

**HUMAN-CENTERED VERSUS TECHNOLOGY-BASED APPROACHES TO
MITIGATING THE EFFECTS OF WIDESPREAD MIS/DISINFORMATION: WHEN IS
ONE APPROACH MORE OR LESS SUFFICIENT?**

by
Rachel L. Greenspan

A research study submitted to Johns Hopkins University in conformity with the requirements for
the degree of Master of Arts in Global Security Studies

Baltimore, Maryland
January 2022

©2022 Rachel L. Greenspan
All Rights Reserved

Abstract

The spread of false information online has become a leading threat to the stability and security of democracies across the globe, as misleading information continues to influence the behaviors and attitudes of increasingly polarized populations. Existing literature makes clear that there is great value in both human-centered and technology-based approaches to countering mis/disinformation, and that a sustainable, long-term, whole-of-society solution will require a practical combination of both measures. However, this field of study lacks a clear understanding of under what circumstances each individual approach may be more or less sufficient. This paper will test the notion that as time sensitivity increases in cases of widespread mis/disinformation, that the use of technology-based solutions, involving fact-checking services and the removal of false content and users online, becomes increasingly effective as the primary tool employed to mitigate the effects of mis/disinformation. The method used in this study is a qualitative content analysis of cases of national crises in the United States, including the COVID-19 Pandemic and the rise of Domestic Violent Extremism (DVE). Altogether, the results of this study point to the insufficiencies of technology-based solutions acting alone to mitigate the effects of widespread mis/disinformation specifically under time sensitive conditions associated with national crises. However, this analysis highlights the apparent strengths, weaknesses, and associated challenges of both technology-based and human-centered approaches to mitigating the effects and increasing civic resiliency to mis/disinformation online. In doing so, the study provides further insights into the ways in which technology-based and human-centered approaches can be employed simultaneously, and often in sync with one another, to have the greatest impact.

Advisors/Reviewers: Professor Sarah Clark, Dr. Mark Stout, Dr. Stephen Grenier, Sarah O’Byrne

Acknowledgements

Thank you to my research advisor, Sarah Clark, and to all of my professors who have provided me with valuable instruction and guidance throughout my pursuit of this degree. I would also like to thank my friends and family for their patience, support and encouragement.

The author's affiliation with The MITRE Corporation is provided for identification purposes only, and is not intended to convey or imply MITRE's concurrence with, or support for, the positions, opinions, or viewpoints expressed by the author.

Table of Contents

Abstract	p. ii
Acknowledgments	p. iii
Introduction	p. 1
Literature Review –	
1. Human-Centered Approaches – Strengths	p. 4
2. Human-Centered Approaches – Weaknesses and Challenges	p. 8
3. Technology-Based Approaches – Strengths	p. 10
4. Technology-Based Approaches – Weaknesses and Challenges	p. 11
5. The Power of Human-Centered and Technology-Based Approaches Working Together	p. 14
6. Gaps in the Research	p. 17
Hypothesis	p. 17
Methodology	p. 17
Data	p. 20
○ COVID-19.....	p. 20
○ 2020 U.S. Presidential Election and the Rise of Domestic Violent Extremism (DVE)...	p. 26
Discussion	p. 33
Conclusion	p. 37
Bibliography	p. 40
Curriculum Vitae	p. 50

Introduction

The spread of false information online has become a leading threat to the stability and security of democracies across the globe, as misleading information continues to influence the behaviors and attitudes of increasingly polarized populations. Most people are not prepared to effectively navigate this complex information environment, largely due to a public deficit in awareness of the issue and media literacy skills, as well as insufficient technological solutions to identify, debunk, and limit the spread of false and misleading information across the internet. Martin Lessenski, author of the Media Index 2021 report, states, “the infodemic has created a trust crisis; eroding trust in medical and scientific knowledge and institutions, as well as in the governance necessary to lead and manage the response to an increasingly all-encompassing crisis – health, social and economic.”¹ The damaging effects of a growing body of disinformation and harmful, polarizing content circulating the media, combined with broader lack of preparedness across the general public to safeguard themselves against these influences is increasingly evident, elevating the need for a systemic solution to address this issue. Such a solution will involve a combination of human-centered and technology-based measures to mitigate the effects of widespread mis/disinformation. While each approach varies in their individual objectives, the measures involved in each strategy will ideally operate in concert with one another to reach the same overarching goal of countering and mitigating the effects of mis/disinformation. As each approach encompasses varying strengths, weaknesses and challenges, this paper will use a

¹ Sue Khalaieff. "Civil Online Reasoning Across the Curriculum." Illinois Civics Hub. Last modified February 22, 2021. <https://www.illinoiscivics.org/news/civic-online-reasoning-across-the-curriculum/>.

qualitative comparative case study analysis to explore if under certain conditions, one approach may prove to be sufficient on its own.

Human-centered approaches focus on broad education and awareness of the issue, while technology-based approaches focus on leveraging technological measures and platforms to flag, remove, and debunk false and misleading information and limit the number of users spreading this content online. It is important to note the key elements of each approach that distinguish these strategies from one another. Based on existing literature, the identified goals of a human-centered approach are to build civil society's capacity to mitigate and counter disinformation by raising public awareness of the issue and equipping individuals with the knowledge and skills necessary to develop healthy habits in navigating the online information environment.²

Practitioners aim to fulfill these objectives through educational media literacy interventions, mass communication efforts on behalf of public and private entities to highlight reliable sources of information, and whole-of-society strategies to enhance public trust in institutions and the media. Overall, the outcomes of this approach will prepare individuals to better differentiate between factual and misleading or fake content online. This includes a multitude of practices and procedures including the heightened and strategic use of critical thinking skills, identifying reliable sources, maintaining situational awareness of the threat and proliferation of mis/disinformation, and understanding the tactics, techniques and procedures of those creating and spreading mis/disinformation online.³ The goals of technology-based approaches include leveraging advanced technology and algorithms to detect false information online, communicate debunked falsehoods or clarify instances of misleading information, and identify and remove

² Henner Gimpel et al., "The Effectiveness of Social Norms in Fighting Fake News on Social Media," *Journal of Management Information Systems* 38, no. 1 (April 2, 2021): Taylor & Francis Online.

³ Darrell M. West, "How to Combat Fake News and Disinformation," Brookings, last modified December 18, 2017, <https://www.brookings.edu/research/how-to-combat-fake-news-and-disinformation/>.

nefarious actors producing and spreading mis/disinformation online. The ideal outcomes of this approach are to limit public exposure to mis/disinformation and the subsequent, and largely negative, impact this exposure will have on society.⁴

Additionally, human-centered approaches are generally proactive, as to pre-emptively and systemically prepare the population to face the threat of mis/disinformation. Although there are proactive measures that technology-based platforms can take, such as limiting the mechanisms through which false and misleading information can spread by removing features that inevitably recommend misleading content based on users' activity, current technology-based solutions are primarily considered to be reactive. Moreover, in the case of human-centered solutions, the responsibility falls primarily on civil society to acquire and apply the awareness, knowledge and skills necessary to become healthy producers and consumers of information online. In the case of technology-based solutions, the responsibility falls primarily on online platforms that disseminate and spread information, predominantly media organizations, social media platforms and various other private and government entities, to develop and leverage, as well as regulate, technological solutions to effectively prevent and limit the spread and impact of mis/disinformation. Furthermore, it is important to acknowledge that these approaches often exist on very different timelines. A human-centered approach serves as an ongoing, long-term, sustainable and systemic measure to address the issue of mis/disinformation. On the other hand, technology-based solutions, while evolving and hopefully improving over time, serve as more of an immediate, short-term remedy to address the problem. Finally, many experts evaluate how the different approaches operate under varying frameworks. These scholars point to technology-

⁴ Karen Naumann, "Using Fact-Checking to Overcome Disinformation," Public Relations Society of America, last modified October 2021, <https://www.prsa.org/article/using-fact-checking-to-overcome-disinformation>.

based approaches as taking on a “war perspective” of the issue, while human-centered approaches take on a “societal perspective.” The war perspective generally evaluates mis/disinformation as an act of war that should be countered by a type of technology-based “weapon,” while the societal perspective will leverage communications and educational interventions to broaden and enhance civil society’s ability to counter mis/disinformation.⁵

Finally, while misinformation refers to false information that is spread without the intention to mislead, disinformation refers to information that is deliberately misleading or biased.⁶⁷ For the purpose of this study, I will group these terms together, as it is the combination of widespread misinformation and disinformation surrounding the COVID-19 pandemic, as well as the disinformation surrounding the 2020 U.S. Presidential election and the misinformation that followed, that I will evaluate. While the extent and ways in which both forms of information spread will vary, and so will the impact, misinformation and disinformation contribute to the same overarching problem of an increasingly misinformed and polarized society.

Literature Review

Human-Centered Approaches – Strengths

Given that media literacy education is a relatively new discipline, most of the existing literature on the efficacy of media literacy interventions is produced by practitioners of this discipline themselves, rather than scholars assessing the big picture of this approach. These

⁵ Vojtěch Bahenský. “On Perspectives on Disinformation.” Peace Research Center Prague, 2019.<http://www.jstor.org/stable/resrep20620>.

⁶ Dictionary.com, <https://www.dictionary.com/browse/misinformation>.

⁷ Dictionary.com, <https://www.dictionary.com/browse/disinformation>

practitioners have contributed to the literature in summarizing the programs they have helped developed and implement, and the findings of these interventions.

A large portion of the research supporting a human-centered approach to mitigating the effects of mis/disinformation points to the value and efficacy of media literacy educational interventions. According to the National Association for Media Literacy Education, media literacy encompasses, “the ability to access, analyze, evaluate, and communicate media messages in a variety of forms.”⁸ Research has shown that a greater understanding of the nature of information being produced and spread across the media will allow individuals to exercise greater control in how they interpret and respond media messages.⁹ There is a large body of research that has explored the impact of media literacy instruction on the cognitive skills, attitudes, and behaviors of young people.¹⁰ These studies have shown that media literacy education can help individuals learn to employ critical thinking skills in assessing information online, determine the credibility of online sources and content, recognize diverse and plentiful points of view, recognize the impact one’s own messages may have on others within the information environment, understand the role of media in one’s culture, and more clearly understand the goals of the author(s) creating or spreading information.¹¹ Additionally, education focused on media literacy has been proven to enhance a sense of unity between people, providing opportunities for engagement with civil society and reducing polarization within communities.¹²

⁸ Huguet, Alice, Jennifer Kavanagh, Garrett Baker, and Marjory S. Blumenthal, *Exploring Media Literacy Education as a Tool for Mitigating Truth Decay*. Santa Monica, CA: RAND Corporation, 2019.

https://www.rand.org/pubs/research_reports/RR3050.html

⁹ Riley Murray et al., "The Importance of Media Literacy," in *Introduction to Media Studies* (PressBooks), digital file.

¹⁰ Hobbs, Renee, and Richard Frost. “Measuring the Acquisition of Media-Literacy Skills.” *Reading Research Quarterly* 38, no. 3 [p.334], (2003): <http://www.jstor.org/stable/4151822>.

¹¹ "What Is Media Literacy, and Why Is It Important?," Common Sense Media, <https://www.commonsensemedia.org/news-and-media-literacy/what-is-media-literacy-and-why-is-it-important>.

