

Beyond Misinformation: The Misrepresentation and Misappropriation of Research

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Contributed Paper Presented at American Political Science Association 2023
Teaching and Learning Conference
September 2, 2023
Los Angeles, California

Abstract

The contemporary information landscape has produced numerous incidents of researchers having their research misunderstood, misrepresented, or misappropriated—or worse, being subjected to intimidation and harassment—by individuals or groups who seek to cherry-pick evidence in support of ideological agendas or who wish to suppress evidence that counters those same agendas. While the covid-19 pandemic elevated these tactics in their frequency, visibility, and intensity, this phenomenon did not start or end with the pandemic. To help prepare current and future researchers for the possibility that their research might be misrepresented, misappropriated, or politicized in other ways by ideologically motivated individuals or groups, Syracuse University Libraries offers a workshop that covers ways to prepare for and respond to the misrepresentation and misappropriation of their research. The workshop offers participants strategies and tools for researchers to stay current on scholarly and popular communication about their research and field of research; suggestions on venues for preparing and testing responses for potential incidents in which their research is misrepresented or misappropriated; and tactics for handling incidents should they arise.

Introduction

In late February 2020, I arrived at Syracuse University and started as its new Social Science Librarian. A Syracuse University Libraries administrator asked me about project ideas I had, and I mentioned the idea of teaching a workshop on the misrepresentation and misappropriation of research. Three weeks later, I began working in my dining room for the next 16 months, and as anger about the effects of the pandemic built and became directed toward researchers and public health officials, it became clear that there was suddenly a heightened awareness of the rationale for this interesting idea I wanted to try.

Drawing on my experience as a former community college political science instructor who regularly encountered instigators in the classroom, I put together and taught a workshop on the misrepresentation and misappropriation of research geared toward graduate students and faculty. The workshop covers strategies, tactics, and tools for preparing for and responding to situations in which research encounters the misunderstanding, misrepresentation, or misappropriation of their research, and I have been offering the workshop regularly since its debut in Spring 2021. This paper will provide an overview of how the workshop operates and what content it covers; review the ongoing efforts to assess the impact of the workshop as it moves from a concept-test stage toward a more systematized incarnation and challenges that have been encountered in that process; and discuss future directions planned for the workshop. Even though the pandemic has waned, the threats to researchers' intellectual freedom—and often their physical safety—have only escalated, and thus it remains vital that researchers have the knowledge and skills to prepare for and respond to situations in which their research is misunderstood, misrepresented, and misappropriated.

Elements of the Workshop

Background

Each year, Syracuse University Libraries offers several workshops as part of its Learn! at Syracuse University Libraries series. I began offering the workshop on the misappropriation and misrepresentation of research at least once each semester starting in the Spring 2021 semester. The workshop was originally entitled “The Public and Your Publications: Strategies for Handling the Misappropriation or Misrepresentation of Your Research”. In the Spring 2022 semester, I retitled the workshop “The Misappropriation and Misrepresentation of Research: Strategies for Facing a Growing and Problematic Trend”. The workshop was originally exclusively online and ran for 60 minutes; it is now exclusively in-person and has been extended to 75 minutes to allow more time for discussion and questions. Because the misrepresentation and misappropriation of research is not a problem that is unique to any one discipline, the workshop is multidisciplinary in scope and has drawn faculty, graduate and undergraduate students, and visiting scholars from a wide range of schools, colleges, and departments at Syracuse University, as well as some participants from outside of the university.

Learning Outcomes

The major learning outcomes for the workshop (and their secondary outcomes) are that workshop participants will be able to:

- Describe how misunderstandings, misinformation, disinformation, and malinformation affect their field of research.
 - Explain the difference between misinformation, disinformation, and malinformation and what their effects are.
 - Describe the difference between misunderstanding, misrepresenting, and misappropriating research and identify examples of each.

