Chapter 4
COVIDiots and Cogency:
Heuristic Dynamics of Defying Pandemic Health Measures

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ABSTRACT

The COVID-19 pandemic in the United States spawns a perplexing polemic. Intransigent coronavirus skeptics who defy public health recommendations often get cast as ideological zealots or as perniciously ignorant. Both characterizations overlook a more fundamental epistemic opposition. The authors recast the conflict between COVID-19 skeptics and public health advocates as the rhetorical incompatibility between the deliberative, scientifically grounded public health experts and the intuitive, emotion-driven mental heuristics of the non-compliant. This study examines the discourse of COVID-19 misinformation purveyors on broadcast media and online. Their main contentions rely on heuristics and biases that collectively not only undermine trust in particular medical experts, but also undercut trust in the institutions and reasoning processes of science itself. The findings suggest ways that public health campaigns can become more effective by leveraging some of the intuitive drivers of attitudes and behaviors that scientists and argumentation theorists routinely dismiss as fallacious.

INTRODUCTION

"Told you!" Laura Ingraham (2020c) tweeted triumphantly in response to an article questioning the effectiveness of masks in preventing the spread of Coronavirus Disease 2019 (COVID-19). Rush Limbaugh (2020e) proclaimed on his eponymously titled satellite radio show that "Once again, the panic mongers and the fearmongers were wrong" in shutting down schools to stop the spread of the virus. Ingraham and Limbaugh, along with a cabal of largely politically conservative pundits like Alex Jones of *Infowars,*

Tucker Carlson of Fox News and other media personalities composed of intransigent coronavirus mini-mizers/deniers, have stormed their respective platforms to defy public health and safety recommendations and to denounce what they believe is a "hoax" of a pandemic. Their vociferous arguments reverberate through "the self-reinforcing nature of online communities and a content-starved, cash-poor journalistic culture that gravitates toward neat narratives at the expense of messy truths" (Mnookin, 2011, p. 8) to minimize the dangers of COVID-19 while amplifying the motivation to defy public health protocols.

Confusion, ineptitude, and denial spurred online media and broadcast debate over the coronavirus, its severity, and appropriate responses. Discord quickly reached a fever pitch as United States institutions and the public at large quarreled over pandemic procedures. Deniers, minimizers, and distorters took to their keyboards and the airwaves in what became a collective attempt to undermine institutional trust in government, medicine, and science. Public disputes over coronavirus measures, how to implement them, and when to do so eventually boiled over into civil liberty disputes. Over 4,800 court cases have been filed against local and state governments since March of 2020. Almost 40 cases have been filed against New York Governor Andrew Cuomo for "issues ranging from business and church closures to the use of sign language interpreters at press briefings and voter access during the presidential primary" (Roos, 2020).

Counterarguments to coronavirus misinformation have created a perplexing polemic that casts op-ponents of public health measures as ideological zealots who politicize public health, or as perniciously ignorant. Both characterizations overlook a more fundamental epistemic opposition. The conflict between COVID-19 minimizers/deniers and public health advocates can be recast as the rhetorical incompatibility between the deliberative, scientifically grounded public health experts and the intuitive, emotion-driven mental heuristics of the non-compliant. COVID-19 skepticism could easily be disregarded as prima facie illegitimate, based on irrational objections correctible through more widespread, accurate dissemina-tion of scientifically grounded facts and logically grounded evidence. Yet, resistance has persisted as the observable effects of the pandemic have become more apparent and public information about it has become more widespread.

This study examines the discourse of COVID-19 misinformation purveyors on television, radio, and social media. Their main contentions rely on heuristics and biases that collectively attempt to undermine institutional trust not only in particular medical experts, but to undercut trust in the institution of science itself and its reasoning process. More broadly, the findings suggest ways that public health campaigns can become more effective by leveraging some of the intuitive drivers of attitudes and behaviors that scientists and argumentation theorists routinely dismiss as logical fallacies.

RATIONALIST BIAS IN COVID-19 RISK ASSESSMENT

The familiar adage that "knowledge is power" seems to guide public health and safety messaging regarding prevention and mitigation of threats. Presumably, once armed with sufficient and accurate knowledge, the public will modify protective behaviors to defend against a pandemic. That presumption relies on a rationalist mindset built upon belief that public health behaviors arise from deliberative calculations of risk. The purported link between information and behavior, however, empirically does not consistently hold. Even as the frequency and quantity of reliable public health recommendations increases, steadfast non-compliance and circumvention still undermine effort to control the spread of COVID-19, especially in the United States. This pattern is not unique to the current health crisis. A review of 149 published studies covering five pandemics worldwide found that knowledge about each disease was relatively

high among participants, but their enactment of appropriate preventive and hygienic measures was far less extensive and consistent (Majid et al., 2020). Greater understanding of motivation and rationales for non-compliance could inform strategies for public health campaigns related to other pandemics and health dangers beyond COVID-19 and across various demographics.

What, then, underlies resistance to public health measures clearly designed to protect the very same people who resist them? The audiences of public health campaigns who resist, circumvent, or ignore these messages remain unreachable if health communication remains overwhelmingly focused on disseminating information without concomitant attention to its interpretation. While circulating accurate facts has a vital role to play, over-reliance on deliberative risk-benefit calculations will fail to address key aspects of how people assess risks and shape their behaviors accordingly. Perceptions, attitudes, and behaviors related to risk develop largely from intuitive, emotionally driven reactions rather than from a probabilistic calculus of threat levels. The drivers of actual decisions that people make throughout the pandemic do not necessarily foreground medical data or scientific methods. The emphasis on these more intuitive drivers becomes especially prevalent in early stages of a crisis, as with the many unknowns surrounding COVID-19. "Especially when the measurable degree of risk is unknown or poorly understood, ...risk assessment becomes a relative judgment reliant on heuristics that establish the comparative threat levels" (Schwartzman, Ross, & Berube, 2011, p. 5).

Objectives

With COVID-19 posing the worst pandemic in more than a century, skepticism about preventive and remedial public health measures to combat it may appear prima facie illegitimate. This reluctance and resistance to implement basic safety precautions such as masking, social distancing, or vaccines presumably relies on irrational objections correctible through more widespread, accurate dissemination of scientifically grounded facts and logically grounded evidence. Yet, resistance has persisted as the observable effects of the pandemic have become more apparent and public information about it has become more widespread. This paradox stimulates two lines of inquiry. First, what might account for the persistence of resistance to health and safety measures related to COVID-19? Second, if simply offering greater quantities of medically sound information do not adequately generate healthier attitudes and behaviors, what communicative measures can induce more effective responses to the virus? The response to the diagnostic question about sources of resistance lays the foundation for the ameliorative question about redirecting attitudes and behaviors.

