



The University of Texas at Austin
Center for Media Engagement
Moody College of Communication

THE STATE OF SCIENCE REPORTING IN TODAY'S DIGITAL MEDIA LANDSCAPE: INTERVIEWS WITH SCIENTISTS WHO USE SCILINE'S SERVICE

Joshua Anderson, Anthony Dudo, and River Terrell

SUMMARY

Shifts in the media landscape, including an increased demand for science reporting in the wake of the COVID-19 pandemic, indicate a need to update our understanding of the relationships between scientists and journalists. To provide insight into these relationships, and to better understand scientists' public communication activities, the Center for Media Engagement conducted in-depth interviews with 21 scientists. Additionally, the interviews explored scientists' experiences using the expert matching services of SciLine, an organization based at the American Association for the Advancement of Science (AAAS).

Although the population of this study was scientists who participate in SciLine's matching service, interviewees reflected broadly about their experiences with media and the current state of science communication. Findings suggest that these scientists' interactions with journalists — especially those leading to sustained relationships — have been mostly positive, but there are concerns about journalists with anti-science agendas. Scientists also shared deep concerns about the spread of science misinformation and disinformation and the lack of material support for science communication.

SUGGESTED CITATION:

Anderson, J., Dudo, A., and Terrell, R. (June, 2023). The state of science reporting in today's digital media landscape: Interviews with scientists who use SciLine's service. Center for Media Engagement. <https://mediaengagement.org/research/state-of-science-reporting-interviews-with-scientists>

KEY FINDINGS

- Scientists' interactions with journalists referred to them through SciLine's service ranged from neutral to positive. Most interviewees did not feel that the journalists from SciLine were distinct from other journalists they had spoken with, but some felt that these reporters tended to be better prepared.
- Scientists' interactions with journalists were mostly positive and may help scientists think more about the implications of their work.
- Core values of science, particularly sticking to one's specific area of scientific expertise, guide scientists' interview behavior.
- Scientists found sustained relationships with journalists to be among their most positive experiences with media.
- Scientists are concerned about the issues of misinformation and disinformation and view them as being intrinsically tied to social media and the politicization of science.
- Scientists viewed the spread of misinformation and disinformation as perpetuating a declining trust in scientists and scientific institutions among some members of the public.
- Scientists viewed combating misinformation and disinformation and serving the public good as core motivators for their participation in public communication activities.
- Scientists saw public communication, including speaking with journalists, as a distinct and trainable skill.
- Despite perceiving widespread encouragement for public communication, scientists view it as rarely being materially incentivized or supported.

RECOMMENDATIONS

- SciLine should emphasize — and continually improve — its ability to be a trustworthy broker between scientists and journalists.
- When seeking to expand its expert database, SciLine should emphasize how participation in its expert-matching service can help scientists serve the public good and fight misinformation.
- SciLine should emphasize — and continually improve — its ability to help provide scientists with supports and incentives that can help sustain their increased interest in public communication.
- Infrastructure development and culture change are essential to improving science communication.

BACKGROUND

The onset of the COVID-19 pandemic and the rise in natural disasters attributed to anthropogenic climate change have driven a recent spike in public interest in science information.¹ As these events have shaped the course of recent history, it is evident that science, broadly, is an important facet of the information ecosystem. Due to its inherent complexity, science information has traditionally been handled by specialized science reporters who work with scientists to transform technical information to a lay audience.²

The transformation of scientific information for a lay audience has not historically been free of conflict. Many of these conflicts have arisen when science topics have become political, such as anthropogenic climate change.³ When such topics became politicized, journalistic institutions generally adopted the trappings of political news for their coverage. In the case of anthropogenic climate change in particular, this meant that in order to appear unbiased, many news outlets provided equal time to scientists who did and did not think that human activities were driving climate change, despite the practical consensus among climate scientists.⁴ Because of these conflicts, scientists have often reported feeling reluctant to speak with journalists, or in some cases, have requested to review the stories before publication.⁴