- Recognize and predict how research in their field could be misunderstood, misrepresented, and misappropriated.
- Contextualize misinformation, disinformation, and malinformation in larger societal trends.
- Deploy strategies to prepare for and respond to the potential misunderstanding, misrepresentation, or misappropriation of their research.
 - Analyze and critique how expert researchers contend with the mis-framing of research.
 - Utilize an undergraduate classroom and Chat GPT to gauge public (mis)understanding of their research and potential responses.
 - Integrate tools available through libraries and social media into their workflow to keep current on the scholarly and public discourse about their research.
 - Apply tactics for handling situations of misunderstanding, misrepresenting, misappropriating research to these situations should they arise.
 - Adapt strategies and tactics covered in the workshop according to the situational interaction of aspects of the identities of the researcher and of the audience.

Content and Structure of Workshop

Definitions and Examples

I begin the workshop by first offering a content advisory and discussing what the workshop is and what it is not. The workshop is not designed to discuss how to rehabilitate extremists or to offer guidance about protecting one's physical safety. Rather, it is designed to provide strategies for monitoring the scholarly and popular communication surrounding one's research and field of research and tactics for working with people who are persuadable.

Next, I conduct an initial assessment (discussed further in a later section of this paper) of participants' knowledge at the start of the workshop, asking them to identify some common misconceptions about their field of research and specific examples of misunderstood research in their fields. In the past, this was done as a verbal discussion; however, I now begin this portion by using Mentimeter polls as a classroom assessment technique to elicit responses in case participants would rather not speak, and then invite participants to expand on their responses should they so

choose.¹ This exercise gets participants to have their own research and field of research in the front of their minds as strategies for preparing for and responding to potential misunderstandings, misrepresentations, or misappropriations of their research are discussed.

Because of the importance of making sure definitions are clear, I next provide definitions of the workshop's terminology. I define misinformation as "false information that an individual or group may consume or share that the individual or group does not know is false", and disinformation as "false information that is created for the purpose of misleading others by an individual or group who know the information is false". I have also added the term "malinformation", which Wardle and Derakhshan (2017) define as "when genuine information is shared to cause harm, often by moving information designed to stay private into the public sphere", which Cooke (2021) expands upon as "false information that is shared with a distinct intent to cause harm, and in the case of racism, to maintain the status quo".

I continue by discussing the effects and goals of mis-, dis-, and malinformation. The first effect/goal I cover is increasing distrust in or hostility toward authority and fellow citizens, possibly leading to social breakdown. There are certainly many recent examples of individuals and entities deploying mis-, dis-, and malinformation to this end. I also include the effect/goal of suppressing active citizenship by encouraging defensive inaction, a consequence/aim of mis-, dis-, and malinformation that is often overlooked.²

¹ See <https://www.mentimeter.com/>

² My own interest in mis-, dis-, and malinformation originates from seeing this second goal/effect seemingly in action during the protests following the disputed 2009 Iranian presidential election. While U.S. media coverage emphasized the use of Twitter to aid communications among protesters, tweets often offered contradictory information about organized rallies as to whether they were legitimate or were traps set by the Iranian regime (Iran [@IranGreen] 2009; Steve [@longcourse] 2009). This would likely have made many potential protesters decide to stay home, thereby sapping momentum from the protest movement, which eventually faded away.

The definitions of mis-, dis-, and malinformation are important because participants might not be saturated with definitions of the words (as one often experiences at conferences on mis-, dis-, and malinformation) and because the next portion of the workshop discusses these words' analogous concepts in the public discourse around research (and researchers). The workshop first examines the misunderstanding of research, which is akin to misinformation, and which I define as "when an individual comes to faulty conclusions about research on their own or adopts the faulty conclusions of an indirect source of information, which the misinformed individual can share with others".

