



EDITORIAL

# Communicating ‘Real Versus Reel’ Science



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*Slogans, sound-bites, and memes...oh my!* Promoting ‘real’ over ‘reel’ science is more critical than ever in this era of digital connectivity and rapid exchange of information. As the public strives to navigate a media landscape rife with competing narratives, the challenge lies in simultaneously fostering responsible public education in science (especially about anomalistics and frontier topics) and also recognizing the role of science communicators or popularizers who may prioritize entertainment over evidence when informing societal perceptions (for an overview, see Fischer et al., 2024). The constant tension between data-driven scientific inquiry and ideologically-charged media storytelling creates a battleground where understanding and knowledge can easily become casualties of misrepresentation and polarization. Whose obligation is it to remedy this situation - the scientific community, the media, the educators? Some of us or all of us? Sober contemplation seems to be warranted.

*Reel science* refers here to the portrayal of scientific concepts in news outlets and popular online and offline media, from Instagram ‘reels’ (short-form video) to books, magazines, podcasts, television shows, documentaries, films, and the internet. Typically, these representations favor entertainment by way of dramatic narratives, hyperbole, or caricatures, as opposed to accuracy and rigor. This often contributes to bias and potentially propagates misleading information whereby scientific findings are oversimplified, exaggerated, distorted, or ignored to fit preconceived narratives. In other words, facts and context are readily sacrificed in the proverbial battle for more clicks to ‘like, share, or subscribe.’ It’s the social media ‘dopamine-hit’ equivalent of a drive-thru meal: Nourishment for the mind or body is of little concern. There’s a balance to be struck in the pursuit of honoring the complexity of the subject matter while presenting it in a comprehensible and compelling way to audiences (for a discussion, see Horst, 2013). That balance seems ever more elusive.

Conversely, *real science* embodies the rigorous methodologies, ethical standards, and critical thinking that underpin a genuine quest for knowledge. It emphasizes the importance of data, evidence, peer review, and transparent debate to validate results or their interpretation or application. Real science is characterized by a commitment to openness, curiosity, skepticism, a willingness to revise hypotheses in light of new evidence, and an understanding of the limitations of our current knowledge (Funtowicz & Ravetz, 1993). *Where reel science is often insistent and unequivocal, real science is ongoing and provisional.* The producers and packagers of scientific programming, therefore, may desire a tidy package of the ‘facts,’ but the denizens of libraries and labs know that the process of science involves an ever-developing description or understanding of reality. *So, how can everyone help science to supersede sensationalism?* We think several key strategies must be considered, each involving distinct challenges and corresponding actions.



## Ponder the Impact of Media on Public Perception

The so-called Fourth Estate wields significant power in shaping the public's understanding of science. Although the media always has been an influencer to general information and discourse, legacy media has been fighting for survival since the internet went mainstream in 2000. Dwindling budgets to hire trained journalists were accompanied by the rise of new influencers, such as paid 'content creators,' who tend to be citizen enthusiasts cleverly producing viral social media. Their content can generate large followings that compete with the traditional press. Anyone today can be a writer, publisher, or broadcaster virtually for free, and the consumer of that content is unaware of that person's bias or (lack of) training. Producing and distributing content on media platforms does not qualify someone automatically as a journalist. Rather, media professionals typically are trained in the art, science, and ethics of investigation, verification, and storytelling.

In the always-on environment of social media and 24-hour news cycles, information spreads hastily, often without all the necessary context or proper scrutiny. Stories that capture attention - whether through dramatic headlines (aka, 'click-bait') or emotionally laden narratives - are more likely to be shared and discussed than the mundane. Unfortunately, this dynamic encourages the proliferation of pseudoscience, conspiracy theories, and misinformation (Lewandowsky et al., 2017). Consider prominent science communicators like Neil deGrasse Tyson or Bill Nye ('The Science Guy'), whose media presence has made them household names. While they have successfully engaged the public with science, their roles as media personalities sometimes overshadow the educational aspects of their work. For example, Tyson's talk-show appearances and social media work often feature entertaining sound bites or ideological commentary over in-depth scientific discourse (Kahlor & Rosenthal, 2009). Similarly, Nye's television appearances often emphasize dramatic demonstrations, which can be alluring, but may nonetheless sacrifice a nuanced understanding of the scientific principles involved (Nye, 2015). Even more concerning is the tendency for some general science communicators or public intellectuals, Tyson and Nye included, to join certain conversations as expert voices.