Structural shifts in the current media ecosystem, ultimately driven by digital media, have caused widespread cuts to traditional media outlets, which have largely responded by cutting specialized news positions such as science reporters.⁵ Over the past 20 years, this shift has resulted in science news that has been produced by either non-specialists, who may not be familiar with the topic material, or freelancers, who may be overwhelmed by the need to find a number of different compensated writing assignments. These trends had already affected the state of science news by the time COVID-19 emerged as a global pandemic in 2020. The rise in demand for science news met a largely unprepared industry, and a number of the journalists who covered it described the labor as emotionally taxing, especially for those who were not science specialists.⁶

While the rise of digital media has presented challenges for traditional media outlets, it also provides new opportunities for science communication. In particular, it allows scientists to directly communicate with public audiences. Using social media, scientists are now able to connect directly to individuals without utilizing traditional media.⁷ Considering the challenges and opportunities afforded by the new media environment, there is a need to update our understanding of the relationships between scientists and journalists. This need is especially salient now due to the increase in demand for science content following the COVID-19 pandemic. The research presented in this report addresses this research gap through semi-structured interviews with 21 scientists who have interacted with journalists through the expert matching services of SciLine, a program based at the American

Association for the Advancement of Science (AAAS). The services provided by SciLine allow journalists to request a match with a domain-relevant expert for their stories. This study was funded through a grant from AAAS and provides insight into the modern science media ecosystem from the perspective of those who create science news, with an eye toward the relationships between scientists and journalists, public communication activities by scientists, and the biggest problems facing science in society, in particular, the rise of science misinformation.

FULL FINDINGS

Finding 1: Scientists' Interactions With the SciLine Expert Matching Service Ranged From Neutral to Positive

Compared to journalists who [have used the SciLine expert matching service](#), scientists reported a more neutral experience with the service than did journalists. Most of the scientists did not strongly differentiate between journalists who contacted them through SciLine with those who did not. That said, several participants attributed benefits to using SciLine. One noteworthy benefit was that SciLine helped give exposure to lower visibility and/or more geographically local researchers:

[Calling on lesser-known academics] is super important, because otherwise, you end up with [only people at schools like Harvard], and there are some fantastic people at schools like Harvard, and there are some real self-promoting idiots at schools like that too.

This perceived benefit of SciLine — diversifying scientist sources — was also emphasized by journalists. Additionally, multiple participants explained that they saw SciLine's mission as similar to their own with respect to the public communication of science:

I saw [SciLine's] role was really the same thing in terms of getting the science to the public, getting the right and correct information, supporting reporters, and being able to communicate science to people.

Although most scientists' experiences with SciLine could be classified broadly as neutral, a small subset of participants recounted negative experiences. These negative experiences were related to poor goodness-of-fit between a scientist's specific expertise and what the journalist was seeking from their source. One participant speculated that poor fit between scientist sources and journalists likely has less to do with the efficacy of SciLine's matching system and more to do with what information the journalist provided in their initial query.

Finding 2: Scientists' Interactions With Journalists Were Largely Positive, With Some Noteworthy Negative Interactions

Based on previous literature, we expected to hear scientists frequently describe contentious relationships with members of the press. Instead, we found that scientists had a strongly positive view of journalists reporting about science. Scientists commonly offered praise for the media professionals covering science, and much of the praise was offered within the context of pandemic news coverage:

Fifty percent of local reporters should get a[n honorary] Master's in epidemiology. I think it's amazing [what they have done] in two and a half years [during the COVID-19 pandemic].

This said, scientists did not regard all journalists positively. Specifically, scientists described two types of journalists as being especially problematic. The first type were journalists with anti-science agendas:

If you are [researching] a controversial thing ... and you have a skeptic [journalist], you'll always lose. Their offense will always beat your defense ... They won't let you complete a sentence.

Although these adversarial interviewers were described as particularly destructive, they were also viewed as relatively rare and avoidable. Scientists also described inexperienced and/or uninterested journalists as being challenging to work with:

The other challenge is even when there's not an active adversarial or "gotcha!" approach, but where there's a journalist who maybe is brand-new or it's like a sportswriter who gets asked to do a climate change story for some reason but who really doesn't have any context ... sometimes that can be equally challenging.