The workshop proceeds to define the misrepresentation of research as "the mischaracterization or misleading selective representation of the conclusions of research, usually to support an ideological agenda or political actions". This can be akin to misinformation or disinformation, depending on the intent. I provide some examples in the workshop, including:

- The deliberate mischaracterization of the scale of unauthorized immigration through the omission of the fact that the statistics the U.S. Customs and Border Patrol collects on apprehensions of individuals do not account for whether the same individuals are apprehended multiple times (Kahn 2021)
- The exaggeration of the benefits of convalescent plasma as a treatment for covid-19 at the height of the pandemic (McDonald 2020)

Next, the workshop defines the misappropriation of research as "a reasonably accurate representation of research to support an ideological agenda or political actions that the researcher does not advocate for". This can be akin to misinformation or disinformation, depending on intent. Some examples of research with potential for misappropriation that the workshop discusses include:

- How detailed 2020 Census data on race and ethnicity showing a decrease in the number of people identifying as White Non-Hispanic from the 2010 Census could be misappropriated by white supremacists (Bahrapour and Mellnik 2021)

- How research showing mutations that generate new covid-19 variants often occur in immunocompromised individuals could be misappropriated to demonize immunocompromised individuals (Mandavilli 2021)³
- How Gallup polling data that showing that nearly one-fifth of Gen Z adults identify as part of the LGBTQ+ community could be misappropriated to justify crackdowns on efforts and materials that support LGBTQ+ youth (Jones 2023)

Having covered the misunderstanding, misrepresentation, and misappropriation of research, the workshop turns to situations in which research and researchers are subject to malinformation through bullying, harassment, and violence or threats of violence, something that has become all too common against public health officials and medical researchers since the covid-19 pandemic.

Illustrative examples in the workshop include:

- The historian of ancient India, Romila Thapar, whom Hindu Nationalists have long targeted due to her opposition to their efforts to rewrite history textbooks that run counter to the historical record, in order to advance Hindu supremacist ideology and the marginalization of religious minorities in India (Masih 2021)
- The historian of medieval Europe, Dorothy Kim, who, after pushing back on their narrative of medieval European history in the wake of the 2017 Charlottesville massacre, was targeted and doxed by the Alt-Right (Kim 2018)

Contextualization of the Issue

The workshop proceeds to then discuss the larger contexts in which this phenomenon is occurring. Mis-, dis- and malinformation are not new, but the amount of information created (whatever its intent and accuracy) and the speed at which it travels differentiate the contemporary impact of mis-, dis-, and malinformation from their effects in previous eras (Chisholm 2022). The technological factors that augment the magnitude and velocity of mis-, dis-, and malinformation coincide with a political, economic, social, and cultural environment in which there is declining

³ Studies cited in Mandavilli (2021) include Avanzato et al. (2020); Baang et al. (2021); Choi et al. (2020); Choudhary et al. (2021); Kemp et al. (2021); and Truong et al. (2021)

trust in established institutions and authorities (Ellis, Webb, and Kaufman 2022). The advent of Gutenberg's printing press and its role in driving the Reformation and the Enlightenment provide an historical analog to the advent and effects of the internet and World Wide Web. That historical information revolution helped undermine the power of the contemporaneous institutions and authorities in Europe (namely, the Roman Catholic Church) and establish the authorities and institutions of the Enlightenment in their place (Dover 2021). It is these authorities and institutions erected by the Enlightenment that are now under threat. This is not to say that the Enlightenment was value-neutral or that questioning the institutions and authorities it established is unhealthy. Ellis, Webb, and Kaufman (2022) note that the "cottage industry" of books about the decline in faith in authorities and institutions is largely driven by publications by white men. This is probably not coincidental, given that the Enlightenment institutions and authorities sprung largely from the ideas of white men of Western European descent. One can posit that the loss of faith in established authorities and institutions has fed the paranoia of QAnon conspiracy theorists and driven hostility toward public health officials during the covid-19 pandemic. One can also make the case that it has made some individuals, who in the past would have reflexively believed a police officer's account of an officer-involved shooting, now approach these situations with more skepticism of the account of events offered by law enforcement. The effects of the decline in trust in established institutions and authorities cut in many directions.

Whatever the effects, the misunderstanding, misrepresentation, and misappropriation of research exist in the context of a decline in trust in established institutions and authorities, and this workshop makes a point of identifying this to participants to help them know that any attack on their research is not about them but is part of a larger societal trend. This is not meant to diminish the seriousness of any situation participants might face or the larger societal trend, nor is it intended

to alleviate any anxiety participants might have. It is meant to describe the context of what is going on, a point revisited later in the workshop when I cover tactics for responding to the misunderstanding, misrepresentation, and misappropriation of research.

