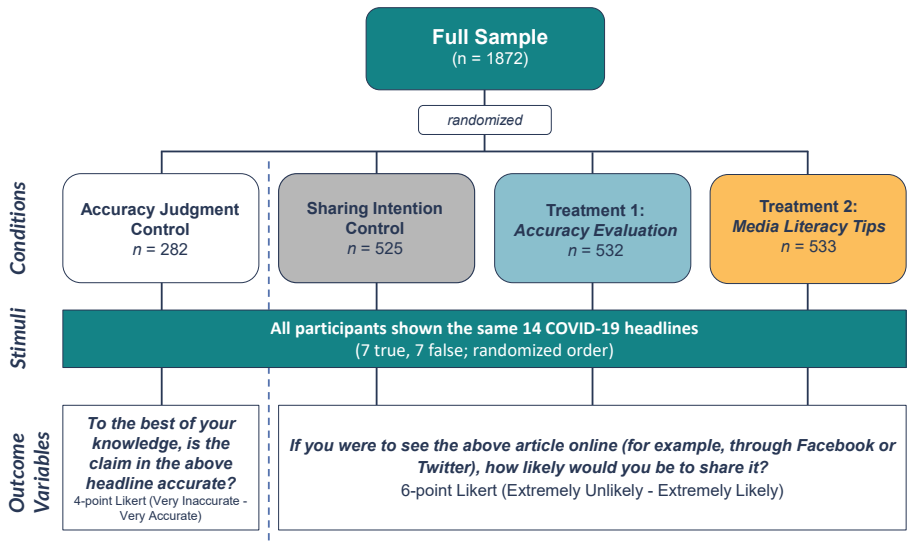
Existing research suggests that changing behaviours relating to sharing misinformation (i.e., the act of being exposed to misinformation and choosing to share it on social media) can significantly impact the quality of information circulating online (Pennycook & Rand, 2022[37]). This study was designed as a first step towards building knowledge on how Canadians engage with COVID-related information online and make choices about what types of information to share or amplify within their social networks.

The academic literature offers a few theoretical accounts of why individuals share misinformation, acknowledging that drivers of susceptibility and spread are complex and multifaceted. One such account, explored in detail in a recent Nature publication by Pennycook and colleagues (2021[38]), hypothesised that most people do care about sharing accurate information, and can discern true from false content; however, they are often distracted from thinking about the accuracy of information in online settings. Other features of the user experience when scrolling rapidly through high volumes of mixed-content likely interfere with analytical thinking processes and pull attention away from the accuracy of information when making decisions about what to share in one's networks (Zimmerman & Kohring, 2020[18]; Pennycook et al., 2020[39]). Accordingly, the authors provide evidence that a brief intervention designed to cue users to think about accuracy, prior to engaging with social media content, can reduce the sharing of false content online (Pennycook et al., 2021[38]). They have since replicated this finding across a number of settings and using a variety of different types of news stimuli (including COVID-related news) (Pennycook and Rand, 2022[37]).

Leveraging this research, Impact Canada and its partners sought to replicate Pennycook and colleagues' (2021[38]) work in a Canadian context and contrast it with a digital media literacy tips intervention (building upon approaches tested by (Epstein et al., 2021[40] and Guess et al., 2020[41]). Cross-national replication and extension of experiments is particularly important here, as belief in misinformation and sharing of misinformation has been found to vary substantially across countries (Arechar et al., 2022[42]). The objectives of this study were threefold: (1) establish a baseline understanding of Canadians' willingness to share COVID-19 information online, (2) better understand the individual- and environmental-level factors contributing to sharing decisions, and (3) evaluate the effectiveness of two behaviourally-informed interventions aimed at cueing attention to information accuracy and thereby reducing spreading of verifiably false or debunked information.

> *Pennycook and colleagues (2021) hypothesised that most people do care about sharing accurate information, and can discern true from false content; however, they are often distracted from thinking about the accuracy of information in online settings.*

Figure 1. Delineative representation of the four experimental groups



Source: Diamond, N.B, Pereira, B., Colasanti, A., Chammat, M., Varazzani, C., & Conway, L. (2022, May[43]). Understanding and countering misinformation in Canada with insights from the behavioural sciences [Conference]. Behavioural Science and Policy Association Annual Conference 2022.

To achieve these objectives, the IIU designed and embedded an online randomised controlled trial within Wave 15 of the COSMO Canada survey (fielded August 12-14, 2021). The study included a broadly nationally representative sample of 1872 Canadians. Participants were randomly assigned to one of four groups: (1) Accuracy Judgment control; (2) Sharing Intentions control; (3) Accuracy evaluation treatment; and (4) Digital Media Literacy treatment (see Figure 1).