The editors of *Nature* (2007) spoke to this point when they cautioned, "But scientists need to take care not to overstep their expertise. It is reasonable to expect a Manhattan Project physicist to weigh in on the dangers of nuclear weapons, with which he or she is entirely familiar. It is less clear-cut to, say, support the candidacy of a politician" (p. 354). Thomas Sowell (2012) put it more

starkly, "...stepping beyond your competence can be like stepping off a cliff. Too many people with brilliance and talent within some field do not realize how ignorant - or worse yet, misinformed - they are when talking like philosopher-kings about other things" (p. 518). This issue of scientists overstepping their expertise—known as 'expert overreach' or 'disciplinary trespassing', - occurs when experts offer authoritative opinions on matters outside their specialized field. The problem has gained attention in recent years, particularly in the areas of public policy, interdisciplinary research, and communication on complex global issues such as climate change, the COVID-19 pandemic, economics, critical race theory or gender ideology, and artificial intelligence.

When scientists or public intellectuals speak outside their domain, they can *unwittingly* mislead the public or policymakers, risking the erosion of trust in science when inaccuracies are revealed (Collins, 2014). One key factor contributing to this issue is the complexity of modern problems. Issues like climate change or global pandemics require input from multiple disciplines. However, scientists who step into fields adjacent to their expertise may lack the necessary depth of understanding, making their contributions less reliable (Moore, 2022). This creates challenges for interdisciplinary research and public discourse, as it becomes difficult to assess which voices are genuinely and fully informed. The public's perception of authority exacerbates this problem. Many people assume that expertise in one domain translates to competence in others, which can give undue weight to scientists' opinions outside their specializations. Such misrepresentation of expertise can skew public understanding and amplify risks inappropriately, as seen in controversial debates on environmental and health issues (Oreskes & Conway, 2011).

The role of the media further complicates this state-of-affairs. Media outlets often seem to value 'credentials' over relevance, giving platforms to scientists whose expertise may not properly align with the issue at hand (e.g., Biermann & Taddicken, 2025). This can lead to distorted narratives and confusion, particularly during crises when the public seeks clear guidance from level-headed and data-driven authorities. Ethical considerations likewise are critical in this debate. Some argue that scientists have a moral responsibility to stay within their expertise, as venturing beyond it risks promoting inaccurate or biased information (Resnik, 2018). An appropriate boundary is essential to maintaining the integrity of scientific communication and protecting public trust.

When mainstream media face tight deadlines, they reach out to recognized science personalities that they know can fill the role. The ones with media savvy. The

ones with a household name, like Tyson. About 30 million people have clicked ‘follow’ on his social media channels, and another 4.2 million are subscribed to his “StarTalk” show on YouTube. There may be overlaps, and not every individual (or ‘bot’) catches every post, but these audience sizes eclipse those of most journalists. *New Scientist*, a mainstream science magazine, counts only 9.5 million followers across its social channels. It’s enough to make one wonder whether the *end* (i.e., media exposure) justifies the *means* (i.e., dilution of scientific context at best and misinformation at worst). While generalist science professionals are certainly valuable to the media, the topic of science, and the media and public as well, are bound to be better served by specialist science professionals who can communicate in more media-and-audience-friendly manners.

### TAKE PERSONAL RESPONSIBILITY FOR QUALITY SCIENCE COMMUNICATION

Responsible science communication is paramount to curbing the prevalence and impact of ‘reel science.’ Researchers, educators, and communicators alike must commit to clarity, accuracy, and accessibility in their outreach efforts. This involves translating complex scientific concepts into relatable terms without sacrificing the crucial meaning or nuance. The goal is to foster understanding and engagement rather than alienation or ignorance. One successful approach to responsible science communication is the use of effective storytelling. By weaving narratives that highlight the human elements of scientific discovery—such as the challenges faced by researchers or the real-world implications of their work - communicators can create compelling connections that strongly resonate with audiences (Berkowitz & Nussbaum, 2021). This tactic educates and humanizes science, making it relatable, relevant, and actionable to real life - or what we like to call the ‘so what?’ of scientific findings. We delve into this latter point in greater detail below.