Preparation Strategies

Following the discussion of definitions and the context, the workshop proceeds to discuss strategies for how participants can prepare for the possible misunderstanding, misrepresentation, and misappropriation of their own research. Fundamentally, this is about knowing one's field of research and what the academic community and the public are saying about one's field of research and one's own research. As a librarian, I see this a perfect point in the workshop to mention how participants can utilize Syracuse University Libraries' resources to keep current on their field of research and their own research. This includes demonstrating to participants how they can create accounts and set up alerts in Scopus, Web of Science, and (especially if participants are students who might not have access to these two databases after graduation) Google Scholar to monitor scholarly communication about their research and their field of research, to let them know when a publication cites their work or the work of important figures in their field. I also show them Syracuse University's open-access institutional repository, SURFACE, and log in to my own account to demonstrate the platform's features, including a map that tracks where and when one's work has been downloaded. Knowing the geographic location of where one's research has been downloaded can provide users of SURFACE a glimpse of who might be interested in their work (including corporate or government entities) and also give them advanced notice that someone might be about to cite, adapt, apply, synthesize, or make other use of their research. Bibliometric and scholarly-communication-monitoring tools such as these are important for professional researchers anyway, but the workshop clarifies how keeping current on the academic conversation

about one's field of research and keeping tabs on how and where one's own research is used can empower a researcher to prepare for potential situations where their research is misunderstood, misrepresented, or misappropriated.

Of course, the overwhelming majority of the public will not likely be hearing about research from peer-reviewed journals or other forms of scholarly communication. They are more likely to find out about research via traditional news outlets or social media. Thus, as a preparation strategy, the workshop recommends that participants monitor traditional and social media discourse about their field of research and their own research. This can include setting up alerts on Google News and on social media outlets. It also includes using tools such as Altmetrics and PlumX Metrics that monitor news sites and social media for mentions of academic research. Again, making a habit of monitoring public discourse about one's field of research and one's own research is advisable notwithstanding, but it is even more so, given that these platforms are likely to be the place where misunderstandings, misrepresentations, and misappropriations of research originate and spread.

Strategies and Tactics for Handling Situations

The workshop continues with a video of a back-and-forth between Senator Rand Paul and Dr. Anthony Fauci at a March 18, 2021, Senate Health, Education, Labor, and Pensions Committee hearing on the federal government's covid-19 response (Senate HELP Committee Hearing on COVID-19 Pandemic Response 2021).^{4,5} As a formative classroom assessment (discussed further

⁴ The clip I use can be found at <https://www.c-span.org/video/?c5065226/user-clip-exchange-dr-anthony-fauci-sen-rand-paul-march-18-2021>

⁵ I first used this video during the Spring 2021 iteration of the workshop, which occurred shortly after the Senate hearing depicted in the video. I continue to show it because the exchange between Dr. Fauci and Senator Paul was quite prescient in retrospect. In the clip, Senator Paul pushes back against mask mandates, saying that they are unnecessary because, he argues that one cannot get covid-19 if one has already had it or been vaccinated. Dr. Fauci counters that that was not known for sure and that it was possible that variants of the virus might circumvent natural or vaccine-induced immunity. By the time I taught the workshop in Fall 2021, the Delta variant had, however unfortunately, vindicated Dr. Fauci's argument for caution.

in a later section of this paper), I ask workshop participants to analyze what techniques Dr. Fauci used in his responses to Senator Paul. In the past, I facilitated a verbal discussion for participants to critique Dr. Fauci; I now also use Mentimeter polls as a classroom assessment technique for this portion for participants to add their thoughts (again, in case there are participants would rather not speak) and then use the Mentimeter responses as a jumping-off point for a verbal discussion. The video is an excellent illustration of an expert researcher who is also an expert communicator defending research against misrepresentation and misappropriation, and workshop participants have been very adept at identifying the main tactics that Dr. Fauci uses. This discussion helps segue into the portion of the workshop that discusses how participants could handle situations in which their own research might be misrepresented or misappropriated, which I will discuss momentarily.