Accuracy Control

The accuracy control group served as a baseline measure of Canadians' ability to discern between true and false COVID-19 news headlines. Participants (n=282) were presented with 14 real COVID-related news headlines (half true and half false, in randomised order) as they would appear on social media. Headlines were drawn from previously published work by Pennycook and colleagues, and false headlines were deemed false by third-party fact-checking websites. Participants were then asked, 'To the best of your knowledge, is this claim in the above headline accurate?' and given a 4-point scale ranging from 'not at all accurate' to 'very accurate', following Pennycook et al. (2021[38]; Studies 3-5).

Sharing Intentions Control

The sharing intentions control group served as a baseline measure of Canadians' intentions to share true and false headlines online. Participants (n=525) were presented with the same 14 headlines and asked, "How likely would you be to share this news headline on social media?". Participants responded using a 6-point scale ranging from 'extremely unlikely' to 'extremely likely'.

INTERVENTION 1

Accuracy Evaluation Prompt

Participants in the accuracy evaluation prompt group (n=532) were presented with an accuracy evaluation prompt containing a neutral, non-COVID-19 related headline, "Scientists discover the 'most massive neutron star ever detected", and asked to rate its accuracy (using the same 4-point scale provided to the accuracy control group). Following this prompt, the participants were presented with the same 14 headlines and asked how likely they would share them on social media (using the same 6-point scale as the sharing intentions control group).

INTERVENTION 2

Digital Media Literacy Tips

Participants in this group (n = 533) were first provided with a list of digital media literacy tips, used in prior academic research (Guess et al., 2020[41]):

- "**Investigate the source**. [Ensure that the story is written by a source that you trust with a reputation for accuracy. If the story comes from an unfamiliar organization, check their "About" section to learn more]";
- "**Check the evidence**. [Check the author's sources to confirm that they are accurate. Lack of evidence or reliance on unnamed experts may indicate a false news story.]";
- "**Look at other reports**. [If no other news source is reporting the same story, it may indicate that the story is false. If the story is reported by multiple sources you trust, it's more likely to be true.]";
- "**Be skeptical of headlines**. [False news stories often have catchy headlines in all caps with exclamation points. If shocking claims in the headline sound unbelievable, they probably are.]";
- "**Watch for unusual formatting**. [Many false news sites have misspellings or awkward layouts. Read carefully if you see these signs.]".

Participants then performed a multiple choice attention check question to confirm they read the tips. Participants were then presented with the same 14 headlines and asked how likely they would share them on social media (using the same 6-point scale as the sharing intentions control group and accuracy evaluation prompt group). In both treatments 1 and 2, the intervention (accuracy evaluation prompt or digital media literacy tips) occurred one time, before beginning the sharing intentions rating task.

FINDINGS

FINDING 1

Some individuals may share news that they do not believe

First, the results of this experiment showed that both accuracy ratings and sharing intentions were higher for true versus false headlines (see Figure 2). That is, overall, respondents were more likely to rate true headlines as accurate compared to false headlines, and indicated higher intentions to share true headlines, as expected. However, the difference in sharing intentions for true versus false headlines was four times smaller (in effect size) than the difference in accuracy judgments.

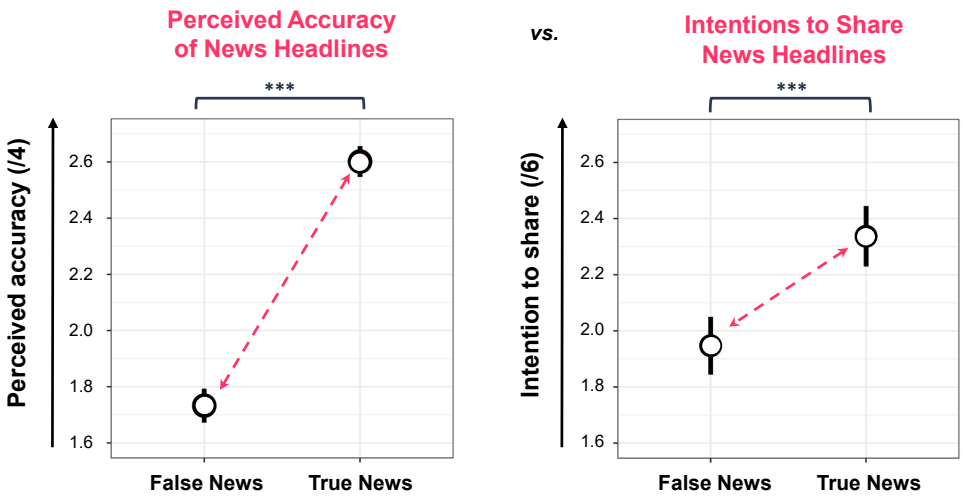
These findings replicate the disconnect between accuracy judgments and sharing intentions first identified by Pennycook et al (2021[38]). Given that sharing intentions appear to be at least partly disconnected from knowledge of what is true and false, these results indicate that some individuals may share news that they do not believe.

