From public deficits to public defects: How journalists embraced technocratic explanations for the Post-Truth Era

Des déficits publics aux défauts publics : Comment les journalistes ont adopté des explications technocratiques pour l'ère de la post-vérité

Gordon Katic

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ABSTRACT

Since 2016, we have been living in what many scholars call a 'post-truth era,' which is said to be dominated by mistrust, misinformation, anti-expert populism, and out-right science denial. Usually, this story focuses on technical issues in our information sphere, or on the public's failings. Conversely, I am informed by critical approaches in science studies that stress how public mis/understanding of science is symptomatic of deeper social and political divides between experts and publics. In that spirit, this polemical article focuses its critical attention on science itself, and more specifically the journalists who disseminate their work. I conduct an exploratory critical discourse analysis on a small selection of the most popular and critically-acclaimed journalists of science, research, and expertise (including Michael Lewis, Ezra Klein, Ed Yong, and others). My analysis reveals an emerging model of science communication for the post-2016 era. Earlier, journalists embraced a public deficit model that assumed a deficient public could be paternalistically educated towards accepting scientific insights. Today, that view is being supplemented (and sometimes supplanted) by something I call the *public defect* model. In this model, journalists see publics as cognitively defective, and therefore resistant—if not outright impervious—to intelligent persuasion. My contributes new theoretical insights to the study of science journalism. Furthermore, I offer a polemical intervention against the creeping anti-democratic tendencies of some of the most well-respected journalists of our time, as well as suggestions for journalists and journalism educators who wish to combat these tendencies.

RÉSUMÉ

Depuis 2016, nous vivons dans ce que plusieurs chercheurs appellent une « ère de post-vérité », qui est censée être dominée par la méfiance, la désinformation, le populisme anti-expert et le déni pur et simple de la science. En général, ce récit se concentre sur les problèmes techniques de notre sphère d'information ou sur les défaillances du public. À l'inverse, je me réfère aux approches critiques des études scientifiques qui soulignent que la mauvaise compréhension de la science par le public est symptomatique de clivages sociaux et poli-

tiques plus profonds entre les experts et le public. Dans cet esprit, cet article polémique concentre son attention critique sur la science elle-même, et plus particulièrement sur les journalistes qui diffusent leur travail. Je mène une analyse exploratoire critique du discours sur une petite sélection des journalistes les plus populaires et les plus acclamés par la critique en matière de science, de recherche et d'expertise (notamment Michael Lewis, Ezra Klein, Ed Yong, et autres). Mon analyse met en évidence un nouveau modèle de communication scientifique pour l'après-2016. Auparavant, les journalistes adoptaient un modèle de déficit public qui supposait qu'un public déficient pouvait être éduqué de manière paternaliste dans la fin d'accepter les connaissances scientifiques. Aujourd'hui, ce point de vue est complété (et parfois supplanté) par ce que j'appelle le modèle de *défaillance du public*. Dans ce modèle, les journalistes considèrent les publics comme déficients sur le plan cognitif, et donc résistants—voire carrément imperméables—à une persuasion intelligente. Mon article apporte de nouvelles perspectives théoriques à l'étude du journalisme scientifique. De plus, je propose une intervention polémique contre les tendances antidémocratiques rampantes de certains des journalistes les plus respectés de notre époque, ainsi que des suggestions pour les journalistes et les formateurs en journalisme qui souhaitent lutter contre ces tendances.

INTRODUCTION

On April 27, 2009, President Barack Obama addressed the National Academy of Sciences in a widely-celebrated speech. "We are restoring science to its rightful place," he proclaimed, before promising "the days of science taking a back seat to ideology are over" (PNAS, 2009, p. 9541). This declaration, met with a standing ovation, set a tone for the era.

These years marked a period of liberal optimism for the status of science and expertise, which was also reflected in prevailing journalistic cultures. Following eight years of the science-denying George W. Bush administration (Dickinson, 2007), many journalists celebrated this new intelligent President—he was "science-savvy" (Scott & Kaplan, 2016), a self-proclaimed "nerd in chief" (Buchanon, 2016) "making science cool" (Wired Staff, 2009). Additionally, journalists were already increasingly turning to experts and scientists in their own work (Albæk, Christiansen, & Togeby, 2003), and emerging genres of expert-driven journalism (like explainer journalism, data journalism, fact-checking, and the broader interpretive or contextual turn) came to define the era (Barnhurst, 2014; Barnhurst & Mutz, 1997; Bielik & Višňovský, 2021; Fink & Schudson, 2014; Graves, 2016). This period looked something like a return to what Hallin (1992) called the "high modernism" of journalism (p. 16). Journalistic modernism shares characteristics with other modernisms, according to Hallin, because it exhibits "confidence that professionals and intellectuals could rise above social divisions and contradictions to produce knowledge of universal validity" (2006, para. 1).

However, we already know that this story does not have a happy ending. The year 2016 marked the emergence of the so-called post-truth era. We no longer live in the modernist optimism of 2009; we live in an anxious world of misinformation, mistrust, and 'alternative facts.' Today, significant portions of the population even deny the basic facts of the COVID-19 pandemic. By now, there are shelves full of books documenting the public's anti-expert, anti-science, post-truth turn (see for instance, Hotez, 2023; Kakutani, 2018; Nichols, 2017). At least, that is the typical story.

This polemical article tells a different story. If there are post-truthers, I will argue that it is not only the public; a certain kind of journalist is embracing their own version of post-truth politics. The post-2016 era seems to have soured their optimism, undermining the hope they have (or had) for the power of facts, experts, and intelligent persuasion. However, instead of embracing a more nuanced understanding of *scientific reason*, these journalists embraced a less nuanced understanding of *public reason*. Put simply, they told a simple story of public irrationality.

Overview of argument

First, I review scholarly literatures to build a theoretical grounding for my case. I draw heavily from a multi-disciplinary area sometimes placed under the umbrella of science studies. Broadly, these perspectives suggest that public mis/understanding of science is shaped by deep social and political

tensions. Second, the body of my article conducts a critical discourse analysis of a small sample of prestigious journalists. In their works, I observe a persistent fixation with certain strands of social science research that suggest limits to human rationality. Through this, I theorize an emerging model of science journalism in the post-truth era. I label this the *public defect model*, since it constructs a public that is supposedly incapable of appreciating scientific information due to ingrained defects of mind. Third and finally, I close with some suggestions for journalists and educators.

LITERATURE REVIEW & THEORETICAL GROUNDING

"Crisis invites self-appraisal": Post-Truth as misinformation, or moral indictment?

Journalists might interpret our moment as the result of thorny technical problems that plague our information systems, and the pseudo-populist influencers that exploit those systems. However, they might also take this moment as an opportunity to engage in a critical introspection about the nature of epistemic authority in a democratic society. In 1942, Robert K. Merton, the influential sociologist of science, advocated this strategy. "An institution under attack must re-examine its foundations, restate its objectives, and seek out its rationale," argued Merton, because "crisis invites self-appraisal" (Merton, 1974, p. 265).

The field of science studies has long been doing the hard work of scientific self-appraisal. This interdisciplinary area (which includes the philosophy, history, and sociology of science) critically examines the social and political factors that inform the production, dissemination, and reception of scientific knowledge. For example, scholars have explored: the socio-cultural divides between experts and communities (Irwin and Wynne, 1996); epistemic injustices (Fricker, 2007) and gendered inequalities in science (Longino, 1990); the neglected value of standpoints (Harding, 2004), situated knowledges (Haraway, 1988), and lay/activist expertise (Epstein, 1996); the commodification of science (Radder, 2019), as well as corporate and military influence (Rohde, 2013; Sismondo, 2018; Schmalzer, Chard & Botelho, 2018); clashes over scientific values, both *in* science and *between* science and the public (Douglas, 2009; Goldenberg, 2021; Kitcher, 2011); and underlying tensions of modernity produced by the creeping authority of inscrutable expert systems (Eyal, 2019; Giddens, 1991; Habermas, 1985a, 1985b).