I also ask workshop participants to critique how Dr. Fauci could have improved his communication, knowing he would not likely have stopped Senator Paul from misrepresenting covid-19 research, but could counter the misrepresentation's ability to misinform the public. Generally, responses note Dr. Fauci's use of jargon and technical terms might confuse members of the public who were only causally paying attention to news about the federal government's response to the covid-19 pandemic.

After the discussion about the video, the workshop dives more deeply into tactics for handling situations in which one's research might be misunderstood, misrepresented, or misappropriated. First, the workshop suggests finding a grain of truth in the incorrect portrayal of research. Participants usually point out Dr. Fauci did this with Senator Paul, noting the senator's notion of permanent immunity matched with the science regarding the original covid-19 variant, but that it was too soon to say it was correct about emerging variants of the virus (which, again was a very prescient point). I also discuss a 2021 op-ed in which a nursing home physician discussed his

efforts to persuade employees at his nursing home to get vaccinated against covid-19 (Merchant 2021). Much of this entailed countering misinformation and disinformation about the vaccine, something he did by first listening to employee concerns about the vaccine and taking the concerns that were unfounded, finding the grain of truth in them, and explaining the facts and how they got misunderstood, misrepresented, or misappropriated. This included clarifying that the vaccine was not changing one's DNA but was injecting RNA strands that cells used to create proteins related to the virus that the body's immune system attacked, thereby conveying immunity. Another example the physician gave was explaining that the vaccine would not inject recipients with a GPS-tracking microchip but that there were such microchips on the boxes in which the vials were shipped to make sure they got to their destinations. I also mention information passed along in many abstinence-only sex education programs that condoms fail to prevent pregnancy one-out-of-six times (Rose 2005). While statistics on contraception effectiveness from the Guttmacher Institute (2020), a think tank and research organization specializing in reproductive health research, indicate a grain of truth in this assertion, in that in typical use, condoms fail to prevent pregnancy 13% of the time (about one-seventh or one-eighth of the time), with perfect use, the failure rate is 2%.

This segues into another strategy for preparation and tactic for handling a misunderstanding, misrepresentation, or misappropriation of research: recognizing what the debate about the incorrect framing of research is really about at the social or political level. It is fair to say—and circumstantial evidence suggests—that the debate about masking and vaccination during and since the height of the covid-19 pandemic has never been about the masks or vaccines, but rather what they represent to people (Haynes 2021; Redbird et al. 2022). Applying this strategy requires preparation through educating oneself about the belief system in which the misunderstanding, misrepresentation, or misappropriation of research arises before one can handle

the situation, at which time, the workshop suggests that to the extent an incorrectly informed audience will allow, a researcher handling a situation should be respectful and convey that they understand the social or political context that informs the beliefs that make an audience receptive to incorrect information about a piece of research.

Along those lines, the workshop suggests to participants that if they want to show the grain of truth in the inaccurate framing of a piece of research and show empathy toward a persuadable audience that adopted the mis-framing, they can employ the tactic of presenting the source of the correct information also showing information that supports—or is even utilized by—a cause or organization that the audience endorses. I provide the example of handling a situation in 2014, when I was teaching political science at a community college, in which a student began providing the class with false statistics about contraception. I began by showing a contemporaneous version of the chart cited above from the Guttmacher Institute and then showed how the Guttmacher Institute's statistics on the total number of abortions since *Roe v. Wade* were used by the anti-abortion movement, which this student supported.⁶ I then empathetically discussed the beliefs and motivations of religious groups that advocated for abstinence-only sex education but also noted that the provision of incorrect or incomplete information can have adverse consequences for people, particularly when their health is on the line.

Another tactic the workshop suggests is to analogize the larger debate in a historical or comparative cultural context. Depending on one's research, this might entail comparing immigration or drug-approval policies across different countries or showing parallels between

⁶ Of course, the Guttmacher Institute, which supports legalized abortion, would probably view the anti-abortion movement's use of their statistics on the total number of abortions since *Roe v. Wade* as a misappropriation of their research, which might explain why that statistic, which was present in 2014, was no longer present on the Guttmacher Institute's website in 2021—when I searched for it in preparation for the workshop—nor since.

present discourse and what these debates looked like in the past. The idea is to find examples from the past or from other cultural contexts that acknowledge the concerns people have that feed into why they believe incorrect information about research but also demonstrate they do not need to be as fearful or angry as they are. All the while, one should show empathy and be careful not to diminish the incorrectly informed individuals or make them feel they are being subjected to an *ad hominem* attack.