¹² Ministry of Education and Culture, *Media Literacy*, p. 6

Research also suggests that media literacy education has the potential to increase individual's willingness and interest in developing the awareness, knowledge, and skills necessary to operate more responsibly within media culture.¹³ This is particularly important, as the role of self-education will be essential in the pursuit of building and maintaining a healthier information environment in the future.¹⁴

While the harmful effects of mis/disinformation are seen across society, the lack of knowledge, skills and awareness necessary for individual's to be resilient against mis/disinformation and propaganda is especially clear amongst students. Recent studies assessing levels of media, digital and news literacy amongst students illustrate an urgent need to expand educational resources and formal training to prepare the population to think more critically about the information they are engaging with daily. One report published by Stanford's Graduate School of Education revealed that college students were easily duped by biased websites with "high production values" including links to news organizations and "polished" 'About' pages, and that 80% of middle schoolers couldn't tell the difference between sponsored content and actual news stories.¹⁵ The report concluded that a greater focus and emphasis on media literacy is necessary to prepare young individuals to be informed and effective consumers of information.¹⁶

¹³ Ministry of Education and Culture, *Media Literacy*, p. 5

¹⁴ Ministry of Education and Culture, *Media Literacy*, p. 5

¹⁵ Javeria Salman and Sarah Butrymowicz, "The In-School Push to Fight Misinformation from the Outside World," The Hechinger Report, last modified February 11, 2021, <https://hechingerreport.org/the-in-school-push-to-fight-misinformation-from-the-outside-world/>.

¹⁶ Donald, "Stanford Researchers," Stanford Graduate School of Education.

A series of media literacy interventions have demonstrated both a moderate and positive impact in improving participants' beliefs, attitudes, and behaviors related to media,¹⁷ including a recent RAND report which revealed that media literacy interventions were more effective in improving consumer beliefs, attitudes and behaviors related to media than were fact-checking practices and public warnings about Russian propaganda.¹⁸ Scholars suggest that educating civilians in media literacy has the potential to enhance public trust and attitudes toward institutions and one another, and exemplifies how a human-centered approach to countering disinformation serves as a sustainable, long-term solution to the growing problem.

Finally, while enhancing media literacy is a core component of human-centered approaches, this strategy also encompasses raising overall public awareness through individual efforts and collaboration amongst both public and private entities at the local, state and national levels. This includes raising awareness of emerging patterns and trends related to mis/disinformation online and according to a diverse array of subjects and/or unfolding or upcoming events. Existing research points to the value of broad public communication efforts to highlight reliable sources of information, such as news and media organizations encouraging citizens to seek public health information from trusted medical professionals versus online social media platforms. For example, a project funded by USAID points to the value of Civil Society Organizations (CSOs) to organize nationwide information and transparency campaigns to raise greater awareness about disinformation techniques and objectives.¹⁹ The project also points to

¹⁷ Jeong, Se-Hoon, Hyunyi Cho, and Yoori Hwang. "Media Literacy Interventions: A Meta-Analytic Review." *Journal of Communication* 62, no. 3 (April 24,2012):45472.
<https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1460-2466.2012.01643.x>.

¹⁸ Helmus, Todd C. and Marta Kepe, A Compendium of Recommendations for Countering Russian and Other State-Sponsored Propaganda. Santa Monica, CA: RAND Corporation, 2021.
https://www.rand.org/pubs/research_reports/RRA894-1.html.

¹⁹ USAID, "Countering Disinformation: Track, Inform, Engage, Inspire," East West Management Institute, last modified April 16, 2020, <http://ewmi-access.org/countering-disinformation-track-inform-engage-inspire/>.

the importance of recognizing the successes of community level organizations to garner greater government support and funding for these organizations to build in capacity and reach.²⁰

Human-Centered Approaches – Weaknesses and Challenges

While the literature predominantly points to the positive potential of a human-centered approach to mitigating the effects of mis/disinformation, existing research also points to the deficiencies and challenges associated with this resolution.

Many scholars have called into question whether media literacy helps to enhance the public's trust in the media and public institutions, or if it leads to individual's developing greater levels of suspicion toward these entities that are detrimental to society.²¹ Building off this point, additional research suggests that media literacy and educational interventions that are delivered, at least in part, by representatives of government, media and other public institutions which maintain low levels of trust, will be ultimately ineffective. Based on these cases, many speculate that government bodies are not well positioned to be the entity directly involved in delivering media literacy interventions. This, however, presents a challenge in developing and delivering a human-centered approach to countering mis/disinformation, as public sector organizations are evidently integral in the funding and formal implementation of large-scale public interventions. Governing bodies maintain the funding, resources, networks and mechanisms to allow local and community level civil society organizations, NGO's, media regulatory authorities, and academic

²⁰ USAID, "Countering Disinformation: Track, Inform, Engage, Inspire."

²¹ Monica Bulger and Patrick Davison, *The Promises, Challenges, and Futures of Media Literacy*, February 2018, https://www.datasociety.net/pubs/oh/DataAndSociety_Media_Literacy_2018.pdf; Huguet, Kavanagh, Baker and Blumenthal, "Exploring Media"

institutions to partner with one another and ultimately create and employ effective media literacy interventions.²²

Moreover, many scholars and skeptics argue that, regardless of public awareness and education on the subject, the existing values, opinions, and biases of individuals will remain the main factor driving one's susceptibility to believing and amplifying mis/disinformation online.²³ In line with this argument, limited studies also suggest that higher levels of media education make it easier to construct arguments and spread information favoring one's existing beliefs.²⁴

On another note, insufficient research and lack of clarity surrounding effective versus ineffective practices and processes involved in delivering media literacy interventions is problematic. This poses a significant challenge for policymakers, curriculum developers, researchers, and various teachers and trainers to understand and assess what media literacy interventions work best, and the best approaches to program implementation and scaling.²⁵ Additionally, wide-ranging interpretations of media literacy competencies pose challenges in aggregating research on the effectiveness of media literacy interventions.²⁶ There is also an absence of a common evaluation framework in order to make effective comparisons between a diverse range of media literacy projects with the same overarching goal.²⁷ While measurement indicators exist to evaluate media literacy skills across the population, these indicators often vary by program, school, and at the national and regional levels. While most interventions are evaluated by comparing the results of assessments completed before and after an intervention,

²² Huguet, Kavanagh, Baker and Blumenthal, "Exploring Media"

²³ Bulger and Davison, *The Promises*; Huguet, Kavanagh, Baker and Blumenthal, "Exploring Media"

²⁴ Huguet, Kavanagh, Baker and Blumenthal, "Exploring Media"

²⁵ Ibid.

²⁶ Ibid.

²⁷ European Audiovisual Observatory, *Mapping of Media Literacy Practices and Actions in EU-28*, by Martina Chapman, p. 31, <https://rm.coe.int/1680783500>.

they are often carried out using self-reporting mechanisms with no robust or standardized measures of effectiveness, and no third party or governing body providing external validity.²⁸ Experts also emphasizes how the specific goals of individual interventions often vary. For example, one study asks, “Is media literacy about instilling confidence, about prompting behavior change, or about creating new practices of media creation? The different goals outlined will require varying mechanisms for assessing levels of effectiveness.”²⁹

Technology-Based Approaches – Strengths

The primary strengths of technology-based approaches outlined in the literature point to technology as providing an effective means to prevent and limit the spread of false and misleading information online, which will in turn limit the negative impact of mis/disinformation on society.³⁰ Findings from recent studies point to the potential for fact-checking and debunking practices to improve individuals’ perceptual accuracy of political and medical misinformation.³¹ For example, studies found that fact-checking has an overall positive effect on political beliefs and that the correction of health-related misinformation has a positive impact on perceptions of topics related to public health.³² Studies also show that fact-checking often increases accuracy in political issues perception, and that “tags such as *disputed* or *rated false* make users perceive false headlines as less accurate.”³³ Many experts also highlight the value of online features

²⁸ Dr Mariya Stoilova et al., *Rapid Evidence Assessment on Online Misinformation and Media Literacy*, [Page #], June 9, 2021, https://www.ofcom.org.uk/_data/assets/pdf_file/0011/220403/rea-online-misinformation.pdf.

²⁹ Bulger and Davison, *The Promises*.

³⁰ Emily Henderson, ed., "Fact-checking is an Effective Tool to Combat Misinformation, Study Shows," News Medical, last modified September 7, 2021, <https://www.news-medical.net/news/20210907/Fact-checking-is-an-effective-tool-to-combat-misinformation-study-shows.aspx>.

³¹ Samikshya Siwakoti et al., "How COVID Drove the Evolution of Fact-Checking," *Misinformation Review*, May 6, 2021, <https://misinforeview.hks.harvard.edu/article/how-covid-drove-the-evolution-of-fact-checking/>.

³² Ibid.

³³ Ibid.

allowing users to submit fact-checking requests to media entities and third-party fact-checking services such as PolitiFact.com, which leverage technology to assess the reliability of a source and validity of content.³⁴ These features help enable collaboration and coordination between the public, civil society organizations, media outlets, and private organizations disseminating information. Research also points to the efficacy of grassroots fact-checking organizations ability to productively respond to rapid changes in the dis/misinformation environment.³⁵

Technology-Based Approaches – Weaknesses and Challenges

The literature points to various shortcomings and challenges associated with technology-based solutions to mitigating the effects of widespread mis/disinformation. These include the difficulty in ensuring that all technologists, journalists and other professionals responsible for providing fact-checking services are sufficiently educated in best practices in identifying falsehoods or misleading information online, differentiating between the two, and avoiding potential biases in doing so.³⁶

Additionally, as was also the case with human-centered approaches, the effectiveness and overall positive impact of technological solutions rely largely on the public's level of trust in the media and the private, non-partisan institutions regulating online content and providing resolutions such as fact-checking services. A lack of public trust will limit the impact of these measures and may even cause further confusion surrounding major events and enhance polarization on key issues facing society. While there is limited research surrounding which entities are considered and proven to be most reliable in providing technology-based solutions,

³⁴ Naumann, "Using Fact-Checking," Public Relations Society of America.

³⁵ Siwakoti et al., "How COVID."

³⁶ Peter Dizikes, "The Fact-Checking Trap," *MIT Technology Review*, April 15, 2020, <https://www.technologyreview.com/2020/04/15/999307/the-fact-checking-trap/>.

many researchers stress the importance of non-governmental entities such as civil-society organizations providing these services in order to limit the impact that a broader lack of trust in public institutions will have on the effectiveness of these measures.³⁷

Moreover, fact-checking and other solutions such as automated filters and blocking and debunking techniques run the risk of imposing on freedoms of speech and potentially producing false positives, which may result in the “backfire effect.”³⁸ The “backfire effect” refers to the idea that in cases where information aligns directly with one’s strong ideological beliefs, calling out this content as wrong will lead these individuals to more firmly believe the information.³⁹

The literature also points to difficulties in streamlining fact-checking measures across online platforms.⁴⁰ Different fact-checking services maintain different mechanisms and systems for classifying content and assigning it a corresponding tag or label to communicate whether the information is entirely false, a conspiracy theory intended to incite violence based on false claims, or simply misleading information.⁴¹ While experts claim that these rating scales can help to avoid confirmation bias, varying systems for applying these rating scales is likely to cause confusion and limit the positive impact these services will have on users. This raises the bar for ensuring that the population is robustly educated on the varying systems and practices used to assess and categorize content, sources, and accounts in order for these measures to be effective.