It is beyond the scope of this paper to explicate this diverse range of views, attend to the important differences between them, or discuss objections. For instance, there are strong versions of this research that have been condemned as outright epistemic relativism (Sokal & Bricmont, 1998; Sokal, 2008), but I do not subscribe to the strongest versions. I gesture to this research to advance a more modest claim: science is a social enterprise that does not uncomplicatedly arrive at a cumulative set of objective truths. Rather, science is a collective enterprise imbued with politics, and therefore open to political contestation. On this reading, we cannot simply return to "truth" in the face of "post-truth," but instead we must author a more humble, inclusive, democratic, and pluralistic science. Therefore, my theoretical perspective reframes controversies over scientific facts as symptomatic of deeper social and political divides.

To that end, the field of science communication has suggested more democratically-minded models, including highlighting diverse forms of expertise, and encouraging two-way dialogue between scientists and publics (Brossard & Lewenstein, 2009; Secko, Amend, & Friday, 2013). These emerging models are in contrast to earlier models that only stressed one-way dissemination. In the literature, mere one-way dissemination of scientific expertise is almost universally disparaged as the public deficit or informational deficit model of communication. All journalists would recognize this style of reporting. Deficit-style reporting simply disseminates scientific knowledge, e.g. perhaps in a compelling infographic, or a simple news report describing a scientific paper. However, critics argue that this style of communication is both empirically ineffective and ethically problematic, since it constructs a supposedly deficient public that must be educated (Scheufele, 2022; Simis et. al, 2016; Suldovsky, 2016). Of course, all journalism must have *some* deficit-thinking; it is impossible to inform audiences about science without assuming they lack some information. As with any ideal type, it is a question of degree. Does the journalist *predominantly* focus on disseminating the

wonders of scientific knowledge, or does something else emerge in the work?

Little conceptual clarity: Science journalism education wrestles with a post-deficit world

Do science journalism educators transcend the deficit model? Reviewing the literature on this subject, it is hard to make definitive conclusions. Articles often begin with an admission that the field is new, and there is minimal research (Wormer, 2019; Mulder, Longnecker, & Davis, 2008; Dudo, Besley, & Yuan, 2021). Scholars have also noted that most programs are overwhelmingly practical, lacking conceptual clarity over basic objectives (Baram-Tsabari & Lewenstein, 2017). Dornan's (1990) early polemic concluded that the views of science communication are naïve, crudely positivist, and dominated by the interests of scientific authorities. Nelkin's landmark *Selling Science* (1995) makes similar types of claims. However, more recent reviews of science communication programs demonstrate that times have changed. Programs now boast a widening diversity of goals (Baram-Tsabari & Lewenstein, 2017). Yet, it is not clear how programs serve them. For instance, Mulder et. al.'s (2008) review of 19 programs from 16 different countries observes that all suggest transitioning away from the deficit model, but perhaps only superficially. Only about half ever raise any questions regarding the social aspects of science (p. 282).

Further, there is little evidence that trainers in North American science communication programs offer meaningful support for two-way dialogue (Yuan et. al., 2017), or for addressing structural inequalities (Dudo et. al., 2021). However, this research is difficult to parse because studies often collapse different types of programs. For instance, Wormer (2019) observes that there is a tendency to mix science journalism programs (as in, for journalism students), with science communication programs (as in, for educators, scientists, and PR professionals) (p. 447). For our purposes, it would be helpful to read a contemporary review that focussed exclusively on ideals of science journalism as they are taught in North American journalism schools, especially as they relate to questions of public distrust or misunderstanding of science. As far as I can tell, no such review exists. Therefore, it remains difficult to reach conclusions. In the end, despite some promising developments, it would be premature to celebrate the arrival of a more critical and democratically-minded science journalism education.

"Servant and guardian of institutions": The press as protector and promulgator of expert knowledge

Perhaps deficit thinking is simply baked into the profession. Scholars of journalism often stress that the media has an affinity for expertise because contemporary journalistic norms grew out of the Progressive Movement, which had a particular vision of expert-managed democracy (Gans, 1979/2004; Schudson, 2001; Tuchman, 1978). For example, Walter Lippmann (1922/1997), one of the most influential journalists of the 20th century, famously argued that experts must rule. Here, the press is merely a "servant and guardian of institutions," not an organ to support direct democracy (Lippman, p. 229). Lippman's anti-democratic view might be labelled technocratic (Akin, 1977) or even epistocratic (Brennan, 2017), since it embraces the rule of capable managers or a learned intellectual elite. In response to Lippman, John Dewey (1927/2016) favoured participatory democracy, in which research could inform a vibrant public sphere. For those following Dewey's pragmatic vision, emphasis is placed on developing the public's deliberative capacities, and then democratizing elite institutions so that their priorities are grounded in that deliberation (see also, Habermas, 1985a, 1985b; Kitcher, 2011; Lasch, 1996).

If we think carefully about the implications of these competing visions, we see that they must reflect different visions of journalistic practice: one brings experts to the public, while the other brings the public to the experts. In contemporary journalism in the United States and Canada, which model reigns? It is impossible to make any grand claims about something so vast and heterogeneous, especially in a short article. However, the next section will review a journalism that looks much closer to Lippman's anti-democratic vision, with some important additions to account for emerging psychological research.

RESEARCH QUESTIONS & METHOD

Critical discourse analysis as social and political theory

I investigate journalistic epistemologies through journalistic work. My method is informed loosely by critical discourse analysis (CDA), especially following Fairclough (1995; 2013). This involves three levels of analysis: text, discursive practice, and social practice. First, at the level of text, I look closely at the arguments, as well as the wording, metaphors, and grammar. Second, the level of discursive practice refers to how text is produced and consumed; this involves intertextual analysis (e.g., who is quoted or excluded), as well as surmising how the text might be interpreted. Third, I analyze the text with respect to a wider set of social relations and epistemological theories. The goal is to see how discourse both shapes and reflects its wider world. However, some have critiqued or revised CDA because they feel it focuses too closely on text and struggles to link to a wider context (Carvalho, 2008; Jørgensen & Philips, 2002). In response, my approach leans towards the social theory aspects of the method. I situate journalistic work in its political moment, and then use the work to theorize emerging models of science communication.

My research asks:

RQ1: Is the 'public deficit' model present in post-2016 discourses of leading journalists of science, research, and expertise? Alternatively, do they shift, supplement, or even supplant that model?

RQ2: What political and epistemological relations are suggested by these discourses? Specifically, how is the role of expert, journalist, and public reconstructed by these journalists?

Sampling and analysis

My sample is more impressionistic than systematic, but it is not indiscriminate. I sought journalists that are discourse- or genre-defining, or can at least be seen as plausible indicators of certain kinds of elite journalistic cultures. In particular, I had in mind journalists who exhibited the kind of journalistic modernism I described earlier. Put simply, I gravitated towards those that are (or were) defined by being *optimistic* about experts. All journalists were U.S.-based, and from liberal-leaning venues known for their detailed coverage of science, research, and expertise. To be included, they also had to meet the following basic criteria: have wide public reach, work at prestigious outlets, and routinely report on expertise. I define expertise here ecumenically, including both science journalism and social science-focused journalism. Then, I reviewed a wide range of their work, primarily related to either Donald Trump and the 2016 election or to the COVID-19 pandemic. Additionally, some offered broader and more conceptual readings of expertise and anti-expert populism, both pre- and post-2016. From this large set of work, I pulled out a smaller set for closer analysis. I focussed especially on longer pieces that grasp towards a theory or guide to emerging political and informational challenges over science and expertise.

Readers should keep in mind that a small critical discourse analysis simply cannot support any definitive claims about the entire industry. It also cannot even support the more limited claim that some new model defines every reporter at every outlet cited here, or even that all pieces ever produced by each of these individual journalists follows the model precisely. At most, such a sample can only suggest emerging strands of thinking. More ambitious claims would require a more comprehensive analysis, perhaps with certain quantitative measures, supplementary interviews, or ethnographic investigations. However, such an analysis would only be possible once scholars had some theoretical clarity about what precisely they are measuring. This exploratory paper grasps towards that critical first step. Through a close reading of a small sample, we can reveal emerging journalistic discourses, and theorize how those discourses relate to established theoretical models offered by science communication scholars.

