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# The Postmodern Medical Paradigm: A Case Study of Anti-MMR Vaccine Arguments

Brett Bricker & Jacob Justice

*This essay analyzes the arguments of the antivaccination movement, arguing that many analysts have misdiagnosed the root causes of vaccine skepticism. It is no longer productive for argumentation scholars to discount scientific skepticism as simply a problem of an ignorant public, religious zealots, or conservative ideologies, because antivaccine beliefs transcend ideology. The authors argue that simplistic accusations of blame on one political or cultural subgroup are inaccurate, and that the emergence of powerful antivaccine advocates points to the power of a conspiracy theory supported by anecdotes.*

*Keywords:* Argument; Conspiracy; Postmodernism; Science; Vaccines

In 1998, Dr. Andrew Wakefield published an essay in *The Lancet*, a respected British medical journal, claiming a connection between the Measles, Mumps and Rubella (MMR) vaccine and autism. The essay was scientific garbage: Wakefield's sample size was miniscule; he deliberately altered the medical history of patients in the study; "timelines were misrepresented . . . to suggest direct culpability of the vaccine"; his research was funded by a law firm hoping to sue vaccine manufacturers (a conflict of interest that he failed to disclose); and, other researchers have been unable to replicate his findings (Dominus, 2011, para. 2). Six years later, *The Lancet* retracted the article, and Britain's medical council subsequently stripped Wakefield of his medical license. Finally, in 2011, the *British Medical Journal* published a special series on Wakefield's

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findings, noting that 3 of the 9 children reported with regressive autism were not officially diagnosed, 5 children had preexisting conditions that were ignored by Wakefield, and patients were recruited through anti-MMR campaigners (Deer, 2011, p. 79).

Despite this denigration of Wakefield and his findings, this *Lancet* essay was the seminal moment for the anti-MMR vaccination movement. Since this essay was published, Wakefield has produced books and movies, participated in interviews and regularly spoken at conferences (Skwarecki, 2016, para. 3). A small but influential group of antivaccinators continue to view Wakefield as a persecuted scientific hero (Gorski, 2009, para. 3); and, they prolifically spread his disproven and scientifically inaccurate message linking vaccines to autism. Their argumentative strategy defends Wakefield and his findings by questioning the authority of qualified scientists who have thoroughly disproven his findings: “When reporters call Wakefield a fraud, he tells them that CDC scientists are the real frauds. When Houston’s mayor won’t give city funding to show anti-vaccine propaganda, they call the decision censorship and fume that it was ‘about money’” (Skwarecki, 2016, para. 29).

Unfortunately, this strategy has been successful. In the United States, vaccination rates are in steady decline; specifically, the MMR vaccine has come under intense scrutiny, with many parents opting out (Chinni, 2015, para. 10). Because of this, herd immunity for a variety of diseases is at risk, and the United States has already seen outbreaks of measles—a disease once thought vanquished due to vaccine success. A meta-analysis reviewing studies dedicated to vaccine refusal found “a substantial proportion of the US measles cases in the era after elimination were intentionally unvaccinated” (Phadke, Bednarczyk, Salmon, & Omer, 2016, p. 1155). Internationally, antivaccine sentiment is growing as well, and poses a significant risk to developing countries (Skwarecki, 2016, paras. 51–53). The potential for global epidemics caused by decreased vaccination based on an unfounded link between the MMR vaccine and autism is rising. What makes this issue particularly dangerous is the limited room for error. Herd immunity depends on near complete immunization, which means that small decreases in MMR vaccination create dangerous possibilities for infection and spread.

This skepticism of scientific consensus is by no means limited to the antivaccination movement. Argumentation scholars have demonstrated that some portions of the public are not persuaded by even the soundest scientific evidence. In several cases of clear scientific consensus, antiscience ideology directly corresponds with conservative ideology and values. Antivaccination advocates are unique because they do not belong primarily to “any recognizable subgroup identified by demographic characteristics, religiosity, science comprehension, or political or cultural outlooks” (Kahan, 2014, p. 4).

What makes the antivaccination movement particularly puzzling is the strange bedfellows comprising the skeptics: uneducated antiestablishment conservatives, educated conservatives supporting “parental choice,” atheists, religious people, and wealthy progressives who repudiate what they judge to be toxic injections. In fact, a 2015 Pew poll shows Democrats are almost twice as likely as Republicans to “say the measles vaccine isn’t safe” (Blake, 2015, para. 5). In the case of vaccine skepticism, it’s

not the ignorant, the poor, the religious zealots, or the Republican Party leading the charge; the largest clusters of unvaccinated children are found in demographically diverse cities. The spread of easily preventable diseases, the rejection of sound science, and the burgeoning alliance of groups across ideological, political, and cultural perspectives provides an enigma which deserves argumentative analysis.

This essay is divided into four sections. First, we evaluate public opinion concerning vaccine science and declining vaccination rates. In doing so, we highlight the key puzzle of vaccine denial: its capacity to transcend partisan and ideological divides. Second, we theorize the characteristics of antivaccine discourse that make vaccine skepticism appealing to individuals across the ideological spectrum, arguing that anecdote and conspiracy theory are central to antivaccine argumentative strategies. Third, we analyze the arguments of two prominent antivaccine texts, demonstrating that anecdote and conspiracy theory bolster the cross-ideological appeal of these arguments. Finally, we conclude by analyzing argumentative strategies that may help counter the trend towards skepticism of the MMR vaccine and the rise of the postmodern medical paradigm.

### **Public Reception of Vaccine Science**

Despite the success of the MMR vaccine, there is considerable public doubt about its use. Pew Research Center (2015) found that 30 percent of parents in the United States supported parental choice, meaning that they should be able to determine whether “vaccines for childhood diseases such as measles, mumps, rubella and polio” were administered to their children (p. 46). Even though overall vaccination rates remain relatively high, the trend towards allowing exemptions for parental choice has created geographical pockets that do not meet the government target of 95 percent coverage for MMR (Seither et al., 2014, p. 915). Twenty-two states do not have 95 percent coverage of school-aged children, and only nine states have 95 percent coverage of children under 3 (Chodosh, 2017, para. 11). In areas with less than 95 percent coverage, vaccine-preventable diseases are likely to occur because the community lacks sufficient vaccination to achieve herd immunity.

Outbreaks are already occurring, with major spikes in measles throughout the United States in 2014 and 2015. Importantly, these outbreaks are directly related to lack of vaccination. In response to the early 2014 outbreaks, the Centers for Disease Control and Prevention (CDC) released a press release directly appealing to vaccine opponents:

The current increase in measles cases is being driven by unvaccinated people, primarily U.S. residents, who got measles in other countries, brought the virus back to the United States and spread to others in communities where many people are not vaccinated. (CDC Newsroom, 2014, para. 2)

However, this warning, despite coming from the country’s highest authority on disease, was not heeded. This state of affairs is quite puzzling. Despite clear historical evidence of success of the MMR vaccine and a complete lack of scientific support for

the claim that vaccines are linked to autism, public opinion is shifting in the opposite direction, against vaccines.