Little progress can ensue by stigmatizing COVID-19 skeptics simply as intellectually deficient or selfishly stubborn. A few researchers have begun to recognize that if more facts and better arguments fail to sway the skeptics, then perhaps the motivation of resistant audiences may arise from processes that circumvent or suppress deliberative rationality. Harrington (2020) urgently calls for more research on "the influence of cognitive biases and heuristics in audiences resistant to scientific, evidence-based information" (p. 1715) as a key component of instilling healthier behaviors regarding COVID-19. Tsipursky (2020) blames the inadequate response to the pandemic in the United States to heuristic biases that take hold without careful reflection, generating erroneous judgments that require correction. These researchers point to the importance of intuitive reactions to threats and crises: the deeply ingrained, rapidly deployed responses that proceed without careful deliberation. These mental shortcuts operate efficiently, analogous to reflex actions. The foundational research in psychology and behavioral economics on heuristics and biases, as well as many current studies, treat this heuristic realm as a major source

of erroneous judgments (Kahneman, 2011). Communication research classifies many such heuristics under the rubric of fallacies—bad habits avoidable through more careful deliberation. The following analysis takes a different approach, emphasizing that heuristics furnish important keys to understanding and potentially altering the motivations that drive attitudes and behaviors. This approach to heuristics probes their functionality in shaping commitments that cannot be dismissed simply as errors that a healthy dose of logic can cure.

Rationale

Present circumstances provide rich soil for cultivating beliefs about disease and public health that depart from prevailing scientific knowledge. The current pandemic, layered atop the 2008 economic crisis and ongoing media consolidations, has been intensified by the drastic cutbacks in science reporting and in scientific outreach efforts directed toward non-specialists. As a result, "science communication—the always problematic bridge between the experts and everybody else—is in a state of crisis" (Mooney & Kirschenbaum, 2009, p. 6). As the communicative connections between science and the public attenuate, other sources have stepped in to fill the void. Elaborate conspiracy theories flourish and circulate rapidly on social media. A recent analysis of social media activity clusters identifies much more robust activity in anti-vaccination groups than in their pro-vaccine counterparts. Compared with medically grounded information, "anti-vaccination clusters offer a wide range of potentially attractive narratives that blend topics such as safety concerns, conspiracy theories and alternative health and medicine, and also now the cause and cure of the COVID-19 virus" (Johnson et al., 2020, p. 231). With a more rapidly proliferating number of counter-scientific sources and social media enclaves plus the richer narratives they provide, and fewer media avenues for public communication about scientifically generated recommendations, scientific communication faces an uphill battle for influencing public opinions and behaviors.

Acting in accordance with misinformation has severe consequences. Even among viewers of prime-time programs on Fox News, those who regularly watched programming that dismissed or minimized the risks of COVID-19 (specifically, *Hannity*) were significantly more likely to contract the virus than people who watched other Fox programming that more realistically acknowledged the risks (Bursztyn, Rao, Roth, & Yanagizawa-Drott, 2020). Since "differential exposure to information broadcast on mass media significantly affected behavior and downstream health outcomes in the context of the COVID-19 pandemic" (Bursztyn et al., 2020, p. 32), redirection toward more valid public health information can reduce morbidity and mortality.

Analytical Approach

The analysis of communication centers on several of the more prolific and vociferous opponents of scientifically grounded COVID-19 explanations, preventive measures, and remediations. These main sources were selected based on their television ratings, the number of followers they have, their abilities to use multiple media platforms, and their association with President Trump who defined the official governmental perspective on the virus.

As a pundit on Fox News, Laura Ingraham unquestionably reaches the broadest viewing audience, which is augmented by her online presence. Since its inception 23 years ago, Fox News has consistently received the highest ratings amongst 24-hour news programs (Nolan, 2021), although in January of 2021, the news giant suffered significant drops in ratings (Baker, 2021). Ingraham's show, *The Ingraham Angle*,

typically rates within the top three most watched Fox programs, netting over 3.6 million viewers (Wulfsohn, 2020). In addition to her traditional broadcast audience, Ingraham has her own website (laurainggraham.com*)* where she claims her radio show draws more listeners than any female-hosted political talk program on that medium, and has accumulated over 3.7 million followers on Twitter (Ingraham, 2020c).

Ingraham's colleague Tucker Carlson joined Fox News as a contributor in 2009 and now hosts *The Tucker Carlson Show* (Tucker Carlson Tonight, 2020). In 2020, Carlson set a ratings record in the second quarter, reaching over 4.3 million views (Brest, 2020). Like Ingraham, Carlson also reaches audiences via his website (tuckercarlson.com), in addition to the site hosted by Fox News*,* and has 4.3 million Twitter followers (Carlson, 2020a).

Rush Limbaugh broadcasts *The Rush Limbaugh Show* through iHeartMedia radio. According to Schnieder (2009), after entering into radio, Limbaugh "quickly became a dominating force not only in propagating a conservative message over the airwaves, but also a huge figure in radio as a whole" (p. 184). While measuring the actual reach of syndicated radio shows can be difficult (Edwards, 2012), according to Limbaugh himself, his show reaches 43 million listeners (Limbaugh, 2020a). Industry records report the number as 15-20 million listeners worldwide (Edwards, 2012). His audience can also participate with the program virtually through an interactive website (rushlimbaugh.com). Prior to deleting his Twitter account in protest of the company deactivating President Trump's account, Limbaugh boasted over 648,000 followers (Sadeghi, 2020).

Another famed pundit of the political far right is Alex Jones of Austin, Texas. By far the least mainstream of the conservative pundits analyzed in this chapter, Jones founded *Infowars* in 1999 as an alternative to traditional news (Relman, 2017). In the ensuing years, the show developed into a YouTube phenomenon. Taking advantage of expanding informational technology, Jones quickly became a "notorious purveyor of conspiracy theories with growing clout" (Madison, Covington, Wright, & Gaspard, 2019). Prior to being removed from YouTube for spreading false information, Jones had cultivated a following of almost 6 million viewers, which included President Trump, who touted Jones' reputation and suggested he be awarded a Pulitzer Prize for his journalism (Madison, Covington, Wright, & Gaspard, 2019). Twitter permanently banned Jones in 2018 for abusive behavior. At the time, he had close to 900,000 followers and *Infowars* had around 430,000 followers (Ortutay, 2018). Despite his removal from a number of social media platforms, Jones maintains a robust online following through his website (Infowars.com). Visitors to Jones' website are visually assaulted with a smattering of livestream conservative commentary programs and cultivated conservative opinion articles. In the interest of this study, some of these videos and articles are composed of people ranting against or discussing the constitutionality of face masks, as well as the constitutionality of closing down churches, businesses, and schools in the wake of a pandemic. They also suggest that COVID-19 has been blown out of proportion by the liberal media.