Table 1 outlines the journalists I looked at, the particular work I analyze most closely, and why I found that work significant.

Table 1: *Sample of Critical Discourse Analysis*

Journalist	Format / Outlet	Title	Significance & Context
Michael Lewis	Book	Moneyball: The Art of Winning an Unfair Game (2003/2004)	Prestigious longform journalist offers pre-2016 allegory for the scientific method, capturing a period of journalistic modernism.
		The Undoing Project: A Friendship That Changed Our Minds (2016)	Revises Moneyball, introduces research on limits of cognition that also informs the journalism to follow in this critical analysis.
	Podcast episode from Against the Rules, Season 03	EP1: Six Levels Down (2022)	Theory of post-truth politics, builds on cognition research to explain why expertise is maligned.
		EP3: Field of Ignorance (2022)	
		EP4: Respect the Polygon (2022)	
Ezra Klein	Book	Why We're Polarized (2020)	Top explainer journalist from Vox.com offers explanation for populism and political polarization.
Brooke Gladstone	Podcast from On the Media	Breaking News Consumer's Handbook: Vaccine Edition (2021)	Top media criticism venue offers guide to understanding COVID-19 news.
Ed Yong	Magazine article, The Atlantic	Why the Coronavirus Is So Confusing (2020)	Pulitzer Prize-winning science journalist offers guide to understanding COVID-19 news.
Wendy Zuckerman	Podcast from Science Vs.	Coronavirus: Was It Made in a Lab? (2020)	#1 US-ranked science podcast conducts forceful debunking of COVID-19 "conspiracy theories"
		Coronavirus: Will Chloroquine Save Us? (2020)	
Brandy Zadrozney	Podcast from, Tiffany Dover is Dead (Rebroadcast on On the Media)	How a Tennessee Nurse Unwittingly Became the Face of an Anti-Vax Campaign (2022)	Respected disinformation reporter's year-long investigation to understand the nature of movements against COVID-19 vaccine.

ON DEFICITS AND DEFECTS: SHIFTING JOURNALISTIC EPISTEMOLOGIES PRE- AND POST- 2016

"Our entire society is like baseball": Michael Lewis's field of ignorance

Michael Lewis is one of the most important longform journalists of our era, often regarded as being an innovator of 'the New New Journalism' (Boynton, 2007). Like the earlier New Journalism, Lewis's work combines the narrative tools of fiction writing with investigative and explanatory journalism, first-person reportage, and social analysis and critique. However, this newer variety is said to be more journalistically rigorous, and less prone to the lurid excesses of the original New Journalism (see, for instance, Thompson, 1971/2010).

Lewis is a prolific author with many bestselling books, including a few—*Moneyball* (2003/2004*), Blindside* (2007)*, The Big Short* (2015)—that were adapted into hit movies. He is especially relevant here not only because of his popularity, but because of his conceptual focus. His work deals extensively with the nature of expertise and how it is (mis)understood within complex systems, from the financial industry, to sports, to the administrative state. Essentially, Lewis offers the closest thing to a journalistic *theory* of science and exper-

tise. As we shall see, that theory has been influential to many in the industry. Therefore, I devote the most substantial portion of my review to his work.

Most recently, his podcast series *Against the Rules* (hereafter ATR) devoted its third season to the topic of expertise, entitled "The Ballad of Expertise." In the first episode of that season (2022a), Lewis articulates his theory of journalism:

> All my books are the same in one crude way. I start knowing very little about the subject. I go find actual experts…but pretty much everything I know . . . is from the people I've written about. *They* are the experts. I'm just a guy who writes books about them. (2:01)

His hit book *Moneyball* (2003/2004) is about how experts revolutionized baseball strategy through the use of advanced analytics. Lewis argues that their new statistics better captured the value of baseball players, and that the folk wisdom of managers, sports writers, and die-hard fans was suboptimal—often, just flat-out wrong. He likens the ensuing conflict between baseball traditionalists and baseball quants as a kind of "religious war," with the traditionalists being compared to creationists who are fighting against reason (pp. 291-298). However, for Lewis, *Moneyball* is not really about baseball; *Moneyball* is an allegory for the ability of science to cut through prejudice. Lewis writes that the story is about "how an unscientific culture responds, or fails to respond, to the scientific method" (p. xiv). Later, in ATR, Lewis further extends the *Moneyball* allegory, claiming that it should be read as emblematic of our wider political struggle with expertise. "Our entire society is like baseball was when I wandered in to write a book about it," Lewis claims (2022b, 2:51). If our entire society is like pre-*Moneyball* baseball, this suggests that our political interests and values are like unscientific cultural prejudices. Further, it suggests that there exists some unappreciated class of experts that have the objectively *correct* answers. Like the *Moneyball*-inspired baseball manager selecting the statistically-optimal gameplan to improve the team's win probability, the *Moneyball*-inspired policymaker strives for the optimal policy position to address social problems.

This analogy is not a hypothetical one; it is almost certain that there are *Moneyball*-inspired policymakers, because *Moneyball* was a sensation far beyond baseball. In the third episode of ATR (2022b), Lewis documents how it became a kind of shorthand for a new way of doing things, with journalists speaking of a "Moneyball for…" basically everything, including policing, financial analysis, political punditry, and more (2022b, 23:56). Without this book, we might not have had Nate Silver's *538.com* (Silver was a quantitative baseball analyst turned political pollster and commentator). In ATR, Silver makes the line from baseball to politics plain once again: "Hey look, we built an audience for this in baseball. And so, politics is *still in the stone age* [emphasis added], and so there must be a kind of audience for this in politics too," says Silver (2022c, 15:22). There could be no clearer an expression of the public deficit view: quantitative knowledge is seen as literally bringing science and reason to a backward place—a place so backward, we might as well call it "the stone age," as Silver does of politics, or "barbarism" as Lewis does of pre-*Moneyball* baseball (2004, p. 274). Still, there is undeniably optimism here. Lewis and Silver truly believed that expertise could enlighten. Notably, *Moneyball* ends by demonstrating how quantitative ideas spread throughout the league. Despite some resistance, the baseball experts eventually got their way.

"A connoisseur of man's limitations": Public defects and the undoing of popular reason

Post-2016, Lewis' work takes a subtle but important turn. Instead of triumphant portraits of modernist experts bringing Enlightenment, he becomes even more focussed on how those experts are resisted. The transition is encapsulated in Lewis' *Undoing Project* (2016). Lewis' introduction suggests that the book is almost like a spiritual sequel to *Moneyball,* which, after 2016, Lewis sees as almost naive. He points to a review from Richard Thaler and Cass Sunstein that Lewis reads as "both generous and damning" (p. 17). The review is generous because they recognize Lewis identified inefficiencies in baseball, but it is damning because they argue Lewis fails to ask why those inefficiencies persisted for so long. Their answer, inspired by the work of Amos Tversky and Daniel Kahneman (see for instance Tversky & Kahneman, 1974; Khaneman,

2013/2011), is that these are hard-wired defects of human reason. Tversky and Kahneman, known for their work in cognitive psychology and behavioral economics, revealed a number of powerful cognitive heuristics and biases that undermined the neoclassical model of the rational, utility-maximizing *homo economicus*. These ideas are the focus of *the Undoing Project*, which is effectively a book undoing human reason. Lewis documents a range of cognitive shortcomings that are likely familiar to the reader now (confirmation bias, priming, various heuristics, etc.).