Finding Opportunities to Practice and Prepare

Circling back to the video of the exchange between Dr. Fauci and Senator Paul, I tell participants who are graduate students or faculty that they can use undergraduate classrooms as a place to both assess how an uninitiated audience understands or misunderstands their research and test their potential responses. I incorporated this suggestion into the workshop based on my own experience dealing with classroom instigators when I was a community college political science instructor and the notion that the public will have, at most, an undergraduate student's understanding of academic research. An undergraduate classroom is also usually a low-stakes environment for assessing the knowledge of uninitiated audiences and testing responses to misunderstandings, misrepresentations, and misappropriations of research, which can make it a useful rehearsal space for navigating situations that involve the wider public. Participants are encouraged to take time to ask students in courses or sections they teach about what those students have heard about topics related to participants' research. These are also opportunities to prebunk false information students might encounter in the future.

An experimental suggestion the workshop has recently added is to utilize Chat GPT by asking the platform about the topic of one's research or one's field of research. Because Chat GPT draws on the open internet (albeit it does not incorporate information on the internet into its dataset

as that information is published but is subject to a delayed ingest of data), one can get a sense of what misinformation, disinformation, and malinformation about one's research and field of research is circulating online. One can also ask Chat GPT to explain one's research and field of research in language that is more accessible to a general audience. The workshop notes that utilizing these features of Chat GPT might be especially useful to researchers who do not teach undergraduates and therefore cannot test strategies and tactics in a classroom environment.

Caveats

At the conclusion of the workshop, I emphasize to participants that if they are being harassed or feel unsafe, they should let their supervisor or someone else in authority at their current or future institution know. I revisit the disclaimer at the beginning of the workshop and note that these situations are best addressed by individuals who have expertise in security.

Furthermore, the workshop adds a caveat that the success of any strategy is dependent on the interplay between the identity characteristics of the researcher and the audience in the situation. Much of the workshop derives from strategies and tactics I used in my community college political science classroom. When I was employing these strategies and tactics, I was a white male speaking to classrooms that mostly consisted of white conservative students. Had I not been a white male or had my class looked different, there might have been the need for different strategies and tactics or for adjusting the ones I was using. I note the two examples of bullying the workshop provides were both of women being harassed by men and that that is likely not coincidental.

After covering those caveats, the workshop opens to participant questions and open discussion. This discussion section was not present at first, but I have found participants want to have in-depth conversations about this topic in addition to having a workshop about strategies and

tactics for preparing for and handling potential situations. This allows participants to discuss their own situations and also provides me with feedback on what to cover in future iterations of the workshop and insight on what brings participants to the workshop. For example, something that I have gleaned from the discussion section is that many participants have had prior experiences with family members who misunderstand their research.

Classroom Assessment

Workshop Interest and Attendance

Attendance at the workshop has been an unfortunate challenge. From Spring 2021 through Spring 2023, there have been 41 sign-ups for iterations of the workshop offered through the Learn! at Syracuse University Libraries series; however, many participants who sign up for workshops do not attend. This has especially become a problem with online workshops. Many people sign up for online workshops with no intention of attending but with the expectation they will receive a recording of the workshop after it concludes. Thus, there were instances of planned online workshops in the Fall of 2022 and Spring of 2023 when no attendees showed up live, which meant there was no workshop to record. After this experience, I decided I would only offer the workshop in-person going forward. While this has not eliminated no-shows, it has improved attendance at the workshops.

Workshop Classroom Pre-Assessment

As was mentioned above, the workshop begins with an initial classroom assessment to gauge participants' understanding of public misconceptions of their field of research. Up until the most recent workshop (a concurrent session at the Syracuse University Future Professoriate Program retreat for graduate students in May 2023), this was done verbally and was not recorded in writing. At the concurrent session at the Future Professoriate Program retreat, I began using

Mentimeter polls as a classroom assessment technique to record workshop attendee responses. The classroom pre-assessment questions ask participants to offer general misconceptions about their field of research and specific examples of misconceptions.