Although several explanations of this conundrum have been forwarded, one of the most widely accepted theories blames political conservatives for antivaccine science propaganda. Chris Mooney (2012), author of the New York Times Best Seller *The Republican War on Science*, argued in *The Republican Brain* that “science denial [is] an increasingly important part of the conservative and Republican political identity” (p. 8). He claims that, based on evidence from “political science, social psychology, evolutionary psychology, cognitive neuroscience, and genetics,” conservatives tend to deny scientific reality at a dramatically higher rate (pp. 10–11). He applies this theory to a large set of scientific topics. Oddly, he sees the vaccine case study as supporting his claim that liberals tend to align themselves with scientific reality: “It is scientists and liberals who have denounced these ideologues [anti-vaxxers]. And for good reason: they’re endangering us all. The vaccine case, therefore, yet again shows the power of liberal self-correction, evidence-following, and belief-updating” (p. 234).

Elsewhere in *The Republican Brain*, Mooney (2012) argues that the willingness to deny science is “clustered among Republicans, conservatives and especially Tea Partiers” (p. 3) while “Democrats are the party of experts, scientists, and facts” (p. 7). Several pundits have agreed with this hypothesis. Nuccitelli (2016), an environmental scientist at *The Guardian* blamed antivaccine beliefs on the Republican Party’s “reliance on the religious right and corporate interests, and the growth of a right-wing media echo chamber that feeds anti-science conspiratorial thinking” (para. 14). Sean McElwee (2013), a *Demos* policy analyst, writes in a Salon article titled “GOP is an anti-science party of nuts,” that “there is a real dichotomy between those who support science and those who don’t—and those who don’t are generally on the Republican side” (para. 23). Lupton and Hare (2015), both academic political scientists, repeated these findings, arguing that “anti-vaccination attitudes appear concentrated among conservatives,” and agreeing with Mooney that “anti-vaccination liberals are quite rare and . . . their existence is mostly anecdotal” (para. 9, 8). Sharing a similar sentiment, a University of New Hampshire survey led by Lawrence Hamilton (2015) found: “liberals also were most likely and conservatives least likely to trust scientists for information about vaccines” (p. 1).

However, in the context of the antivaccination movement, this explanation is inaccurate. Regarding opinions about MMR vaccine policy, Democrats are almost twice as likely to reject vaccines for safety reasons as Republicans (Blake, 2015, para. 5). Moreover, several high-profile progressives have publicly opposed vaccination, largely basing their fear on the discredited link between the MMR vaccine and autism. For example, Robert F. Kennedy Jr., who is considered a progressive hero for his call to jail climate change science deniers, has publicly crusaded against vaccines containing thimerosal on the basis that they make autism more likely (Johnson, 2015, para. 1). In 2005, Kennedy published articles in *Rolling Stone* and *Salon* “alleging a government and pharmaceutical company wide conspiracy to cover up connections between thimerosal and childhood autism” (Johnson, 2015, para. 4). These pieces were

subsequently removed from each news source because they were found to be based on inaccurate data.

Despite these retractions, Kennedy remains one of the “most effective proponents” of the idea that vaccines cause autism (Helmuth, 2013, para. 2). Sadly, Kennedy’s views are not outliers among members of the Democratic Party. In 2004, Dave Weldon (R-FL) introduced legislation banning thimerosal from vaccines. This legislation gathered 30 democratic cosponsors, including Dennis Kucinich (D-OH), Anthony Weiner (D-NY), Leonard Boswell (D-IA), Sheila Jackson-Lee (D-TX), Tim Ryan (D-OH), and Steve Israel (D-NY)—the head of the Democratic Congressional Committee (108th Congress, 2004). Even then presidential candidate Barack Obama responded to a vaccine-related question at a Pennsylvania town hall meeting in April 2008 with “we’ve seen just a skyrocketing autism rate . . . the science right now is inconclusive, we have to research it” (qtd. in Kliff, 2015, para. 2). At the time of Obama’s statement, Wakefield’s original findings had been thoroughly disproven. Further to the left on the political spectrum, 2016 Green Party presidential candidate Jill Stein questioned vaccine science during her campaign. In an interview with *The Washington Post*, Stein echoed the concerns of antivaccine advocates, saying “there were real questions” about vaccines that “needed to be addressed” and expressing fears of undue “corporate influence” in the vaccine approval process (qtd. in Weigel, 2016, paras. 3–7).

Vaccine skepticism is also common in the cultural left. Ostensibly progressive Hollywood personalities like Bill Maher, Mayim Bialik, Jim Carrey, and Jenny McCarthy (who self-identified as a Democrat during her early antivaccine days) all publicly espouse antivaccine views. Clearly, there is no GOP monopoly on scientific inaccuracy. Measles outbreaks are commonly occurring in blue states (California, Washington, Illinois, Minnesota, Pennsylvania, and New York), with the highest rates in primarily liberal areas (Ingraham, 2015).

While opposition to mandatory vaccination is strongest among cultural liberals, many conservatives share a similar view. In fact, overall “across ideology—neither side is substantially more likely than the other to hold anti-vaccine beliefs” (Bouie, 2015, para. 4). In fact, no single demographic characteristic explains anti-MMR sentiment. Some blame racial inequality, or the fear of medical treatment oftentimes found within the Black community; however, White and non-Whites share similar risk perceptions (Kahan, 2014, p. 30). Others point the finger at religious zealots, however, “in contrast to other disputed science issues, public opinion on the safety and efficacy of childhood vaccines is not meaningfully affected by . . . religiosity” (Kahan, 2014, p. 10). Science comprehension, intelligence, and wealth are not meaningful indicators of division over vaccine risks and benefits (Kahan, 2014, p. 10). Neither is sex (Kahan, 2014, p. 30).

The preceding section shows that anti-MMR sentiment cuts across lines of culture, race, political ideology, affluence, and educational attainment. Not only do mono-causal interpretations not reflect reality, but there is significant danger in “repeatedly . . . accusing one or another of the groups currently polarized . . . of being the source

of it,” as it “could generate exactly such resentment and fear” (Kahan, 2014, p. 9). Given the political, ideological, and demographical cross-cutting nature of the issue, we argue that something fundamentally different from other disputes about science-related public policy is influencing vaccination opinion formation: the postmodern medical paradigm, which elevates subjective experience and raises skepticism towards objective bases for knowledge. In the next section, we theorize the qualities of antivaccination arguments that lend themselves to such widespread appeal.