These ideas also animate several episodes of *Against the Rules*. A close listening of the podcast episode "Respect the Polygon" (Lewis, 2022c) illustrates most clearly how psychological explanations are mobilized by Lewis to explain public distrust of science. The protagonist is James Spann, a meteorologist who offers tornado warnings. However, the public is hostile to Spann. In the episode, as in much of Lewis' work, this public is mostly imagined—never spoken with directly. Here, they are only represented by Spann reading mean tweets:

> **SPANN**: You cost the people in the state millions of dollars by your [expletive redacted], poor [expletive redacted] forecasts!
>
> . . .
>
> **SPANN**: James, you're the worst meteorologist I've ever layered [sic] my eyes on. Or you have the worst luck at predicting the weather. I think it's time to step down, brother!" (2022c, 8:05-8:42)

To explain this anger, Lewis claims our minds crave certainty and have trouble dealing with Spann's probabilistic knowledge. Since the time of fleeing lions on the savannah, we are hard-wired to reject probabilistic knowledge, as our minds crave a "simple answer rooted in our experience, or some story we've heard," concludes Lewis (31:42). The core claim here is presented without serious evidence. In fact, the scholarly research in science communication is decidedly mixed. There is reason to believe publics are comfortable with scientific uncertainty, or only marginally affected (Retzbach & Maier, 2015). Like his imagined public, Lewis does not carefully evaluate the evidence; he only offers simple answers from stories he has heard, this one from an aggrieved weatherman.

In the end, what is Lewis' revised view of this post-2016 public? This public is not suffering from a lack of good information (the deficit view), they are instead *intrinsically incapable of understanding* the information that is presented to them. The more radical reading, not considered here, is that this public may have some justified resentments that make Spann and other experts suspect; perhaps the public ignored warnings because they have been historically burned by their media, their experts, and their government. For instance, perhaps they mistrust the mainstream media for its various failures during the Iraq War, the financial crisis, or the opioid epidemic. Whatever the case, an honest assessment would go beyond individualized conceptions of faulty *risk assessment;* an honest assessment would think critically about the context that informs how a media message is read by its recipient in their particular context. However, that kind of sociological empathy is missing here. In Lewis' ballad of expertise, the poor expert is quite literally just a misunderstood hero. He suggests that Spann's viewers should be overwhelming him with "hailstorms of gratitude, hurricanes of appreciation, tornadoes of awe—but that's not the weather he now lives in," followed by the mean tweets quoted earlier (2022c, 7:49-8:04). Perversely, tornado-ravaged victims become the tornados in Lewis' discourse.

"Immune to truth:" Ezra Klein and the limits of explainer journalism

Ezra Klein, co-founder of the enormously successful 'explainer' website *Vox.com,* shares similar interests, and similar trajectories. Just like *538's* Nate Silver, Klein is heavily influenced by Lewis' work. Using a Google search into *Vox*, one can find dozens of articles referencing Lewis.

When Klein co-founded *Vox*, the introductory video asserted that *Vox* was an effort to help readers understand the news, and that if readers misunderstood "that failure was 100% on us as writers, that is entirely our fault" (Vox, 2014). Yet, Klein's own writing quickly turns the blame outward. In one article, he asserted that politics was "making us stupid," documenting Dan Kahan's research that purports to show that our political identities "short-circuited" intelligence and make

us resist factual information (Klein, 2014, para 13). One is left asking the obvious question: if we are impervious to reasoned explanation, why do explainer journalism?

In Klein's *Why We're Polarized* (2020), he doubles down on his self-defeating pessimism. Notably, the book is introduced as an explanation for the results of the 2016 election. Klein's primary explanation is to bombard the reader with brief summaries of an enormous range of experimental psychology, behavioral economics, and evolutionary biology. All this evidence is marshalled towards arguing one basic point: voters are stupid. Klein claims that voters are pulled magnetically to their parties because those parties are exquisitely tuned to our psychological dispositions, the biology of our political differences, and our insurmountable group affinities and cultural prejudices. To make this case, he gestures to the instincts supposedly encoded in our brains since the time we were hunter-gatherers (p. 61). In the end, we are effectively "locked in" by our nature, and virtually no information will change us (p. 10). Ironically, in the face of Trumpism, this self-styled wonk completely discards the epistemic foundations of his craft, and much else. In the end, we are left with the most regressive portrait of humanity: humans are beasts governed by natural and immutable characteristics, and therefore in need of wise policy wonks and careful expert managers. As we move forward, we shall see that these kinds of psychological ideas animating Lewis' and Klein's technocratic discourse continually re-emerge in other reporting.

Interlude: Theorizing the public defect model

I am not the first to recognize this emerging fascination with the public's supposed irrationality. For instance, Goldenberg (2021) demonstrates how these same research ideas have been especially influential in media portrayals of vaccine hesitancy (pp. 41-42). At this juncture, it is worth mentioning that some of this research is now being critically re-examined in light of psychology's replication crisis. Many headline findings about cognitive biases and heuristics have been shown to be overstated or not be replicable, likely because researchers simply tortured their data to produce exciting results and filed away efforts that failed (see Kim, 2019). More recently, a *New Yorker* investigation examines how two luminaries of the field may have even falsified data (Lewis-Kraus, 2023). Regardless of these methodological concerns, we might still accept the basic directions of these insights. However, even then, Goldenberg (2021) has argued that the research does not necessitate a totalizing picture of human irrationally, as is commonly suggested in media accounts. Rather, she argues it merely invites us to also attend to the deeper social and political relations that inform our understanding of science (pp. 41-70). However, if we reject Goldenberg's invitation, what does science communication become?

I argue that a *public defect* model emerges. In this model, journalists abandon the modernist optimism of the deficit model. Table 2 constructs these as two ideal types. In the sections that follow, I elaborate on these characteristics.

Table 2: *Deficits vs. Defects*

	Public Deficit Model of Science Communication	**Public Defect Model of Science Communication**
Journalist is:	Humble purveyor of expert knowledge	Investigator and corrector of public shortcomings
Expert is:	Unproblematic provider of truth	Imperfect provider of truth, but self-aware enough to correct imperfections
Public is:	Uneducated and deficient, but reasonable and therefore educable	Cognitively defective, and therefore uneducable
Journalistic genres:	Explainer and data journalism, fact-checking, research dissemination	Amateur information scientist, debunker, exposer of misinformation and conspiracy

"The great waiting room of science": On the media's self-defeating science journalism

WNYC's *On the Media* (hereafter OTM) provides a useful case study in how the contradictions between defects and deficits are navigated. This radio show and podcast is one of the leading venues for media criticism and analysis in the U.S. I reviewed all their episodes since the emergence of COVID-19 that dealt with the emerging science. One pertinent example is an April 2021 episode. Following a controversy with the Johnson & Johnson vaccine, OTM published a "Breaking News Consumer's Handbook" for vaccine stories (OTM, 2021). This is part of a recurring series of media literacy guides OTM publishes.

To open, host Brooke Gladstone claims we are all "in the great waiting room of science," as vaccines emerge (OTM, 2021, 3:00). This reinforces the deficit-style view that scientists stand apart and disseminate their innovations to the rest of us. In truth, the public is not "waiting" for vaccine science; it would be more accurate to say that vaccines are being publicly-constructed, since they are publicly-funded, distributed, regulated, patented, and negotiated. Instead of attending to those political questions, OTM tells us to simply wait.

While we wait, we are offered a math lesson. Gladstone explains how to understand the numbers about vaccine risks. Here, the discourse is thoroughly statistical: the audience is told to "do the math," and the math is explained (OTM, 2021, 4:69). Yet, as the episode moves from deficit into defect, we are told about cognitive defects that make our individual statistical assessments faulty. Her guest claims that humans are bad at judging risks because we have an "illusion of control," gesturing to psychological research that I have already discussed here (9:31). This public is driven by inarticulate *feelings* which Gladstone describes curiously as "floating like vapor in the air" (11:27).

To be certain, this podcast 'handbook' on vaccine science does involve scientific dissemination, as the deficit model would have us do. Yet, the inclusion of the defect model's assumptions undercuts the enterprise. I wonder if the episode is almost designed to be dizzying. The 20-minute story includes no less than 10 main points, each summarizing a large range of research and statistics—a torrent of information, with no affective storytelling techniques. In the end, OTM seems unconvinced that their audience can understand what is presented to them. Gladstone's last piece of advice is that we "either pay *really close attention* to vaccine news, or not much at all. If you are vaccinated, you've already got it covered" (OTM, 2021, 19:18). For a media criticism program, this is a surprising conclusion. OTM awkwardly resolves the contradictions between deficit and defect by inviting their audience to simply ignore the news.