Overall, our participants mostly felt they have a capacity to identify and avoid journalists with anti-science agendas. They also seem well-versed in sensing when a journalist is new to covering scientific topics and adapting their interview behavior accordingly (e.g., being more careful about what they say and how they say it during interviews). Notably, many of the scientists who described having interactions with these types of journalists also exhibited a degree of empathy for them, describing how structural issues in the production of science news are often forcing non-specialist journalists to cover science topics. Regardless, many of the scientists we spoke with seemed concerned about media interactions that expose them to agenda-driven journalists or reporters who lack experience covering scientific topics.

Finding 3: Core Values of Science Guide Interview Behavior

The scientists we spoke with commonly viewed their interview behaviors as being intertwined with what they understood as core values of their profession (e.g., speaking only from evidence, speaking only on their specific subject area, being objective). An emergent theme on this topic was the ways that scientists engaged with journalists in order to keep themselves safe. Clarification in area of specialty was the first of such behaviors. It was common among our participants to note that they — like most scientists — have a narrow area of expertise:

I think it's important that [reporters understand] that we are experts of a specific [area of expertise].

Scientists also seemed to commonly grapple with the idea of objectivity and how it factors — or should factor — into their interactions with journalists:

I think the idea of projecting objectivity [in an interview with a journalist] in its extreme form is disingenuous and I think people can smell it from a mile away ... We think it's our objectivity that makes us trustworthy. I actually think it's our approach that makes us trustworthy. Because we're not objective, that's just garbage.

On a related topic, scientists also often struggled with how best to manage politics as it relates to their science, and how willing they were to express their personal political views during interviews. As one participant described, it is hard to come across as being apolitical despite their best intentions to avoid conveying any sort of direct partisan alignment:

I often [hear] the claim that science isn't political, which is just objectively untrue, but I will differentiate between science being political and science being partisan ... So it's very naive to say that science is free of politics, but I do also think that science should be free from ideology in practice.

In addition to the ways that core values of science guide interview behavior, we also sought to learn how interviews could influence the core values and functions of the scientists themselves (e.g., evidence of how participating in interviews contributes to how a scientist does or regards their work). Numerous scientists spoke about how their participation in interviews led them to see a “bigger picture”:

I'm always the person in the meeting with fellow scientists going: “So what's the big question here? How does this small issue we're getting hung up on relate to the bigger picture? How do we actually tell somebody who's not in this select group of people why what we do matters?”

In sum, many scientists spoke with us about the different ways they use core values of science to guide their behavior in interviews. It is also clear, however, that these interactions commonly connect back to how scientists make sense of their work, often by helping them to think more about how their research is situated and relevant in broader contexts.

Finding 4: Scientists Found Sustained Relationships With Journalists to be Among Their Most Positive Experiences With the Media

We were especially interested to learn about how scientists characterize a “good” interaction with a journalist. We found that scientists viewed interviews as more personally fulfilling when there was a quality, two-way interaction between them and the journalist:

I think that the best interactions I have had have been when a journalist really wants to sit and it's not about a topic, it's not about an event, it's not about a select paper. It's “hey, I'm interested in writing a story about X and I'm trying to understand more about the general field and where it's going...” Those tend to be longer conversations and more back and forth... And I think that those are always really beneficial because you learn from the questions the journalist asks.

This perspective often emerged when scientists contrasted poor experiences with journalists who lacked science experience or interest; they spoke glowingly about interactions with other journalists who had “done their homework” and come to the interview informed and ready to engage with the science. Scientists also often described the value of having — or wanting to have more — contact with journalists outside of specific interviews:

I remember an interesting experience because it was sort of a two-way interaction [during a conference with scientists and reporters]. So, if I think of things like that, where you can have scientists in the room with reporters [and] just kind of do a crash course in learning about “what is mpox,” something like that, that would be valuable.

We heard from many participants that the most valuable interactions they had with journalists were those that extended outside of one-time interactions and developed into ongoing interpersonal relationships with media professionals:

I have a couple of editorial writers here in our local paper who really like to write about the environment and so they'll call me and they'll ask me what I think about it... So, I would say probably half of that interaction with the media is not quoted material; it's on background, networking, that kind of stuff which I've worked really, really, really hard to cultivate. I'm perfectly happy [with this kind of relationship with the press].

Overall, scientists seemed to strongly prefer interactions with journalists where they felt like partners in journalists' efforts to communicate science.