### **Countering Consensus: Anecdote and Conspiracy Theory**

The appeal of antivaccination discourse in its most powerful form is linked to two aspects of the postmodern medical paradigm. First, antivaccination advocates counter appeals to scientific consensus by relying upon anecdotes and highly emotional personal stories. These anecdotes typically involve the firsthand testimony of parents of autistic children who are convinced of the vaccination–autism link and use their own experiences to caution the audience against vaccination. Although educated and scientifically literate audiences may rightfully be skeptical of such anecdotal appeals, lay audiences often find them persuasive because of the sincerity of the featured parents and their seemingly common-sense arguments. Second, antivaccination arguments utilize conspiracy theory rhetoric to discount provaccination counterarguments, alleging a concerted effort by the media, government agencies, and pharmaceutical industry to conceal the truth about the vaccination–autism link. This argumentative technique casts doubt on the scientific consensus, by implying that the vaccination–autism link could be definitively proven were it not for widespread collusion to stifle the flow of information, creating an atmosphere of pervasive skepticism and uncertainty that is not conducive to rational, evidence-based persuasion. In what follows, we describe these two themes in greater detail and, illustrate their form and function within antivaccination discourse.

Researchers across several disciplines have noted the rhetorical power of anecdote, and its capacity to foster skepticism towards scientific consensus. In this context, anecdote may be defined as an “interstitial medium for the transmission of medical knowledge” (Hunter, 1986, p. 619) that is rooted in “personal experience” and not replicable “evidence-based data” (Shelby & Ernst, 2013, p. 1799). Anecdotes are “informal accounts of cases past and present” (Hunter, 1986, p. 621) that highlight “the fundamental nature of the object of medicine’s study: the workings of an abstraction called disease in the individual human being” (p. 630). Anecdotes are persuasive because they highlight tension between theoretical scientific knowledge and particular individual experiences.

Antivaccines anecdotes have proven challenging for health professionals to combat because they are “impossible to forget,” “difficult to refute,” and “seemingly immune to facts” (Shelby & Ernst, 2013, pp. 1795–1796). Shelby and Ernst (2013) argue that “the most pervasive narrative told by the anti-vaccine community is the ‘overnight autism’ account,” wherein a child regresses into a language-less state



almost immediately after administration of the MMR vaccine (p. 1796). The overnight autism account has proven to be particularly resonant because of its sheer emotional impact and because “the validity of these stories and the credibility of the individuals sharing them typically go unchallenged” in antivaccine communities, particularly online ones (p. 1797). Anecdotes garner such an emotional impact because they capitalize on the tendency of parents to “think of risk for their own child rather than from a population-based approach often used in public health: what does this risk mean for my family and me?” (Dubé, Vivion, & MacDonald, 2015, p. 107).

The second theme that is characteristic of antivaccination discourse is conspiracy theory rhetoric. Conspiracy theories can be defined as “attempts to explain events as the secret acts of powerful, malevolent forces” (Jolley & Douglas, 2014, p. 1). Richard Hofstadter played a prominent role in theoretical developments concerning conspiracy. In his work on paranoid style, Hofstadter (1996) traced accusations of conspiracy from the fear of Illuminism in the late 18th century through McCarthyism of the mid-20th century. In each case, he noted that antielitism, apocalypticism, and imaginative leaps defined conspiracy theories (Hofstadter, 1996, p. 37). Those employing the paranoid style were most often “oversuspicious, overaggressive, grandiose, and apocalyptic” (Hofstadter, 1996, p. 4).

Conspiracy theories “by their very nature, are communicated narratively” and are “framed as compelling stories of good versus evil” (Desantis & Morgan, 2004, p. 320). These theories often emerge in response to a need to “explain a complex, often chaotic, and sometimes stupefying world” (Goldzweig, 2002, p. 495), providing people “coping mechanisms for contemporary angst” (p. 497; Kelley-Romano, 2008). In the vaccine context, “conspiracy theories may be a way to reassure oneself that there is an order to our lives, that calamity and disaster are not meaningless or random,” helping to combat a sense of “powerlessness” felt by the parents of autistic children (Blaskiewicz, 2013, p. 260). Conspiracy theories have been a fixture of American public life throughout the country’s history, reflecting and reinforcing a deep suspicion of “those in power” and “those who secretly covet power” (Dorsey, 2002, p. 454). The widespread circulation of these theories is enabled by a deep sense of “cynicism” towards political and economic elites in America, creating “fertile ground for conspiratorial theories to germinate and take root” (Clarke, 2002; Desantis & Morgan, 2004, p. 320; Miller, 2002).

Conspiracy theory is a central element of antivaccination discourse, as vaccine opponents frequently allege that “large pharmaceutical companies and governments are covering up information about vaccines to meet their own sinister objectives” (Jolley & Douglas, 2014, p. 1). In pragmatic terms, conspiracy theory is a valuable tool that opponents of vaccination use to respond to criticism. Desantis and Morgan (2004) argued that “built into the conspiracy genre is a self-protecting mechanism that thwarts traditional approaches to argumentation, e.g., the use of respected sources and credible evidence” (p. 335). Vaccine skeptics can cite the existence of a shadowy web of collusive forces to account for the abundance of contradictory evidence and relative dearth of supporting evidence for their arguments. This in turn allows vaccine opponents to



maintain and cultivate a coherent (if poorly evidenced) Manichean worldview, further radicalizing members of their ranks against their perceived enemies.

These narratives have become so pervasive that Blaskiewicz (2013) argued, “Big Pharma conspiracy theories . . . constitute their own genre within the larger category of conspiratorial narratives” (p. 259). Big Pharma conspiracy theories, including vaccination conspiracy discourse, represent a distinct genre insofar as they contain “a number of conventions that set [them] apart from other conspiracy theories” (p. 259). The most important distinguishing characteristic is the antagonist of these narratives: a vilified and caricatured pharmaceutical industry referred to using the umbrella “Big Pharma” label, which serves as a sort of rhetorical “shorthand for an abstract entity comprised of corporations, regulators, NGOs, politicians, and often physicians” (p. 259). These theories are also characterized by “fears over side effects, ‘unnatural’ substances . . . and a general suspicion of the profit motive in health care,” all of which are “supercharged” by deep parental anxieties about the safety of their children (p. 260).

The conspiratorial nature of this discourse helps explain why antivaccination sentiment transcends partisan boundaries, uniting ideologically diverse groups under a single banner: these narratives may resonate with liberal/progressive individuals because of their skepticism towards the motives of corporations, while they may also manipulate conservative fears of invasive government run amok. Conspiracy theory also serves as a tool of community-building, fostering identification among disparate individuals by constituting them against an amorphous, shadowy “Other.” By positing a wronged “community with which the individual can identify,” conspiracy rhetoric “fulfills psychological functions in that it compliments believers by affirming they have knowledge of which most other Americans are oblivious” (Kelley-Romano, 2008, p. 117). Antivaccination conspiracy theories therefore “warrant further critical examination precisely because they hold influence beyond the lunatic fringe” (Warner & Neville-Shepard, 2014, p. 3).