"The psychological loam of fear and uncertainty": Why Ed Yong's coronavirus coverage is so confusing

The work of *Atlantic* science journalist Ed Yong produces similar effects. Yong is undoubtedly one of the most accomplished science journalists in the English-speaking world, having won a Pulitzer Prize for his COVID-19 reporting. Encouragingly, he sometimes writes critically about scientists and the social and political factors that underlie their work. Yet, Yong also exhibits a jaundiced view of public reason.

His magazine article "Why the Coronavirus is so Confusing" (2020) is presented as a guide to making sense of emerging science news, similar to OTM's guide. This article, as many others by Yong, is little more than a quasi-academic literature review presented using the genre conventions typical of specialist blogs. That is especially evident when examining the intertextual chains that support Yong's work. A typical paragraph includes an overwhelming number of hyperlinks—one short paragraph has as many as eight hyperlinks, most linking to various expert assessments (para. 24).[1] Yong's discourse here is thoroughly scientific, filled with technical language, unnecessary acronyms, and usually delivered in passive voice. Here is a typical sentence: "Estimates of its case-fatality rate (CFR)—the proportion of diagnosed people who die—have ranged from 0.1 to 15 percent [hy-

[1] Sometimes, the hyperlinks are rather puzzling. In his conclusion, he references how COVID-19 will not follow a "classic hero's journey," and Yong hyperlinks a definition and instructional guide from a book written by a university lecturer and professional screenwriter. It is not clear why we should read this guide, or why Yong is compelled to provide intertextual aids and expert verification for his every claim—even his rhetorical devices.

perlinked]" (para. 13). Who made these estimates of a scientific concept that passively ranges from one percentage point to the next? This is not character- or event-driven journalism; it does not focus on people, places, or things. In classic deficit style, this is one-way science dissemination. Yong's work is about numbers and models that reveal, studies that suggest or cast doubt, and abstract constructions of science itself, with Yong reassuring us of how this thing "actually works" (para. 23).

Refreshingly, Yong is willing to criticize scientific authorities. For instance, he concedes that much of COVID-19 news is confusing because some scientists have made mistakes by stepping outside of their area of expertise. He then turns to praising experts who are aware of their own limitations. However, like Lewis and others quoted above, Yong believes that this fundamentally conflicts with the public's alleged expectations of certainty. His article then covers theories of misinformation, which suggest COVID-19 misinformation is especially effective because it exploits a "psychological loam of fear and uncertainty," as well as our cognitive biases and our purported desire for "simple narratives" (para. 45-48). Therefore, the epistemic hierarchy is *reconstructed*. In the deficit view, science was crudely positivistic: the scientist had uncomplicated access to truth, and that put them above the public. Here, we get a more nuanced portrait of the scientific enterprise. Nevertheless, the epistemic hierarchy is re-established by virtue of the scientist's supposed intellectual humility, in contrast to the stubbornness of the public mind. Yet, there is evidence to the contrary. For instance, Wynne (1993) has argued that laypeople demonstrate more self-reflexivity and intellectual humility than experts. Unfortunately, that sort of self-critical research is not considered by this leading science journalist in his statement piece on misunderstanding and mistrust around COVID-19 science.

Interlude: Theorizing the misinformation reporter as paragon of public defect

If the rising journalistic star of the Obama-era was the political fact-checker (Graves, 2016), I would argue that the rising journalistic star of the post-truth era is the misinformation reporter. They are similar, but different in key respects. I contend that the fact-checker maintains fidelity to the deficit model, whereas the misinformation reporter shifts to a defect model. I develop this interpretation through reading Graves's *Deciding What's True* (2016), an ambitious academic study of fact checkers. Graves describes fact-checking as a kind of journalistic reform movement that builds off the analytical turn in journalism and shares the epistemological and political optimism of the Progressive Era (pp. 63-66). However, they also write for an "idealized, information-hungry citizenry" that is capable of informed public debate (p. 180). Therefore, this looks like an optimistic expression of the public deficit view; we need to be educated, but we are hungry for that education.

How do fact-checkers respond to the post-2016 world, including the kind of psychological theories embedded in the public defect model? According to Graves' research observing a fact-checking conference, they mostly shrug. Graves even captures one discussion in which two political scientists present research that purports to show how fact-checking may actually reinforce existing erroneous beliefs. Yet, the fact-checkers "seemed unfazed by the grim picture painted by research about their real-world influence," observes Graves (p. 181). The fact-checkers seem to retain the view that it is their job to provide the public with good information, and what the public chooses to do with that is not the fact-checker's business (pp. 181-184). In contrast, the misinformation reporter has a more forceful project. They are not merely a corrector of facts, but an active crusader against the purveyors of untruth. As we shall see, they have a cynical vision of a society beset by dangerous and defective fools.

"But then, there's science!": Why science always wins in *Science Vs*.

The award-winning podcast *Science Vs*. provides a useful waypoint between deficit-driven fact-checking and defect-driven misinformation reporting. As of writing, they are the Number 1 science podcast on Spotify's U.S. charts (Chartable, 2024). Everything you need to know about their philosophy of science is in its very title: *Science Vs*. In this view, there is something called Science that stands apart from the rest of the world, until it is

brought in to compete (i.e., the "Vs." part) against other things. Many episodes are set up in a similar way: host Wendy Zuckerman summarizes some narrative that politicians or publics have pushed, excerpting a brief clip of their most outlandish claims, before introducing Science. Then, there is a sound effect that is best described as clouds parting as heavenly beams shoot down (Science Vs., 2020a, 2:45). This heavenly view of science—as a unified Science, as provider of Truth, as untainted by politics, and even as *decider* of politics—should be carefully shielded from any colleagues who do critical work in science studies, because hearing it would be sure to trigger a fatal aneurysm. The fact that this view of science is met with journalistic plaudits, and not cackles of laughter, is all the evidence one needs to conclude that mainstream journalism is yet to abandon its longstanding positivism (Dornan, 1990; Nelkin, 1995).

In many episodes, *Science Vs*. is a paragon of the public deficit view of science communication. An enormous range of research is deftly summarized. This demonstrates a basic faith in public educability. However, the podcast's very structure—its explicit allegiance to a heavenly Science—means it forcefully pits itself against what it deems misinformation. For instance, a close listening of their lab leak episode (Science Vs., 2020b) reveals some overt biases. Zuckerman cheekily dismisses the theory, suggesting that even entertaining it is to "put my conspiracy hat on" (10:10). The episode then constructs a straw man of the hypothesis, only asking whether it is the work of an "evil scientist" who wanted to cause chaos (9:35). The podcast never considers the more widely-held view that a lab leak might have been an accident, a view seriously considered by many scientific and intelligence organizations (Thacker, 2021). I am not well-versed enough to pass judgement on competing theories. However, it seems reasonable to conclude that there was—and perhaps always will be—a high degree of scientific uncertainty, and therefore it would be improper to label the theory conspiracy or misinformation (Scheufele, Krause, & Freiling, 2021, p. 524). Regardless, *Science Vs*. never offered a serious hearing then, nor have they revisited the subject since new information emerged. Therefore, they appear to be scientific ambassadors to the lay world. Usually, they are optimistic ambassadors educating an educable public. Other times, they become frustrated ambassadors protecting Science's legitimacy from the so-called misinformation of the conspiracy-minded public.

Why Tiffany Dover *is* actually dead: How Zadrozny's misinformation reporting misses the story

Brandy Zadrozny is a reporter at NBC who focuses primarily on misinformation. Of all her stories, she tweets that the story of Tiffany Dover is the one that "she can't let go of" (2023b). Dover was a Tennessee nurse who fainted on live TV shortly after receiving a COVID-19 vaccine. Soon, a conspiracy theory surfaced that Dover eventually died of that vaccine. The hospital posted a video of her alive, but conspiracy theorists found it unconvincing. Suspicions only grew because Dover avoided media. Zadrozny looks to find Dover in a podcast series humorously titled, "*Tiffany Dover is Dead*."