FINDING 2

Shifting attention to accuracy significantly increased the quality of information shared

Secondly, replicating Pennycook et al. (2021[38]), the experiment demonstrated that providing an accuracy evaluation prompt (i.e., asking respondents to evaluate the accuracy of an unrelated, neutral news headline)

Figure 2. Perceived Accuracy of News Headlines vs. Intentions to Share News Headlines



***p < .001, **p < .01, *p < .05; Holm correction for multiple comparisons; error bars are 95% confidence intervals. For accuracy perceptions, participants were asked 'To the best of your knowledge, is this claim in the above headline accurate?', and participants responded on a 4-point scale ranging from 'not at all accurate' to 'very accurate'. For sharing intentions, participants were asked 'If you were to see the above article online (for example, through Facebook or Twitter), how likely would you be to share it?', and participants responded on a 6-point scale ranging from 'extremely unlikely' to 'extremely likely'. Here, and in below analyses, participants who responded 'extremely unlikely' to every headline (both true and false) were omitted from analysis, consistent with prior literature. Scales were derived from Pennycook et al. (2021[38]; studies 3-5).

Source: Diamond, N.B, Pereira, B., Colasanti, A., Chammat, M., Varazzani, C., & Conway, L. (2022, May[43]). Understanding and countering misinformation in Canada with insights from the behavioural sciences [Conference]. Behavioural Science and Policy Association Annual Conference 2022.

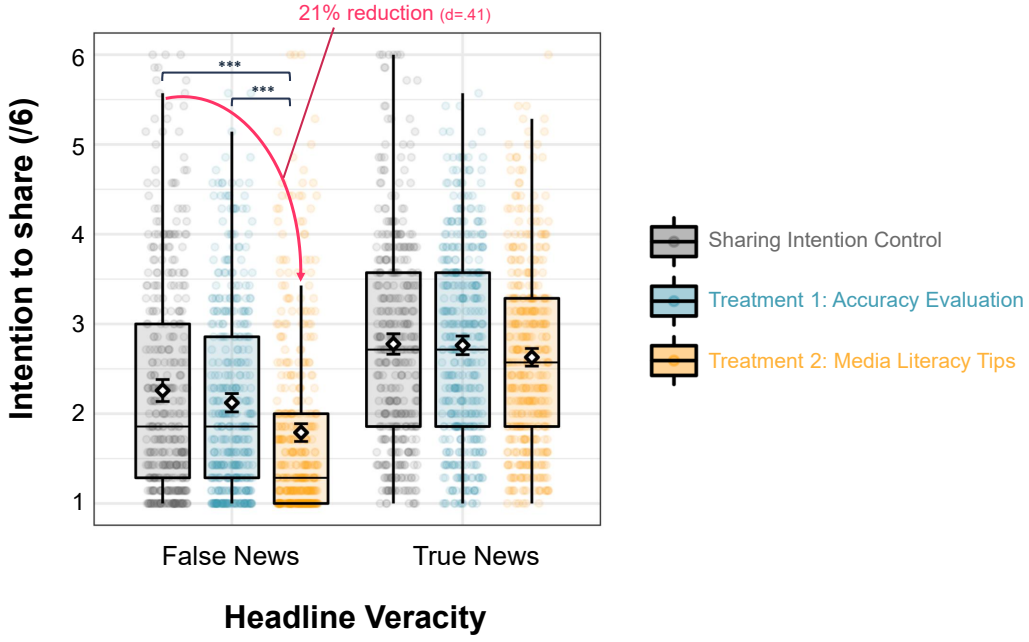
improved the overall quality of news shared relative to the control condition (see Figure 3). In other words, the accuracy evaluation prompt increased the gap in sharing intentions for true versus false headlines by eliciting a small reduction in sharing intentions for false headlines. The effect of this intervention was very subtle, but consistent with Pennycook et al. (2021[38]), who also demonstrated that alternative prompts (e.g. asking participants to rate the humorousness of a single headline prior to engaging with social media content) did not affect sharing intentions. Ultimately, this finding replicates and extends what has previously been demonstrated in the literature to a Canadian context, and provides additional evidence that accuracy evaluation prompts may be a promising tool for improving the quality of information shared online.

FINDING 3

Digital media literacy tips had the greatest impact on reducing intentions to share false headlines online

Similar to the accuracy valuation prompt, providing a list of digital media literacy tips also improved the overall quality of news shared. Although both interventions were found to be effective relative to the sharing intentions control group, digital media literacy tips were much more effective than the accuracy evaluation prompt in reducing participants' intentions to share false headlines (see Figure 3).