This study examines COVID-19 rhetoric from these sources and their allies beginning in March 2020, which marked the beginning of most state shutdowns. Prior to March 2020, the reach and severity of the virus remained hypothetical and thus unaddressed by many in the U.S. media. Additionally, from January through March 2020, President Trump's messaging, particularly via Twitter, suggested that all was well. As such, few of his loyalists publicly acknowledged the possibility of a global pandemic prior to March 2020. When states began to implement restrictions and quarantines—which many equated to economic shutdowns—both the president and his supporters in the media began questioning the severity of the virus and the public health responses.

Skepticism about medically endorsed anti-COVID-19 measures encompasses several types of messages observable across the discourse of major right-wing opinion leaders and their followers. In the face of

compelling and obvious evidence to the contrary, early doubts about the reality of the virus evolved into several types of misleading claims. A detailed content analysis of COVID-19 themed items flagged as misinformation by prominent fact checking organizations found few outright denials of the pandemic's reality or outright total fabrications (Brennen, Simon, Howard, & Nielsen, 2020). Most of the misinformation contained distortions such as misleading content, false context, or manipulating content to reach faulty conclusions. Denial comes into play mainly as a refusal to endorse the legitimacy of public health measures that are supported by a consensus of scientists and medical experts.

Discourse surrounding the coronavirus pandemic demonstrates how public health crises intertwine rhetorical components with medical issues. As Alcabes (2009) observes, "an epidemic has an identity as a narrative that knits its other aspects together: we tell ourselves stories about ourselves, accounts that make sense of what we see happening as well as what we fear (and hope) will happen" (p. 5). The following analysis unpacks the narratives espoused by opinion leaders who challenge public health messages endorsed by the medical establishment. Since the contentions of dissenters resist scientific confirmation, they will be examined from the perspective of heuristics and biases. This approach identifies the sense-making techniques that bypass scientific proof and flaunt criteria for sound arguments, but instead rely on appealing to affective connections and decision shortcuts that quickly induce belief while conserving cognitive effort. Far from mere fallacies of error, these heuristic devices can generate satisfying and tenacious beliefs.

TRIBALISM AND FRAMING

Group Affiliation and Polarization

Social identity theory documents how readily people consider themselves as members of a group, quickly and firmly differentiating between their own in-group and designated out-groups (Tajfel & Turner, 1979). The minimal group paradigm reveals that even when based on arbitrary, trivial, or fictitious criteria, differentiation from an out-group builds cohesion between in-group members and affirms their shared identity as distinct from the outsiders (Sherif, 1956, 1988). The more absolute and identifiable the categorical distinctions between those who belong in or should be excluded from one's in-group become, the more extreme the opposition to out-groups becomes (Berger, 2018). The two most obvious and visible signs of complying with COVID-19 preventive health measures—face masking and social distancing—offered immediately recognizable signs of affiliation with scientists and public health experts. Since these public health measures had been politicized, these behaviors (or absence thereof) also publicly marked members as belonging to the COVID-19 minimizers (supported by allegiance to President Trump and his allies) or the COVID-19 cautionaries (represented by Dr. Anthony Fauci and medical consensus).

Examples of inter-group polarization manifest in "us versus them" narratives that attack the specific public health & safety measures government officials and medical professionals urge people to abide by. Masks, social distancing, vaccinations, etc. are treated as betrayals, since they are observable symbols of weakness and indicative of herd mentality (or, more precisely, membership in the herd designated as the out-group). Public health measures signify a particular kind of political allegiance—an identity marker of sorts—that stigmatizes the compliant. Fox News pundit Tucker Carlson pontificates:

What kind of person covers his face in public? Armed robbers do that sort of thing. So do Klansmen and radical Wahhabis. The rest of us don't do that. Dissent used to be a defining feature of American life, but no more. Now we have mandatory consensus: Masks are good. Anyone who questions the utter goodness of masks is bad. What they're really telling you is that masks are magic. What appears to be a flimsy cotton face covering is in fact a holy amulet that protects us from disease. (Carlson, 2020b)

According to Laura Ingraham, masks and social distancing become instruments of insufferable leftist indoctrination: "The media have been selling panic for weeks and weeks and weeks. They have fewer images to sell hysteria to justify continued lockdowns. The masks, well they're kind of a constant reminder" (Ingraham, 2020a).

Goffman (1986) defines stigma as an individual's feelings toward the self in relation to those society deems "normal." Goffman (1986) separates stigma into three components: The Stigmatized, The Normal, and The Wise. The stigmatized are those individuals who bear the stigma as opposed to the normal who do not. The wise are those who are normal, but are privy to the plight of the stigmatized (i.e., they understand what the stigmatized are going through). Conservative narratives stigmatize mask wearing in a multitude of ways. Social media abounds with rants against face-masks suggesting that only terrorists, child molesters, and other criminals wear masks. Newly elected U.S. Representative Marjorie Taylor Greene, a Republican and QAnon follower, equates face masks to "muzzles" and argues that healthy people should not have to wear them (Peterson, 2021). Alex Jones led an anti-mask demonstration where protesters chanted "I can't breathe," mimicking Black Lives Matter activists who used the same phrase to protest the death of George Floyd (Palmer, 2020). In essence, COVID-19 deniers and minimizers use health and virility to stigmatize those who follow CDC guidelines and mask mandates. In some cases, anti-public health activists even become The Wise, as Ingraham (2020e) does when she sympathizes with "those of you who thought this was about the science, well guess again. This is about power, my friends. This is about social control."

In line with foundational research documenting the minimal group paradigm (Sherif, 1956), cultivating a sense that shared susceptibility to the virus demands communal action could reduce polarization. Emphasizing that "the pandemic not only highlights a common identity with individuals all facing the same risk, but could also foster a sense of shared fate" (Van Bavel et al., 2020, p. 464) may enable public health messages to resonate beyond the boundaries of insular partisan groups.