### **The Antivaccine Arguments of *Callous Disregard* and *Vaxxed*, Examined**

In this section, we illustrate the centrality of these argumentative strategies in two texts that are central to the antivaccination movement: *Callous Disregard: Autism and Vaccines — The Truth Behind a Tragedy* by Andrew Wakefield and the documentary film adapted from this book, *Vaxxed: From Cover-Up to Catastrophe*. We selected these texts because Wakefield has “a following who trust[s] what he says” and is considered “a trusted expert” by “many within the anti-vaccination movement,” and these texts are critical documents within antivaccination communities and are therefore ripe for analysis (Harrison, 2013, pp. 20–21). Additionally, these texts represent “a typical communication product supporting the conspiracy theory of anti-vaccine activists,” and can therefore be utilized as the basis for drawing conclusions about antivaccination discourse broadly (Bennato, 2017, p. 3; Plait, 2016, para. 8). Both works rely heavily on anecdote and conspiracy theory to diminish scientific authority and constitute their audiences into a community.

*Anecdote*

Although actual scientific evidence for the vaccine–autism link is sorely lacking in antivaccine texts, critics noted that “what Wakefield does have is powerful anecdotal evidence” in the form of “scores and scores of families” who “have been traumatized by the experience of living with perfectly normal children who suddenly turn abnormal after a year or so of life” (Roston, 2016, para. 10). In *Callous Disregard*, Wakefield (2010) carefully described the experiences of the “Lancet 12,” the 12 children profiled in the seminal MMR study (p. 46). The second chapter, titled “The Children,” contains a specific narrative for each child, detailing their reason for joining the study, interactions with medical professionals, and their lifelong symptoms supposedly triggered by the MMR vaccine. Despite removing the names of the children, and instead referring to them through anonymous coding (“Child 1,” “Child 2,” etc.), the anecdotes are remarkably personal (p. 46). Here, Wakefield describes the development of autism in Child 3:

And so the pattern continued: Child 3’s history was of normal development followed by sudden changes in behavior just 2 days after MMR vaccination at 14 months, when he started head-banging accompanied by fever and rash. At 15 months of age he underwent a dramatic deterioration in behavior, with hand flapping (a very common feature of autism), aggression, and deterioration in speech. By the time he was 2 years old, he could no longer speak. From the very outset, his mother was convinced of the association between her child’s deterioration and MMR vaccination. His bowel problems started with diarrhea and progressed to chronic laxative-dependent constipation, pain, and the passage of blood in his feces. (pp. 28–29)

He describes these stories as “documentary evidence” that should call into question the consensus of scientists that believe the vaccine is safe (p. 245). Despite presenting limited anecdotal evidence, Wakefield makes an enormous inferential leap by asserting that these cases are consistent with a global pattern of dangerous side-effects of the MMR vaccine:

These presentations (and those in many thousands more children worldwide) and the pattern that emerged from the commonalities in their symptoms and clinical findings should have initiated a cascade of urgent clinical research that would have led through an iterative process to discovery—discovery of cause, treatment, and prevention. (p. 25)

To summarize, in *Callous Disregard*, Wakefield asserts the existence of a pattern of evidence proving the MMR–autism link, but bases this assumption on limited anecdotal evidence. The powerful description of each case distracts from the large gaps in logic, an insufficient number of patients to make a causal claim, and the robust scientific evidence pointing towards MMR vaccine safety.

A similar argumentative theme is present in *Vaxxed*. Highly emotional anecdotes appear repeatedly throughout the documentary, frequently assuming the form of an “overnight autism” narrative wherein a distressed parent recounts how their child instantly underwent radical personality and behavioral changes after vaccination. The

most emotionally impactful overnight autism narrative occurs around 35 minutes into the film. This account features Sheila Ealey, an African American mother of twins, a boy named Temple and a girl named Lucinda. According to Ealey, only Temple received the MMR vaccination due to the confusion and chaos caused by both babies crying in the doctor's office that day. Although Temple was vaccinated, Ealey claims that his sister Lucinda "never got her shots" (Bigtree & Wakefield, 2016). Ealey recounts that after the vaccination, Temple regressed, exhibiting unusual behavior like "banging his head on the floor" and "staring into space" as though he was paralyzed (Bigtree & Wakefield, 2016).

The full weight of this narrative's emotional impact hits several minutes later. After testimony from Wakefield and others about the heightened risk of vaccine-induced autism for African American boys, the audience is shown Lucinda playing the piano. With teary eyes, Sheila Ealey begins to speak again, describing how "Temple's twin is amazing. She is fluent in three languages. She speaks French like a native. She is an A student. She plays classical piano." She then adds "one of the best decisions I made for her was to walk out of that office without her being vaccinated" (Bigtree & Wakefield, 2016). Ealey then makes a pained facial expression and begins to cry, expressing sadness that "his twin is going into the 11<sup>th</sup> grade" while Temple "still can't manage to cross the street" (Bigtree & Wakefield, 2016). The musical proficiency of Lucinda is then contrasted with footage of Temple watching a children's television show on a laptop computer. The scene concludes as the mother reflects that she was "so naïve" to think "he would live a fulfilling life" (Bigtree & Wakefield, 2016). To a lay audience, this scene is not only emotionally resonant but also appears to be a real-life approximation of a scientific study featuring an experimental and control group.

The film's reliance on anecdotal argument is made explicit during testimony from the film's producer. Del Bigtree, who is introduced as an "investigative medical journalist," acknowledges the scientific consensus, but nonetheless emphatically discounts it using anecdote:

We know in medicine, that there have been many, many studies proving that vaccines do not cause autism. But the problem I have always had with that, is thousands and thousands of parents all telling the same story. My child got a vaccine, usually the MMR vaccine, and then that night or the next day, broke out in a fever, and then when they came out of the fever, lost speech, lost the ability to walk . . . I wanted to look into this story and find out: what is this disconnect between medicine, science, and real parents? (Bigtree & Wakefield, 2016)

This sequence hammers home the film's key point: that the anecdotal, authentic, folk knowledge of parents should be trusted over that of scientific knowledge. For the viewer to believe in vaccine science would require them to doubt their own eyes and ears, and the painful testimony of multiple trustworthy parents, many of whom are shown to have scientific expertise themselves. The film's argument that the subjective experiences of parents should be privileged over those of experts is in turn bolstered by the second argumentative strategy of the film: conspiracy theory.

### *Conspiracy Theory*

Conspiratorial thinking runs deep in both *Vaxxed* and *Callous Disregard*. Conspiracy is implied in the film's very title, which invokes a "cover-up" and "catastrophe," and by advertisements that described *Vaxxed* as "the film *they* don't want you to see." Similarly, in *Callous Disregard*, Wakefield (2010) addresses the conspiratorial nature of his writings head-on:

It was recently suggested to me . . . that this was really just conspiracy theory. As it happened, earlier that week, internal memos from the pharmaceutical giant Merck were disclosed to the Australian court in the Vioxx litigation. They talked of how Merck had to "neutralise" dissent from those doctors who questioned the safety of this drug. In relation to these concerned doctors, one of the e-mails read: We may need to seek them out and destroy them where they live. It would seem that rather than being conspiracy theory, this can sometimes be corporate policy. (p. 4)

From beginning to end, *Vaxxed* bombards viewers with accusations of foul-play, collusion, and deception directed at a variety of actors. The film begins by suggesting the government and media have collaborated to misinform the public, reeling through footage of doctors, pundits and even President Obama denying the link between vaccines and autism. As Obama is shown encouraging parents to seek out the available evidence on vaccine safety, recommending the Centers for Disease Control's research, the film then proceeds to tarnish this agency's reputation. The screen goes dark, and soon fingers can be seen operating a keyboard, combined with dramatic voiceover. An unseen voice says: "I have waited a long time to tell my story, and I want to tell it truthfully. I was involved in deceiving millions of taxpayers regarding the potential negative side effects of vaccines. We lied about the scientific findings" (Bigtree & Wakefield, 2016). These words are then attributed to William W. Thompson of the CDC.