Because some of the eight workshop participants made multiple submissions, there were ten responses to the question about general misunderstandings of participants' fields. Of those the responses to the first question,

What is your field of research and what are some common misconceptions about it?

- Four discussed how the way people interpret the official title of their discipline (in this case, political science, information science, and rhetorical studies) overlooks the diversity of research that takes place within the field.
- Five (from African American studies and political science) cited issues related to implicit biases around the study of topics involving race and ethnicity.
- One (from psychology) noted the regularity with which research results are presented out of context.

The second classroom pre-assessment question was about specific examples of misunderstood research in participants' fields and received six responses. Unlike the first question, this one did not ask for respondents to identify their discipline. Of those responses to the question,

What are some specific examples of research in your field that get misunderstood?

- Four mentioned issues pertaining to the definition and application of technical terms and procedures within their disciplines.
- Two mentioned issues related to implicit biases around race and ethnicity.

Again, the Mentimeter polls were followed by the opportunity for participants to verbally elaborate on their responses. The responses and the discussion helped me identify content I should emphasize as the workshop proceeded. It also helped build rapport among participants, as many of them had questions about the technical terms and procedures included in responses to the second

question. Thus, the discussion also gave participants the chance to share their experiences and provided a receptive audience for them to practice their clarifications of misunderstandings in their fields, setting the stage for the workshop's later discussion of practice settings.

Workshop Formative Classroom Assessment

The main formative classroom assessment in the workshop has been participants' analysis and critique of the tactics Dr. Fauci used in his back-and-forth with Senator Paul in the video clip. Again, this was done verbally until the May 2023 iteration of the workshop, when I asked participants to provide responses via a Mentimeter poll and then invited participants to elaborate on their responses. Participation in the Mentimeter polls in this workshop iteration declined as the workshop proceeded. The question "What were some techniques Dr. Fauci used?" generated only four responses. The participants who responded to the question indicated that Dr. Fauci:

- Acknowledged what truth lay in Senator Paul's representation of covid-19 research while also pointing out the limitations and inaccuracies of that representation.
- Contextualized Senator Paul's views and acknowledged his disagreement with them
- Restated his own views for clarification.
- Stayed level-headed and kept a respectful demeanor

. The responses participants submitted identified many of the tactics Dr. Fauci used and that the workshop covered (namely, finding the grain of truth and contextualizing the opposing view) after the discussion of the video. Additionally, participants also noted tactics related to Dr. Fauci's demeanor (namely, staying level-headed and being respectful) that are incorporated into the tactics covered in the workshop following the discussion of the video. The workshop also offered a Mentimeter poll where participants could offer critiques of Dr. Fauci's techniques. Participants chose not to submit Mentimeter responses to this question at the May 2023 iteration and instead gave their responses verbally. As with previous iterations of the workshop, the use of technical

terms was noted as a possible impediment to a casual, uninitiated observer’s ability to follow what Dr. Fauci was saying.

Workshop Summative Classroom Assessment

Table 1: Summary of Responses to Post-Instruction Operational Classroom Assessment (Composite: Spring 2021-Spring 2023)

Question	Response Summary
What is the most valuable thing you learned in class today?	<ul style="list-style-type: none"> • Citation tracking methods and tools • Importance of tracking public opinions in scientific fields • Tactics used by professional science communicators to combat misinformation • Discussion on how misconceptions and misrepresentations can surround a specific topic • Suggestions for familiarizing oneself with belief systems and engaging in the cultural/social context
Is there anything about the way you do research that you will change as a result of this class?	<ul style="list-style-type: none"> • Will adapt how present research to a general audience • Will use citation-tracking tools • Will monitor social media for public misconceptions about field of research • Will adapt teaching practice as well as research practices • Will keep public communication in mind when conducting research • Will utilize undergraduate classroom as a space for trial runs in gauging understanding of research and for testing responses to misconceptions about research
What questions remain unanswered? What did you find confusing?	<ul style="list-style-type: none"> • Better coverage of recent changes in the information landscape (e.g. Twitter's new ownership and TikTok’s possible ban) • More strategies to track public conversations • More information about library resources • Research communication information more tailored toward the needs of civil service members • More focus on the actors creating disinformation about research rather than those who are misinformed