Figure 3. Sharing intentions for false vs. true headlines across the three sharing conditions



***p < .001, **p < .01, *p < .05; Holm correction for multiple comparisons; along with boxplots, diamonds with white fill depict groups means, error bars depict 95% confidence intervals, and small coloured dots depict individual participants.

Source: Diamond, N.B, Pereira, B., Colasanti, A., Chammat, M., Varazzani, C., & Conway, L. (2022, May[43]). Understanding and countering misinformation in Canada with insights from the behavioural sciences [Conference]. Behavioural Science and Policy Association Annual Conference 2022.

The digital media literacy tips intervention reduced false headline sharing 3.5x more than the accuracy evaluation prompt. Relative to the control group, digital media literacy tips resulted in a 21% decrease in stated intentions to share false headlines. Having found that digital media literacy tips had such a strong effect on false news sharing intentions, it is clear that more research is needed to investigate which aspects of digital media literacy, and kinds of information delivery, are most effective.

FINDING 4

Individual differences in trust and information consumption shape sharing of, and belief in misinformation about COVID-19

As some individuals may believe and/or share misinformation more than others, several key questions remained: who believes and spreads misinformation in the first place, and why? Do our interventions work similarly for different sub-groups of people? To answer these questions, we leveraged the richness of the COSMO Canada survey data, which included a variety of validated measures of respondents' attitudes, beliefs, cognitive factors, as well as data on trust and information consumption. We hypothesised that differences in the sources respondents trust for COVID-related information, and the way they seek out and react to that information, would be associated with differences in susceptibility to misinformation – both in terms of belief and in sharing.

First, a multivariate machine learning approach ('k-means clustering') was used to identify underlying trust and information consumption profiles. This analysis is a common method for identifying sub-groups or 'clusters' of individuals from a larger sample, where individuals within a cluster have similar patterns of responses, and individuals in different clusters have different patterns of responses.

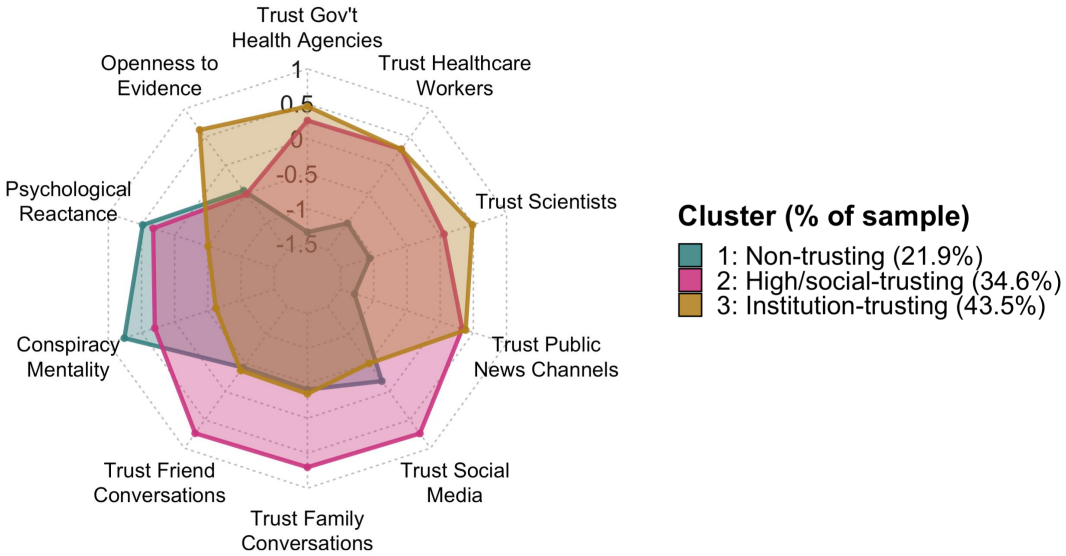
The following variables were used in this analysis: ratings of trust in a variety of sources for COVID-related information (federal government health agencies, healthcare workers, public news channels, social media, family and friends), trust in scientists, conspiratorial thinking (from the Conspiracy Mentality Questionnaire; Bruder et al., 2013[44]), psychological reactance (measuring one's aversion to perceived threats to their freedom; Hong & Faedda, 1996[45]), and openness to evidence (from the actively open-minded thinking about evidence scale; Pennycook et al., 2020[39]).[1]

The analyses identified three clusters of respondents based on their trust and information consumption profiles. They are visualised in Figure 4.

The section below briefly describes each cluster, including how many respondents each cluster comprises (as a percentage of the sample). Differences in select demographic and socioeconomic factors across clusters were also explored, and those that emerged as statistically significant are reported below.