### ACTIVELY ENCOURAGE CRITICAL THINKING

Critical thinking is another essential component to bridge the gap between ‘real and reel’ science. Educators should equip individuals with the tools to analyze information logically, discern the credibility of sources, and question any and all claims that have little to no empirical support (Baker et al., 2020). Promoting media literacy empowers individuals to navigate the complex information landscape more effectively, fostering an informed citizenry capable of making sound judgments about scientific issues. Moreover, integrating discussions about the scientific method into education can demystify

the processes of inquiry and hypothesis testing. By understanding how scientists arrive at conclusions and the iterative nature of research, people can better appreciate the rigor behind research findings and recognize the importance of evidence-based decision-making.

Both scientists and journalists are trained to investigate the truth. Both seek evidence to determine fact versus fiction; and both bear the ‘burden of proof’ to demonstrate their insights. Credibility is vital. For instance, journalism students are instructed to follow the Code of Ethics established by the Society for Professional Journalists (see <https://www.spj.org/ethics/>) and, in the case of hard news, to verify the facts using multiple sources. A journalist’s obligation is to explore the information underlying all ‘versions’ of the truth, objectively and fairly evaluate that information, and ultimately communicate it in a meaningful context to the audience. Ethics and integrity constitute the credibility needed to earn public trust. That said, it is well-documented that many journalists and news outlets haven’t consistently lived up to their own proclaimed standards of transparency, fairness, or truthfulness (e.g., Huang et al., 2024; Leung & Strumpf, 2024; Pan et al., 2023). There’s clearly much room for significant improvement and growth in addressing the various forms of media bias.

### MAKE RESEARCH MORE RELEVANT AND RELATABLE

One of the biggest hurdles to communicating ‘real’ science lies in the language and the meaning conveyed. Researchers and scientists use jargon to talk about their fields, but that specialized vocabulary and manner of speaking quickly loses outside audiences. On the other hand, speaking to journalists and the public in more grounded, plain language will help to ensure that messages are understood and appreciated. And it must pack *meaning*. What is relevant and relatable about the scientific evidence? Who or what does it affect, and how? What’s the applicable context of this discovery? These kinds of questions should be the narrative backbone to answers that scientists give to media interviewers.

If the answers to these questions are meaningful only for those in the scientist’s field, the chances are that there’s no substantive story to be told. If it holds significance and application to potentially inform or influence the audience’s beliefs or behaviors, then there’s a real story. Journalists are looking for the truly newsworthy information: “Does this finding having any material impact?” or “Is it new, different, exclusive or significant – and to whom for what purpose?” If the research can be related to lessening harm or improving the quality of life

in any way whatsoever, chances are you have a good story to pitch to a journalist, as well as information that general audiences want to hear.

The media and science industries are in powerful positions to serve the public good. If those in science can become more approachable to journalists and the public—via language and visibility—the context and evidence of your particular topic will be conveyed and comprehended with meaning. Here are three simple actions that anyone can take to support this goal:

- *For every paper published, think about how you would explain the concept, evidence, and progress to a pre-teen relative.* For instance, *JSE* articles begin with a ‘Highlights’ summary in lay terms to engage non-specialist readers. How might you likewise draw a line between the findings and their relevance to quality of life? Invoke a common, practical touch to your topic.
- *Unlock the vault of your work, so Google (or other search engines) can find it and decipher its meaning.* Chances are that there’s a conversation happening on social media right now about your topic. People are searching for information. It may be waiting behind a paywall, disguised in scientific language, or locked in a format unreadable by search function (audio, video, PDF, etc.). It is crucial to make the content accessible, whether that’s transcribing the audio, tagging it (via hashtags or website content tagging), or placing a text explanation with keywords and phrases to accompany a PDF.
- *Search the Internet and social media forums (e.g., Reddit, YouTube, LinkedIn, or BlueSky) for your topic to understand how people are engaging around it.* Find the media coverage and make note of the journalist. Then Google that person and follow him or her on social media. Interact with their content and, in time, make contact to offer yourself as a source when the topic is covered again.