Finding 5: Scientists are Concerned About the Issues of Misinformation and Disinformation and View Them as Being Intrinsicly Tied to Social Media

Scientists had much to say about this topic, and nearly all of them brought it up early in the interview without prompting. Scientists almost unanimously described misinformation about science as a major problem facing society, and one that has escalated rapidly in recent years. Many of our participants linked this increase to the rise of social media:

I think a lot of this Infodemic is certainly perpetuated by the rapidity of social media and just that there are no editors. It's not like a reporter writing an article and the editor has to check it. It just goes out there and once it's out there, even if it's retracted, it doesn't matter, it's still out there.

Many scientists also conveyed pessimism about the prospect of combating science misinformation that spreads online. These scientists often understood much of this misinformation to actually be disinformation that was intentionally spread by bad actors attempting to sow chaos in an organized manner:

I'm absolutely convinced that we in public health and academia are badly reactive to what happens on social media ... The anti-vaccine group, if you will, they're much more organized and much more determined [than science communicators]. They're often funded and so they're out there proactively, whereas we — the good guys — are coming after trying to unring their bell, which is an enormous challenge.

The scientists we spoke with also commonly expressed views about how the uptick in misinformation and disinformation was exacerbated by the politicization of science. One participant explained this dynamic through a sports metaphor:

An example I often use in class is sports. If you're rooting for your favorite team it's a highly emotional time ... at some point the ref made a decision that doesn't fall your way and your mind may immediately think that the refs are biased or paid off or that they clearly want the other team to win. You have no evidence for that. But the emotion and the outcome you want will play tricks on you.

Although scientists largely regarded social media as being central to the spread of misinformation and disinformation, many also attributed the spread to wider social factors, as we discuss in the next section.

Finding 6: Scientists Largely Attributed the Spread of Misinformation and Disinformation to Falling Trust in Scientists and Scientific Institutions Among Some Members of the Public

Scientists overwhelmingly viewed the rise of science misinformation and disinformation as occurring in tandem with a decline in trust in scientists and scientific institutions. Our participants held a widespread view that an increasing proportion of the public have lost faith in scientific institutions, and as a result are vulnerable to bad actors spreading disinformation:

When people feel as though they can't trust authoritative sources of information, they're going to be drawn to non-authoritative but impressive sounding sources of information; giving equivalence to Robert Kennedy's anti-vaxxer views and the CDC being a perfect example of that.

The scientists we spoke with also shared possible explanations for eroding trust in scientific institutions. Some participants cited failures on the part of these institutions to effectively manage recent crises:

I like to think I'm the president of the CDC fan club... but their communication throughout COVID could have been vastly improved, and [their communication] continues to need improvement. Like their initial coyness about the population affected with mpox (men who have sex with men) because they were so concerned about stigma. I said you've got to communicate with the community affected so that they understand that they are at risk and need to modify their behavior if they want to avoid mpox, and we've learned how to do this without stigma! And stop being coy! Because when you're being coy, the public senses that instantaneously and you lose credibility.

Other scientists, however, blamed wider social and political phenomena for the growing distrust of many social institutions. Several of the scientists who discussed these social trends spoke about how the Trump administration moved American society toward a more populist atmosphere where scientific institutions were no longer authorities of knowledge:

Maybe it's always been there, but my sense was with the Trump Administration, [scientific facts] became not so much the "science," as it became a belief system and when it became a belief system then it didn't matter what you say. It doesn't matter what the facts are.

Regardless of causes, the scientists we spoke with understood the current environment of science communication as being marked by abundant misinformation and declining trust in scientific institutions.

Finding 7: Combating Misinformation and Disinformation and Serving the Public Good Are Key Motivators for Scientists' Participation in Public Communication Activities

Scientists' most common motivation for participating in public communication (including interviews with journalists) was to combat the perceived abundance of science misinformation and disinformation discussed in the previous section. Many scientists describe their role as providing accurate information as a counterweight to misinformation:

What I'm trying to reach, as a scientist, is the people who are in the gray area ... it's a bunch of people who are confused because they're hearing both [facts and misinformation]. And that's the importance of the media, incorporating more and more scientists like me who just speak to the facts.