In the first episode Zadrozny (2022), characterizes the Dover story as part of a broader "global information war" fought by people she calls "Truthers," who are mostly presented by torrents of clips underscored by a slightly ominous soundtrack. When the hospital releases their unconvincing video, Zadrozny says it is "like chum in the water," suggesting the Truthers are merely fish (15:02). She lists off no less than seven news and fact-checking organizations that have debunked the Truthers theories (10:03). However, "all that fact-checking didn't resolve the issue, actually, it arguably got worse" (10:26). Here, we see more clearly the evolution from fact-checker to misinformation reporter; the fact-checker is seen as naive and ineffectual. In a later section, she has an exchange with Anna Merlan, another misinformation reporter. This exchange demonstrates how the deficit-based view, almost instinctive to Zadrozny, is reluctantly ceded to the defect view expressed by Merlan:

> **ZADROZNY**: That feeling… like appealing to the Truthers could be a *rational* course. I feel that all the time. I can't help but be tempted by their constant refrains of like, just show us this thing, and then, ya'know, we'll all go away . . .

> **MERLAN**: But of course they won't, will they? Because if she does a video, it will be, "that's not Tiffany." . . . Like, anything she does will feed into it. (17:40-18:80).

Zadrozny (2022) then concludes by stating that her series will show us that facts can only take us so far. Yet, they did already take us quite far: the basic facts are already known by Zadrozny, and it is only marginal online conspiracy theorists who refuse them.[2] Still, Zadrozny looks for Dover over this five-episode series. As Fiona Sturges (2022) pointed out in a review for the *Financial Times,* this is "an obviously pointless exercise since we know she is alive" (para. 2). It seems that Dover does not want to be found, "yet here Zadrozny is," writes Sturges, "lurking outside her place of work and her home, and using her name in the title of her podcast in the glibbest possible fashion" (para. 4). Zadrozny claims that the Truthers have weaponized Dover in their global information war; ironically, Zadrozny fails to realize that she is doing the very same thing.

After the series finishes, we finally learn why Dover refused to speak publicly. According to Zadrozny's follow-up report (2023a), Dover was forbidden to speak by her hospital's PR staff, in a tactic PR professionals call "strategic silence." She even faced discipline for making posts to her own Instagram feed (para. 53-55). Therefore, Zadrozny discovered a well-documented phenomenon in expert institutions: their obsession with message control and the way this sometimes negatively affects the rights of their employees (Rowe & Brass, 2008, 2011; Brass & Rowe, 2009). However, the capstone article spends scant time seriously considering the implications of that discovery, instead quickly shifting to considering whether PR strategies should merely be tweaked in the misinformation era.

Therefore, Zadrozny reasserts the technocratic authority of the administrators. Ironically, it turns out the Truthers were righter than we thought. The all-powerful medical elites did not actually kill Dover, but as far as this information war is concerned, they might as well have; they silenced her with total impunity, and refused to answer basic questions. If medical authorities behave like that, it should be no surprise that publics distrust them.

To be clear, there can still be value in misinformation research and reporting, especially when it is focussed on the powerful interests that shape these narratives (see for instance, Oreskes & Conway, 2010). However, even then, I contend, we should focus on the background social and political conditions that make the misinformation seem plausible, rather than focus too narrowly on the misinformation itself.

SUMMARY OF FINDINGS

Regarding RQ1, there was indeed a change to prevailing models of science communication within the journalists reviewed here. My analysis finds that the public deficit model still persists in their work, but it is being supplemented and sometimes supplanted. None of these journalists quit being messengers for expert knowledge, but all of these journalists expressed some ambivalence in public educability. That ambivalence was motivated in part by a particular reading of social science research that focuses on cognitive biases, heuristics, and other distortions to rationality. This created an awkward tension; journalists teach a public that they believe incapable of learning. I have characterized this view as the *public defect* model of communication because it focuses excessively on the public's supposed cognitive defects, counteracting the paternalistic optimism of the earlier public deficit view.

Regarding RQ2, the respective roles of expert, journalist, and public also shifted. For the expert, this shift was slight. These journalists did sometimes demonstrate a willingness to critique experts, yet they also reinforced the epistemic hierarchy between experts and publics. They did so by presenting experts as imperfect, but still self-critical enough to *correct* their imperfections—conversely, the public could not. The journalistic role also shifted only slightly. They maintained the interpretive role of making sense of the world for their audience (Barnhurst, 2014), but they shifted their critical attention: they spent more time punching down against a misinformed public,

[2] Neither her first episode nor the later capstone longform article quantitatively define the size of this conspiracy theory, aside from a link to a deactivated Facebook group of about 5,600. Zadrozny mostly provides anecdotal evidence that the theory is influential on certain corners of the internet.

rather than up at the political and scientific leaders that make misinformation seem plausible. Finally, the public came out battered and bruised. These journalists reconstructed their post-2016 publics as unthinking and impersonal threats that have become resistant, if not outright impervious, to the power of reason.

LIMITATIONS

Critical readers will likely object that I have not provided systematic evidence. Rather, I have cherry-picked particular journalists for a strand of thinking I condemn. Indeed, there would be some truth to that charge. As I described in my methodology section, this should be read as an exploratory paper that identifies and theorizes an emerging model within an admittedly small set of journalists. In particular, these were U.S.-based longform journalists at mainstream, liberal-leaning outlets known for their detailed coverage of science, research, and expertise. Certainly, this is a small group. However, this is not just *any* small group; these are award-winning journalists that are almost universally applauded in mainstream media. There is good reason to suspect that they are representative of something larger, or perhaps might be leading indicators of broader shifts to come. More research should be done to examine how widely these ideas are expressed now and into the future. Scholars might also interview individual journalists to elicit their views on deficits, defects, and related themes.

CONCLUSIONS

By this point in our polemic, the reader is probably seeking advice on how they might practically implement my alternative vision. Unfortunately, they will likely leave disappointed. Mostly, that is because this is a problem of theory, and not of technique. On matters of technique, the journalists I reviewed here are at the top of their field. My concern is that they have not asked themselves more foundational questions about the nature of scientific expertise and its role in a democratic society. These are the kinds of questions journalists and educators should ask themselves and their students. Most of all, they should ask what the journalist's role is in the increasingly hostile relationship between publics and experts.

Is the journalist a representative for an expert culture against an unruly mass, or a representative for a dignified and rational public struggling to make sense of an intelligent, but imperfect expert elite? Admittedly, I am hyperbolically presenting this choice as a stark dichotomy. In truth, publics clearly suffer from deficits, and perhaps some defects too (as we all do). We should still attend to those, so long as we are fair and not one-sided. Nevertheless, it is helpful to reckon with ideal types.

To put the question bluntly: are we true democrats, or are we technocrats? The journalists we reviewed here were decidedly technocratic. My view is clear. However, I see no convincing argument that either is more realistic. Each requires a leap of faith. The democratic view requires faith that a polarized and distrustful public can engage in healthy debate over complex scientific matters. The technocratic view requires faith in the expert's ability to develop universal knowledge within a small cadre, and continuously manage any consternation from the much larger and increasingly dissatisfied mass. Does the journalist struggle in the technocrat's information war, or do they struggle to rebuild a truly democratic politics? That is for them to decide.

Gordon Katic is a PhD candidate in the Department of Social Justice Education at the University of Toronto's Ontario Institute for Studies in Education. He is also an award-winning journalist and director of Cited Media.
gordon.katic@mail.utoronto.ca

REFERENCES

Akin, W. E. (1977). *Technocracy and the American Dream: The Technocrat Movement, 1900-1941*. University of California Press.

Albæk, E., Christiansen, P. M., & Togeby, L. (2003). Experts in the mass media: Researchers as sources in Danish daily newspapers, 1961–2001. *Journalism & Mass Communication Quarterly*, *80*(4), 937–948. https://doi.org/10.1177/107769900308000412

Ball, J. (2018). *Post-Truth: How Bullshit Conquered the World*. Biteback Publishing.