## PROMOTE COLLABORATIVE EFFORTS

Cooperation between scientists and media professionals further helps to alleviate the conflict between ‘real and reel’ science. Specifically, engaging journalists in conversations about scientific methodologies and the importance of particular insights or evidence often leads to more accurate representations in the media (Shapiro, 2017). Similarly, scientists can benefit from media training that equips them with the skills necessary to convey their findings effectively to diverse audiences, including news reporters and the public alike.

Several organizations have already begun to support

this strategy. Initiatives that connect scientists with journalists, provide resources for accurate science reporting, and emphasize ethical standards in media coverage are crucial steps toward fostering a more informed public (National Academies of Sciences, Engineering, and Medicine, 2017). Moreover, public forums and community discussions often provide spaces for dialogue where experts and laypeople can engage in meaningful exchanges about scientific issues.

Journalists and scientists also can collaborate to address community challenges. “Solutions journalism is news reporting focused on emerging responses to societal problems,” according to The Center for Media Engagement at University of Texas at Austin’s Moody School of Communication (Curry et al., 2016, para. 1). This reporting style involves journalists working with stakeholders - such as organizations, charities, advocates, or activists - to discover what can effectively unravel problems like poverty, climate risk, education drop-out rates, or public health threats. The news stories track efforts to improve the target issue. It also makes for positive news by leaving the public feeling inspired and empowered (Curry et al., 2016).

## RECOGNIZE AND SUPPORT GROWTH OPPORTUNITIES ON BOTH SIDES

The UK-based Science Media Centre unapologetically states on its website that “The media will do science better when scientists do the media better” (see <https://www.sciencemediacentre.org/about-us/>). This group serves as an independent press office for any science and engineering topics thrust onto the front page of the newspaper or the top spot of nightly news programs. The Centre, which is piloting a new service in Ireland, acts as a resource for mainstream journalists who find themselves needing to understand complex topics in order to cover them, such as public health. In fact, the Centre blossomed as the pandemic broke. It is an ideal resource for both the media and the scientific community, but the Centre’s scope is limited to mainstream science stories. This leaves a major gap - what about frontier topics involving anomalous phenomena and controversial topics, which are often looked askance by many of these researchers’ colleagues? Well, there’s some good news on this point that we will address below.

But more fundamentally, the Center for Media Engagement and the Frontier Journalists’ Network (FJN) independently conducted surveys that revealed the press believes scientists can be more proactive with communication (Dudo et al., 2024). The Center specifically partnered with SciLine—based at the American Association

for the Advancement of Science (AAAS) - whose mission is about “enhancing the amount and quality of scientific evidence in news stories.” They notably offer a free service that matches journalists with scientists for their coverage in the U.S. The Center/SciLine report indicated that “...journalists think scientists should focus more on broadening participation in science communication” (Dudo et al., 2024, para. 3), among other interesting findings. The FJN is similarly devoted to making it easier for the press to cover science, although its focus concerns more the niche areas of human phenomena like spirituality and the nature of consciousness.

These types of esoteric topics are generally marginalized, if not derided and denied (even called ‘spooky’ or ‘woo woo’), by mainstream media, despite the public’s enthusiasm for them (e.g., Hill et al., 2018; McClenon, 1984; Webster & Saucier, 2023). When the FJN asked editorial professionals what barriers exist to covering these sorts of frontier science topics (see <https://frontiernet.org/2022/10/consciousness-is-top-interest-for-journalists/>), the survey respondents acknowledged challenges to finding newsworthy story ideas, securing credible sources, and better comprehending topics. But, these barriers reveal important opportunities for those in the scientific community, namely, to raise the online visibility of their work and themselves so that their topics and expertise can be found through Google search and understood by the public. Interestingly, the FJN also found that both journalists and scientists often must surmount internal friction at their own institutions on frontier topics.