Recent research also highlights how nefarious actors spreading mis/disinformation online are adapting their tactics and techniques to transcend these technological countermeasures.

Research indicates that, “Rather than spreading objectively verifiable falsehoods,

³⁷ Huguet, Kavanagh, Baker and Blumenthal, “Exploring Media”

³⁸ Stoilova et al., *Rapid Evidence*.

³⁹ "The 'Backfire Effect' Is Mostly a Myth, a Broad Look at the Research Suggests," NiemanLab, <https://www.niemanlab.org/2019/03/the-backfire-effect-is-mostly-a-myth-a-broad-look-at-the-research-suggests/>.

⁴⁰ Dizikes, "The Fact-Checking."

⁴¹ Ibid.

mis/disinformation campaigns are increasingly based on ‘soft facts’ comprised of malleable information whose provenance is uncertain and thus harder to debunk.”⁴²

Additionally, a study conducted by the Brookings Institution determined that the extent to which an individual was “informed” about a particular subject largely determined their ability to accurately assess the credibility of a source of information when encountering a fact-check.⁴³ The study involved quizzing people on a list of 25 facts that had been checked by certified fact-checking groups, and then showing participants a fact-check about one of the issues they were previously quizzed on.⁴⁴ Those who were classified as misinformed, referring to those who were confident that they knew the answer to a specific question when they are actually mistaken, proved to be the least affected by exposure to the fact-check.⁴⁵ These people were also more likely to report the fact-check as biased. In discussing the results of the study, researchers noted the need for broader attitudinal changes in individuals for these services to be more effective.⁴⁶ This conclusion points to an area where a human-centered approach may be useful.

Finally, research examines the limited effectiveness of technology-based solutions given that this approach is broadly classified as non-systemic. The literature suggests that while these measures should not be underestimated, their successes are limited according to time and adaptability.⁴⁷ This argument emphasizes how, by the time false or misleading content has been debunked, “the world of media has already moved on, producing a vast number of new items in the process.” This idea highlights the rapid emergence of new sites and user accounts as others

⁴² Pamment and Kimber Lindwall, A. (2021). Fact-checking and Debunking. Riga: NATO Strategic Communications Centre of Excellence, p. 104.

⁴³ Jianing Li and Michael W. Wagner, "When Are Readers Likely to Believe a Fact-Check?," Brookings, last modified May 27, 2020, <https://www.brookings.edu/techstream/when-are-readers-likely-to-believe-a-fact-check/>.

⁴⁴ Ibid.

⁴⁵ Ibid.

⁴⁶ Ibid.

⁴⁷ Vojtěch Bahenský. “On Perspectives on Disinformation.”

are being flagged or removed for their practices in generating and spreading mis/disinformation.⁴⁸ This leads to a never-ending game of “whack-a-mole,” which, regardless of the technical measures in place, private entities can never truly win.

The Power of Human-Centered and Technology-Based Approaches Working Together

While it is important to debunk and limit the spread of as much false and misleading content as possible to limit exposure and the overall impact on society, it is equally critical to equip civil society with the knowledge, skills, and tools necessary to be resilient to the mis/disinformation that does fall through the cracks of technology-based countermeasures. Therefore, experts conclude that the solution lies in the synergy of human-centered and technology-based measures, complementing one other to enhance defenses and increase resiliency.

The U.S. Department of State’s Global Engagement Center (GEC) highlights the efficacy of a counter-brand approach to address the malign foreign influence of U.S. adversaries seeking to advance their own agendas via comprehensive disinformation campaigns.⁴⁹ This is an example of an approach that will be most effective in leveraging the strengths of both technological analyses of disinformation campaigns and comprehensive educational curriculum on the subject. In order to employ counter-brand campaigns, entities must gather information about the tactics, techniques and procedures (TTP’s) of foreign adversaries and domestic extremist groups in order to identify trends of mis/disinformation and build a substantial, evidence-based case against these actors. This information then must be shared with the population in a way that is far-

⁴⁸ Vojtěch Bahenský. “On Perspectives on Disinformation,” p. 36-37.

⁴⁹ *Academic and Think-Tank Research on Common Practices for Countering Disinformation* (Global Engagement Center, n.d.).

reaching and effective and paints an accurate picture of the nefarious activities of U.S. adversaries. This collaborative process depicts how fact-checking and debunking services, enabled by advanced technology, play a key role in the development of media literacy education material. For example, the Alethea Group is an organization that helps private companies figure out how to fight disinformation online based on varying case studies they conduct surrounding significant events such as the United States withdrawal from Afghanistan.⁵⁰ The group “detects and mitigates instances of disinformation and social media manipulation to help clients navigate the new digital reality,” combining technical measures with broader public education to communicate tactics and trends of online mis/disinformation to a variety of entities.⁵¹ Moreover, one study compared the ways that PhD historians, professional fact-checkers, and Stanford University students evaluated online social and political information.⁵² The results indicated that while the historians and students used trust metrics to evaluate information, which include variables that can be easily manipulated by sophisticated online actors, that fact-checkers more often took the approach of leaving the website to quickly research its validity. The fact-checkers were able to identify trustworthy information significantly quicker than the historians and students, likely due to their strong understanding of how information is disseminated online.⁵³ This research provides further support for the idea that there is a lot that civil society can learn from professionals trained to assess the credibility and validity of online sources and content.

Finally, scholars reference concepts surrounding System 1 and System 2 thinking, developed by notable psychologist and economist Daniel Kahneman, to highlight the importance of both technology-based and human-centered approaches operating in synch with one another.

⁵⁰ Alethea Group, <https://www.aletheagroup.com/resources/categories/case-studies>.

⁵¹ Alethea Group.

⁵² Bulger and Davison, *The Promises*.

⁵³ Ibid.

The literature notes how, “System 1 cognition is automatic and produces instant judgments in less than a second, whereas System 2 cognition is deliberate and requires cognitive effort, and that individuals usually do not invoke System 2 cognition unless they notice something amiss that requires deeper thought.”⁵⁴ Working within this framework, one study highlights how an effective intervention would involve an adequate fact-checking flag that first produces a strong enough response to stop a user from passively consuming the information, and subsequently prompting this user to activate their system 2 thinking in order to determine that the information is false or misleading.⁵⁵ The study also found that training raised the effectiveness of flags on user’s beliefs, as the fact-checking flags that combined System 1 and System 2 interventions were more than twice as effective following training.⁵⁶ This conclusion points to the notion that entities can raise the effectiveness of their technology-based measures by further educating users.

Finally, while scholars continue to acknowledge the value of technology-based approaches such as fact-checking, experts increasingly point to the pitfalls of this approach and emphasize the demand for greater awareness and comprehensive civic education on the subject.⁵⁷ Altogether, the literature increasingly points to the need for a ‘societal perspective’ on the issue, which will demand broader systemic changes and reforms necessary for long-term resilience against the threats posed by mis/disinformation.

⁵⁴ Alan R. Dennis, Antino Kim, and Patricia L. Moravec, *Appealing to Sense and Sensibility: System 1 and System 2 Interventions for Fake News on Social Media*, research report no. Vol. 31 No. 3 (2020), p. 4, <https://pubsonline.informs.org/doi/abs/10.1287/isre.2020.0927>

⁵⁵ Dennis, Kim, and Moravec, *Appealing to Sense*.

⁵⁶ Ibid.

⁵⁷ "Peter Pomerantsev: 'You can no longer fight lies with facts,'" Ukrainian Institute London, last modified July 5, 2016, <https://ukrainianinstitute.org.uk/peter-pomerantsev-you-can-no-longer-fight-lies-with-facts/>.

Gaps in the Research

Existing literature makes clear that there is great value in both human-centered and technology-based approaches to countering mis/disinformation, and that a sustainable, long-term, whole-of-society solution will require a practical combination of both measures. However, this field of study lacks a clear understanding of under what circumstances one individual approach may be more or less sufficient in serving as the primary tool employed in counter-mis/disinformation campaigns. In recognizing the impact of mis/disinformation surrounding time sensitive events, this study will explore whether technology-based solutions can effectively serve as the primary tool employed to mitigate the effects of mis/disinformation in times of national crises within the United States.

Hypothesis

My hypothesis is that as time sensitivity increases in cases of widespread mis/disinformation, that the use of technology-based solutions, involving fact-checking services and the removal of false content and users online, becomes increasingly effective as the primary tool employed to mitigate the effects of mis/disinformation.

Methodology

The method used in this study will be a qualitative comparative case study analysis of cases in which mis/disinformation was spread widely across the internet, specifically amongst social media platforms, and is reasonably presumed through available data to have had a

negative impact on society despite the application of technology-based solutions to counter the proliferation of this content. The cases I will evaluate will be scenarios of national crises in the United States. I have chosen to focus my study on cases of national crises as these scenarios are characterized by a large degree of time sensitivity. This aligns with my hypothesis, which states that I would expect these time sensitive national crises to create an environment in which technology-based measures will be sufficient as the primary measure employed to mitigate the effects of mis/disinformation. This hypothesis relies on the notion that technology-based solutions serve as an effective short-term, more immediate remedy to mis/disinformation. For the purpose of this study, I will define periods of national crisis as, “a situation or time at which a nation faces intense difficulty, uncertainty, danger or serious threat to people and national systems and organizations, and a need for non-routine rules and procedures emerge accompanied with urgency,” as described by the IGI Global Study, “A Proposed Framework for Incorporating Big-Data Technology in National Crisis Management Center.”⁵⁸ The national crises I will evaluate will be the COVID-19 Pandemic and the rise of Domestic Violent Extremism (DVE) in the United States. Regarding the COVID19 Pandemic, I will focus on the proliferation of vaccine mis/disinformation surrounding the public health crisis, and the impact of this false and misleading content on the public’s willingness to be vaccinated. Regarding the rise of DVE in the United States, I will focus on the proliferation of mis/disinformation surrounding the 2020 Presidential election and how this led to an influx of further mis/disinformation to include conspiracy theories and hate speech, and the impact of this on the rise of DVE ideologies and activities, culminating in the January 6th Insurrection. In both cases, I will evaluate technology-

⁵⁸ Kabeil, Magdy, and Kabil. "A Proposed Framework for Incorporating Big-Data Technology in National Crisis Management Center." In *Encyclopedia of Information Science and Technology, Fourth Edition*. edited by Khosrow-Pour, D.B.A., Mehdi, 2006-2019. Hershey, PA: IGI Global, 2018. <http://doi:10.4018/978-1-5225-2255-3.ch174>

based measures taken, predominantly by private entities, media organizations, and social media platforms, to prevent and limit the spread of mis/disinformation and reduce the impact this content had on public attitudes and behavior. I will evaluate whether the technology-based solutions were effective in doing so, and then draw conclusions regarding the overall effectiveness of these measures to serve as the primary approach employed to limit the spread, as well as the attitudinal and behavioral impact on the American public, in time sensitive cases such as national crises within the United States. If I find my hypothesis to be disproven, I will provide an assessment of how a greater emphasis on a human-centered approach to complement technological measures may have provided a better outcome. However, there will be no direct comparison of technology-based and human-centered approaches in the context of these cases, as the focus of the study remains on the effectiveness and sufficiency of technology-based solutions in cases of time sensitivity such as during the COVID-19 pandemic and the rise of DVE.