[1] Conspiratorial thinking measures the tendency to engage in conspiratorial ideation. Psychological reactance measures how individuals react when they experience a threat to or loss of their freedoms. The actively open-minded thinking scale (AOTE) measures to what extent respondents think their beliefs/opinions ought to change according to evidence.

Figure 4. Clustering participants based on trust, information consumption, and cognitive traits



Note: The scale on this graph (ranging from -1.5 to 1) reflects standardised scores for each of the included variables. This means that '0' represents the average score for each variable across the whole sample (i.e., prior to clustering). This graph is designed to highlight differences across clusters, separately for each variable – differences in average trust across variables (e.g., greater average trust in government health agencies versus social media) are not visible here.

Source: Diamond, N.B, Pereira, B., Colasanti, A., Chammat, M., Varazzani, C., & Conway, L. (2022, May[43]). Understanding and countering misinformation in Canada with insights from the behavioural sciences [Conference]. Behavioural Science and Policy Association Annual Conference 2022.

Three clusters

- Non-Trusting (22.5% of the sample). Respondents falling in this cluster, are characterised by low self-reported trust in all sources (with lowest trust in government health agencies and highest trust in social media, relative to other respondents). They exhibit relatively high conspiratorial thinking and psychological reactance, and low openness to evidence.
- High (Social Media) Trusting (34.6% of the sample). Respondents falling in this cluster, exhibit high trust in all sources, especially (by comparison to the other clusters) in social media, family, and friends. Their lowest trust ratings were for government health agencies and scientists. They exhibit a medium-high degree of conspiratorial thinking, high psychological reactance, and low openness to evidence.
- Institution-Trusting (42.9% of the sample). Respondents falling in this cluster exhibit high trust in institutional/authoritative sources of information (government health agencies, healthcare workers, public news sources and scientists) and low trust in social news sources (social media, family and friends). They exhibit low conspiratorial thinking and psychological reactance, and high openness to evidence. On average, institution-trusting respondents are significantly older, more educated (higher proportion of university graduates), and have higher income than respondents in the other two clusters.

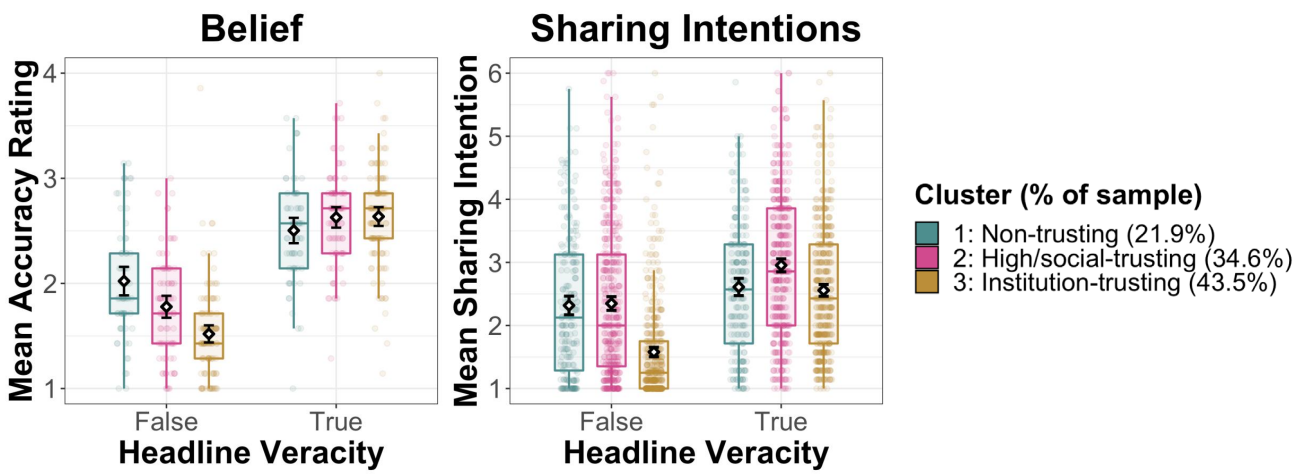
Having identified three profiles of respondents based on their trust and information consumption profiles, we investigated whether these profiles were associated with differences belief in and sharing of COVID-19 news headlines (see Figure 5). Indeed, as shown in Figure 5, the three clusters of respondents differed significantly in their belief of false news headlines about COVID-19, as reflected in their accuracy ratings (this analysis was restricted to respondents in the accuracy control group).

Specifically, respondents in the Non-Trusting and High (Social Media) Trusting clusters reported significantly higher belief in false news headlines than Institution-Trusting respondents, despite no difference in belief in true news headlines. As shown in Figure 5, there was evidence of a similar pattern for sharing intentions, as well: Non-Trusting and High (Social Media) Trusting respondents reported significantly higher sharing intentions for false news, compared to Institution Trusting respondents.

