

Mis- and Disinformation Research Agenda Survey: Key Themes

July 2021

INTRODUCTION AND METHODOLOGY

In the summer of 2021, MITRE surveyed recent mis- and disinformation research agendas and priorities, as well as related conference and workshop proceedings, from across academia, government, civil society, and industry to create a meta-analysis of priority research needs. Our inclusion criteria for relevant materials were as follows: the publication, conference, or workshop must be dated 2017 or more recent; the material must address mis- and disinformation research priorities (rather than specific policy or intervention recommendations); and the materials should preferably represent the interests of a group of researchers within a sector, rather than those of a sole lab.¹ In total, we reviewed 29 agendas and workshop summaries and identified researchers' key priorities for future work. 21 agendas and workshop summaries are included here.

We identified several major themes from the literature, which we present below. In this research agenda survey, we have aimed to identify areas of consensus and priority, and also have included perspectives that are specific to certain research communities. Direct quotes and citations from the literature are listed in each theme. Each bullet represents a stated research priority, need, or enabler. Note that most bullets are direct quotes from the referenced source, but some have been slightly condensed or paraphrased.

This work was originally performed as part of MITRE's partnership with the Aspen Institute Commission on Information Disorder.

THEMES

Infrastructure and Data Needs

Infrastructure

- Bliss et al. point to the need for a common research infrastructure to obtain data from technology platforms, while preserving user privacy, following ethical guidelines, and protecting intellectual property [1].
- A shared social, institutional, and technological infrastructure is necessary to develop datasets for studying the spread of misinformation on social media. This infrastructure can facilitate research and replicability but requires pressuring social media companies to share data [2].
- Research will continue to be hindered without broader access to historical data and to a wider range of platforms via application programming interfaces (APIs) for Instagram, TikTok, WhatsApp, and YouTube [3].
- APIs are needed to access data relating to deletions, profile changes, third-party application activities, abuse reports, and suspended accounts [3].

¹ To ensure the inclusion of materials by prominent researchers in the domain, this was not always possible.

- API endpoints are needed to show specific actions platforms take once a message is identified as containing misinformation (e.g., removals, warning labels, downranking) [3].

Data

- There is a need for both expression data (e.g., data corresponding to engagement with content such as likes and retweets) and impression data (i.e., data corresponding to people who read content). Impression data is hidden from researchers; access to this data would enable new research directions in studying both the spread of misinformation and the effectiveness of mitigation techniques [3].
- Demographic data about social media platform users can enable research into the spread, motivations for sharing, countermeasures against, and behavioral impacts of misinformation [3].
- Fine-grained temporal data is required to characterize networks in which misinformation thrives, to enable analysis of the types of events, policies, and technologies that are susceptible to mis/disinformation campaigns, and to aggregate characteristics about the populations that share misinformation [3].
- The research community would benefit from encrypted messaging data (e.g., WhatsApp data), specifically aggregated information about users and uses of the platform, viral and widely spread content, and random samples of names and groups [3].

Attribution

- Identify who is conducting “social cybersecurity” attacks [4].
- Attribution is listed as one of the goals of detection of disinformation at scale by Bliss et al. [1].
- Understanding who shares misinformation would offer pathways to design and test interventions [3].
- Politicians, elites, and government officials are major (but understudied) sources of false information [5].

Tactics, Techniques, and Procedures (TTPs)

- Identify, track, and assess emerging propaganda and disinformation tactics, technologies, strategies, and patterns used by state and non-state actors to spread disinformation and propaganda across varied regions and cultures [6].
- Increased data access would enable improved characterization of misinformation in real-world contexts [3].
- Researchers are interested in accumulating the requisite data to study, detect, and combat manipulation. Regarding nation-state data, access to all the organic Russian content from 2016 across various platforms can reveal TTPs and

motives. For example, how much content was election related? What was troll behavior like in battleground states and across the nation? [3]

- Better understand strategies of international influence campaigns on target states [7].