My data includes metrics and trends regarding the spread of false or misleading information on social media platforms, surveys outlining public information consumption habits and the attitudinal or behavioral indicators of the impacts of mis/disinformation, and various studies and news media surrounding technology-based measures taken by private entities to counter the spread of mis/disinformation in these specific cases. My criteria for evaluating whether the data presented confirms or denies my hypothesis includes a careful evaluation of attitudinal and/or behavioral outcomes in each situation. Regarding the COVID-19 pandemic and the proliferation of mis/disinformation concerning vaccines, I will evaluate the general populations' willingness to be vaccinated. Regarding the proliferation of mis/disinformation about the 2020 U.S. Presidential election and subsequent falsehoods and conspiracy theories

fueling DVE movements, I will evaluate the presence and rise of violence contributing to DVE activity in the United States.

The limitations of this study include the challenges associated with measuring both the spread and the attitudinal and behavioral impact of mis/disinformation. The impact of mis/disinformation is a significant and rising concern amongst the population, but how to effectively measure the influence of mis/disinformation is still largely unknown. Additionally, my conclusions regarding the effectiveness and/or ineffectiveness of the countermeasures employed are drawn from a limited subset of information regarding the proliferation of mis/disinformation surrounding these national crises, the degree of spread and level of impact of this content, and the amount and type of measures taken to prevent the spread and influence of this content. Finally, my analysis is conducted under the premise that the variables of widespread mis/disinformation regarding the COVID19 pandemic and the 2020 U.S. Presidential election, as well as ideologies fueling DVE groups, are reasonably linked to overall vaccination rates and attitudes, and the presence and rise of violence contributing to DVE activity.

Data

COVID-19

Widespread Disinformation about the COVID-19 Vaccine

Reports prior to COVID-19 revealed that most search results for the term “vaccine” were anti-vaccine, backed mainly by two online groups spreading misinformation, each with over 140,000 members.⁵⁹ Recent studies indicate that this trend has grown tremendously in the

⁵⁹ Kari Paul, "It Let White Supremacists Organize!: The Toxic Legacy of Facebook's Groups," The Guardian, last modified February 4, 2021, <https://www.theguardian.com/technology/2021/feb/04/facebook-groups-misinformation>

proliferation of mis/disinformation surrounding the COVID-19 vaccine. NewsGuard, a journalism and technology tool that tracks online misinformation and rates the credibility of news platforms across the U.S., recently reported that 519 of the 6,730 (approximately 7%) domains they've rated have published COVID-19 misinformation.⁶⁰ Recent research also suggests that there is a "disinformation dozen" of accounts behind the majority of COVID-19 vaccine mis/disinformation circulating Facebook, Instagram and Twitter.⁶¹ They claim that this "disinformation dozen" produces approximately 65% of the anti-vaccine misinformation across social media platforms.⁶² These studies also discovered that many of these accounts have been active on social media for years and have remained largely unchecked by technology platforms' efforts to limit the spread of false and misleading content on their sites.⁶³ Finally, one Facebook account that is associated with the conspiracy-oriented website *World Truth TV* repeatedly posted content claiming that the COVID-19 vaccine contains a microchip.⁶⁴ This claim was made in over 100 posts over 6 months and is projected to have been shared with an audience of roughly 1.7 million Facebook users.⁶⁵

⁶⁰ "Sizing the Infodemic: NewsGuard Analysts Have Now Found More than 500 'News' Sites Peddling COVID-19 Misinformation and Identified 50 Hoaxes Relating to the COVID-19 Vaccines," NewsGuard, last modified September 8, 2021, <https://www.newsguardtech.com/press/newsguard-finds-more-than-500-sites-50-covid-vaccine-myths/>.

⁶¹ Shannon Bond, "Just 12 People Are Behind Most Vaccine Hoaxes On Social Media, Research Shows," npr, last modified May 14, 2021, <https://www.npr.org/2021/05/13/996570855/disinformation-dozen-test-facebooks-twitthers-ability-to-curb-vaccine-hoaxes>.

⁶² Ibid.

⁶³ Ibid.

⁶⁴ "Sizing the Infodemic," NewsGuard.

⁶⁵ Ibid.

News Consumption via Social Media Leads to Widespread exposure to COVID-19 Vaccine Mis/Disinformation

According to a 2021 Pew Research Center survey, approximately half of Americans reported getting some (30%) or most (18%) of their news and vaccine information from social media sites.⁶⁶ Although, 33% of respondents noted social media as an important, but not the *most* important way to gather news on the COVID-19 vaccine.⁶⁷ The portion of those surveyed who noted social media as an important source of vaccine information was higher among those who regularly consume news via social media.⁶⁸ Facebook was reported to be the most popular platform that Americans rely on for news, totaling approximately 31% of respondents. Finally, those that reported regularly gathering news from the eight social media sites referenced in the survey also asserted that social media is an effective way to keep up with developing news.⁶⁹

Efforts, Successes, and Failures of Social Media Platforms to Address and Limit the Proliferation of COVID-19 Mis/Disinformation

Facebook reports to having removed over 3,000 accounts and 20 million pieces of content related to the spread of mis/disinformation about COVID-19 and the COVID-19 vaccine since the onset of the pandemic.⁷⁰ Facebook has also allegedly removed 16 accounts associated with the “Dirty Dozen,” and imposed significant penalties on 22 others, including removing

⁶⁶ Amy Mitchell and Jacob Liedke, "About Four-in-Ten Americans Say Social Media Is an Important Way of Following COVID-19 Vaccine News," Pew Research Center, last modified August 24, 2021, <https://www.pewresearch.org/fact-tank/2021/08/24/about-four-in-ten-americans-say-social-media-is-an-important-way-of-following-covid-19-vaccine-news/>.

⁶⁷ Mitchell and Liedke, "About Four-in-Ten," Pew Research Center.

⁶⁸ Ibid.

⁶⁹ Ibid.

⁷⁰ Monika Bickert, "How We're Taking Action Against Vaccine Misinformation Superspreaders," Meta, last modified August 18, 2021, <https://about.fb.com/news/2021/08/taking-action-against-vaccine-misinformation-superspreaders/>.

content or users, moving certain posts lower down in the news feed, or discontinuing the recommendation of these posts to other users.⁷¹ Twitter also suspended two of the accounts associated with the “Disinformation Dozen,” removed approximately 22,400 tweets for violating policies regarding information about COVID-19, and added flags linking questionable content to credible vaccine information.⁷² Facebook also added features directing users to reliable sources of COVID-19 related information such as World Health Organization and pledged hundreds of millions of dollars to support journalists, local news outlets, fact-checking organizations, and various marketing efforts to make up for the loss of advertising revenue from removing problematic ads posted to pages spreading mis/disinformation.⁷³ Facebook later extended these efforts to the messaging platform WhatsApp, using AI to identify and then shut down spam accounts sending automated messages including false and misleading content.⁷⁴ YouTube has taken steps to adjust their policies in order to ban popular conspiracy theories such as those connecting COVID-19 to 5G technology, and Google has leveraged automated and manual review systems to identify and remove fake reviews and misinformation about healthcare locations on Google Maps.⁷⁵ Google has also developed a fact-check explorer feature, which gives users the ability to search for content that has been fact-checked.⁷⁶

While these measures have seen some success in limiting the proliferation of COVID-19 mis/disinformation on social media, many of these technology-based solutions have fallen short

⁷¹ Bickert, "How We're," Meta; Shannon Bond, "Unwelcome on Facebook and Twitter, QAnon Followers Flock to Fringe Sites," npr, last modified January 31, 2021, <https://www.npr.org/2021/01/31/962104747/unwelcome-on-facebook-twitter-qanon-followers-flock-to-fringe-sites>.

⁷² Bond, "Unwelcome on Facebook," npr.

⁷³ "Coronavirus: How Are the Social Media Platforms Responding to the 'Infodemic'?", First Draft, last modified March 19, 2020, <https://firstdraftnews.org/articles/how-social-media-platforms-are-responding-to-the-coronavirus-infodemic/>.

⁷⁴ "Coronavirus: How Are the Social Media Platforms Responding to the 'Infodemic'?"

⁷⁵ Ibid.

⁷⁶ Ibid.

of limiting the negative impact this threat continues to have on the stability of society. In evaluating the responses of Facebook and Twitter to the “Disinformation Dozen” discovery, reports indicate that many of the accounts linked to this identified list are still available and easily accessible on these platforms. Experts describe these platforms’ insufficient measures as being linked to their strict policies distinguishing between “harmful vaccine misinformation that contradicts credible public health information” and “negative vaccine sen Ministry of Education and Culture, *Media Literacy*, p. 6timent that is a matter of opinion” and the subsequent actions that can be legally and reasonably taken under each circumstance.⁷⁷ A NewsGuard Tech report evaluating the spread of COVID-19 vaccine misinformation found that for most (approximately 72%) of the false and misleading content they identified on Facebook, the platform did not provide any warning, fact-checking label, or links to reliable sources of COVID-19 related information.⁷⁸ The assessment also found that the posts that were labeled as fact-checked by third-party organizations did not maintain the same labels when they were made and/or shared by other Facebook pages or in different threads of content.⁷⁹ Additionally, multiple Facebook accounts earlier identified by NewsGuard Tech as spreading misinformation related to COVID-19 have remained operational and continue to share misinformation with large audiences. The report highlights how three of these accounts have even seen a significant uptick in “likes” of their page and content.⁸⁰ Finally, Facebook has faced significant backlash for its failure to block

⁷⁷ Bond, "Unwelcome on Facebook," npr.

⁷⁸ Marie Richter et al., "COVID-19 Vaccine Misinformation: Super-Spreaders Misinformation about Development of a COVID-19 Vaccine Spreads Widely on Facebook," NewsGuard, last modified November 30, 2020, <https://www.newsguardtech.com/special-reports/special-report-covid-19-vaccine-misinformation/>.

⁷⁹ Ibid.

⁸⁰ Ibid.

the #VaccinesKill hashtag in a timely-enough manner to limit the spread of misleading information containing this tag.⁸¹

Impact of Widespread Mis/Disinformation about COVID-19 on American's Intent to Get Vaccinated

The Covid States Project has used large-scale surveys administered to a sample of approximately 20,699 Americans from all 50 states and Washington, D.C. to monitor COVID-19 related issues since the onset of the coronavirus outbreak. The project recently gathered data on where Americans were gathering COVID-19 related news from, referencing Facebook, CNN, Fox, MSNBC, the Biden administration, and Newsmax.⁸² The report revealed that those who got their news predominantly from Facebook were less likely to get vaccinated than the average American and non-Facebook users.⁸³ Results also noted that the relationship was stronger for the 16% of those who got their news only from Facebook and no additional alternative sources.⁸⁴ Of this 16%, only 47% indicated that they were vaccinated, and 25% noted that they would not get vaccinated. Facebook users were also found to be more likely to believe false narratives about the COVID-19 vaccine than users more active on alternative platforms.⁸⁵

A Nature Human Behavior study measuring the impact of COVID-19 vaccine misinformation on vaccination intent in the U.S. and U.K. found that misinformation generated a

⁸¹ Katie Pellico and Brian Stelter, "Instagram Blocked the #VaccinesKill Hashtag Two Years Ago. Facebook Only Just Now Got Around to Doing Itt," CNN Business, last modified July 21, 2021, <https://www.cnn.com/2021/07/21/tech/facebook-vaccineskill-hashtag/index.html>.