Metaphoric Architecture of Frames

Metaphors play a vital role in shaping intuitive perceptions. In their explanatory role, metaphors "express, reflect, and reinforce different ways of making sense of particular aspects of our lives" and thus render complex, conflicting, or confusing information and claims more coherent (Semino, Demjén, & Demmen, 2018, p. 625). This framing function provides a foundation for cognitive understanding, patterns of language usage, and legitimation for actions (Semino, Demjén, & Demmen, 2018). Metaphors operate heuristically as frames when the acceptability of incoming information or arguments is judged by how well they resonate with whatever metaphors have been adopted. For example, an accepted configuration of medical experts as greedy dictators automatically delegitimizes their public health recommendations, rendering assessment of risk probabilities moot. Such framing justifies dismissal of advice from health officials, most notably, Dr. Fauci. "Oh, my God. It's worse than we thought. We haven't even gotten to

the second wave. Dr. Fauci says, Dr. Fauci says, Dr. Fauci says. Whatever Dr. Fauci says, it gets amplified" (Limbaugh, 2020b, para. 1).

COVID dissidents draw on metaphors that echo the rugged individualism associated with classic liberalism. They portray themselves as tough and courageous—true patriots facing down the tyrannical Left:

Joe Biden and the democrats do not have a mandate from the voters to wreck the economy or take away your civil liberties, my civil liberties, in the name of COVID. Over 71 million patriots voted for President Trump (Ingraham, 2020d).

And patriots are not afraid of COVID:

This isn't who we are, folks, this cowering and fearful and almost giving up in the face of this enemy, COVID-19. We've not ever done anything like this before. So much of the way we are dealing with this is unprecedented — and it's un-American. It's nothing compared to the way we have overcome enemies and obstacles in our past. (Limbaugh, 2020c, para. 27)

Perhaps not surprisingly, metaphors that highlight patriotism, strength, and individualism quickly take on gendered language patterns:

If I may be so bold, Biden doesn't know what it is to be a man. There's a reality out there. There's a virus. There's one of countless viruses out there. Most viruses we do not have a vaccine for. Most viruses we do not have a cure for, by definition. We still don't have a way to deal with AIDS. We don't have a vaccine for AIDS. We certainly don't have a cure for it. We don't have a cure for the flu. We don't have a cure for the common cold. What do we do? We live with it. We adapt. We do whatever we have to do. We can't do anything else…We can't, as Trump said, hide in the basement (Limbaugh, 2020f, para. 13)

Where Biden is weak, Trump is brave. "Donald Trump has let it be known that he's not going to let the virus get him or paralyze him. He's not gonna allow it to prevent him from living. He's going to live. He's going to deal with things as they happen" (Limbaugh, 2020d, para. 9).

The tough patriot sharply contrasts with the duped follower, who is notably not an individual, and therefore, not a patriot. Often, "the media'' and "the left" are to blame for indoctrinating the masses. Ingraham (2020d), for example, refers to the media as "poodles" of the left and scientists as "medical elites," juxtaposing these groups with the "free thinkers" that watch her program.

Loss Framing and Affect

The polarizing narratives support more dubious online claims, like that of Facebook user Peter Curti, who sought to start a "public movement called TAKE IT OFF!" (Kertscher, 2020). In a Facebook post, Curti shared an infographic, that among other inaccuracies, claimed wearing a mask "Decreases oxygen intake; increases toxin inhalation; shuts down immune system; increases virus risk; scientifically inaccurate; effectiveness not studied" (Kertscher, 2020). At an Orange County public health meeting on mask mandates, an angry constituent screamed, "You're telling me that I have to breathe in CO2 when God gave this body the ability to extract that from my body, and now you want me to put it back in my body?" (Burling, 2020).

In particular, face masks have become a visual symbol of deviance from nature. Identification of a person, product, or condition as "natural" activates a powerful desire to preserve and protect it, to leave it in an unaltered state (i.e., a state of nature). Invocation of the positive affect associated with nature/natural undergirds successful efforts to reject genetically modified agricultural crops, for example (Schwartzman, 2014).

Opposition to coronavirus-related public health measures relies heavily on loss framing: loss of the ability to act and breathe naturally (analogous to defilement or loss of innocence, violation of a state of nature) and loss of freedom. The impositions of preventive health measures restrict choice, so opposition to medical guidance affirms individual liberty. Laura Ingraham explains, "Americans are happy to cooperate on health measures, including masks, that will truly benefit our health. But they are not going to give up their traditional liberties as part of a political effort to start pulling the country together" (2020b).

According to prospect theory, probabilities framed as prospective losses have greater impact than the same, equally probable future condition presented as a prospective gain (Kahneman & Tversky, 1979). Research consistently finds that people exhibit loss aversion, placing disproportionately higher value on losing something they have than on gaining something they lack. Fischhoff (1995) summarizes these results as suggesting that "laypeople place greater weight on catastrophic potential" even when it has a low likelihood of realization. Related studies show a more generalized negativity bias that extends beyond judgments of probability. The disproportionate impact of negativity generalizes across many domains, such as memory, stereotype formation, self-image, first impressions of others. Consistently, negative information carries greater importance, has a deeper impact, and proves more resistant to change than more positive information (Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001). For maximal effectiveness, pro-vaccine messages could amplify how dire the consequences of COVID-19 could be, thereby strengthening the desire to avoid the harm by getting vaccinated. Clearly the approximately 90 percent efficacy of the first two vaccines approved in the U.S. makes the probability of their benefits far higher than the likelihood of suffering an adverse reaction. Perceptions of probability, however, form more quickly through availability heuristics than through comparative calculations of probability. To render the losses from coronavirus more compelling than the losses from vaccine side effects will require pervasive, vivid examples to maximize their memorability.

One way for good messages (e.g., vaccines are safe and effective) to outweigh bad messages (e.g., vaccines are dangerous) would be to offer more instances of good than bad results from vaccines. But simply countering the negative messages may not work, since it may take many more positive messages to allay a few negative claims. Investigation of positive versus negative experiences in interpersonal relationships suggests that at least five positive actions may be required to offset one negative experience (Gottman, 1994, p. 57). Applied to COVID-19 vaccines, multiple positive messages stand a better chance to out-compete a single negative message. Thus, every example of someone experiencing an adverse reaction to the vaccine would require five or more positive examples of people suffering no harm or gaining benefits to counteract it.

Distorting the etiology and nature of COVID-19 affects more than immediate perceptions. One recent study (Bolsen, Palm, & Kingsland, 2020) revealed that people who were exposed to false conspiracy claims that the virus was engineered by humans in a Chinese laboratory prioritized punitive actions against China over the need for more research on the virus. This "emphasis framing" established an agenda-setting effect, influencing where public opinion and policymaking may focus (Bolsen, Palm, & Kingsland, 2020). Prioritizing retributive actions toward China diverts energy and resources away from

addressing the immediate health crisis, distracting from combating the disease and potentially damaging multilateral cooperative efforts to control the pandemic.