These results suggest that the information people consume, and the way they react to it, can in part be predicted by their beliefs about the world.

As a final step, the team examined whether the effects of the two interventions – accuracy evaluation prompt and digital media literacy tips – differed significantly across the identified clusters. This was not the case. This null finding suggests that the effect of the interventions on false news sharing intentions did not significantly differ across sub-populations, regardless of differences in cognitive factors, information consumption, trust and beliefs. Future research is needed to replicate and extend this finding in larger and diverse samples.

Figure 5. Group assignment predicts degree of misinformation belief and sharing intentions



Note: Both belief and sharing intentions models revealed significant interactions between segment and headline veracity. ***p < .001, **p < .01, *p < .05; Holm correction for multiple comparisons'.

Source: Diamond, N.B, Pereira, B., Colasanti, A., Chammat, M., Varazzani, C., & Conway, L. (2022, May[43]). Understanding and countering misinformation in Canada with insights from the behavioural sciences [Conference]. Behavioural Science and Policy Association Annual Conference 2022.

FINDINGS SUMMARY

1

Some individuals may share news that they do not believe (see figure 2)

2

Shifting attention to accuracy significantly increased the quality of information shared

3

Digital media literacy tips had the greatest impact on online users, reducing intentions to share fake news by 21% (see figure 3)

4

Individual differences in trust and information consumption shape sharing of, and belief in misinformation about COVID-19 (see figures 4 and 5)

LIMITATIONS

While this study replicates and extends published findings in the academic literature, there are some key study limitations to bear in mind.

The experiment was conducted online in the context of the COSMO Canada survey, and therefore results have limited external validity. Testing these interventions using a simulated social media environment, or, better yet, directly on social media platforms where individuals interact with information in day-to-day life, would provide better estimates of real world impacts, both at the level of individuals and on the aggregate quality of information circulating online. Pennycook et al. (2021[38]) demonstrated the real-world efficacy of the accuracy evaluation prompt in a real-world social media field experiment, and make the case that even small effects on individuals' sharing behaviour could amount to larger improvements to the social media ecosystem via compounding network effects.

There is, however, little solid evidence at present about the macro-scale consequences of deploying these interventions at scale. Research in this area is rapidly advancing, however, and new computational modeling work highlights the importance of multi-pronged interventions for meaningfully tackling the problem of viral online misinformation at scale (Bak-Coleman et al., 2022[46]).

Relatedly, the study only analysed sharing intentions and not actual sharing behaviour. Previous work has demonstrated concordance between surveyed sharing intentions and actual social media sharing behaviour 'in the wild' (Pennycook et al., 2021[38]), but we can only speculate about the degree to which sharing intentions in our sample generalise to real-world behaviour. In general, self-reported data, though common, is limited in the sense that there are often discrepancies between individuals' stated intentions and their actions.

Finally, the present study measured responses to only 14 real COVID-19 news headlines. Though these were drawn from pre-validated stimuli from previous publications, it is unclear whether and how these particular headlines (necessarily reflecting sentiments/events in the world at a particular moment in time) generalise to the broader, contemporary set of true and false COVID-19-related news circulating on social media. Future work is also needed to determine if the results may be applicable to other domains, topics, and to what extent misinformation susceptibility is shared across content domains (e.g., COVID-19 vs. climate change) within individuals.

3

FUTURE CONSIDERATIONS FOLLOWING FIRST CASE STUDY

KEY TAKEAWAYS FROM THE CASE STUDY

Given the complex and unprecedented nature of today's digital world, it would be irresponsible to believe that there was a single solution for mitigating all risks associated with misinformation. An issue as complex as misinformation demands a response equally multifaceted and agile. With this in mind, the following section offers insights from the case study.

The results gathered in this international collaboration suggest that intentions to share false (i.e., independently debunked) news headlines about COVID-19 online could be improved with solutions that leverage user-end decision-making. The results show that briefly cueing users' attention to the accuracy of the content they encounter on social media can have a subtle but positive effect on the quality of information they choose to share. Explicitly communicating media literacy tips to users, by contrast, has an even greater impact on their sharing decisions, significantly reducing intentions to share false news specifically.

Broadly, the outcomes of the study suggest that employing behaviourally-informed modifications to users' online journey can have a positive effect on their ability to self-monitor their content consumption and the spread of misinformation, while also preserving freedom of choice. The results of the segmentation analysis provide compelling support for expanding the scope of variables used by policy makers to better understand the cognitive, emotional, and social drivers that shape people's relationship with information. These findings highlight the utility of employing complementary approaches for rigorous policy and other data-driven initiatives that aim to understand variability across individuals' information consumption behaviours. A richer understanding of complex and multifactorial social issues – like the spread of misinformation – is required to develop lasting solutions that will generalise beyond stand-alone solutions, and to meet the changing demands of a diverse population.