Motives

- Understand what the perpetrator's motive is—that is, why the attack is being conducted [4].
- Understand why people share misinformation (e.g., whether exposure to one's political opponents or allies affects willingness to share) [3].
- Understand what misinformation is shared with whom and why [3].
- Understand what motivates people to share information, particularly they know that the information is false [3].
- Researchers can focus on answering underlying questions about information operations. For example, what are the motives behind a disinformation campaign? Why do people engage with problematic content [8]?

Spread/Diffusion

- Tracing and even predicting the spread of an influence campaign, including tracing attackers across multiple social media platforms. Develop monitors that suggest when diffusion is about to explode, peak, and peter out. Improve theories of and methods for monitoring diffusion [4].
- If platforms can dampen the spread of information from just a few websites, the fake news problem might drop precipitously. Steps by platforms to detect and respond to manipulations from bots and cyborgs will also naturally dampen the spread of fake news [2].
- Impression data is currently unavailable. Access to fine-grained impression data would allow researchers to measure the true reach of misinformation and could enable prediction of virality and the diffusion path of misinformation with greater accuracy [3].
- Implement product design and policy changes on technology platforms to slow the spread of misinformation. Researchers should prioritize understanding how people are exposed to misinformation [9].
- Algorithms prioritize content that has or is expected to have a high level of engagement. The risk is an overexposure of polarizing and controversial content and underexposure to less emotive but more informative content. Implications for policymaking include requiring online platforms to provide reports to users showing when, how, and which of their data is sold/used [10].
- Exposure and belief in false information depends a lot on individuals' social connections; however, researchers have not paid sufficient attention to the impact of social ties. Researchers have not established the extent to which

people are exposed to false information via their social connections or the effects of such exposures [5].

Impact

Quantify the Impact/Influence/Effect of Misinformation

- Quantify short- and long-term impacts of influence campaigns through creation of improved measures of impact, such as polarization or mass hysteria, rather than traditional measures of reach, such as number of followers, likes, and recommendations [4].
- Precise, reliable, and validated measurement of the effect or impact of disinformation on communities requires formal statistical causal inference on human belief dynamics. It also requires advances in identification and extraction of complex cognitive/rhetorical structures and the development of an experimental sandbox representative of the ecosystem [1].
- Develop useful metrics of impact on single and multiple platforms [7].
- Quantification of psychological impacts of disinformation/propaganda is a non-trivial challenge [6].
- Further research should be done that measures the impact of inauthentic behavior. Better systems for recording these observations would enable this research. In addition, common metrics for measuring inauthentic behavior at scale should be developed [11].
- Lack of common research standards are a concern. There is a lack of methods to measure the effects of influence operations [8].

Causal Models

- Explore measurement, processes, and effects of polarization, particularly affective polarization (whether political, religious, ethnic, or another type). Causal models of polarization driven by informational, environmental, demographic, and institutional factors are of particular interest [12].
- Expand research that deepens understanding of health information and why it impacts people [9].
- The research community has not well documented the effects of disinformation on outcomes such as voting, polarization, the rise of white nationalism, or echo chambers [5].
- Politicians, elites, and government officials are major sources of false information. Regardless of whether people believe these claims, do members of the public respond to this information with more incivility, by becoming more engaged, or by ultimately becoming more polarized [5]?