Another finding about emphasis frames raises concerns about compliance with public health measures. The same study found that stories attributing COVID-19 to Chinese bioengineers reduced the likelihood that readers would implement preventive health measures such as wearing masks and social distancing. Presumably, this framing retains the conspiracy narrative's victim role for the readers and extends it to suggest personal actions could not counteract the conspiratorial plot. Two points render these results especially disturbing. First, participants in the study expressed lower likelihood to practice healthy behaviors after reading only one short article that falsely attributed the COVID-19 pandemic to a Chinese government plot. The authors note with alarm that "it is also potentially worrisome insofar as a single exposure to a conspiracy theory in our study reduced individuals' intentions to practice urgently necessary public health behaviors" (p. 15). Given such a low threshold for emphasis framing effects, their influence would intensify in an online environment such as social media platforms whose algorithms expose users to additional content that reinforces user-preferred content. Second, frames affect views on matters beyond the immediate issue at hand. By providing a generalizable narrative context, frames offer generalizable interpretations that shape information to conform with the storyline.

Persistence of Resistance

The plethora of misinformation about COVID-19 also stimulates a cognitive behavior similar to the Dunning-Kruger effect, in which people systematically overestimate their knowledge or ability because they fail to recognize their own limits. Paradoxically, the confidence in knowledge or ability is inversely correlated with competence in it. Kim, Ahn, Atkinson, and Kahlor (2020) found a related phenomenon with information-seeking patterns regarding COVID-19. In a study covering the United States, Singapore, and South Korea, the researchers found that exposure to misinformation about COVID-19 in the early stages of the pandemic reduced the desire to seek additional information, thereby also reducing the likelihood of correcting the false information. This phenomenon may help explain why adherents to false beliefs about COVID-19 become so recalcitrant in their beliefs: they avoid disconfirming information. Early in the pandemic, uncertainty peaked and motivated extensive information seeking. Scientific research emerges relatively slowly, as it relies on meticulous procedural protocols, careful analysis, and replication of results. Meanwhile, misinformation abounds to fill the knowledge gap. Much of this misinformation operates contrary to the precautionary principles that guide scientists to qualify their results, avoid overclaims, and have the humility to expose their research to critical scrutiny by experts. By contrast, misinformation typically offers definitive explanations generating assent that quells the desire to know more. Scientific research proceeds through provisional acceptance of findings that in turn generate more research questions. Kim and colleagues (2020) linked these effects of misinformation to heuristic processing that shortcuts the deliberative operations of critically evaluating evidence and claims. The researchers noted that these heuristics were especially prevalent among participants in the United States.

The sheer quantity of misinformation and disinformation also provides what the Elaboration Likelihood Model identifies as a peripheral cue (Petty & Cacioppo, 1986). According to this theory, people who are relatively uninformed about or not deeply involved with the subject matter will more likely respond to message characteristics that provide rapid, simple indicators of what to believe that require minimal reflection. One such method of processing conflates quantity with quality, generalizing the assumption that the more arguments, the better the position they support must be (Petty & Cacioppo, 1984). Ren-

dered in the vocabulary of rhetorical theory, this pattern of judgment centers on the locus of quantity as the driver of belief (Perelman & Olbrechts-Tyteca, 1969; Rice, 2020). Since false information can be produced and disseminated more rapidly than the results of scientific research, misconceptions can take hold early in the course of an ongoing health crisis and become embedded as preferred explanations.

CONSPIRACY NARRATIVES AS HEURISTICS

Karl Popper (1980) identified falsifiability as a key component of the scientific method, providing the engine for progressively more accurate knowledge. Falsifiability operates through constantly seeking ways to test claims, subjecting hypotheses to potential disproof so they can be modified or discarded in the face of disconfirming evidence. Falsifiability, however, reflects a distinctively rationalistic bias in its failure to account for how emotionally invested one can become in defending a claim. If a claim offers reassurance, comfort, or other advantages, then rejecting or eroding the strength of such a claim causes pain and disappointment. The falsifiability doctrine presumes that a conclusive level of disproof—whatever its threshold in a given case—(a) will be recognized as sufficient to modify commitment to the tested claim, and (b) the investigator judges the commitment to the modified claim as more satisfying than the previous one. Thus, falsifiability requires an existent commitment to abide by the guidance of logical evidence and arguments as well as accept the negative consequences of being proven wrong. Falsifiability therefore can carry negative emotional baggage in two ways. First, it prioritizes correctness over comfort by requiring an abiding admission of vulnerability to refutation. Second, it promises the pain of cognitive dissonance whenever a firmly believed claim merits rejection. Perhaps these drawbacks are the price one pays for scientific progress. Or perhaps an entirely different cognitive framework could provide the reassurance and emotional rewards that falsifiability cannot.

Constructing Conspiracies

As narratives, conspiracies require a level of coherence that makes them believable, which means they require characters (including villains) to behave appropriately in regard to character, motive, and action. Origin conspiracy stories of COVID-19 can be traced to national villains (China) and those customary villains, such as wealthy Jews, that maliciously manipulate the innocent. For example, Facebook user Mary Lewis, (whose profile proclaims she is "Saved by THE BLOOD OF JESUS. I'm a Christian, a wife, and a servant of CHRIST!! Repent and be saved!!"), received 102 reactions, 110 comments, and over 3,000 shares for her post declaring: "George Soros owns the WuXi PHARMA LAB located in Wuhan, China where COVID-19 was developed and conveniently Broke Out" (Lewis, 2020). While certainly some of the feedback to her post was negative, the majority of those who saw the post offered support: "That doesn't surprise me at all!"; "Don't doubt it. I hope he goes broke"; "No fear because God has prepared a table before our enemies!"; "Money hungery [sic] evil man"; "Good info Patriot" (Lewis, 2020).

Alex Jones also promotes conspiracies around COVID-19. Originally, Jones (2020) downplayed the virus and invoked the nature heuristic: "I think we should look at something that isn't much worse than the flu and say we all need natural vitamins and nutraceuticals and sunlight and health and people should just know that they've just got to deal with it the way it is." His narratives began to divulge something more sinister when he began arguing that governments are using lockdowns to create "a new world or-

der" (Jones, 2020). Jones (2020) begins to bring in "evidence" from the "Rockefeller 2010 document" which warns that global elitists will employ "a viral release or a simulated one that creates total fear while bringing a police state, martial law…" (Jones, 2020). According to Jones, COVID-19 is the fruition of the "Rockefeller 2010 document" predictions. This attribution of intent renders the Rockefeller document functionally equivalent to the forged *Protocols of the Elders of Zion*: a secret plan detailing the nefarious plans of a (Jewish) cabal. The actual Rockefeller Foundation report provides suggestions for contingency planning. It details a hypothetical future scenario of increased authoritarianism following a prospective global pandemic, but stresses the need to maintain humanitarian efforts and technological innovation amid the prospect of greater governmental restrictions (Rockefeller Foundation, 2010).