Journalists must sell the story to an editor or producer who may be biased on the topic – and scientists usually operate in clandestine ways to study esoteric topics, making active outreach a tougher proposition. Until such topics are fully normalized in culture - and wholly accepted academically - they are subject to the bias and shackles of decision-makers who suppress them. This includes editors, producers, university department heads, and press offices. Journalists and scientists can meet in the middle through common language, curiosity, openness, and mutual outreach. The FJN has actioned its survey findings by creating content specifically for journalists: *Story Ideas* to seed coverage ideas (i.e., published studies on meditation curbing activity by cancer cells), and *Topic Briefs* that explain subjects and provide sources (i.e., Consciousness, Near-Death Experiences, the Placebo Effect). FJN also provides media training for scientists, scholars, and practitioners, so they can learn how to engage positively with the press. An online directory of vetted journalists and scientists is likewise being developed to encourage communication between the two camps. Readers can learn more about these and other initiatives at FJN’s website:

<https://frontiernet.org>.

## CONFRONT IDEOLOGIES AND CONTROVERSIES WITH EMPATHY

The interplay between science and ideology presents unique challenges in our increasingly polarized world. Some media outlets clearly promote certain perspectives that are not rooted in scientific evidence, which can lead to the entrenchment of misinformation about real-life issues like government policy, health care, or environmental challenges. Of course, we also know that sometimes scientific voices are actively censored by academic journals or the press (e.g., Walach & Klement, 2024). In either scenario, responsible science communication becomes even more crucial. Scientists and communicators must proactively address misconceptions and provide accurate information that counters ideologically-based narratives (Goertzel, 1994). Addressing the emotional components of scientific issues also can facilitate the public’s understanding. By acknowledging the values, fears, and concerns that underpin public attitudes (pro or con) toward science, communicators can advance more empathetic dialogues. This approach should help to ease tensions and promote constructive discussions about scientific issues that truly matter in people’s daily lives.

## CLOSING THOUGHTS

The divide between ‘real and reel’ science poses significant challenges to the public’s understanding of scientific issues and its trust in scientists. And make no mistake, the public’s trust in science and scientists is currently tenuous (e.g., Agle, 2020; Cologna et al., 2024; Pew Research Center, 2023). According to a 2024 Gallup survey (cf. Brenan, 2024), more people (36%) said they had “no trust” in the mass media to report the news “fully, accurately and fairly” than those who have a “great deal” or even a “fair amount” of confidence (31%) in media. Those under 50 years old are the least trustful of the media. Internationally, trust in scientists varies across countries. One large-scale study encompassing 68 countries highlighted that public trust in scientists is influenced by factors such as cultural values, economic development, and exposure to scientific information (Cologna et al., 2024). Nevertheless, these trends have resulted, to some extent, from self-inflicted wounds (e.g., Grimes et al., 2018; Serra-Garcia & Gneezy, 2021; Zillich et al., 2024). Cultivating trusted relationships between scientists and journalists is, therefore, a good bedrock for both to restore the public’s trust.

As the media and cultural landscapes evolve, the responsibility for effective science education arguably falls

to scientists, educators, communicators, and the public. Avoiding hype in scientific communication can prevent disillusionment and maintain trust (Master & Resnik, 2011). This means prioritizing clarity, accuracy, and critical thinking to negotiate the complexities of the information age and foster a more informed citizenry capable of engaging with the scientific issues that shape our world. Ultimately, resolving the rift between 'real and reel' science requires a collective effort; one that values evidence, embraces curiosity, and champions the pursuit of knowledge rather than headlines.

Doing so, we should be able to create an environment where science thrives, informed by the richness of data and evidence rather than the whims of people or organizations that support anti-science views, government or media propaganda, scientism (i.e., excessive belief in the power of scientific knowledge and techniques), or other ideologies. By forging a balance between entertainment and education, we can ensure that the public remains engaged with the scientific enterprise while also acknowledging - and perhaps even appreciating - its nuances and complexities. As in life, relationships are at the core of improving the quality of science media coverage. Journalists and scientists are both seekers and messengers of truth in their own ways. This means that both parties must be open to learning the *needs* and *language* of the other to join forces to bring meaningful research to the public; especially when the findings very well may alter our understanding of the nature of reality...and humanity's place in it.

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