Other scientists, however, described values of science communication as not limited strictly to disseminating scientific facts. Notably, numerous scientists described how efforts at transparency of the scientific process, and connecting with individuals at their levels, could go a long way:

I think that the communication aspect of [science] is so critical. It's so important. The Ivory Tower paradigm — no more. Please, God, no more! We have to be able to get out among the public and tell them what we're doing ... If we don't, we're just going to be at the mercy of whatever misinformation is out there.

These findings should be qualified, however, by the fact that the scientists we spoke with were not particularly optimistic about the state of public science communication. Although a subset of participants discussed how public communication of science could be done more or how it could be done better, other participants made a point that even good public communication has issues reaching the right people:

The problem of course, is that we are preaching to the choir. The people who read The New York Times, The Washington Post, etc., are rational, intelligent human beings who are inclined to believe what they read [in the news]. The problem in America is the people who prefer social media — who believe what's on Granny's Facebook feed — make incredibly poor choices.

Even among those who were less optimistic about the potential for public communication to combat the rise in science misinformation, it was still common to hear that this was the primary reason they were personally motivated to communicate publicly about science.

The other commonly cited motivation for public communication was that, independent of the loss of confidence in scientific institutions, science has an obligation to the public good. Intrinsically linked to this public good obligation is an obligation to communicate the benefits of scientific research to the public. As one participant explained:

Science has an obligation to society in some way, like if science is making society worse, then what's the point? So, it's not just discovery for the sake of discovery, it is discovery for the sake of making the world a better place ... if that's a guiding philosophy then you really have to have a public-facing component to it, or it is not going to have that effect.

Among the scientists who discussed this public communication obligation, two participants (both from different departments at a specific university) stood out because both described a well-established philosophy of their university as being a central concept to their public communication activities:

The [redacted name] is a philosophy that ... all the benefits of the university extend beyond the campus to the entire state of [redacted]. And that philosophy has since evolved and progressed to not just being the borders of our state.

Although this example relates to a particular geographic region, it is illustrative of the power that academic identity has on the readiness of scientists to work towards the public good.

Finding 8: Public Communication is a Distinct and Trainable Skill

Generally, the scientists we spoke with viewed public communication as requiring a skill set that is distinct from scientific skills, and many described how a good scientist is not always a good science communicator. Specifically, in reference to their behavior in interviews, scientists commonly emphasized the importance of using accessible language:

You're playing in [the reporter's] game. You must adapt yourself to learn how to play their game, if you wish to be effective ... be clear and use small words, not "myocardial infarction," but "heart attack."

Although many participants noted that scientists vary with respect to public communication skills, few thought these skills were inherent traits. Many described similar personal journeys as public communicators where they developed their public communication skills through their own experiences — both good and bad — over time. Several participants, however, noted that their communication skills were developed through training:

Just describing climate impacts to the ocean was not enough. Like I was just talking to the people who were like me, I needed to get that message out ... the technical side of me evolved to be thinking about how my research could be positioned to inform people who aren't like me. And then the communication side also grew. I underwent media training, and I thought about how we get the message out.

Notably, among the scientists who discussed experiences or perspectives related to communication training, many emphasized the same caveat: not all training programs are of equal quality. They further described a thirst for training programs that directly enable real-world public communication experiences.

Finding 9: Public Communication is Largely Encouraged but Rarely Materially Incentivized

We also asked scientists about the support structures or material incentives they receive for communicating with the public. Scientists described mixed situations regarding support for their public communication efforts. Informal encouragement and modest support (e.g., access to a media relations staffer) seem somewhat common, while material incentives seem quite rare. Many participants spoke about how their employers praised their communication activities:

[My employer is] very supportive ... [They view media coverage as] just a good way of increasing visibility of our campus research.

Other scientists, however, noted that even this soft encouragement of public communication activities was not universal. One participant described their employer's ongoing struggle to broadly encourage public communication while avoiding any sort of controversy:

The university gives me a lot of positive reinforcement and I'm going to put a humongous asterisk after that ... sometimes I'm talking about things that are controversial and so the university doesn't always back me. I mean, they don't throw me under the bus, but sometimes it's like, "Oh, look what our director said, she's so amazing." And other times it's like, "Director who? No comment" which I completely understand ... they can support [public communication] and enable it, but then they also have sort of plausible deniability when the politics get sticky.