⁸² Pippert, Trujillo, Lazer, Baum, Simonson, Ognyanova, Perlis, et al. 2021. "The COVID States Project #68: Heightened Parental Concerns About COVID-19 Vaccinations for Children." OSF Preprints. October 18. doi:10.31219/osf.io/4u6hb.

⁸³ Ibid.

⁸⁴ Ibid.

⁸⁵ Ibid.

6.4% decrease in intent to be vaccinated among Americans.⁸⁶ Additionally, a BMJ Global Health Study assessing the relationship between social media and vaccine hesitancy found that a 1-point upward shift on a 5-point disinformation scale was correlated with a 2% decline in mean vaccinations year over year.⁸⁷ This data displays the impact of mis/disinformation surrounding COVID-19 and the COVID-19 vaccine on the American population's willingness and intent to be vaccinated.

2020 U.S. Presidential Election and the Rise of Domestic Violent Extremism (DVE)

Widespread mis/disinformation surrounding the 2020 U.S. Presidential election served as a catalyst for the emergence and spread of misleading information and conspiracy theories which have driven the networks and motivations of domestic violent extremist movements in the United States.⁸⁸ This pattern is particularly concerning because many of the individuals consuming and sharing this mis/disinformation are true believers of the content they are exposed to and continue to use this content as justification for violence. In this case, it becomes clear that the proliferation of disinformation can quickly and dangerously translate into widespread misinformation, further amplifying the negative impact on society. Another problem with the spread of conspiracy theories across the information environment is that this feeds into an existing paradigm of the general public's inability to recognize disinformation.

⁸⁶ Loomba, S., de Figueiredo, A., Piatek, S.J. *et al.* Measuring the impact of COVID-19 vaccine misinformation on vaccination intent in the UK and USA. *Nat Hum Behav* 5, 337–348 (2021). <https://doi.org/10.1038/s41562-021-01056-1>

⁸⁷ Wilson and Wiysonge, Social media and vaccine hesitancy *BMJ Global Health* 2020; <https://gh.bmj.com/content/bmjgh/5/10/e004206.full.pdf>

⁸⁸ Center for an Informed Public, Digital Forensic Research Lab, Graphika, & Stanford Internet Observatory (2021). *The Long Fuse: Misinformation and the 2020 Election*. Stanford Digital Repository: Election Integrity Partnership. v1.3.0 Available at: <https://purl.stanford.edu/tr171zs0069>

2020 U.S. Presidential Election Mis/Disinformation

According to a recent MIT study, false political news is the category of mis/disinformation most frequently shared on Twitter. The study revealed that false political news reached over 20,000 people nearly three times as fast as other types of false news reached 10,000 people.⁸⁹

The Election Integrity Partnership (EIP) gathered data on false and misleading content leading up to the 2020 election. The study found that 72% of the individual pieces of mis/disinformation gathered were related to the delegitimization of the election.⁹⁰ The findings from the study included how misleading stories often focused on unreliable mail-in voting and accusations of fraud and discarded or destroyed ballots.⁹¹ The EIP report concluded that despite the lack of evidence of voter fraud in the 2020 U.S. Presidential election, a large portion of the population still believe that the election was stolen.⁹²

According to a 2021 Yahoo News/YouGov poll, 29% of Americans (1,552 surveyed) remain in question of the 2020 election results.⁹³ The survey indicates that 66% of Republicans continue to insist that “the election was rigged and stolen from Trump” and 28% of independent voters shared that they think, “Trump was the rightful winner of the 2020 election.”⁹⁴

⁸⁹ Sinan Ara, Deb Roy, and Soroush Vosoughi, *The Spread of True and False News Online*, p. 3, March 9, 2018, <https://ide.mit.edu/wp-content/uploads/2018/12/2017-IDE-Research-Brief-False-News.pdf>.

⁹⁰ Center for an Informed Public, Digital Forensic Research Lab, Graphika, & Stanford Internet Observatory, “The Long Fuse.”

⁹¹ Ibid.

⁹² Ibid.

⁹³ Caitlin Dickson, "Poll: Two-thirds of Republicans Still Think the 2020 Election Was Rigged," Yahoo News, last modified August 4, 2021, https://news.yahoo.com/poll-two-thirds-of-republicans-still-think-the-2020-election-was-rigged-165934695.html?guccounter=1&guce_referrer=aHR0cHM6Ly93d3cuZ29vZ2xiLmNvbS8&guce_referrer_sig=AQAAALYQPDAJteflhCLjnypRNsa7ht8q05gOCucsTYQn9YWewkMVpBto0DUFdGlaGTV84H3sgrCMQzrI2GyhkaXIEr95gws232rkKHblYeEVI0rIiJRG2wVwJRINEisXXptMvAzIoXUTpZQE3M7xFRjhVoS7RQLpaG7YhG7Fy-QcnK.

⁹⁴ Ibid.

Election Mis/Disinformation as a Catalyst for Misinformation Driving DVE Movements

The Election Integrity Partnership (EIP) report also highlighted how the narrative of a stolen election quickly transformed into the #StopTheSteal movement, arousing the organization of online DVE groups and nationwide protests.⁹⁵ This data also demonstrated how prominent right-leaning figures often transformed one-off stories into broader narratives characterizing the election as a hoax.⁹⁶ Finally, the report highlights the challenges associated with fact-checking operations, including attempts to debunk non-falsifiable information and noting how fact-checks often risk attracting greater attention to debunked content.⁹⁷

Widespread exposure to the misinformation and conspiracy theories driving DVE movements is evident through the rapid rise in popularity of online groups such as QAnon. QAnon began as an online conspiracy group in 2017 and in 2019 was classified by the FBI as a domestic terrorism threat.⁹⁸ The group has gained traction across the U.S. population through the spread of numerous conspiracies including Democrats' involvement in child sex-trafficking, an imminent deep-state coup against former President Donald Trump, and the credibility of the COVID-19 pandemic.⁹⁹ Recent studies revealed that almost 1 in 5 Americans have believed a conspiracy theory generated and spread by QAnon, and the uptick in online followers of these movements in recent years continues to amplify this threat.¹⁰⁰ For example, one group that has supported and praised the January 6th Insurrection continues to post conspiracy theories,

⁹⁵ Center for an Informed Public, Digital Forensic Research Lab, Graphika, & Stanford Internet Observatory, "The Long Fuse."

⁹⁶ Ibid.

⁹⁷ Ibid.

⁹⁸ Abdul Basit. "Conspiracy Theories and Violent Extremism: Similarities, Differences and the Implications." *Counter Terrorist Trends and Analyses* 13, no. 3 (2021): 1–9. <https://www.jstor.org/stable/27040260>.

⁹⁹ Ibid.

¹⁰⁰ Ibid.

misleading information, and calls for violence in private groups such as “The Patriot Party,” which at one point comprised of over 23,500 members.¹⁰¹

Finally, although social media platforms have increased measures to crack down on these groups’ activity on their platforms, available data shows that users have not been deterred and have simply migrated to alternative social networks and messaging platforms such as Gab, Telegram and Parler.¹⁰² Immediately following the January 6th Insurrection, Telegram reported to have attracted 25 million new users, and Tgstat, a platform collecting Telegram user analytics, noted 370,000 additional subscribers to the Trump Telegram channel following the Insurrection.¹⁰³ An abundance of messages discovered on Telegram also revealed far-right extremists advocating for violence leading up to the inauguration of President Joe Biden.¹⁰⁴

Efforts, Successes and Failures of Social Media Platforms to Address and Limit the Proliferation of COVID-19 Mis/Disinformation

In response to the rise of hate groups spreading conspiracy theories and calls for violence online, Facebook reported having hired 35,000 new employees to address safety and made significant investments in AI and other advanced technologies to spot harmful, false and misleading content online.¹⁰⁵ Facebook also reported having suspended their “recommendations” feature for political groups prior to the 2020 U.S. Presidential Election and claimed to have

¹⁰¹ David Mack, Ryan Mac, and Ken Bensinger, "If They Won't Hear Us, They Will Fear Us': How the Capitol Assault Was Planned on Facebook," BuzzFeed News, last modified January 19, 2021, <https://www.buzzfeednews.com/article/davidmack/how-us-capitol-insurrection-organized-facebook>.

¹⁰² Bond, "Unwelcome on Facebook," npr.

¹⁰³ Gian M. Volpicelli, "Trump's Mob Is on Telegram and They're Already Getting Organized," Wired, last modified January 14, 2021, <https://www.wired.co.uk/article/trump-telegram>.

¹⁰⁴ Ibid.

¹⁰⁵ Julia Carrie Wong, "Down the Rabbit Hole: How QAnon Conspiracies Thrive on Facebook," The Guardian, last modified June 25, 2020, <https://www.theguardian.com/technology/2020/jun/25/qanon-facebook-conspiracy-theories-algorithm>

leveraged their own technical tools to remove more than 25 million pieces of terrorism-related content on their platform since 2018.¹⁰⁶

An investigation conducted by The Markup, a nonprofit newsroom that evaluates how powerful institutions are using technology to alter society,¹⁰⁷ used data collected on 1,900 Facebook users to evaluate the influence of Facebook’s “recommendation” feature on the spread of false and misleading content on the platform. The investigation found that Facebook continued to recommend political groups to users through January of 2021.¹⁰⁸ The investigation also revealed that a handful of these groups included misleading information about election fraud and users promoting the storming of the Capitol on January 6th.¹⁰⁹ More specifically, the “Stop the Steal” group which formed in response to claims of election fraud and eventually lead the movement sparking the January 6th Insurrection, grew and remained widely active and accessible on Facebook long after the platform claimed to have stopped recommending political groups as a means to limiting the spread of mis/disinformation.¹¹⁰

Additionally, the Tech Transparency Project (TTP) found that while Facebook did take actions against users promoting DVE ideologies and movements, that new groups and pages simply continued to pop up on the platform, with limited disruption in their communications and spread of harmful content.¹¹¹ The report pointed specifically to groups such as the Oath Keepers and Three Percenters, which are characterized as militant movements that preach distrust of the

¹⁰⁶ *Examining Social Media Companies' Efforts to Counter On-Line Terror Content and Misinformation: Hearings Before the Committee on Homeland Security*, One Hundred Sixteenth, First (2019).

¹⁰⁷ "About Us," The Markup, <https://themarkup.org/about>.

¹⁰⁸ Leon Yin and Alfred Ng, "Lawmaker Questions Facebook on Broken Election-Related Promise," The Markup, last modified January 26, 2021, <https://themarkup.org/citizen-browser/2021/01/26/lawmaker-questions-facebook-on-broken-election-related-promise>.

¹⁰⁹ Leon Yin and Alfred Ng, "Lawmaker Questions Facebook."

¹¹⁰ Wong, "Down the Rabbit," The Guardian.