Once Jones committed to the narrative, he took it in an interesting direction. He said he was wrong to say the virus was simply the flu. Notably, he was not agreeing with medical experts, rather he suggests COVID-19 is something far more sinister. In a meandering narrative, Jones (2020a) describes how HIV, which he argues is a "well documented man-made virus," is "in" COVID-19. This human-crafted (thus unnatural) disease, created by a shady, underground, new world order, has genetically programmed HIV into the DNA of COVID-19 (Jones, 2020). "COVID-19 is a real virus, but it is a stimulated virus so they [the conspiratorial villains] can track and trace and control people" (Palmer, 2020).

Heuristic Power of Conspiracies

Conspiracy narratives proceed by enacting verifiability, precisely the opposite of scientific falsifiability. Since they operate so differently from scientific theorizing, the terminology of "conspiracy narratives" better describes their operation as stories that continually expand to accommodate confirming evidence. Instead of subjecting claims to empirical tests as falsifiability requires, conspiracies adapt new observations as further evidence for the storyline of powerful malevolent forces secretly manipulating the masses. This confirmatory bias drives conspiracy advocates toward constantly accumulating more and more bits of evidence that can provide support for the preferred conspiracy narrative (Rice, 2020). While the strength of a scientific theory consists of the amount of disconfirmation tests it can withstand, a conspiracy's strength derives from the amount of information it can absorb and interpret as confirmation. The heuristic modus operandi of conspiracies creates confirmation through conformation, conforming each new item of information to the explanations provided by the conspiracy narrative. Conspiracy narratives "contain an inherent element of argumentation" by promoting "coherent explanations for complicated problems" (Berger, 2018, pp. 86, 88). Unlike scientific theories, conspiracy narratives attribute motives to observed (or assumed) conditions, adding a layer of explanation that non-teleological scientific thinking eschews. By purporting to understand these hidden forces that guide events, conspiracy adherents gain a sense of power (Pomerantsev, 2019).

The realm of conspiracy narratives offers a comprehensive explanatory tool, and this powerful capacity to give meaning offers an attractive worldview amid the uncertainties and complexities of the pandemic. Jenny Rice (2020) cautions that the seemingly outlandish claims propounded in some conspiracy narratives should not detract from appreciating the emotional fulfillment their webs of belief can provide. Within the conspiracy narrative framework, believers occupy a privileged position of being in the know, so conspiracies provide a satisfying ego boost in direct contrast to the perpetual humility required for practicing scientific falsifiability (Mercieca, 2020). Conspiracy narratives present an impermeable argumentative fortress, with potentially contrary evidence reinforcing the conspiracy claims.

Any disavowals of the conspiracy provide further proof of a cover-up, so the attributions of conspiracy remain irrefutable (Nichols, 2017).

Not only do conspiracy narratives operate differently from science, but credence in conspiracy "theories" correlates with distrust in science (Gorman & Gorman, 2016). Proponents of science err in advocating a reformist program of converting conspiracy adherents to scientific thinking as a solution. As discussed previously, conspiracy narratives play functional roles in simplification, sense-making, and status elevation for believers. Replacing certainty with systematic doubt, reassurance of confirmation with constant susceptibility to falsification, and inclusion in privileged enclaves of secrecy with humility of conditional belief exacts a heavy emotional toll. Simply put, the sacrifices of scientific thinking may not offer the fulfillment available through conspiracy narratives. Value-free science leaves many emotional voids that conspiracy narratives and other pernicious beliefs (e.g., authoritarianism—see Proctor, 1991) fill. To offset this prospect of loss, trust in science and commitment to scientific rationality stands little chance of success unless the emotional and psychological advantages of conspiracy narratives receive attention. Debunking conspiracy narratives will promise disappointment and humiliation if these functional, non-factual sense-making devices are not replaced with equivalently satisfying narratives compatible with scientific evidence, methods, and findings.

Furthermore, conspiracy accusations depress desire to engage with opposing positions even if such information were sought. Conspiracy narratives may intensify inter-group divisiveness by clearly delineating the evil manipulators and the innocent victims (Berger, 2018). Believers in a conspiracy would have little desire to dialogue with opponents who are suspected collaborators with the malevolent conspirators.

VACCINES: MAGIC BULLETS OR DEADLY WEAPONS?

Heuristic Drivers of COVID-19 Vaccine Opposition

Resistance to COVID-19 vaccines reinscribes characterizations of vaccinations as an introduction of dangerous foreign substances to the human body. This plot line activates the nature heuristic already discussed, positioning the vaccines as intrusive disruptions that undercut rather than activate the body's innate healing capacity. An intuitive trust in "the wisdom of nature," however, can stifle the willingness to consider important innovative medical or technological enhancements, rendering the nature heuristic unnecessarily regressive (Bostrom & Sandberg, 2017). Since both the virus and the modus operandi of mRNA vaccine technology remain poorly understood, anti-vaccine narratives sow suspicions by invoking familiar scapegoats. In Wyoming, the state's Readiness and Countermeasures Program Manager disregarded the severity of COVID-19 and suggested that the vaccine is part of a communist plot involving microchips (Bhardwaj, 2020). Online variations of this narrative claim "the coronavirus pandemic is a cover for a plan to implant trackable microchips and that the Microsoft co-founder Bill Gates is behind it" (Goodman & Carmichael, 2020).

Many of anti-vaxx stories draw from fears of the unnatural—or what this human-made vaccine might do to our bodies. Tucker Carlson, for example, urged medical professionals to:

Be honest about the risks and let the rest of us decide. In this country, we control our own bodies. They're always telling us that, but no. Suddenly the rules have changed. On the question of the corona vaccine, our leaders are definitely not pro-choice. (Ellefson, 2020)

The heuristic of the natural stretches across the anti-vaxx spectrum. It can be found in the narratives of shock jocks and in statements by members of Congress. Alex Jones, for example, touts the benefits of healthy living and taking supplements as a means of fighting COVID-19. "This is normalized mass extermination, a bio attack on humanity," he exclaimed on *The Howard Stern Show* (Howardstern.com, 2020). Rather than take the vaccine, Jones pitched his line of supplements as the key to avoiding the virus. "I test all of the products personally," he assured the audience (Howardstern.com, 2020).