These results can inform a wide spectrum of whole-of-society approaches relating to various policy areas. Although replication and further testing is required to understand the effects of these interventions in other contexts, the results signal the potential for behavioural applications that extend beyond prompting related cues on digital platforms associated with misinformation. Through behavioural approaches, data science tools can offer insights into different sub-populations which

provides new avenues to initiate and tailor measures and mechanisms that are better informed, situated, and accepted. In this sense, similar applications of behavioural science can help inform government communications and policy-making strategies and to ensure that key information is reaching its intended target audience. The results open the possibilities for employing behavioural research beyond misinformation as an isolated policy challenge, but also exploring how misinformation converges with other policy challenges such as climate change, gender equality, war and conflict, and the health and safety of citizens.

NEXT STEPS IN BEHAVIOURAL RESEARCH FOR MISINFORMATION

Advancing knowledge on the use of behavioural science to understand and address mis- and disinformation

Although the case study provides robust evidence in support of behaviourally-informed interventions for tackling misinformation, it provides limited insights into why some individuals are more susceptible to believing or sharing misinformation than others and how misinformation circulates among individuals and across communities. While academic literature on this topic is rapidly advancing, the application of such research in the public sphere remains limited. This is partly due to the limitations of current literature to speak to real-world effects of lab-tested experiments. Research methodologies can be easily outpaced by the rapidly changing architecture of the digital world, making it difficult for relevant stakeholders to anticipate the full impact and implications of misinformation and any solutions aimed at reducing its related harms.

Our knowledge remains limited with regards to the effects that cognitive, social, attitudinal, and emotional processes – such as trust in governments, in institutions and in each other – have on the way individuals navigate informational ecosystems and relatedly, how information ecosystems influence individual and collective behaviour. Defining the issue of misinformation remains challenging to all relevant actors, especially since consensus on definitions relating to misinformation such as "scientific truth", remain contentious (Krause et al., 2022[48]). What we do know is that factors such as trust are multidimensional and differ considerably across public institutions, levels of government, socio-economic dimensions such as sex, age, education and household income, and across different policy areas and challenges, which often shift and evolve over time (Brezzi et al., 2021[23]).

As such, additional efforts to apply a behavioural perspective to policy challenges are required to better understand and identify the necessary interventions needed to preserve the integrity and quality of the information that circulate both off and online. These efforts should strive to build upon classic socio-economic classifications of populations and include measures of cognitive, emotional, and social factors that can contribute to a more comprehensive and accurate overview of the dynamics of the digital world and the associated risks and solutions for misinformation.

Most importantly, advancements in related research should be executed with a global objective that matches the expansive nature of today's informational landscape. This can include international collaboration to produce preliminary research, develop cross-border comparative analyses in policy testing and evaluation, or offer open-access to data on completed or ongoing projects applying behavioural science, including their methodology, analyses, and outcomes.

Replicating and adapting empirical results

Beyond upholding scientifically rigorous practices, independent replication is vital for establishing the validity of ones' findings and their generalisability to a larger and/or different population (Arechar et al., 2022[42]). In the context of public policy, replication contributes to a greater understanding of the micro and macro trends in the economic, social, and political factors that guide individuals' preferences and beliefs while serving to validate or advance existing literature and research on related topics.

Intervention testing should be replicated and adapted by governments to different contexts. For instance, governments may choose to test the effects of both interventions across different demographic groups or adjust the digital literacy tips to present different cues for discerning false news from factual sources. Modifying already tested interventions will generate additional data about their effectiveness in different environments. It will also subject existing research to constructive scrutiny, which serves to improve the data and research often used to inform current and future policy outcomes.

Follow-up testing is required to understand the lasting effects of the interventions. Performing follow-up analyses is crucial for designing sustainable policy that will have durable effects. Studying how participants respond to the accuracy evaluation prompts and digital media literacy tips when presented repeatedly over time can reveal how stable these interventions are in the long run or whether other interventions are better at producing more effective results. Literature in this domain, relating to inoculation approaches for instance, tend to focus more heavily on the short-term effects of interventions and typically, invest less effort in designing studies that assess long-term effects (or lack thereof). As such, conducting follow up analyses that explore the persisting impact of interventions are necessary for better identifying the lifespan of a given policy measure.