¹¹¹ "Facebook Ran Recruitment Ads for Militia Groups," Tech Transparency Project, last modified October 19, 2020, <https://www.techtransparencyproject.org/articles/facebook-ran-recruitment-ads-militia-groups>.

federal government and contributed to calls for violence that led to the January 6th Insurrection.¹¹²

Additionally, *The Guardian* points to the presence and ongoing reach of QAnon on online platforms as evidence of Facebook and other social media giants' failures to regulate the growth of these groups and the broader flow of mis/disinformation on their platforms.¹¹³ A recent report noted the presence of over 170 QAnon groups, pages and accounts across Facebook and Instagram, garnering approximately 4.5 million followers.¹¹⁴ In evaluating the growth in the online presence of these QAnon-linked groups on Facebook and Instagram, the Guardian reported a 34% increase in documented groups, pages and accounts between June and August and noted that the biggest groups included more than 200,000 users.¹¹⁵

Impact of Widespread Mis/Disinformation Fueling DVE and Leading to Violence

The key takeaways from the Election Integrity Partnership (EIP) report highlight how the disinformation and misleading narratives surrounding the 2020 U.S. Presidential election contributed to the broader, widespread belief of a stolen election, which ultimately fueled DVE activity and culminated in the January 6th Insurrection.¹¹⁶

PolitiFact, a fact-checking platform that evaluates and rates the accuracy of online claims made by elected officials via its "Truth-O-Meter" tool, conducted a comprehensive review of news reports and court filings to assess the extent to which misinformed beliefs drove the

¹¹² "Facebook Ran Recruitment Ads for Militia Groups," Tech Transparency Project

¹¹³ Wong, "Revealed: QAnon," *The Guardian*.

¹¹⁴ *Ibid*.

¹¹⁵ Wong, "Revealed: QAnon," *The Guardian*.

¹¹⁶ Center for an Informed Public, Digital Forensic Research Lab, Graphika, & Stanford Internet Observatory, "The Long Fuse."

January 6th Insurrection.¹¹⁷ The report highlights how many of the 430 defendants charged in connection with the Insurrection viewed their behavior as patriotic, citing their experience as being, “On the frontlines of a new revolution or civil war.”¹¹⁸ Most of the defendants were active users on social media and alternative communication platforms such as Facebook, Instagram, Twitter, YouTube, Parler, and Telegram, where evidence suggests that they consumed and shared beliefs fueled by misinformation about topics such as the COVID-19 pandemic, gun confiscation, and false narratives surrounding voter fraud and the delegitimization of the 2020 U.S Presidential election.¹¹⁹

The Value of a Human-Centered Approach to Complement Technology-Based Solutions

The merits of media literacy interventions are illustrated through IREX’s “Learn to Discern” (L2D) program, designed to deliver comprehensive digital media literacy education all over the world.¹²⁰ The program provides both virtual and in-person media literacy training and has been proven to enhance critical thinking skills to identify misinformation and demand better quality information.¹²¹ One specific intervention evaluated the implementation of this program in Ukraine over a period of one and a half years. The study was targeted at both schoolchildren and adults and aimed to build community resilience to state-sponsored disinformation, inoculate communities against public health misinformation, promote inclusivity by empowering communities to reject divisive narratives and hate speech, improve the youth’s ability to navigate

¹¹⁷ Bill McCarthy, "Misinformation and the Jan. 6 Insurrection: When 'Patriot Warriors' Were Fed Lies," PolitiFact, last modified June 30, 2021, <https://www.politifact.com/article/2021/jun/30/misinformation-and-jan-6-insurrection-when-patriot/>.

¹¹⁸ Ibid.

¹¹⁹ Ibid.

¹²⁰ "Learn to Discern (L2D) - Media Literacy Training," IREX, last modified 2021, <https://www.irex.org/project/learn-discern-l2d-media-literacy-training#component-id-783>.

¹²¹ Ibid.

the polluted online environment. and enable leaders to shape decisions based on facts.¹²² Overall, students who received L2D curricula were 13% more likely to say they believe critical information consumption skills are useful in life, compared to control group students.¹²³ Adults were 28% more likely to demonstrate sophisticated knowledge of the news media industry, 25% more likely to self-report checking multiple news sources, 13% more likely to correctly identify and critically analyze a fake news story, and 4% more likely to express a sense of agency over what news sources they access.¹²⁴

The strategies employed and skills addressed throughout these interventions, which align in outcomes and expectations focused on building community resilience to mis/disinformation, provide support for the efficacy of media literacy education.

Discussion

The data demonstrates the significant role that the internet, and particularly social media outlets, play in enabling the production, flow and widespread consumption of mis/disinformation. This is especially the case surrounding polarizing topics such as the efficacy of vaccines and dangerous conspiracy theories fueling DVE in the United States. Altogether, the presented data leads me to conclude that technology-based approaches are not sufficient as the primary tool employed to limit the impact of mis/disinformation in cases of U.S. national crises such as the COVID-19 pandemic and the rise of DVE activity. This conclusion disproves my hypothesis, demonstrating that as time sensitivity increases in cases of widespread

¹²² "Learn to Discern (L2D) - Media Literacy Training," IREX

¹²³ *Learn to Discern (L2D)*, p. 2, https://www.irex.org/sites/default/files/L2D%20Fact%20Sheet_Final.pdf.

¹²⁴ *Learn to Discern (L2D)*, p. 2.

mis/disinformation, the use of technology-based solutions does *not* become increasingly effective in mitigating the effects of harmful and false content. The data indicates how a strategy relying on technology and private entities to provide a comprehensive solution to the effects of widespread mis/disinformation is insufficient on its own partly because these entities are not incentivized to take drastic and necessary measures to address the issue. As it currently stands, social media platforms largely capitalize on the virality of mis/disinformation on their sites and have significant profits to gain from increased user engagement via the free flow of any and all information. Therefore, without robust government regulation, greater enforcement mechanisms, and a lack of financial incentives to commit to stricter policies backed by advanced technology and key partnerships, the measures social media platforms take to counter the proliferation of mis/disinformation will remain largely inadequate. Facebook's failure to effectively and broadly disable the "political recommendations" feature on their platform ahead of the 2020 U.S. Presidential election is one byproduct of this unfortunate reality.

The data displays when and how social media platforms were indeed effective in removing or restricting users spreading false or misleading information. However, the data also indicates that the so-called "whack-a-mole" effect was especially evident in these cases of national crises, where those users who were removed or restricted access simply shifted their activity to new or alternative accounts, or different emerging platforms with fewer restrictions. For example, the social network Gab was created shortly after Facebook and Twitter were pressured by the U.S. Government to step up their efforts in monitoring and addressing racist and anti-Semitic posts on their platforms.¹²⁵ Additionally, the data demonstrates the potential harmful

¹²⁵ W.J. Hennigan, "How Big a Role Does Social Media Play in Homegrown Terrorism?," Time, last modified October 29, 2018, <https://time.com/5438481/terrorism-social-media/>.

effects of fact-checking operations. Many experts continue to highlight cases in which fact-checking leads individuals to call out a specific fact-check, or fact-checking service or organization, as biased. This outcome is even more common with information that is already polarizing across American society, including the outlined topics of COVID-19 and the rise of conspiracy theories fueling DVE. Additionally, the data reveals how content that has been classified as false or misleading has sometimes attracted even more attention to the post or account, further contributing to the problem.

This conclusion supports the notion that technology-based and human-centered approaches to countering mis/disinformation are both essential under varying conditions, and that the measures involved in each approach can and often do complement each other. This material points to the demand for better and broader education on the methods and means by which mis/disinformation is spread via social media platforms and by a multitude of actors with varying intentions and objectives. The demand for education is also seen in the need to increase users' understanding of the measures platforms are taking to flag and debunk false and misleading information online. Without a sufficient awareness of the methods applied and what varying labels and flags associated with content mean, the impact these measures will have on users' information consumption and dissemination habits will be limited. Additionally, many of the false and misleading messages about the COVID-19 vaccine outlined above are similar in nature to misinformation that has been proliferated in the past in response to other vaccine campaigns.¹²⁶ This points to a clear need for broader education on sensitive and often polarizing subjects such as public health crises and pandemic related information, as well as the nature and growing threat of DVE. This emphasis on raising public awareness and educational campaigns

¹²⁶ Bond, "Just 12 People," npr.

will increase civic resiliency to mis/disinformation surrounding sensitive matters and in crisis situations where emotions are often heightened, and individual opinions strengthened. Public communication efforts in particular can be employed to highlight reliable sources of information. This may be performed through a variety of channels, such as having news anchors and representatives of large internet forums encourage citizens to seek public health information from trusted medical professionals.

Furthermore, the growth and expansion of the competencies addressed through the IREX program serve as promising antidotes to the gaps and common pitfalls of technology-based solutions. Greater knowledge of how the news industry and social media platforms operate will contribute to individual's awareness and understanding of their exposure to mis/disinformation. As studies have suggested, this broader civic understanding of the ins and outs of today's complex information environment will lead individuals to think more critically about the credibility of the sources and content that they are exposed to. As individuals are educated on best practices in engaging with information online, the acquired skills will complement the technology-based efforts employed by private entities and fact-checking services to limit the spread and impact of mis/disinformation. For example, practices such as checking multiple news sources and pausing to differentiate between fact and opinion are actions that technology-based measures take, just at greater scale and at a faster pace with the help of advanced technologies. Therefore, equipping the public with the outlined competencies will ultimately enhance the effectiveness of technology-based solutions to counter mis/disinformation, as these approaches both aim to achieve the same outcome.

Moreover, while the data and existing research suggest that technology-based solutions may achieve limited success in addressing online falsehoods, clickbait, and regulating the

environment in which mis/disinformation flows, the production, consumption and dissemination habits of online audiences can and will only be influenced by human-centered approaches.¹²⁷ Therefore, this study supports that private entities must embrace the value of a human-centered approach to serve as a critical foundation on which other strategies and more technical measures may be developed and implemented.

Finally, while the data and information presented is promising in demonstrating the insufficiencies of technology-based solutions to counter mis/disinformation online in cases of national crises, the data is not enough to draw definitive conclusions about the connections between widespread mis/disinformation and the attitudinal and behavior impact of COVID-19 and election-related mis/disinformation fueling DVE movements.

Conclusion

Altogether, the results of this study point to the insufficiencies of technology-based solutions acting alone to mitigate the effects of widespread mis/disinformation specifically under conditions associated with national crises. However, this analysis highlights the apparent strengths, weaknesses, and associated challenges of both technology-based and human-centered approaches to countering and increasing civic resiliency to mis/disinformation. In doing so, the study provides further insights into the ways in which technology-based and human-centered approaches can be employed simultaneously, and often in sync with one another, to have the greatest impact.

¹²⁷ Stoilova et al., *Rapid Evidence*.

Digital platforms, the media, and broader civil society must come together to develop and deliver solutions to address mis/disinformation in a concerted manner in which all stakeholders play an essential and unique role. While fact-checkers and advanced technology will play a critical role in preventing, detecting and removing falsehoods online, these measures will not be sufficient under all conditions. This conclusion points to the importance of committing equal funding and resources to human-centered initiatives in order to mitigate the effects of large-scale information operations employed by state and non-state actors. Informed and media literate citizens will help provide a sustainable, long-term solution to the challenge of mitigating widespread mis/disinformation, and as a complement to more technical solutions.

This conclusion also places significant emphasis on collaboration, highlighting a hybrid and collaborative approach as the key to successful and systemic efforts to mitigate the effects of mis/disinformation. This includes the role media and private entities can play in not only the technological aspect of fact-checking and debunking information, but also in educating the public on best practices for consuming reliable information and becoming increasingly resilient to false and misleading content. Additionally, a diverse consortium of entities spanning civil society, to include government agencies, media and news outlets, social media platforms, academic institutions, and civil society organizations, must coordinate their efforts to develop a framework to better understand and assess the impact of different forms of mis/disinformation, as well as the conditions and contexts in which certain measures associated with both human-centered and technology-based approaches are most effective.