Audio recordings of Thompson, who alleges that the CDC covered up evidence of the link between vaccines and autism, appear throughout *Vaxxed* and serve as the film's "ace-in-the-hole," seemingly confirming government responsibility for the vaccine controversy (O'Sullivan, 2016, para. 11). Presenting Thompson's comments as antivaccination arguments was disingenuous in light of other statements that he has made, where he clarifies that "I want to be absolutely clear that I believe vaccines have saved and continue to save countless lives . . . I would never suggest that any parent avoid vaccinating children" (qtd. in Goldschmidt, 2014, para. 25). Although these recordings of Thompson are "highly edited" and were "made without his knowledge, as the filmmakers admit," they may nonetheless be interpreted as concrete proof of conspiracy by lay audiences (para. 11).

In *Callous Disregard*, Wakefield (2010) similarly posits that "the system" corrupts the scientific processes and discourages meaningful dissent from doctors and scientists (p. 3). Several chapters of the book follow a textbook conspiracy theory outline. For Wakefield and his followers, there is a hidden truth known only to the most diligent and careful scientists (p. 177). That truth includes a corrupt and elite industry with a

financial incentive to keep that truth a secret (pp. 66–67), government support for that industry (p. 226), a whistleblower who sacrifices their own reputation for the good of the population (p. 65) and a vilification of that individual based on false accusations (p. 178).

*Vaxxed* alleges a society-wide conspiracy involving multiple powerful actors. A vilified “Big Pharma” industry plays a central role in in this conspiracy. David Weldon, an M.D. and former congressman, accuses the CDC of not conducting “objective research,” describing the agency as “institutionally conflicted” (Bigtree & Wakefield, 2016). This claim is developed further when Mark Blaxill, author of the *Age of Autism*, alleges the existence of deep financial ties between the CDC and a host of pharmaceutical industry players such as Merck, GlaxoSmithKline, Pfizer, and Sanofi Aventis. Blaxill describes these companies as the main beneficiary of vaccination mandates, asserting the existence of “regulatory capture” within the Health and Human Services agency because of this financial relationship (Bigtree & Wakefield, 2016). Brandy Vaughn, a former sales representative at Merck, appears in the film to testify that “if a drug company gets just one vaccine added to the schedule, they can make upwards of \$30 billion in one year” (Bigtree & Wakefield, 2016). Blaxill then says that the end game of this conspiracy is a policy of “constant vaccination from cradle to grave” mandated by the government to fill the pharmaceutical industry’s coffers (Bigtree & Wakefield, 2016). *Callous Disregard* similarly documents collusion between the government and industries that gain from mandated MMR vaccination: “The UK government had decided to put protection of policy before protection of children. Beyond this point, vaccine uptake may genuinely have fallen, for which the government with its ‘our-way-or-no-way’ policy must take responsibility” (p. 226).

*Vaxxed* attempts to substantiate this alleged financial collusion by pointing out that Julie Gerberding, a former director of the CDC, later served as the head of the vaccines department at Merck. Bigtree sarcastically comments: “Clearly, Merck appreciated the work she had done investigating their vaccine” (Bigtree & Wakefield, 2016). How was the CDC able to get away with taking pharmaceutical industry bribes in exchange for favorable regulation of their products and the production of exculpatory research denying the vaccine–autism link? According to Bigtree, it is because the conspiracy involves not just the federal government and the pharmaceutical industry, but also the entire media industry. Bigtree alleged that because “all of television” is produced and funded by the industry, mainstream outlets like CNN, Fox News, and MSNBC refuse to report on William Thompson’s whistle-blowing (Bigtree & Wakefield, 2016). There is something for everyone, across political lines, to like about this conspiracy: It validates libertarian fear of choice-killing government mandates, while demonizing the pharmaceutical industry, a reviled corporate enemy of progressives. The film concludes with calls for congressional investigation, and for figures pivotal to the alleged conspiracy like Thompson and Gerberding to testify before Congress about vaccine safety. To further thwart the conspiracy, former congressman Weldon additionally calls for vaccine safety responsibilities to be stripped from the CDC and delegated to another, more objective body.

### *Community-Building Functions of Anecdote and Conspiracy Theory*

Importantly, it is the combination of these two strategies that makes *Vaxxed* and *Callous Disregard* such potent resources for opponents of vaccination. The conspiracy theory elements of *Vaxxed* and *Callous Disregard* enhance the persuasiveness of the anecdotes. Pro vaccination forces may correctly point out that the plural of anecdote is not data; however, the film makes it easier to embrace anecdotes as hard evidence by systematically attacking the legitimacy of institutional knowledge sources such as the CDC and the medical profession writ large. In turn, the anecdotes make the claims to conspiracy seem more plausible. The existence of “overnight autism” stories, no matter how limited in the broader context, discourages the audience from dismissing these accounts as mere coincidence, and makes the idea of a grand conspiracy seem less outlandish. In addition, both anecdote and conspiracy theory serve important psychological functions for the audience. The numerous emotional stories shared by parents of autistic children may serve a reassuring function, reminding viewers who have autistic family members that they are not alone. The conspiracy theory also encourages identification by positing a shared enemy around which antivaccination individuals can rally against. The coalescence of these argumentative tropes into one cohesive strategy is what makes *Vaxxed*, *Callous Disregard*, and other antivaccination texts, so dangerous. In the next section, we conclude by suggesting argumentative strategies that could potentially address this dilemma.

### **Conclusion: Recovering Vaccines from the Postmodern Medical Paradigm**

Importantly, anti-MMR arguments discussed in the previous section persuade not because of their scientific accuracy, but because they draw on and support skepticism of the modern medical paradigm. They reject scientific authority, question power, and emphasize the importance of individually created realities. Seen this way, combating antivaccination arguments with more facts proving the safety and efficacy of vaccines will fail to persuade many since those very arguments are viewed, a priori, by vaccine skeptics as built on misinformation. Anti-MMR arguments are effective because they rely on a subjective reality constructed “outside of the scope of scientific observation, with ideas that come to use through custom, experience and education” (Bouie, 2015, para. 8). Therefore, examining the underlying social discourses that produce vaccine skeptics is essential for developing effective responses.