Anti-vaccine narratives also employ the tempting but scientifically untenable approach of herd immunity. This tactic advocates letting nature take its course by allowing people to get infected so that a sufficient number of people develop resistance to the disease to mitigate further risk. United States Senator Rand Paul tweeted: "Great news! - Pfizer vaccine 90% effective - Moderna vaccine 94.5% effective - Naturally acquired COVID-19 99.9982% percent effective* *(estimating 200 reinfections out of 11 million Americans, which is likely an overestimation of actual reinfections)" (Paul, 2020). He then replied to his own tweet to ask, "Why does the left accept immune theory when it comes to vaccines, but not when discussing naturally acquired immunity?" (Paul, 2020). Left to its own devices, the human body will protect and heal itself without the in(ter)jection of foreign substances.

Paul, an outspoken proponent of herd immunity, survived COVID-19 and has worn his immunity as badge of honor much as Trump has touted his (unconfirmed) immunity as a sign of his innate superiority. During a campaign rally, Paul and Trump congratulated themselves on being immune by bumping fists and declaring, "Here's to immunity!" (Rand Paul at Trump's, 2020). Paul's enthusiasm aside, medical experts have repeatedly and publicly challenged his claims concerning herd immunity (Chisenhall, 2020), but Paul stands by his claim.

Addressing Anti-Vaccine Heuristics

If risk perception were guided primarily by calculating probabilities associated with exposure to danger, efforts to remediate COVID-19 would face little resistance. But statistical probability can prove difficult to determine. Even if accessible and known, such probability calculations often do not provide the most appealing ways to assess risk. Especially when overloaded by information, faced with conflicting information difficult to resolve (e.g., changing CDC recommendations regarding the efficacy of face coverings, proper space for social distancing, and quarantine duration after COVID-19 exposure), or confronting messages that resist ready interpretation (e.g., esoteric research findings), the items that most impact risk assessment are those easiest to access or call to mind (Tversky & Kahneman, 1973). This availability heuristic has the advantage of providing quick impressions of risks. The conclusions, however, rely on a perceptual bias that inordinately prioritizes the most prominent information even if it misrepresents the degree of risk or the frequency of harm. In the context of COVID-19 vaccinations, the availability heuristic may enable a single widely publicized adverse reaction suffered by a famous person to carry more weight than hundreds of unproblematic doses that attract minimal attention. The prevailing Western paradigm of logical argumentation would dismiss this form of judging risk as an error based on confusing prominence with probability. Simply informing people that their beliefs are mistaken, however, fails to address the factors that drive them to these conclusions. Addressing availability-based risk perceptions as lapses in logic presupposes that logical deliberation generated the conclusions. The availability heuristic drives probability estimates so frequently because it provides a rapid, simple route to an outcome of judgment. The availability heuristic therefore poses a potent obstacle to more thoroughly evidence-based risk assessment, especially regarding vaccines against COVID-19.

The most widely distributed COVID-19 vaccines currently require two doses to achieve full efficacy. Administering the additional vaccine introduces compliance issues in itself due to inconvenience, supply chain challenges, or potential overconfidence after the first dose that depresses follow-up. These multi-dose vaccines will require more time to complete than single-dose vaccine regimens. Omer, Amin, and Limaye (2017) observe that the longer and more widely a vaccine is administered, the more opportunities arise to accumulate instances of adverse reactions and thus energize the availability heuristic. In early stages of a vaccine's rollout, especially given the rapidity of COVID-19 vaccine deployment, highly publicized instances of severe side effects can assume disproportionate significance. Even if such instances remain small in absolute numbers or as a proportion of total vaccines administered, they gain high perceptual priority due to their ease of recall and frequent reinforcement through coverage across various media that can amplify the apparent impact. Unaddressed, these reports of vaccine-induced harms can have cumulative effects, particularly when they acquire magnified importance through observable, vivid, detailed description.

Iatrogenic disease and suffering offer dramatic opportunities to generate intense emotional reactions. A non-event of getting a vaccine without any ill effects hardly merits mention in drama-driven media. Repeated reports, images, and video of celebrities and respected leaders getting vaccinated provide only a mundane snapshot of the uneventful moment of injection. By contrast, adverse effects easily generate sustained reports of the agonies that vaccine victims suffer. To compete with these potentially powerful messages that fuel fear, promotional messages for vaccines could portray the experience and consequences of vaccination more explicitly. For example, chronicling a wide variety of sports celebrities performing at peak levels shortly after receiving the vaccine likely would generate more interest and recall.

Another angle on vaccine promotion could concentrate on pre-empting or countering the potentially high availability of fear-inducing iatrogenic scenarios. One option to confront fears of vaccines would present vivid scenes of agonies attendant to COVID-19. If sufficiently intense and amplified through repetition with many equally severe scenarios (i.e., repetition with variance), these graphic descriptions and images could become more available for recall. Research suggests that severe fear appeals can induce the desired behavioral outcomes if audiences receive a clear solution to the fear inducement (Pratkanis & Aronson, 2000). Omer and colleagues (2017) recommend applying the extended parallel processing model (Witte, 1992) to encourage vaccinations. This approach would direct fears toward the disease, offer the vaccine to alleviate those fears, and stress the feasibility of enacting this solution.

Early in the vaccine rollout, concern already has arisen that pro-vaccine messaging has been too tepid. With mass distribution of vaccines just getting underway, the cautionary tales of what vaccines cannot do and their rare side effects continue to gain attention while their remarkably high efficacy, especially compared to other vaccines, has not been communicated as prominently (Leonhardt, 2021). This concern, however, also attributes the slow momentum of vaccine endorsement to insufficient circulation of factual information, as if people will endorse the vaccines if only given enough facts. The fundamental challenge lies less in boosting the quantity of facts than in improving the quality of narratives surrounding the COVID-19 vaccines so that getting a vaccine resonates more strongly with preferred values and effectively mitigates fears.

Willingness to vaccinate interfaces with conspiracy narratives. Conspiratorial thinking about coronavirus vaccines already has had deleterious effects. A pharmacist in Wisconsin deliberately spoiled 570 doses of vaccines, believing they were part of a plot to alter human DNA (Li, 2021). As noted previously, conspiracy narratives can depress the desire to seek new information, especially any that may not fit within the conspiracy narrative's plot line. Emergent vaccines threaten the continuity of conspiracy

narratives, since the vaccines promise a substantial resolution to the threats the virus poses. Since these vaccines are newly developed, relatively little publicly available scientific research on them has been disseminated. Conspiracy narratives offer a pre-developed framework for incorporating the vaccines into a larger thread of persistently circulated machinations of evil manipulators. This ease of narrative placement combined with inhibited desire to seek additional information could generate rapid and ongoing resistance to COVID-19 vaccinations.