Overall, scientists felt that material incentives (e.g., compensation, formal job responsibilities, professional advancement) for their public communication efforts were scant. Among our interviewees, only one scientist was partially appointed by a university to engage in public communication. They explained that having public communication as an explicit requirement in their position gave them more time to engage with journalists and other media. That said, they emphasized that they still often found themselves in a position where they needed to justify the value of their communication efforts to administrators and colleagues. Throughout the course of our conversation, they reflected on why positions such as theirs are so rare:

There is so much demand for public-facing science communication right now. It's just astronomical, through-the-roof demand. But in practice, there are almost no institutions or job descriptions that accommodate it. The gap is very bizarre ... because everyone's like [science communication] is so important. It's a crisis ... but nobody is supporting it tangibly. I am increasingly baffled by why this gap persists.

The scientist's observation of the "gap" highlights the need for material action on the part of employers to support public science communication efforts.

RECOMMENDATIONS

SciLine Should Emphasize – and Continually Improve – Its Ability to be a Trustworthy Broker Between Scientists and Journalists

The scientists we spoke with offered clear descriptions of “bad” journalists who write about science. The worst experiences they described were the result of journalists who had malicious intentions in interviews. Scientists described these malicious journalists as those who interviewed them with what seemed like intentions to embarrass and/or entrap them. They also described how this subset of journalists use tactics like “gotcha!” questions designed to get soundbites they could weaponize, or confrontational techniques that would knock the participant off balance during the interview. Our participants noted that these journalists generally belonged to outlets with “anti-science” points of view.

Overall, scientists seemed highly concerned about engaging with these types of journalists even if they had not yet personally experienced this sort of interaction. Another subset of journalists that the scientists found challenging in interviews were those that were inexperienced with science coverage. They felt that these journalists might have tried to do a good job covering science issues but may have unintentionally caused harm due to their lack of expertise. The scientists we spoke with were generally sympathetic to these journalists, and saw malicious journalists as being vastly more problematic and much harder to work with.

As SciLine continues to evolve its current and future programming, it should keep firmly in mind that scientists are intensely concerned about predatory journalists. We recommend that SciLine systematically review the procedures they have in place to identify and filter out journalists representing malicious and/or agenda-driven outlets and continually seek to maximize the quality control provided through its matching service. Additionally, SciLine should expand its ability to help non-specialist journalists surmount learning curves about scientific issues to address other, albeit lesser, concerns from scientists. SciLine could address these recommendations by bolstering some of its current program offerings (e.g., hosting media briefings on scientific topics, collecting and distributing expert quotes on breaking news) and by developing new programs or partnerships in service to improving the quality of journalists who participate in the matching service. SciLine’s efforts should also include emphasizing their commitment to quality control to current and future experts who participate in the matching service.

When Seeking to Expand Its Expert Database, SciLine Should Emphasize How Participation in Its Expert Matching Service Can Help Scientists Serve the Public Good and Fight Misinformation and Disinformation

When we asked scientists to describe what draws them to reallocate some of their research time to public communication, they predominately mentioned two key goals: combatting misinformation and disinformation and serving the public good. These two communication goals echo findings from previous research⁸ and seem, among our scientist interviewees, to be connected by a through-line of deep concern about growing anti-science, anti-expert sentiments among the American public.

As SciLine continues to grow and improve its expert database, it should position its expert matching service as a conduit through which scientists can attain goals they are likely to already hold: to curtail misinformation and disinformation and to empower their fellow citizens to make more informed decisions related to science and health issues. This framing may help SciLine optimize recruitment.

Tied to their descriptions of these goals, however, was a shared concern among scientists about their ability to achieve them. In short, scientists expressed misgivings about efficacy; they often doubted their ability to communicate in ways that could effectively cut through echo chambers, connect across personal values, and counter confirmation biases. These concerns signal that SciLine should, beyond the practical issue of recruitment, think deeply about how they are structuring their expert matching service — and other programs — to maximize scientists' ability to help move the needle when it comes to achieving these goals. Likewise, these concerns could lead SciLine to think about how it could leverage new partnerships to expand its experts' communication abilities. In what ways, for example, could SciLine help its experts get connected to other well-established science communication training programs or opportunities?