Offline (“Real-World”) Influence

- Real-world influence efforts should be studied, along with cyber-social efforts to better illuminate how real-world and cyber-world efforts converge, cohere, and amplify one another [7].
- Combine real-world study of human behavior with the study of cyber behavior in a diversity of local social contexts, investigating how social media engagement and participation in new social worlds result in the formation of different identities, beliefs, and behaviors that have significant implications for social stability within different systems of government [7].
- Consider both “hard influence” (influence that promotes the development of fissures in society) and “soft influence” (constructive, positive narratives and social rewards) [7].
- Measure and assess the impact and effects (including secondary effects) of propaganda and disinformation events on U.S. and international audience decision making [6].
- There is a lack of rigorous research on the link between disinformation and resulting sub-optimal behaviors [6].
- Links between online engagement and radicalization remain unsubstantiated by data. Put more investment into understanding the problem, how it’s manifesting, and where it’s manifesting, in order to be strategic [13].
- Due to the difficulty of measuring real-world impact, much disinformation research has focused on spread using readily measurable behavior (clicks, retweets, site visits, etc.) [14].
- Look beyond the spread of disinformation online and especially beyond social media, and incorporate more diverse news-sharing behaviors, including offline. Focusing online on social media neglects the significance of traditional media and offline communication networks. Social and traditional media should not be considered in isolation [14].
- Research deterrents to online and offline problematic behavior related to dangerous speech and harmful conflict [12].

Impacts on Subpopulations

- Prioritize understanding how people are exposed to and affected by misinformation and how this may vary for different subpopulations [9].
- Understanding how people navigate and trust information sources in specific contexts likely requires qualitative sociological and ethnographic research. The more community-specific research is, the better [14].

- Understand how people across different backgrounds, communities, and cultures interact with, are affected by, and decide to promote or share the spectrum of possibly problematic content [12].

Mitigation

Countering and Mitigating Effects of Disinformation Through Interventions

- Use agent-based modeling to assess the relevant impact of interventions [4].
- External randomized control trials on social media platforms without interference or involvement from the companies themselves would allow for rigorous research to understand what kinds of interventions are most effective at reducing an individual's propensity to share misinformation, and to what extent revealing the source of factual interventions affects behavior [3].
- Research exploring the impact of interventions ideally involves randomly assigning users of platforms to various intervention versus control conditions. Specific interventions include labeling news headlines with fact-checking warnings, prompts that nudge users to consider accuracy before sharing, attempts to increase digital literacy, and assessing the impact of incorporating layperson accuracy ratings [3].
- Study how mitigation tactics such as removal, warning labels, and downranking affect the way audiences respond to misinformation [3].
- Determine which mitigation tactics work best with which audiences or demographics [3].
- Develop new approaches to counter influence campaigns, including proactive and reactive strategies by the U.S. and allies for messaging activities and other cyber-social efforts, as well as economic and other real-world approaches to counter influence [7].
- Study phases of disinformation operations to identify where technology-based solutions could be implemented [6].
- Passive fact checking may not be enough; rather, researchers should consider corrective messages as a form of persuasion or social influence. Researchers don't yet know what message features are effective. Applying theories of social influence and persuasion can help by indicating what message elements are persuasive, which sources are credible, and how to reach less attentive audiences [5].
- Focus on issues surrounding algorithmic transparency, digital advertising, and data privacy [20].

Building Community Resilience to Attacks

- Use scalable techniques for teaching critical thinking for social media [4].
- Conduct basic research on the characteristics of resilient communities [4].
- Identify the necessary ingredients for social information systems to encourage a culture that values and promotes truth [2].
- Encourage generation of factual information, discourage those who provide false content, and form bridges across communities. However, understand that not all individuals will be susceptible to intervention [2].
- Understand ways in which a common ground for evidence and rules of arguments can be re-established [3].
- Explore the relation between digital literacy and vulnerability to misinformation, including studies of individuals, small groups, and larger communities, but also wider inquiries into factors that shape the context for the user experience online [12].
- Create programs to develop digital literacy to identify disinformation in real contexts [6].
- Equip Americans with the tools to identify misinformation, make informed choices about what information they share, and address health misinformation in their communities in partnership with trusted local leaders [9].
- Invest in longer-term efforts to build resilience against health misinformation, such as media, science, digital, data, and health literacy programs and training for health practitioners, journalists, librarians, and others [9].
- Strengthen and scale the use of evidence-based educational programs that build resilience to misinformation [9].
- Establish quality metrics to assess progress in information literacy [9].
- Tools for digital literacy, particularly among older generations, may be useful in limiting the spread of inauthentic behavior [11].
- Educate the public on trustworthy digital information. Establish a grant program led by the National Science Foundation (NSF) for the purpose of developing a curriculum on trustworthiness of information in the digital age [15].
- The effectiveness of fact-checking and social interventions is questionable. Going forward, the field aims to identify social factors that sustain a culture of truth and design interventions that help reward well-sourced news [2].