Summative classroom assessment has also been a challenge in terms of follow-through. Syracuse University Libraries has a standard post-instruction “Workshop Minute Paper” where workshop attendees can briefly give operational feedback on: 1) what they felt was the most

valuable concept covered in a workshop; 2) how they might change how they conduct research after attending a workshop; and 3) what questions remain after a workshop and how they recommend it be improved. Unfortunately, the participation rate in these quick surveys among those who attend the workshop has also been low. I utilized the Libraries “Workshop Minute Paper” operational classroom assessment in all workshops until the May 2023 iteration at the Syracuse University Future Professoriate Program graduate student retreat, when I created a post-instruction assessment tailored specifically for this workshop. In addition to the questions from the Workshop Minute Paper, in the newly created classroom assessment specific to this specific workshop, I asked participants to evaluate the helpfulness of the techniques covered in the workshop and indicate how likely they are to use them. However, the response rate for the new summative classroom assessment instrument from the May 2023 workshop was 0%, despite the attendance of six students and two faculty.

The cumulative responses to the “Workshop Minute Paper” standard operational feedback survey for “Misappropriation and Misrepresentation of Research” workshop offerings through the Learn! at Syracuse University Libraries series from Spring 2021 through Spring 2023 (Table 1), while limited, have provided some useful feedback on the workshop. Aspects of the workshop participants have labeled as valuable include the demonstration of citation-tracking tools and the discussion of familiarizing oneself with the cultural and social context of public misconceptions about research. Participants have indicated that changes in how they conduct research will include consideration of public communications as they move through the research process and the utilization of undergraduate classrooms to explain their research in accessible terms. Much of the feedback on remaining questions and suggested improvements revolves around how to keep up with the implications of changing technology and more focus on communication with policy-makers and

on perpetrators of disinformation about research. As was mentioned, the feedback in Table 1 is a composite of feedback from iterations of the workshop from Spring 2021 through Spring 2023, and many of the suggestions offered by participants in earlier workshops have been incorporated into later iterations of the workshop.

Future Directions

The workshop is moving on from its concept-testing phase, and while I feel strongly that this is a topic current and future researchers need to have awareness of, the current method of delivering the content has had limited success. Thus, while I will be teaching in-person workshop sessions again in the Fall 2023 semester, I am working on converting the content of the workshop into a series of videos. My hope is that asynchronous delivery of the workshop content will enhance its reach and impact. Of course, the creation of asynchronous digital learning objects will itself create issues related to updating content as trends surrounding the misrepresentation and misappropriation of research evolve. My next steps also include reaching out to past workshop attendees to follow up on whether and how they are using the strategies and tactics suggested in the workshop and if so, how successful they have found them to be.

Conclusion

Challenges to researchers' intellectual freedom are not new. From Galileo Galilei to Charles Darwin to the present, groundbreaking research is apt to generate controversy. Some pushback will come from the public; some will come from figures and institutions of authority. The contemporary information ecosystem provides ample opportunities for the creation and spread of misinformation, disinformation, and malinformation—including the misunderstanding, misrepresentation, and misappropriation of research. However, the same technology ill-intentioned or unwitting actors use

to spread incorrect or mis-framed information about research can also empower researchers to prepare for and respond to incidents when their own research might be misunderstood, misrepresented, or misappropriated. It is crucial that both established and budding researchers gain competencies in strategies and tactics for preparing for and responding to such incidents. I have designed and facilitated the “Misappropriation and Misrepresentation of Research” workshop as a means for building these competencies. Just like the nature of mis-, dis- and malinformation, the workshop will continue to evolve, incorporating pedagogical enhancements and adapting to the changing information landscape so that it can more effectively empower its participants to defend their own intellectual freedom and that of others.

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