Finally, it is important to emphasise the value of adapting results in a real-world environment for understanding and documenting the ways in which self-reported intentions translate to real sharing behaviour. The discrepancy between individuals' intentions and actions are frequently observed in the behavioural science literature - this is commonly referred to as the intention-action gap. This gap can help explain why some studies that generate effective results in artificial environments fail to scale once implemented in the real world. Although previous studies testing accuracy nudges were able to find similar results in field testing, testing accuracy prompts and digital literacy tips in digital spaces where users may encounter and share misinformation, will be the best way to understand their impact for reducing the spread of information online. These results should be used to inform governments' policy decisions – including upstream educational efforts – as well as the design of the user-experience curated and determined by tech companies.

3 SO WHAT? IMPLICATIONS FOR POLICY MAKERS

The following section outlines key implications and considerations for policy makers and other relevant actors concerned with the spread of mis- and disinformation:

1. **A comprehensive policy response to mis- and disinformation should include user-centred approaches that are informed by an expanded understanding of human behaviour.** Many of the current measures for combatting the spread of misinformation employ top-down solutions, whereby restrictions on the type of information circulated online are imposed vis-à-vis content quality regulation (Haciyakupoglu et al., 2018[50]). Proactive approaches that seek to 'inoculate' individuals against mis- and disinformation offer a user-centred approach that is complementary to existing measures and can act as an additional safeguard for when false information circumvents content regulation and accurate information fails to reach its audience (Van der Linden et al., 2021[15]). Policy makers and regulators should consider the impact and potential of implementing user-end solutions that empower individuals to be critical thinkers and encouraging online spaces to adapt such measures where applicable. These solutions should be designed to enhance individuals' ability to manage their own consumption of mis- and disinformation and preserve their freedom of choice while navigating the online world.

2. **Behavioural interventions provide effective, feasible, and scalable methods for combatting the spread of misinformation.** The results of the experiment suggest that behaviourally-informed modifications can be effective interventions to help mitigate the spread of misinformation online. Online platforms and technologies drastically outperform traditional policy processes in terms of responsiveness and adaptability, severely disadvantaging policy makers seeking to implement timely and relevant policy to mitigate the spread of mis- and disinformation (Lorenz-Spreen et al., 2020[13]). Behavioural interventions provide effective tools that are cost- and time-effective and can be useful for providing intermediary solutions while awaiting comprehensive regulatory measures to be implemented, as well as long-term solutions that boost regulatory approaches to digital regulation and user protections when/if enacted.

3. **Behaviourally-informed research provides insights into the underlying conditions that influence information consumption and exchange.** Designing effective and targeted solutions to misinformation requires a comprehensive assessment of the landscape in which it circulates. Exploring the dynamics of cognitive, emotional and social factors can offer new opportunities to understand the contextual conditions that influence individuals' behaviours and preferences (Brezzi et al.,

2021[23]). Armed with this knowledge, policy makers and regulators can enhance current and future policy decisions as well as produce innovative solutions that encourage citizens to be empowered and knowledgeable online users.

4. **There are no one-size-fits-all solutions for addressing mis- and information.** Although the study's results suggest both interventions are effective on all three clustered groups despite differing along socio-demographic dimensions, it also signals the potential for using behavioural science to offer bespoke solutions that align with the distinct and diversified abilities and interests of a given population. This study is one of the first steps to improving our understanding of the underlying conditions that should be considered when designing and implementing policy aimed for all of society. Behavioural science can expand the basis of variables policy makers refer to when designing policy by providing a richer understanding of their population's priorities, experiences and expectations. Equipped with knowledge on who spreads misinformation and why, decision makers can make informed judgements on how to strategically implement policy according to the specific preferences of a chosen population (Terracino et al., 2022[51]).

5. **International and collaborative experimentation to understand what works, for whom, and in which context is crucial for tackling global policy challenges.** International organisations such as the United Nations, the World Bank, and the World Health Organisation align with the OECD in a call for an increase in co-ordinated international efforts to tackle today's global challenges (United Nations, 2022[52]; World Bank Group, 2022[53]; WHO, 2022[54]). Cross-border experimentation is key for revealing the necessary conditions for successful policy in any given context. By replicating experiments in different jurisdictions, environments and among diverse populations, policy makers can better understand to what extent the unique cultural, social, political, and economic dimensions of their population shape policy outcomes (see Arechar et al. 2022[42] for examples of comparative analyses for reducing misinformation online).

6. **Partnerships between governmental and non-governmental actors are vital for an effective and sustainable response to the spread of mis- and disinformation.** A collective approach that is inclusive of government, experts, academics and other non-governmental actors is necessary for a co-ordinated and immediate response to this and other global policy challenges. Strategic partnerships such as the one formed for the provided case study create opportunities to foster knowledge-sharing and exchange best practices for mitigating the risks of misinformation. Engaging a diverse set of stakeholders in decision-making processes can enhance collective knowledge on the threats posed by the spread of harmful and inaccurate information as well as the immediate and long-term solutions (Terracino et al., 2022[51]).

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