Strengthening Institutions

- Support efforts to strengthen local reporting in the face of tightening budgets through subsidies for local news outlets and help obtaining nonprofit status [2].
- Help people understand the rigor that goes into journalism (e.g., source gathering, fact checking, no surprises policy) [15].
- Government has a responsibility to encourage independent, professional journalism. Avoid crackdowns on the news media's ability to cover the news. Fund efforts to enhance news literacy [16].

- Understanding how people navigate and trust information sources in specific contexts is critical, and likely requires offline ethnographic research to address community-specific concerns [14].

Interdisciplinary and Cross-Sector Collaboration

- Increase platform transparency and develop new safety standards [20,21].
- Outreach and collaboration across academic institutions is needed. Currently, this is being facilitated in large part by the Department of Defense Minerva program and the Knight Foundation [4].
- The next generation of technologists needs to be trained in applied ethics so that their processes align with a practicable mindset and toolset [1].
- Collaboration between conservatives and liberals to identify bases for factual agreement will heighten the credibility of counter-misinformation endeavors [2].
- Find ways to support and partner with the media to increase the reach of high-quality, factual information.
- Scholarship that proceeds without acknowledging the theoretical framework of propaganda, analysis of ideology and culture, notions of conspiracy theory, and concepts of misinformation and impact does so to its empirical detriment and makes identifying solutions harder to articulate because the actual problem to be solved is unclear [17].
- Kenneth Joseph, Nir Grinberg, and John Wihbey have identified broad avenues of future collaboration between technology platforms and the academic community, ranging from frameworks for survey studies, user-level data about misinformation interactions, actions taken by platforms, content curation and moderation algorithms, and access to historical data [3].
- Miriam Metzger and Andrew Flanagin likewise identified areas of collaboration between social media platforms and academic researchers to capture user and network-level data [3].
- Both government and industry have called for social-science-forward approaches to drive the next generation of computational research into quantification of disinformation and its community impacts.
- Facebook has called for collaboration within academic disciplines, with particular attention paid to social science methods, comparative politics and cultural research, and studies that focus on non-Western measures and analyses [12].
- Topic 4 of the Minerva 2021 research priorities seeks multidisciplinary theoretically innovative approaches from disciplines such as anthropology, cross-cultural sociology, political science, political economy, and cross-cultural social psychology, working in collaboration with computer and information sciences to develop a social-science-forward approach to the development of social theory and the creation of new techniques needed to carry out a systemic analysis of

social influence in online and offline cross-cultural milieus, cyber-social dynamics, narrative, and in languages other than English. Particular attention is paid to studies in important strategic regions in Asia, Africa, and Latin America [7].

- Topic 5 of the Minerva 2021 research priorities seeks to involve social scientists, media researchers, area specialists working with information, and/or scientists to develop approaches to studying the influence of both online and offline communities [7].
- Topic 6 of the Minerva 2021 research priorities calls for new models of collaboration, innovative experimental design, and data analysis to explore computational social science research on difficult-to-access environments [7].
- The U.S. State Department Global Engagement Center Counter Disinformation and Propaganda Center identified primary shortfalls in two areas, understanding the information environment and measuring impact and effectiveness, suggesting that basic capabilities to develop an awareness of propaganda and disinformation may be low, and that there is limited interagency and intergovernmental capability coordination [6].
- In the U.S. Surgeon General’s Advisory on Confronting Health Misinformation, one key area of concern was to convene federal, state, local, territorial, tribal, private, nonprofit, and research partners “to explore the impact of health misinformation, identify best practices to prevent and address it, issue recommendations, and find common ground on difficult questions, including appropriate legal and regulatory measures that address health misinformation while preserving user privacy and freedom of expression” [9].
- Funders and foundations are encouraged to move with urgency toward coordinated, at-scale investment to tackle misinformation, and to incentivize coordination across grantees to maximize reach, avoid duplication, and bring together a diversity of experience [9].
- Projects and development should be informed by anthropologists, with particular attention paid to differences in ways individuals interact with information [11].