Baram-Tsabari, A., & Lewenstein, B. V. (2017). Science communication training: What are we trying to teach? *International Journal of Science Education, Part B*, *7*(3), 285–300. https://doi.org/10.1080/21548455.2017.1303756

Barnhurst, K. (2014). The interpretive turn in news. In C. Zimmermann & M. Schreiber (Eds.), *Journalism and Technological Change: Historical Perspectives, Contemporary Trends*. University Of Chicago Press.

Barnhurst, K. G., & Mutz, D. (1997). American journalism and the decline in event-centered reporting. *Journal of Communication*, *47*(4), 27–53. https://doi.org/10.1111/j.1460-2466.1997.tb02724.x

Bielik, P., & Višňovský, J. (2021). Explanatory journalism – A new way how to communicate in digital era. *Media Literacy and Academic Research*, *4*(1).

Blum, D., Knudson, M., & Henig, R. M. (Eds.) (2006). *A field guide for science writers* (2nd ed). Oxford University Press.

Boynton, R. (2007). *The new new journalism: Conversations with America's best nonfiction writers on their craft*. Knopf Doubleday Publishing Group.

Brass, K., & Rowe, D. (2009). Knowledge limited: Public communication, risk and university media policy. *Continuum*, *23*(1), 53–76. https://doi.org/10.1080/10304310802570874

Brennan, J. (2016). *Against Democracy*. Princeton University Press.

Brossard, D., & Lewenstein, B. V. (2009). A critical appraisal of models of public understanding of science: Using practice to inform theory. In L. Kahlor & P. Stout (Eds.), *Communicating science: New agendas in communication* (1st ed., pp. 25–53). Routledge. https://doi.org/10.4324/9780203867631-9

Buchanan, M. (2016, November 2). Obama relishes role as "nerd in chief." *ShareAmerica*. https://share.america.gov/obama-relishes-role-as-nerd-in-chief/

Callison, C., & Young, M. L. (2019). *Reckoning: Journalism's limits and possibilities*. Oxford University Press.

Carvalho, A. (2008). Media(ted) discourse and society: Rethinking the framework of critical discourse analysis. *Journalism Studies*, *9*(2), 161–177. https://doi.org/10.1080/14616700701848162

Chartable. (n.d.). *Science Vs podcast*. Chartable. Retrieved April 28, 2023, from https://chartable.com/podcasts/science-vs

Dewey, J. (2016). *The public and its problems: An essay in political inquiry*. Ohio University Press. (Original work published 1927)

Dickinson, T. (2007, June 28). Six years of deceit. *Rolling Stone*. https://www.rollingstone.com/politics/politics-news/six-years-of-deceit-192430/

Dornan, C. (1990). Some problems in conceptualizing the issue of "science and the media." *Critical Studies in Mass Communication*, *7*(1), 48–71. https://doi.org/10.1080/15295039009360163

Douglas, H. E. (2009). *Science, policy, and the value-free ideal*. University of Pittsburgh Press. https://muse.jhu.edu/book/3730

Dudo, A., Besley, J. C., & Yuan, S. (2021). Science communication training in North America: Preparing whom to do what with what effect? *Science Communication*, *43*(1), 33–63. https://doi.org/10.1177/1075547020960138

Epstein, S. (1996). *Impure science: AIDS, activism, and the politics of knowledge*. University of California Press.

Eyal, G. (2019). *The crisis of expertise* (1st edition). Polity.

Fairclough, N. (1995). *Media discourse*. Arnold.

Fairclough, N. (2013). Critical discourse analysis. In J. P. Gee & M. Handford (Eds.), *The Routledge handbook of discourse analysis*. Routledge.

Fink, K., & Schudson, M. (2014). The rise of contextual journalism, 1950s–2000s. *Journalism*, *15*(1), 3–20. https://doi.org/10.1177/1464884913479015

Fricker, M. (2007). *Epistemic injustice: Power and the ethics of knowing*. Clarendon Press.

Gans, H. J. (2004). *Deciding what's news: A study of CBS evening news, NBC nightly news, Newsweek, and Time*. Northwestern University Press. (Original work published 1979)

Giddens, A. (1991). *The consequences of modernity* (1st edition). Stanford University Press.

Goldenberg, M. J. (2021). *Vaccine hesitancy: Public trust, expertise, and the war on science*. University of Pittsburgh Press.

Graves, L. (2016). *Deciding what's true: The rise of political fact-checking in American journalism*. Columbia University Press.

Habermas, J. (1985a). *The theory of communicative action, Volume 1: Reason and the rationalization of society* (T. McCarthy, Trans). Beacon Press.

Habermas, J. (1985b). *The theory of communicative action, Volume 2: Lifeworld and system: A critique of functionalist reason*. (T. McCarthy, Trans). Beacon Press.

Hallin, D. C. (2006). The passing of the 'high modernism' of American journalism revisited. *Political Communication Report*, 16(1), Winter, 2006. https://diamantmediacourse.files.wordpress.com/2016/01/the-passing-of-the.docx

Hallin, D. C. (1992). The passing of the "high modernism" of American journalism. *Journal of Communication*, *42*(3), 14–25. https://doi.org/10.1111/j.1460-2466.1992.tb00794.x

Haraway, D. (1988). Situated knowledges: The science question in feminism and the privilege of partial perspective. *Feminist Studies*, *14*(3), 575–599. https://doi.org/10.2307/3178066

Harding, S. G. (2004). *The feminist standpoint theory reader: Intellectual and political controversies*. Psychology Press.

Hotez, P. J. (2023). *The deadly rise of anti-science: A scientist's warning*. JHU Press.

Irwin, A., & Wynne, B. (Eds.). (1996). *Misunderstanding science? The public reconstruction of science and technology*. Cambridge University Press.

Jørgensen, M., & Phillips, L. (2002). *Discourse analysis as theory and method*. SAGE Publications Ltd. https://doi.org/10.4135/9781849208871

Kakutani, M. (2018). *The death of truth: Notes on falsehood in the age of Trump* (1st Edition edition). Tim Duggan Books.

Kahneman, D. (2013/2011). *Thinking, fast and slow*. Farrar, Straus and Giroux (Reprint edition).

Kitcher, P. (2011). *Science in a democratic society*. Prometheus.

Klein, E. (2014, April 5). How politics makes us stupid. *Vox*. https://www.vox.com/2014/4/6/5556462/brain-dead-how-politics-makes-us-stupid

Klein, E. (2020). *Why we're polarized* (Illustrated edition). Avid Reader Press / Simon & Schuster.

Kim, A. B. (2019, November 1). Psychologists confront impossible finding, triggering a revolution in the field [Podcast Episode]. In *CBC: Ideas* [Podcast Series]. CBC Radio. https://www.cbc.ca/radio/ideas/psychologists-confront-impossible-finding-triggering-a-revolution-in-the-field-1.5344467

Lasch, C. (1996). *The revolt of the elites and the betrayal of democracy*. W. W. Norton & Company.

Lewis-Kraus, G. (2023, September 30). They studied dishonesty. Was their work a lie? *The New Yorker*. https://www.newyorker.com/magazine/2023/10/09/they-studied-dishonesty-was-their-work-a-lie

Lewis, M. (2004). *Moneyball: The art of winning an unfair game*. W. W. Norton & Company. (Original work published 2003).

Lewis, M. (2007). *The blind side: Evolution of a game*. W. W. Norton & Company.

Lewis, M. (2015). *The big short: Inside the doomsday machine* (Movie Tie-in Edition). W. W. Norton & Company.

Lewis, M. (2016). *The undoing project: A friendship that changed our minds*. W. W. Norton & Company.

Lewis, M. (2022a, April 4). Six levels down [Podcast Episode]. In *Against the Rules* (Season 03, Episode 01) [Podcast Series]. Pushkin Industries. https://www.pushkin.fm/podcasts/against-the-rules/six-levels-down

Lewis, M. (2022b, April 12). Field of ignorance [Podcast Episode]. In *Against the Rules* (Season 03, Episode 03) [Podcast Series]. Pushkin Industries. https://www.pushkin.fm/podcasts/against-the-rules/field-of-ignorance

Lewis, M. (2022c, April 19). Respect the polygon [Podcast Episode]. In *Against the Rules* (Season 03, Episode 04) [Podcast Series]. Pushkin Industries. https://www.pushkin.fm/podcasts/against-the-rules/respect-the-polygon

Lippmann, W. (1997). *Public opinion* (Reissue Edition). Free Press. (Original work published 1922)

Longino, H. E. (1990). *Science as social knowledge: Values and objectivity in scientific inquiry*. Princeton University Press.