SciLine Should Emphasize – And Continually Improve – Its Ability to Help Provide Scientists With Support That Can Help Sustain Their Increased Interest in Public Communication

The scientists we spoke with described a paradox: they perceived increasingly widespread acknowledgment from within the STEM community that science communication is important, but they did not see this acknowledgment anchored in sufficient support. One scientist we spoke with, whose job description includes specific expectations related to public communication, described how even they must scrape to find resources to support their communication efforts and how their employer distances themselves whenever their public communication is connected to anything adjudged to be remotely controversial. This scientist worries about how this paradox could have a chilling effect on scientist communicators — a worry that is both merited and instructive.

To be clear, making systems- and cultural-level changes to enable increased material support for science communication is complex.^{9,10} Organizations like SciLine, however, are more agile than many STEM institutions (e.g., universities, research institutions) and are fundamentally driven — as part of their mission statements — to foster more fluid connections between experts, media professionals, and citizens through improved communication. We encourage SciLine to reflect on how they may be uniquely positioned to help confront and address the gap between words and actions when it comes to fomenting more abundant and more effective public communication about science. At a systems level, SciLine could ask itself what roles it can play to impact the structures in which scientists work, particularly regarding how these structures can materially support public engagement. At the level of individuals, SciLine could ask itself what roles it can play in helping to sustain and grow scientists' commitment to public engagement even in situations where meaningful support from their employers is lacking. For example, could SciLine help scientists learn how to advocate for the importance of public engagement — including taking time to help science reporters — more effectively to their employers? Could this topic — or something like it — be integrated into the curricula of the training it offers to scientists?

When scientists choose to participate in public communication, which includes serving as a source for a journalist, they are taking a risk. They are making themselves vulnerable to potential antagonists who have an ax to grind with experts or the establishment. The scientists we spoke with are aware of this risk. They are also aware that they are often taking this risk without material support from their employers. This scenario seems unsustainable. It requires that stakeholders who seek to empower science communication, such as SciLine, increasingly think about how they can do so at different levels of resolution — from building individual scientists' communication skills to helping to evolve the systems in which these scientists are embedded.

Infrastructure Development and Culture Change are Essential to Improving Science Communication

The previous recommendation focused specifically on SciLine but it applies more broadly to the ecosystem of science communication. Moving forward, we believe that improving science communication requires nothing less than infrastructure development and culture change. Building capacity for science communication at micro levels (e.g., training individual scientists) and meso levels (e.g., developing communication fellowship programs) remains important, but the impacts of these efforts will never be optimized without placing more focus on macro levels (e.g., the systems and cultures within which science communication unfolds). This macro-level focus will, for example, require science communication stakeholders to reevaluate and redevelop the systems and cultures where many current

and future scientist communicators work: institutions of higher education.⁹ However, this macro-level focus also requires that we attend to domains that extend far beyond scientists' places of employment. Crucially, we must seek to better understand the current landscape of science communication stakeholders (e.g., communication training programs, professional scientific societies, science philanthropies) so that we can more thoughtfully build sustainable partnerships that amplify strengths, create synergies, and illuminate best practices. And we must do so in ways that maximize inclusion,¹¹ use strategy,¹² build coalitions,¹³ and prioritize systems-thinking.¹⁴ Embracing these challenges is essential if we are to create a new "culture of civic science"¹⁵ that can more effectively bridge intense societal divides associated with increasingly complex scientific, technological, and environmental issues. Failing to meet these challenges means we will continue to place an unfair burden — and the commensurate personal and professional risks — on individual science communicators. The scientists we interviewed are aware of this unsustainable dynamic. We must ask ourselves: how much longer will they accept it?

METHODOLOGY

We conducted semi-structured interviews in the summer and fall of 2022 with 21 scientists who speak with journalists. Scientists were selected from a list of experts who have participated in the SciLine expert matching service. From this list, we contacted potential interviewees with an eye toward maximizing variance in terms of the scientists' research topic (e.g., atmospheric science, biology). All interviews were conducted online using video conferencing software. Prior to conducting interviews, scientists completed an online form that affirmed their consent to be interviewed and were asked a short set of demographic questions. From this intake survey, we observed that eleven scientists identified as cisgender women, nine scientists identified as cisgender men, and one scientist chose to not disclose their gender. Additionally, thirteen scientists identified as white or Caucasian, one scientist identified as Asian and Caucasian, one scientist identified as Hispanic, one scientist identified as white and Hispanic, one scientist identified as white and Latina, one scientist identified as white and New Zealander, one scientist identified as white and Ashkenazi Jewish, one scientist identified as South Asian, and two scientists chose not to disclose their ethnicity.