Cross-Platform and Cross-Format Research

- Inspect information practices and flows across multiple communication technologies or mediums, in particular individual, group, and community effects of information campaigns, inauthentic behavior, or coordinated activities across multiple communities, networks, channels, or platforms [12].
- Platforms should provide vetted researchers with comparable, open APIs to enable cross-platform analytics [1].
- Determine whether some types of events, policies, or technologies are uniquely susceptible to mis/disinformation campaigns [3].

- Determine how to enable research using private encrypted messages, such as those on WhatsApp, to track the dissemination of misinformation at scale [3].
- Enable cross-platform information ecosystem understanding using research that inspects information practices and flows across multiple communication technologies or mediums [12].
- Researchers need to investigate non-obvious platforms (e.g., Airbnb) [13].
- Investigate the impact of non-textual media (images, videos, audio, etc.) on the effectiveness of and people's engagement with misinformation. Media types include basic multimedia, simple or advanced manipulated multimedia (deepfakes, cheapfakes), out-of-context imagery, and impersonation of public figures/organizations [12].

International Perspectives

- Comparative research and inclusion of non-Western regions that have experienced a growth in social media platform use, particularly South and Central America, Sub-Saharan and Northern Africa, the Middle East, and Central, South and Southeast Asia [12].
- Utilize non-Western measures and analyses to study affective polarization, particularly when applied to questions of equitable impact on vulnerable communities [12].
- Analyze dangerous speech, conflict, and violence in markets with limited institutions, developing media markets, and various levels of democracy in non-Western contexts.
- Research has lagged in studying important strategic regions in Asia, Africa, and Latin America. Multidisciplinary theoretically innovative approaches are needed to carry out systemic analysis of social influence in online and offline cross-cultural milieus and in languages other than English [7].
- Enhance understanding of difficult-to-access environments, such as countries experiencing enduring conflicts or societies that broadly restrict researcher access [7].
- Overseas disinformation trends incubate in other countries before coming to the U.S. Likewise, U.S. disinformation exports to other countries (e.g., anti-vaccination content) [18].
- Other countries could use the U.S.'s seizure of Iranian-controlled domains as an opportunity to use claims of disinformation to silence dissent [18].
- The global reach of the internet leads to what Mary McCord, Executive Director of the Institute for Constitutional Advocacy and Protection at Georgetown University, describes as a "morphing of grievances" by which the extremist groups adapt messaging to the "the [new] issue of the day" to remain relevant [13].

- Not all disinformation campaigns are aimed at causing violence; some seek to rewrite history [13].
- Researchers need to also look at non-Western dominant brand names (e.g., WeChat) [13].
- Little work is done to understand how governments use influence operations on their own citizens, the role of media in these campaigns, influence in Africa, and non-English language influence operations [8].
- In many countries, few individuals share news on social media, fewer trust it, and the trust is declining [14].
- Study disinformation's impact in a broader range of cultural contexts [14].
- Improve linguistic and cultural understanding and capabilities. For example, “[I]n Ethiopia there are 83+ languages. As of June [2021] there was only automated translation available for Amharic (the national language) and neither human [n]or automated translation for any other languages. In a society like Ethiopia where politics are indexed by ethnicity and therefore language, this meant that Facebook, Twitter and other social media [sic] corporations literally could not see/hear/understand the content circulating on their platform.” [19].

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