The postmodern medical paradigm is at least partially to blame for skepticism of the scientific evidence supporting MMR vaccine efficacy and safety. Although postmodernism is an intentionally slippery term, when applied to medicine the postmodern medical paradigm has three characteristics:

1. Hostility toward singular truths
2. Aversion to scientific objectivity
3. Decreased trust in expertise (Gray, 1999, p. 1550)

In many ways, postmodernism developed as a necessary corrective to uncritical enthusiasm for technological efficiency and expertise. As “unintended consequences” (p. 1550) of technological advancement became more clear, scientific theories came under intense public scrutiny.

In the context of the vaccine debate, postmodern tendencies have nurtured a group of skeptics who rejects robust scientific evidence proving the MMR vaccine is safe and effective as merely one version of reality (Kata, 2010, p. 1714). Moreover, skeptics use postmodern philosophical tenets to favor online communities and social networks over traditional physicians for information concerning vaccine decisions (Kata, 2012, p. 3778). Nan and Daily’s (2015) study about the effects of blogs on vaccine-related beliefs found that “searching for information about the HPV vaccine online or in blog posts may lead to opposition to the vaccine” because of misinformation or polarization (p. 469). Patient choice is “no longer restricted by the higher status allocated to ‘experts’”; instead, everyone is an expert in Web 2.0 health care, characterized by patient-to-patient collaboration and medical theorization developed by fringe conspiracy theorists (Kata, 2012, p. 3779). By rejecting robust vaccine science and validating personal experience as an “equally valid” form of medical understanding, antivaccine skeptics have created a dangerous mass of fearful and misinformed, yet confident, patients (Kata, 2012, p. 3779). They view MMR–vaccine science as uncertain, reject the scientific rebuttals to the link between vaccines to autism, and mistrust scientists—fulfilling each of the three characteristics of the postmodern medical paradigm.

The response to antivaccine advocacy by vaccine proponents has been to advocate that evidence-based interventions better integrate “the science of science communication into its culture and practices” (Kahan, 2014, p. 12). According to Amin (as cited in Sun, 2017), a coauthor of a 2017 study on attitudes and vaccination, a large body of research about vaccine attitudes focuses on education, the assumption being that “if we throw some fact out there, it will change their minds” (para. 9). However, simply repeating the facts denying the link between vaccines and autism is clearly insufficient. Science-based medicine has lost authority, largely because of the “back-and-forth antagonism” that followed Wakefield’s MMR paper (Kata, 2010, pp. 1714–1715), coupled with antivaccine websites that often cite Vioxx, Thalidomide, and cigarettes as examples of “science that was wrong before” (Kata, 2012, p. 3783). A purely rational response to a belief system that values irrationality will not sufficiently address the problem of vaccine skepticism. A web-based analysis found that individuals exposed to scientifically supported information “explaining the lack of evidence that MMR causes autism” and “information about the dangers” of MMR did not increase parental intent to vaccinate a future child (Nyhan, Reifler, Richey, & Freed, 2014, p. 1). Paradoxically, the argument that there is the potential for loss of herd immunity because of insufficient vaccination rates may normalize the decision to not vaccinate a child by “conveying the false impression that a substantial proportion of parents or of the public generally doubts vaccine safety” (Kahan, 2014, p. 11).

Parents are not rational consumers of scientific information; they are emotional beings making difficult decisions. Although time and energy devoted to defending the scientific paradigm may be a necessary element of vaccine advocacy, this strategy only



attacks the rational prong of the belief system held by vaccine skeptics. Instead of solely relying on scientific consensus as the primary argumentative strategy, a “broader perspective” must be used that recognizes why many parents are hesitant to vaccinate their children (Poland & Brunson, 2015, p. 279). Vaccine advocates ought to broaden their understanding of the problem to account for the complex “psychological, ethical, social, cultural, political, economic, ecological and historical factors, not to mention interpersonal, institutional and state power structures” that influence vaccine decision-making (Poland & Brunson, 2015, p. 278).

To do so, vaccine proponents must understand the messaging tactics of the antivaccination activists. The antivaccine movement “with little or no science or evidence-based information to back up claims of vaccine danger,” has “relied on the profound power of storytelling to infect an entire generation of parents with fear and doubt” (Shelby & Ernst, 2013, p. 1796). Antivaccination activists are winning not because of their accumulation of scientific data, but because “they have told a better story” (p. 1796). Pro-vaccine messages must be “responsive to the needs and attitudes of [their] audience,” accounting for the fact that humans are not always logical, calculating, or rational creatures (George & Selzer, 2007, p. 125). Consequently, pro-vaccine advocates must combine scientific argument with effective story-telling (Shelby & Ernst, 2013, p. 1799).

Vaccine advocates could do this in a variety of ways. First, vaccine advocates should provide anecdotes of pediatricians and family doctors who vaccinate their own children, and share the experiences of those individuals (Shelby & Ernst, 2013, p. 1799). Second, advocates should portray the experiences of children who lived through, or died from, measles, mumps or rubella, including testimony from affected parents and children. Parents need to be shown that these diseases are not simply the diseases of their parents and grandparents. Although the utilization of such fear tactics may be criticized as crass, this appeal is necessary to counter the perception that measles, mumps, and rubella are diseases of the past. The power of stories about these diseases is validated by the results of Nan and Daily’s (2015) study, which demonstrated “the powerful effect of stories or narratives on vaccine beliefs,” leading them to conclude that anecdotes are “apparently more persuasive” than scientific arguments (p. 469). Realizing the consequences of a failure to vaccinate will likely make more parents choose the MMR vaccine for their children. Finally, vaccine advocates should “encourage parents who are already confident about their choice to vaccinate to speak up about their decision and become a part of online communities that share positive stories about immunization” (Shelby & Ernst, 2013, pp. 1799–1800). Stories are more “tangible and engaging” than scientific data; and, because they are more difficult to refute, they can become the “evidence that drives decision-making” (Feemster, 2013, p. 1753).

In the struggle to persuade hesitant parents, those who care about immunization should recognize that narratives and anecdotes are a “powerful tool for messages in support of vaccination” (Feemster, 2013, p. 1753). The narrative approach has particular appeal given the conspiratorial narrative embraced by vaccination skeptics. Because one central component of their approach is to accuse vaccine proponents of establishment elitism, it may prove helpful to show that diverse communities of everyday people safely vaccinate their children, or face the disastrous consequences of mumps, measles, or rubella.

The proliferation of self-proclaimed online expertise and overemphasis on narrative at the expense of scientific data consistent with the postmodern medical paradigm has stripped authority from the scientific paradigm. The natural response from vaccine advocates has been to repeat the facts, because the facts are clearly on their side. However, MMR vaccine skepticism is not an objectively calculated belief driven by rational arguments alone; it is influenced by a variety of factors that are subject to irrational risk perception and cognitive biases (Poland, 2011, p. 871). Therefore, MMR vaccine advocates must trumpet the message of MMR safety by coopting the persuasive strategies of skeptics; namely, using the power of narrative and anecdote alongside their robust scientific argument denying the link between the MMR vaccine and autism.