Areas of further research include which entities are best equipped and positioned to provide fact-checking services and unbiased technology-based solutions to limit the spread of mis/disinformation while avoiding extensive allegations of biases and politicization. While

existing research has pointed to the importance of third-party civil society organizations serving as unbiased entities providing fact-checking services, this research is limited in scope and scale. Additionally, although existing media literacy interventions delivered across democratic nations have seen success, many communities, states and nations lack the funding, organizational structure, and resources needed to expand these programs into larger scale efforts to enhance media literacy on a whole-of-society level. Effective practices in how to increase awareness and deliver core skills to the population must be more clearly understood. Finally, best approaches to fostering collaboration in order to encourage consortiums of diverse entities to develop effective whole-of-society approaches to countering mis/disinformation deserves further exploration.

Bibliography

"About." Global Internet Forum to Counter Terrorism. <https://gifct.org/about/>.

"About Us." The Markup. <https://themarkup.org/about>.

Academic and Think-Tank Research on Common Practices for Countering Disinformation. N.p.: Global Engagement Center, n.d.

Alethea Group, comp. *Foreign Media Influence on US Election*. October 2020.
<https://www.aletheagroup.com/resources/categories/case-studies>

Allam, Hannah. "A March Without Millions Is Still A Worrying Sign of a Nation Divided." *npr*. Last modified November 15, 2020.
<https://www.npr.org/2020/11/15/935181031/a-march-without-millions-is-still-a-worrying-sign-of-a-nation-divided>.

Ara, Sinan, Deb Roy, and Soroush Vosoughi. *The Spread of True and False News Online*. March 9, 2018. <https://ide.mit.edu/wp-content/uploads/2018/12/2017-IDE-Research-Brief-False-News.pdf>.

Bahenský, Vojtěch. "On Perspectives on Disinformation." Peace Research Center Prague, 2019.
<http://www.jstor.org/stable/resrep20620>.

"The 'Backfire Effect' Is Mostly a Myth, a Broad Look at the Research Suggests." NiemanLab.
<https://www.niemanlab.org/2019/03/the-backfire-effect-is-mostly-a-myth-a-broad-look-at-the-research-suggests/>.

Basit, Abdul. "Conspiracy Theories and Violent Extremism: Similarities, Differences and the Implications." *Counter Terrorist Trends and Analyses* 13, no. 3 (2021): 1–9.
<https://www.jstor.org/stable/27040260>.

- Bauder, David. "Conservative Media Offers Mixed Messages on COVID-19 Vaccine." AP News. Last modified July 21, 2021. <https://apnews.com/article/joe-biden-health-government-and-politics-arts-and-entertainment-media-74f36fead348661aeba170422381a972>.
- Berghella, Vanina. "Disinformation, Elections, Fact-Checking and Beyond: The View from Latin America." ifex. Last modified September 26, 2016. <https://ifex.org/disinformation-elections-fact-checking-and-beyond-the-view-from-latin-america/>.
- Bickert, Monika. "How We're Taking Action Against Vaccine Misinformation Superspreaders." Meta. Last modified August 18, 2021. <https://about.fb.com/news/2021/08/taking-action-against-vaccine-misinformation-superspreaders/>.
- Bliss, Nadya, Elizabeth Bradley, Joshua Garland, Filippo Menczer, Scott W. Ruston, Kate Starbird, and Chris Wiggins. *An Agenda for Disinformation Research*. December 2020. <https://arxiv.org/pdf/2012.08572.pdf>.
- Bond, Shannon. "Just 12 People Are Behind Most Vaccine Hoaxes on Social Media, Research Shows." npr. Last modified May 14, 2021. <https://www.npr.org/2021/05/13/996570855/disinformation-dozen-test-facebooks-twitthers-ability-to-curb-vaccine-hoaxes>.
- Bond, Shannon. "Revealed: QAnon Facebook Groups are Growing at a Rapid Pace Around the World." The Guardian. Last modified August 11, 2020. <https://www.theguardian.com/us-news/2020/aug/11/qanon-facebook-groups-growing-conspiracy-theory>.
- Bond, Shannon. "Unwelcome on Facebook and Twitter, QAnon Followers Flock to Fringe Sites." npr. Last modified January 31, 2021. <https://www.npr.org/2021/01/31/962104747/unwelcome-on-facebook-twitter-qanon-followers-flock-to-fringe-sites>.

Boosting Immunity to Disinformation: Ukrainian Students Better Detect False Information after Teachers Integrate Media Literacy into Standard Subjects.

<https://www.irex.org/sites/default/files/node/resource/evaluation-learn-to-discern-in-schools-ukraine.pdf>.

Bowyer, Benjamin, and Joseph Kahne. "Educating for Democracy in a Partisan Age: Confronting the Challenges of Motivated Reasoning and Misinformation." *American Educational Research Journal* 54, no. 1 (February 2017): 3-34.

<https://journals.sagepub.com/doi/pdf/10.3102/0002831216679817>.

Bulger, Monica, and Patrick Davison. *The Promises, Challenges, and Futures of Media Literacy*. February 2018.

https://www.datasociety.net/pubs/oh/DataAndSociety_Media_Literacy_2018.pdf.

Carlos Carvalho, Nicholas Klagge, and Emanuel Moench, "The Persistent Effects of a False News Shock," *Journal of Empirical Finance* 18, no. 4 (September 2011): 597-615.

Center for an Informed Public, Digital Forensic Research Lab, Graphika, & Stanford Internet Observatory (2021). *The Long Fuse: Misinformation and the 2020 Election*. Stanford Digital Repository: Election Integrity Partnership. v1.3.0 Available at: <https://purl.stanford.edu/tr171zs0069>

Chou, Wen-Ying Sylvia, Anna Gaysynsky, and Robin C. Vanderpool. "The COVID-19 Misinfodemic: Moving Beyond Fact-Checking." *Health Education & Behavior* 48, no. 1 (February 2021): 9–13. <https://doi.org/10.1177/1090198120980675>.

Clarke, Colin P. "Domestic Terrorism in the US, Disinformation and the Impact of COVID19." Observer Research Foundation. Last modified August 19, 2021. <https://www.orfonline.org/expert-speak/domestic-terrorism-in-the-us-disinformation-and-the-impact-of-covid19/>.

"Coronavirus: How Are the Social Media Platforms Responding to the 'Infodemic'?"

First Draft. Last modified March 19, 2020. <https://firstdraftnews.org/articles/how-social-media-platforms-are-responding-to-the-coronavirus-infodemic/>.

Courchesne, Laura, Julia Ilhardt, and Jacob N. Shapiro. "Review of Social Science Research on the Impact of Countermeasures Against Influence Operations." *Misinformation Review*, September 13, 2021. <https://misinforeview.hks.harvard.edu/article/review-of-social-science-research-on-the-impact-of-countermeasures-against-influence-operations/>.

Dennis, Alan R., Antino Kim, and Patricia L. Moravec. *Appealing to Sense and Sensibility: System 1 and System 2 Interventions for Fake News on Social Media*. Research report no. Vol. 31 No. 3. N.p., 2020. <https://pubsonline.informs.org/doi/abs/10.1287/isre.2020.0927>

Dickson, Caitlin. "Poll: Two-thirds of Republicans Still Think the 2020 Election Was Rigged." Yahoo News. Last modified August 4, 2021. https://news.yahoo.com/poll-two-thirds-of-republicans-still-think-the-2020-election-was-rigged-165934695.html?guccounter=1&guce_referrer=aHR0cHM6Ly93d3cuZ29vZ2xiLmNvb8&guce_referrer_sig=AQAAALYQPDAJteflhCLjnypRNsa7ht8q05gOCucsTYQn9YWewkMVpBto0DUFdGlaGTV84H3sgrCMQzrl2Gyhk_aXIEr95gws232rkKHbIyeEVI0rIiJR G2wVwJRINEisXXptMvAz1oXUTpZQE3M7xFRjhVoS7RQLpaG7YhG7Fy-QcnK

Dictionary.com, <https://www.dictionary.com/browse/misinformation>.

The Disinformation Dozen: Why Platforms Must Act on Twelve Leading Online Anti-Vaxxers. 2021. https://252f2edd-1c8b-49f5-9bb2cb57bb47e4ba.filesusr.com/ugd/f4d9b9_b7cedc0553604720b7137f8663366ee5.pdf.

Dizikes, Peter. "The Fact-Checking Trap." *MIT Technology Review*, April 15, 2020. <https://www.technologyreview.com/2020/04/15/999307/the-fact-checking-trap/>.

Donald, Brooke. "Stanford Researchers Find Students Have Trouble Judging the Credibility of Information Online." Stanford Graduate School of Education. Last modified November 22, 2016. <https://ed.stanford.edu/news/stanford-researchers-find-students-have-trouble-judging-credibility-information-online>.

European Audiovisual Observatory. *Mapping of Media Literacy Practices and Actions in EU-28*. By Martina Chapman. <https://rm.coe.int/1680783500>.

Examining Social Media Companies' Efforts to Counter On-Line Terror Content and Misinformation: Hearings Before the Committee on Homeland Security, One Hundred Sixteenth, First (2019).

"Facebook Ran Recruitment Ads for Militia Groups." Tech Transparency Project. Last modified October 19, 2020. <https://www.techtransparencyproject.org/articles/facebook-ran-recruitment-ads-militia-groups>.

Fowler-Watt, K., and McDougall, J Media Literacy versus Fake News: Critical Thinking, Resilience and Civic Engagement WJEC, Paris. 2019

Gimpel, Henner, Sebastian Heger, Christian Olenberger, and Lena Utz. "The Effectiveness of Social Norms in Fighting Fake News on Social Media." *Journal of Management Information Systems* 38, no. 1 (April 2, 2021): 196-221. Taylor & Francis Online.

Hameleers, Michael. "Separating Truth from Lies: Comparing the Effects of News Media Literacy Interventions and Fact-Checkers in Response to Political Misinformation in the US and Netherlands." *Information, Communication and Society*, May 18, 2020. <https://www.tandfonline.com/doi/pdf/10.1080/1369118X.2020.1764603>.

Helmus, Todd C. and Marta Kepe, A Compendium of Recommendations for Countering Russian and Other State-Sponsored Propaganda. Santa Monica, CA: RAND Corporation, 2021. https://www.rand.org/pubs/research_reports/RRA894-1.html.

Henderson, Emily, ed. "Fact-checking is an Effective Tool to Combat Misinformation, Study Shows." News Medical. Last modified September 7, 2021. <https://www.news-medical.net/news/20210907/Fact-checking-is-an-effective-tool-to-combat-misinformation-study-shows.aspx>.

Hennigan, W.J. "How Big a Role Does Social Media Play in Homegrown Terrorism?" Time. Last modified October 29, 2018. <https://time.com/5438481/terrorism-social-media/>.

Hobbs, Renee, and Richard Frost. "Measuring the Acquisition of Media-Literacy Skills." *Reading Research Quarterly* 38, no. 3 (2003): 330–55. <http://www.jstor.org/stable/4151822>.