We developed the protocol for our semi-structured interviews after conducting an extensive literature review of relevant peer-reviewed research that examined science reporting. The core research questions were as follows:

- What do scientists most value about the SciLine expert matching service?
- How do scientists think they are different from and similar to journalists?
- How do scientists describe their experiences interacting with journalists?
- What strategies do scientists use during media interviews?
- What do scientists do after they have participated in a media interview?
- What motivates scientists to speak with journalists and to participate in public communication more generally?
- What are some of the other ways scientists describe communicating with public audiences?
- What do scientists identify as being the most urgent science communication challenges?

ENDNOTES

- ¹ Bogomoletc, E., Goodwin, J., & Binder, A. R. (2021). Masks Don't Work but You Should Get One: Circulation of the Science of Masking During the Covid-19 Pandemic. In *Pandemic Communication and Resilience* (pp. 213–244). Springer International Publishing. https://doi.org/10.1007/978-3-030-77344-1_14
- ² Jamieson, K. H., Kahan, D., & Scheufele, D. A. (2017). *The Oxford Handbook of the Science of Science Communication*. Oxford University Press.
- ³ Dunwoody, S. (2021). *Science journalism: Prospects in the digital age*. In *Routledge handbook of public communication of science and technology* (pp. 43-55). Routledge.
- ⁴ Dunwoody S. (1982). A question of accuracy. *IEEE Transactions on Professional Communication*, PC-25(4), 196–199.
- ⁵ Ashwell, D. J. (2016). The challenges of science journalism: The perspectives of scientists, science communication advisors and journalists from New Zealand. *Public Understanding of Science*, 25(3), 379–393. <https://doi.org/10.1177/0963662514556144>
- ⁶ Anderson, J., & Dudo, A. (2023). A View From the Trenches: Interviews With Journalists About Reporting Science News. *Science Communication*, 0(0). <https://doi.org/10.1177/10755470221149156>
- ⁷ Welbourne, D. J., & Grant, W. J. (2016). Science communication on YouTube: Factors that affect channel and video popularity. *Public Understanding of Science*, 25(6), 706–718. <https://doi.org/10.1177/0963662515572068>
- ⁸ Dudo, A., & Besley, J. C. (2016). Scientists' prioritization of communication objectives for public engagement. *PloS one*, 11(2), e0148867; Besley, J. C., Dudo, A., Yuan, S., & Lawrence, F. (2018). Understanding scientists' willingness to engage. *Science Communication*, 40(5), 559-590.
- ⁹ Hoffman, A. J. (2021). *The engaged scholar: Expanding the impact of academic research in today's world*. Stanford University Press.
- ¹⁰ Smith, B. (2019). A Metro for science communication: Building effective infrastructure to support scientists' public engagement. In T. Newman (Ed.), *Theory and best practices in science communication training* (pp. 154-165). Routledge.
- ¹¹ Menezes, S., Murray-Johnson, K., Smith, H., Trautmann, H., & Azizi, M. (2022). Making science communication inclusive: an exploratory study of choices, challenges and change mechanisms in the United States from an emerging movement. *Journal of Science Communication*, 21(5), A03.
- ¹² Besley, J. C., & Dudo, A. (2022). *Strategic Science Communication: A Guide to Setting the Right Objectives for More Effective Public Engagement*. JHU Press.
- ¹³ Scheufele, D. A. (2022). Thirty years of science–society interfaces: What's next?. *Public Understanding of Science*, 31(3), 297-304.
- ¹⁴ Meadows, D. H. (2008). *Thinking in systems: A primer*. Chelsea Green Publishing.
- ¹⁵ Christopherson, E., Scheufele, D. A., & Smith, B. (2018) The Civic Science Imperative. *Stanford Social Innovation Review*, 16(20), 46-52.