## References

- 108th Congress. (2004). H.R.4169 - mercury-free vaccines act of 2004. *Congressional government tracker*. Retrieved from <https://www.congress.gov/bill/108th-congress/house-bill/4169/cosponsors>
- Bennato, D. (2017). The shift from public science communication to public relations. The *Vaxxed* case. *Journal of Science Communication*, 16(2), 1–11. Retrieved from [https://jcom.sissa.it/sites/default/files/documents/JCOM\\_1602\\_2017\\_C02\\_en.pdf](https://jcom.sissa.it/sites/default/files/documents/JCOM_1602_2017_C02_en.pdf)
- Bigtree, D., (Producer), & Wakefield, A., (Director). (2016). *Vaxxed: From cover-up to catastrophe [Motion picture]*. Burbank, California: Cinema Libre Studio.
- Blake, A. (2015). Here's how many Americans are actually anti-vaxxers. *Washington Post*. Retrieved from <http://www.washingtonpost.com/blogs/the-fix/wp/2015/02/09/heres-how-many-americans-are-actually-anti-vaxxers/>
- Blaskiewicz, R. (2013). The Big Pharma conspiracy theory. *Medical Writing*, 22(4), 259–261. doi:10.1179/2047480613Z.000000000142
- Bouie, J. (2015). Anti-science views are a bipartisan problem. *Slate*. Retrieved from [http://www.slate.com/articles/news\\_and\\_politics/politics/2015/02/conservatives\\_and\\_liberals\\_hold\\_anti\\_science\\_views\\_anti\\_vaxxers\\_are\\_a\\_bipartisan.html](http://www.slate.com/articles/news_and_politics/politics/2015/02/conservatives_and_liberals_hold_anti_science_views_anti_vaxxers_are_a_bipartisan.html)
- Centers for Disease Control. (2014). Measles cases in the United States reach 20-year high. *CDC Newsroom*. Retrieved from <http://www.cdc.gov/media/releases/2014/p0529-measles.html>
- Chinni, D. (2015). State by state: How vaccination rates have changed. *Wall Street Journal*. Retrieved from <http://blogs.wsj.com/washwire/2015/02/04/state-by-state-how-vaccination-rates-have-changed/>
- Chodosh, S. (2017). Why are the measles coming back? *Popular Science*. Retrieved from <http://www.popsci.com/why-are-measles-coming-back>
- Clarke, S. (2002). Conspiracy theories and conspiracy theorizing. *Philosophy of the Social Sciences*, 32(2), 131–150. doi:10.1177/004931032002001
- Deer, B. (2011). How the case against the MMR vaccine was fixed. *BMJ*, 342(7788), 77–82. doi:10.1136/bmj.c5347
- Desantis, A. D., & Morgan, S. E. (2004). Civil liberties, the constitution, and cigars: Anti-smoking conspiracy logic in cigar aficionado, 1992–2001. *Communication Studies*, 55, 319–339. doi:10.1080/10510970409388622
- Dominus, S. (2011). The crash and burn of an autism guru. *The New York Times Magazine*. Retrieved from <http://www.nytimes.com/2011/04/24/magazine/mag-24Autism-t.html>
- Dorsey, L. G. (2002). Re-reading the X-files: The trickster in contemporary conspiracy myth. *Western Journal of Communication*, 66(4), 448–468. doi:10.1080/10570310209374749
- Dubé, E., Vivion, M., & MacDonald, N. E. (2015). Vaccine hesitancy, vaccine refusal and the anti-vaccine movement: Influence, impact and implications. *Expert Review of Vaccines*, 14(1), 99–117. doi:10.1586/14760584.2015.964212

- Feemster, K. A. (2013). Overview. *Human Vaccines & Immunotherapeutics*, 9(8), 1752–1754. doi:10.4161/hv.26217
- George, A., & Selzer, J. (2007). *Kenneth Burke in the 1930s*. Columbia, SC: The University of South Carolina Press.
- Goldschmidt, D. (2014). Journal questions validity of autism and vaccine study. *CNN*. Retrieved from <https://www.cnn.com/2014/08/27/health/irpt-cdc-autism-vaccine-study/index.html>
- Goldzweig, S. R. (2002). Conspiracy rhetoric at the dawn of the new millennium: A response. *Western Journal of Communication*, 66(4), 492–506. doi:10.1080/10570310209374751
- Gorski, D. (2009). Antivaccine hero Andrew Wakefield: Scientific fraud? *Science-Based Medicine*. Retrieved from <http://www.sciencebasedmedicine.org/antivaccine-hero-andrew-wakefield-scientific-fraud/>
- Gray, J. A. (1999). Postmodern medicine. *Lancet*, 354(9189), 1550–1553.
- Hamilton, L. C. (2015). Conservative and liberal views of science: Does trust depend on topic? *Carsey Research*, 45, 1–10.
- Harrison, J. A. (2013). Wrong about vaccine safety: A review of Andrew Wakefield’s “Callous Disregard”. *The Open Vaccine Journal*, 6, 9–25. Retrieved from <https://benthamopen.com/contents/pdf/TOVACJ/TOVACJ-6-9.pdf>
- Helmuth, L. (2013). So Robert F. Kennedy Jr. called us to complain... *Slate*. Retrieved from [http://www.slate.com/articles/health\\_and\\_science/medical\\_examiner/2013/06/robert\\_f\\_kennedy\\_jr\\_vaccine\\_conspiracy\\_theory\\_scientists\\_and\\_journalists.html](http://www.slate.com/articles/health_and_science/medical_examiner/2013/06/robert_f_kennedy_jr_vaccine_conspiracy_theory_scientists_and_journalists.html)
- Hofstadter, R. (1996). *The paranoid style in American politics, and other essays*. Cambridge, MA: Harvard University Press.
- Hunter, K. M. (1986). “There was this one guy...”: The uses of anecdotes in medicine. *Perspectives in Biology and Medicine*, 29(4), 619–630.
- Ingraham, C. (2015). California’s epidemic of vaccine denial, mapped. *Washington Post*. Retrieved from <http://www.washingtonpost.com/blogs/wonkblog/wp/2015/01/27/californias-epidemic-of-vaccine-denial-mapped/>
- Johnson, C. (2015). Here’s another prominent democrat who says vaccines cause autism #anti-vaxxers. *Got news*. Retrieved from <http://gotnews.com/breaking-heres-another-prominent-democrat-says-vaccines-cause-autism-antivaxxers/>
- Jolley, D., & Douglas, K. M. (2014). The effects of anti-vaccine conspiracy theories on vaccination intentions. *PLOS One*, 9(2), 1–9. doi:10.1371/journal.pone.0089177
- Kahan, D. M. (2014). *Vaccine risk perceptions and ad hoc risk communication: An empirical assessment*. New Haven, CT: Yale University.
- Kata, A. (2010). A postmodern Pandora’s box: Anti-vaccination misinformation on the internet. *Vaccine*, 28(7), 1709–1716. doi:10.1016/j.vaccine.2009.12.022
- Kata, A. (2012). Anti-vaccine activists, Web 2.0, and the postmodern paradigm—An overview of tactics and tropes used online by the anti-vaccination movement. *Vaccine*, 30(25), 3778–3789. doi:10.1016/j.vaccine.2011.11.112
- Kelley-Romano, S. (2008). Trust no one: The conspiracy genre on American television. *Southern Communication Journal*, 73(2), 105–121. doi:10.1080/10417940802009509
- Kliff, S. (2015). Obama supports vaccines now — But pandered to anti-vaxxers in 2008. *Vox*. Retrieved from <https://www.vox.com/2015/2/2/7963837/obama-vaccine-autism>
- Lupton, R., & Hare, C. (2015). Conservatives are more likely to believe that vaccines cause autism. *Washington Post*. Retrieved from [https://www.washingtonpost.com/news/monkey-cage/wp/2015/03/01/conservatives-are-more-likely-to-believe-that-vaccines-cause-autism/?utm\\_term=.24bbbd67551c](https://www.washingtonpost.com/news/monkey-cage/wp/2015/03/01/conservatives-are-more-likely-to-believe-that-vaccines-cause-autism/?utm_term=.24bbbd67551c)
- McElwee, S. (2013). GOP is an anti-science party of nuts (sorry, Atlantic!). *Salon*. Retrieved from [http://www.salon.com/2013/11/13/gop\\_is\\_an\\_anti\\_science\\_party\\_of\\_nuts\\_sorry\\_atlantic/](http://www.salon.com/2013/11/13/gop_is_an_anti_science_party_of_nuts_sorry_atlantic/)
- Miller, S. (2002). Conspiracy theories: Public arguments as coded social critiques: A rhetorical analysis of the TWA flight 800 conspiracy theories. *Argumentation and Advocacy*, 39, 40–56. doi:10.1080/00028533.2002.11821576