- Huguet, Alice, Jennifer Kavanagh, Garrett Baker, and Marjory S. Blumenthal, Exploring Media Literacy Education as a Tool for Mitigating Truth Decay. Santa Monica, CA: RAND Corporation, 2019. https://www.rand.org/pubs/research_reports/RR3050.html.
- Ingram, Matthew. "Facebook's Fact-Checking Program Falls Short." *Columbia Journalism Review: Media Today*, August 2, 2019. https://www.cjr.org/the_media_today/facebook-fact-checking.php.
- Jeong, Se-Hoon, Hyunyi Cho, and Yoori Hwang. "Media Literacy Interventions: A Meta-Analytic Review." *Journal of Communication* 62, no. 3 (April 24, 2012): 454-72. <https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1460-2466.2012.01643.x>.
- Kabeil, Magdy M., and Ahmad M. Kabil. "A Proposed Framework for Incorporating Big-Data Technology in National Crisis Management Center." In *Encyclopedia of Information Science and Technology, Fourth Edition*. edited by Khosrow-Pour, D.B.A., Mehdi, 2006-2019. Hershey, PA: IGI Global, 2018. <http://doi:10.4018/978-1-5225-2255-3.ch174>
- Khalaieff, Sue. "Civil Online Reasoning Across the Curriculum." Illinois Civics Hub. Last modified February 22, 2021. <https://www.illinoiscivics.org/news/civic-online-reasoning-across-the-curriculum/>.
- "Learn to Discern (L2D) - Media Literacy Training." IREX. Last modified 2021. <https://www.irex.org/project/learn-discern-l2d-media-literacy-training#component-id-783>.
- Li, Jianing, and Michael W. Wagner. "When Are Readers Likely to Believe a Fact-Check?" Brookings. Last modified May 27, 2020. <https://www.brookings.edu/techstream/when-are-readers-likely-to-believe-a-fact-check/>.
- Loomba, S., de Figueiredo, A., Piatek, S.J. *et al.* Measuring the impact of COVID-19 vaccine misinformation on vaccination intent in the UK and USA. *Nat Hum Behav* 5, 337–348 (2021). <https://doi.org/10.1038/s41562-021-01056-1>
- Lord, Kristin M., and Katya Vogt. "Strengthen Media Literacy to Win the Fight against

- Misinformation." Stanford Social Innovation Review. Last modified March 18, 2021. https://ssir.org/articles/entry/strengthen_media_literacy_to_win_the_fight_against_misinformation.
- Mack, David, Ryan Mac, and Ken Bensinger. "If They Won't Hear Us, They Will Fear Us': How the Capitol Assault Was Planned on Facebook." BuzzFeed News. Last modified January 19, 2021. <https://www.buzzfeednews.com/article/davidmack/how-us-capitol-insurrection-organized-facebook>.
- McCarthy, Bill. "Misinformation and the Jan. 6 Insurrection: When 'Patriot Warriors' Were Fed Lies." PolitiFact. Last modified June 30, 2021. <https://www.politifact.com/article/2021/jun/30/misinformation-and-jan-6-insurrection-when-patriot/>.
- Ministry of Education and Culture. *Media Literacy in Finland: National Media Education Policy*. 2019. <https://medialukutaitosuomessa.fi/mediaeducationpolicy.pdf>.
- Mitchell, Amy, and Jacob Liedke. "About Four-in-Ten Americans Say Social Media Is an Important Way of Following COVID-19 Vaccine News." Pew Research Center. Last modified August 24, 2021. <https://www.pewresearch.org/fact-tank/2021/08/24/about-four-in-ten-americans-say-social-media-is-an-important-way-of-following-covid-19-vaccine-news/>.
- Murray, Riley, David Muite, Erica Morrissette, Simon Pierpont, and Julie Nagel. "The Importance of Media Literacy." In *Introduction to Media Studies*. PressBooks. Digital file.
- Naumann, Karen. "Using Fact-Checking to Overcome Disinformation." Public Relations Society of America. Last modified October 2021. <https://www.prsa.org/article/using-fact-checking-to-overcome-disinformation>.
- Nawrat, Allie. "US Accuses Russia of Covid-19 Vaccine Disinformation Campaign." Pharmaceutical Technology. Last modified March 9, 2021. <https://www.pharmaceutical-technology.com/news/us-accuses-russia-covid19-disinformation/>.

Pamment, J., & Kimber Lindwall, A. (2021). Fact-checking and Debunking. Riga: NATO Strategic Communications Centre of Excellence.

Pasquetto, I., Swire-Thompson, B., Amazeen, M.A., Benevenuto, F., Brashier, N.M., Bond, R.M., Bozarth, L.C., Budak, C., Ecker, U.K.H., Fazio, L.K., Ferrara, E., Flanagan, A.J., Flammini, A., Freelon, D., Grinberg, N., Hertwig, R., Jamieson, K.H., Joseph, K., Jones, J.J. ... Yang, K.C. Tackling misinformation: What researchers could do with social media data. Harvard Kennedy School (HKS) Misinformation Review, 1(8).

Paul, Kari. "It Let White Supremacists Organize': The Toxic Legacy of Facebook's Groups." The Guardian. Last modified February 4, 2021. <https://www.theguardian.com/technology/2021/feb/04/facebook-groups-misinformation>

Pellico, Katie, and Brian Stelter. "Instagram Blocked the #VaccinesKill Hashtag Two Years Ago. Facebook Only Just Now Got Around to Doing It." CNN Business. Last modified July 21, 2021. <https://www.cnn.com/2021/07/21/tech/facebook-vaccineskill-hashtag/index.html>.

"Peter Pomerantsev: 'You can no longer fight lies with facts.'" Ukrainian Institute London. Last modified July 5, 2016. <https://ukrainianinstitute.org.uk/peter-pomerantsev-you-can-no-longer-fight-lies-with-facts/>.

Pippert, Caroline H., Kristin L. Trujillo, David Lazer, Matthew Baum, Matthew D. Simonson, Katherine Ognyanova, Roy H. Perlis, et al. 2021. "The COVID States Project #68: Heightened Parental Concerns About COVID-19 Vaccinations for Children." OSF Preprints. October 18. doi:10.31219/osf.io/4u6hb.

Richter, Marie, Kendrick McDonald, John Gregory, Sophia Tewa, and Virginia Padovese. "COVID-19 Vaccine Misinformation: Super-Spreaders Misinformation about Development of a COVID-19 Vaccine Spreads Widely on Facebook." NewsGuard. Last modified November 30, 2020. <https://www.newsguardtech.com/special-reports/special-report-covid-19-vaccine-misinformation/>.

Salman, Javeria, and Sarah Butrymowicz. "The In-School Push to Fight Misinformation from the Outside World." The Hechinger Report. Last modified February 11, 2021. <https://hechingerreport.org/the-in-school-push-to-fight-misinformation-from-the-outside-world/>.

Siwakoti, Samikshya, Luca Zanotti, Ulas Erdogdu, Kamyaa Yadav, Nicola Bariletto, and Jacob N. Shapiro. "How COVID Drove the Evolution of Fact-Checking." *Misinformation Review*, May 6, 2021. <https://misinforeview.hks.harvard.edu/article/how-covid-drove-the-evolution-of-fact-checking/>.

"Sizing the Infodemic: NewsGuard Analysts Have Now Found More than 500 'News' Sites Peddling COVID-19 Misinformation and Identified 50 Hoaxes Relating to the COVID-19 Vaccines." NewsGuard. Last modified September 8, 2021. <https://www.newsguardtech.com/press/newsguard-finds-more-than-500-sites-50-covid-vaccine-myths/>.

Stoilova, Dr Mariya, Matthew Smith, Gail El-Halaby, Dr Nick Anstead, Andra Fry, and Lee Edwards. *Rapid Evidence Assessment on Online Misinformation and Media Literacy*. June 9, 2021. https://www.ofcom.org.uk/_data/assets/pdf_file/0011/220403/rea-online-misinformation.pdf.

Susarla, Anjana. "Big Tech Has a Misinformation Problem - Here's What a Social Media Expert Recommends." The Conversation. Last modified July 29, 2021. <https://theconversation.com/big-tech-has-a-vaccine-misinformation-problem-heres-what-a-social-media-expert-recommends-164987>.

USAID, CEPPS. "Building Civil Society Capacity to Counter Disinformation." Countering Disinfo. Last modified April 3, 2021. <https://counteringdisinformation.org/topics/csos/2-fact-checking>.

USAID. "Countering Disinformation: Track, Inform, Engage, Inspire." East West Management Institute. Last modified April 16, 2020. <http://ewmi-access.org/countering-disinformation-track-inform-engage-inspire/>.

Volpicelli, Gian M. "Trump's Mob Is on Telegram and They're Already Getting Organized." Wired. Last modified January 14, 2021. <https://www.wired.co.uk/article/trump-telegram>.

"What Is Media Literacy, and Why Is It Important?" Common Sense Media.

<https://www.common sense media.org/news-and-media-literacy/what-is-media-literacy-and-why-is-it-important>.

West, Darrell M. "How to Combat Fake News and Disinformation." Brookings. Last modified December 18, 2017. <https://www.brookings.edu/research/how-to-combat-fake-news-and-disinformation/>.

"White Supremacy Groups' Related Pages on Facebook." Tech Transparency Project.

<https://www.techtransparencyproject.org/data>.

Wilson SL, Wiysonge C, Social media and vaccine hesitancy *BMJ Global Health* 2020;

<https://gh.bmj.com/content/bmjgh/5/10/e004206.full.pdf>

Wojcieszak, Magdalena, Jingwen Zhang, Jieyu Ding Featherstone, and Christopher Calabrese.

"Effects of Fact-Checking Social Media Vaccine Misinformation on Attitudes toward Vaccines." *Effects of Fact-Checking Social Media Vaccine Misinformation on Attitudes toward Vaccines* 145 (April 2021).

<https://www.sciencedirect.com/sdfe/reader/pii/S0091743520304394/pdf>.

Wong, Julia Carrie. "Down the Rabbit Hole: How QAnon Conspiracies Thrive on Facebook."

The Guardian. Last modified June 25, 2020.

<https://www.theguardian.com/technology/2020/jun/25/qanon-facebook-conspiracy-theories-algorithm>

Yin, Leon, and Alfred Ng. "Lawmaker Questions Facebook on Broken Election-Related

Promise." The Markup. Last modified January 26, 2021. <https://themarkup.org/citizen-browser/2021/01/26/lawmaker-questions-facebook-on-broken-election-related-promise>.

Curriculum Vita

Rachel Greenspan works as an Associate Systems Engineer for The MITRE Corporation and has recently completed a Master of Arts in Global Security Studies with a Certificate in Intelligence at Johns Hopkins University. Rachel has also earned a Bachelor of Science in Communication Studies and Certificates in Security Studies and Business Administration from the University of Texas at Austin. Prior to joining MITRE, Rachel served as a policy intern for the Intelligence and National Security Alliance (INSA), facilitating collaboration between leaders across the U.S. Government, the private sector and academia to address challenges and develop innovative solutions to issues facing the National Security community. In this capacity, Rachel managed INSA's Cyber Council, Insider Threat Subcommittee, and Security Policy Reform Council, and participated in the collection, research, and analysis of open-source information on issues related to cyber threats and insider threat programs to produce white papers, position papers and opinion articles. Rachel also served as a Virtual Student Federal Service (VSFS) intern for the Department of State's Global Engagement Center (GEC), where she produced literature reviews, problem assessments, logical frameworks, and maturity models to help broaden the GEC's international communication efforts to counter international terrorist and state-sponsored propaganda and disinformation campaigns. Rachel grew up on Long Island, New York, loved calling Austin, TX home throughout her 4 years of college, and currently resides in Washington, D.C.