Merton, R. K. (1973). *The sociology of science: Theoretical and empirical investigations* (N. W. Storer, Ed.). University Of Chicago Press.

Mulder, H. A. J., Longnecker, N., & Davis, L. S. (2008). The state of science communication programs at universities around the world. *Science Communication*, *30*(2), 277–287. https://doi.org/10.1177/1075547008324878

Nelkin, D. (1995). *Selling Science: How the press covers science and technology* (Revised edition). W.H. Freeman & Company.

Nichols, T. M. (2017). *The death of expertise: The campaign against established knowledge and why it matters*. Oxford University Press.

On the Media. (2021, April 16). Breaking news consumer's handbook: Vaccine edition [Podcast Episode]. https://www.wnycstudios.org/podcasts/otm/segments/breaking-news-consumers-handbook-vaccine-edition

Oreskes, N., & Conway, E. M. (2010). *Merchants of doubt: How a handful of scientists obscured the truth on issues from tobacco smoke to global warming* (1st U.S. ed). Bloomsbury Press.

Proceedings of the National Academy of Sciences [PNAS]. (2009). President Barack Obama addresses the 146th annual meeting of the National Academy of Sciences. *Proceedings of the National Academy of Sciences*, *106*(24), 9539–9543. https://doi.org/10.1073/pnas.0905049106

Radder, H. (2019). *From commodification to the common good: Reconstructing science, technology, and society*. University of Pittsburgh Press.

Retzbach, A., & Maier, M. (2015). Communicating scientific uncertainty: Media effects on public engagement with science. *Communication Research*, *42*(3), 429–456. https://doi.org/10.1177/0093650214534967

Rohde, J. (2013). *Armed with expertise: The militarization of American social research during the Cold War*. Cornell University Press.

Rowe, D., & Brass, K. (2008). The uses of academic knowledge: The university in the media. *Media, Culture & Society*, *30*(5), 677–698. https://doi.org/10.1177/0163443708094015

Rowe, D., & Brass, K. (2011). "We take academic freedom quite seriously": How university media offices manage academic public communication. *International Journal of Media & Cultural Politics*, *7*(1), 3–20. https://doi.org/10.1386/mcp.7.1.3_1

Scheufele, D. A. (2022). Thirty years of science–society interfaces: What's next? *Public Understanding of Science*, *31*(3), 297–304. https://doi.org/10.1177/09636625221075947

Scheufele, D. A., Krause, N. M., & Freiling, I. (2021). Misinformed about the "infodemic?" Science's ongoing struggle with misinformation. *Journal of Applied Research in Memory and Cognition*, *10*(4), 522–526. https://doi.org/10.1016/j.jarmac.2021.10.009

Schmalzer, S., Chard, D. S., & Botelho, A. (Eds.). (2018). *Science for the people: Documents from America's movement of radical scientists*. University of Massachusetts Press. https://doi.org/10.2307/j.ctv3s8ts5

Schudson, M. (2001). The objectivity norm in American journalism. *Journalism*, *2*(2), 149–170. https://doi.org/10.1177/146488490100200201

Science Vs. (2020a, March 26). Coronavirus: Will chloroquine save us? [Podcast Episode]. In *Science Vs*. [Podcast Series]. Gimlet Media. https://gimletmedia.com:443/shows/science-vs/brhoo5n

Science Vs. (2020b, April 24). Coronavirus: Was it made in a lab? [Podcast Episode]. In *Science Vs*. [Podcast Series]. https://gimletmedia.com:443/shows/science-vs/dvheexn

Scott, D., & Kaplan, S. (2016, December 11). Obama's science adviser explains why a "science-savvy" president matters. *Business Insider*. https://www.businessinsider.com/obamas-science-adviser-explains-why-a-science-savvy-president-matters-2016-12

Secko, D. M., Amend, E., & Friday, T. (2013). Four models of science journalism: A synthesis and practical assessment. *Journalism Practice*, *7*(1), 62–80. https://doi.org/10.1080/17512786.2012.691351

Simis, M. J., Madden, H., Cacciatore, M. A., & Yeo, S. K. (2016). The lure of rationality: Why does the deficit model persist in science communication? *Public Understanding of Science*, *25*(4), 400–414. https://doi.org/10.1177/0963662516629749

Sismondo, S. (2018). *Ghost-Managed medicine: Big Pharma's invisible hands*. Mattering Press.

Sokal, A., & Bricmont, J. (1998). *Fashionable nonsense: Postmodern intellectuals' abuse of science*. St. Martin's Griffin.

Sokal, A. D. (2008). *Beyond the hoax: Science, philosophy and culture*. Oxford University Press.

Sturges, F. (2022, April 25). Tiffany Dover is dead—podcast explores how a conspiracy theory gained traction. *Financial Times*. https://www.ft.com/content/dc33bbc6-cca6-461d-9c3d-c96c9cb9e1b0

Suldovsky, B. (2016). In science communication, why does the idea

of the public deficit always return? Exploring key influences. *Public Understanding of Science*, *25*(4), 415–426. https://doi.org/10.1177/0963662516629750

Thacker, P. D. (2021). The covid-19 lab leak hypothesis: Did the media fall victim to a misinformation campaign? *BMJ (Clinical Research Ed.)*, *374*, n1656. https://doi.org/10.1136/bmj.n1656

Thompson, H. S. (2010). *Fear and loathing in Las Vegas: A savage journey to the heart of the American dream*. Knopf Doubleday Publishing Group. (Original work published 1971)

Tuchman, G. (1978). *Making news: A study in the construction of reality*. Free Press.

Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science*, *185*(4157), 1124–1131. https://doi.org/10.1126/science.185.4157.1124

Vox. (2014, March 17). Vox: Understand the news. [Video] https://www.youtube.com/watch?v=PQnhigbI4g4

Wired Staff. (2009, November 24). Making science cool: "Educate to innovate." *Wired*. https://www.wired.com/2009/11/making-science-cool-educate-to-innovate/

Wormer, H. (2019). 21. Teaching science journalism as a blueprint for future journalism education. In A. Leßmöllmann, M. Dascal, & T. Gloning (Eds.), *Science communication* (pp. 439–464). De Gruyter. https://doi.org/10.1515/9783110255522-021

Wynne, B. (1993). Public uptake of science: A case for institutional reflexivity. *Public Understanding of Science*, *2*(4), 321–337. https://doi.org/10.1088/0963-6625/2/4/003

Yong, E. (2020, April 29). Why the coronavirus is so confusing. *The Atlantic*.

Yuan, S., Oshita, T., AbiGhannam, N., Dudo, A., Besley, J. C., & Koh, H. E. (2017). Two-way communication between scientists and the public: A view from science communication trainers in North America. *International Journal of Science Education, Part B*, *7*(4), 341–355. https://doi.org/10.1080/21548455.2017.1350789

Zadrozney, Brandy (2022, May 13). How a Tennessee nurse unwittingly became the face of an anti-vax campaign [Podcast Episode]. In *Tiffany Dover is Dead* [Podcast Series] and excerpted in *On the Media* [Podcast Series]. WNYC Studios. https://www.wnycstudios.org/podcasts/otm/segments/how-nurse-became-face-antivax-campaign-on-the-media

Zadrozny, B. (2023a, April 10). She became an anti-vaccine icon, and vanished. She's finally ready to talk about it. *NBC News*. https://www.nbcnews.com/tech/misinformation/tiffany-dover-conspiracy-theorists-silence-rcna69401

Zadrozny, B. [@BrandyZadrozny]. (2023b, April 10). [Tweet]. https://web.archive.org/web/20230412091029/https://twitter.com/BrandyZadrozny/