- Mooney, C. (2012). *The Republican brain: The science of why they deny science and reality*. Hoboken, NJ: Wiley.
- Nan, X., & Daily, K. (2015). Biased assimilation and need for closure: Examining the effects of mixed blogs on vaccine-related beliefs. *Journal of Health Communication*, 20, 462–471. doi:10.1080/10810730.2014.927034
- Nuccitelli, D. (2016). Can the Republican Party solve its science denial problem? *The Guardian*. Retrieved from <https://www.theguardian.com/environment/climate-consensus-97-per-cent/2016/apr/28/can-the-republican-party-solve-its-science-denial-problem>
- Nyhan, B., Reifler, J., Richey, S., & Freed, G. L. (2014). Effective messages in vaccine promotion: A randomized trial. *Pediatrics*, 133(4), 1–8. doi:10.1542/peds.2013-0750
- O'Sullivan, M. (2016). 'Vaxxed' closer to horror film than documentary. *The Columbian*. Retrieved from <http://www.columbian.com/news/2016/jun/17/vaxxed-closer-to-horror-film-than-documentary/>
- Pew Research Center. (2015). *Public and scientists' views on science and society*. Retrieved from [http://www.pewinternet.org/files/2015/01/PI\\_ScienceandSociety\\_Report\\_012915.pdf](http://www.pewinternet.org/files/2015/01/PI_ScienceandSociety_Report_012915.pdf)
- Phadke, V. K., Bednarczyk, R. A., Salmon, D. A., & Omer, S. B. (2016). Association between vaccine refusal and vaccine-preventable diseases in the United States: A review of measles and pertussis. *JAMA*, 315(11), 1149–1158. doi:10.1001/jama.2016.1353
- Plait, P. (2016). The Tribeca Film Festival pulls anti-vax “documentary”. *Slate*. Retrieved from [http://www.slate.com/blogs/bad\\_astronomy/2016/03/27/tribeca\\_pulls\\_anti\\_vax\\_documentary\\_by\\_andrew\\_wakefield\\_from\\_its\\_lineup.html](http://www.slate.com/blogs/bad_astronomy/2016/03/27/tribeca_pulls_anti_vax_documentary_by_andrew_wakefield_from_its_lineup.html)
- Poland, C. M., & Brunson, E. K. (2015). The need for a multi-disciplinary perspective on vaccine hesitancy and acceptance. *Vaccine*, 33(2), 277–279. doi:10.1016/j.vaccine.2014.11.022
- Poland, G. A. (2011). MMR vaccine and autism: Vaccine nihilism and postmodern science. *Mayo Foundation for Medical Education and Research*. Retrieved from <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3257990/>
- Roston, T. (2016). New documentary chooses anecdotal evidence over scientific credibility. *PBS*. Retrieved from <http://www.pbs.org/pov/blog/docsoup/2016/04/andrew-wakefield-vaxxed-documentary-autism/>
- Seither, R., Masalovich, S., Knighton, C., Mellerson, J., Singleton, J., & Greby, S. (2014). Vaccination coverage among children in kindergarten-United States, 2013-14 school year. *Morbidity and Mortality Weekly Report*, 63(41), 913–920.
- Shelby, A., & Ernst, K. (2013). Story and science. *Human Vaccines & Immunotherapeutics*, 9(8), 1795–1801. doi:10.4161/hv.24828
- Skwarecki, B. (2016). Public health takes on anti-vaccine propaganda: Damage done, challenges ahead. *PLOSblogs*. Retrieved from <http://blogs.plos.org/publichealth/2016/07/16/public-health-takes-on-anti-vaccine-propaganda-damage-done-challenges-ahead/>
- Sun, L. (2017). The moral differences between pro- and anti-vaccine parents. *The Washington Post*. Retrieved from [https://www.washingtonpost.com/news/to-your-health/wp/2017/12/04/anti-vaccine-parents-have-very-different-moral-values/?utm\\_term=.47422b259927](https://www.washingtonpost.com/news/to-your-health/wp/2017/12/04/anti-vaccine-parents-have-very-different-moral-values/?utm_term=.47422b259927)
- Wakefield, A. J. (2010). *Callous disregard: Autism and vaccines – The truth behind a tragedy*. New York, NY: Skyhorse Publishing.
- Warner, B. R., & Neville-Shepard, R. (2014). Echoes of a conspiracy: Birthers, truthers, and the cultivation of extremism. *Communication Quarterly*, 62(1), 1–17. doi:10.1080/01463373.2013.822407
- Weigel, D. (2016). Jill Stein on vaccines: People have ‘real questions’. *The Washington Post*. Retrieved from [https://www.washingtonpost.com/news/post-politics/wp/2016/07/29/jill-stein-on-vaccines-people-have-real-questions/?utm\\_term=.762123a6880f](https://www.washingtonpost.com/news/post-politics/wp/2016/07/29/jill-stein-on-vaccines-people-have-real-questions/?utm_term=.762123a6880f)