CONCERNS AND RECOMMENDATIONS

Caveats

An important potential objection deserves consideration. Could far simpler explanations for COVID-19 distortions explain the tendency to spread misinformation? Two studies conducted early in the cycle of the COVID-19 pandemic (early March 2020) involving a total of 2,009 participants (Pennycook et al., 2020) attributed credulity in misinformation about COVID-19 on social media and likelihood to share it to the distracting nature of social media that discourages diligent fact-checking. The researchers found that social media users displayed skill in analyzing information, but inattention to content in social media discouraged critical evaluation of content. Placing a short verbal reminder alongside posts to check accuracy increased discernment in sharing content. These findings suggest that spreading misinformation about COVID-19 qualifies as simply a lapse in attention, correctible by a nudge reminding social media users to check posts for accuracy.

Although displaying methodological rigor and presenting consequential findings, studies such as these presume an existent commitment to factual accuracy as the decisive test for determining believability and dissemination of content. Placement of a verbal nudge to refocus on critical discernment offers a practical way to counteract misinformation. While certainly providing a simple means to induce critical thinking, it may not adequately address the social media processes that fuel misinformation. Although the stimulus materials "were presented in the format of Facebook posts," (Pennycook et al., 2020, p. 772) these COVID-19 news items appeared as decontextualized individual bits of information. Separated from the participants' social media accounts, the content lacked (a) the attribution of endorsement from a social media friend who shared or "liked" the content (thus acting as a presumed endorser) and (b) the algorithm-generated reinforcement of similar content throughout the newsfeed that provides amplification and implicit confirmation. Absent such context, the content the participants examined did not replicate a genuine social media environment. The phenomenon of the ever-expanding newsfeed of new posts from friends would add to the same distraction from detailed analysis and pressure to share before assessing truth value that the researchers identify as driving the likelihood to believe and circulate COVID-19 misinformation. Within the social media environment, each post gains plausibility and desirability through its embeddedness in a network of mutually supportive content.

Possibilities for Improving Health Communication

Widely disseminated suggestions for remediating the spread of COVID-19 misinformation often lack a focus on the role communication plays in motivating and perpetuating anti-scientific attitudes and behaviors. Instead, corrective recommendations—especially those arising from the scientific commu-

nity—concentrate on altering the means of conveying messages with little attention to message substance. A recent opinion article in *Scientific American* recommends teaming scientists with popular influencers (celebrities, etc.), purging false information from social media, identifying and exposing false claims, and engaging with the public (Bagherpour & Nouri, 2020). Exactly what communication this public engagement would entail aside from error correction escapes discussion. The underlying rationales for denying or resisting science therefore remain intact as long as factual accuracy is treated as sufficiently compelling in itself. As research on messaging about climate change affirms, successful public engagement with scientific information must actively utilize the affective domain that shapes intuitive reactions to scientific findings (van der Linden, Maibach, & Leiserowitz, 2015).

As for counteracting COVID-19 distortions, trust in science and scientists can go too far. Belief in science could ossify into deference, whereby "people believe that decision-making concerning science and technology should be the purview of the scientific community and not part of larger democratic discourse" (Howell et al., 2020, p. 801). In contrast to rationally grounded and evidentially based trust in science, strong deference involves authoritarian views that relegate decision making to scientists and restrict the involvement of other stakeholders (Howell et al., 2020). Hastily discounting these other non-scientific constituencies, however, dangerously shifts faith to sources exempt from critical scrutiny simply due to their status as scientific. Aside from the open question regarding what suffices to categorize a claim as scientific (actual credentials of the source, peripheral characteristics of the source such as titles or celebrity status, methodological features, etc.), strong deference to science represents the opposite extreme of scientific skepticism that rejects scientifically based claims out of hand.

Contrary to deference, grounded trust in science continually checks the validity of claims through the dual standards of logical soundness (compelling arguments) and compatibility with moral commitments (commendable values). When operationalized within the various narratives that vie for public attention and adherence, these evaluative loci correspond to Walter Fisher's (1987) familiar delineation of narrative coherence (rational merit) and fidelity (compatibility with audience values) as the core components of stories.

Intuitive and deliberative understanding can operate as complementary rather than contradictory bases for health behavior. The conflicting assessments offered by COVID-19 minimizers such as President Trump and his allies versus public health experts regarding COVID-19 and how to deal with it pitted political authority against scientific expertise. Even within the same public briefings on the pandemic, the president and epidemiologists often took different positions concerning the nature of the virus, its severity, and recommendations to counteract it. While prominent immunologist Dr. Anthony Fauci was pleading with Americans to wear masks and maintain at least six feet of social distance, Donald Trump rarely wore a mask and ridiculed those who did (Relman, 2020). Harrington (2020) observes that scientific expertise requires rehabilitation and coordination with the messages of political leadership to counteract the COVID-19 pandemic. Even prominent public figures who dispute some scientific findings in other areas (e.g., climate change) should be able to find a point of convergence with mainstream scientists in uniting against a deadly disease that poses an immediate threat. Categorical distrust of science or politics as institutions can be ameliorated by identifying specific sources that key audiences respect. Instead of castigating skeptics of science, a more inviting approach would recruit public figures they respect as spokespersons for public health measures. If one person cannot fulfill that role for everyone, then various sources can microtarget their constituencies with information and advice that has scientific merit. In this way, the public does not have to choose between trusting authority figures or trusting scientific experts.

CONCLUSION

"The discussions about an epidemic…are not really about the facts of illness or death; they are about the competition to impart meaning and convince others that one preferred meaning is correct" (Alcabes, 2009, p. xiv). Successful public health communication throughout and beyond the COVID-19 pandemic requires acknowledging and accounting for the heuristic drivers of non-compliance. Attempts to encourage scientifically supported healthy behaviors must address how to generate the explanatory power and emotional satisfaction that heuristic processes provide. Rather than simply dismiss intuitive judgments as fallacies, scientifically supportable counter-narratives can promote satisfying values and emotional fulfillment that heuristically generated viewpoints offer. As noted throughout this investigation, even if behaviors do not qualify as rational in a logical sense, they do have rationales grounded in the ease, simplicity, and satisfaction that cognitive heuristics provide. Any public health campaigns that ignore these points can imperil the populace by allowing pernicious but convenient and emotionally powerful drivers of non-compliance to fill the void.

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KEY TERMS AND DEFINITIONS

Availability Heuristic: The tendency to treat whatever information comes to mind most easily as the most important when making decisions.

Falsifiability: The capability of a claim to be disproven. Constant subjection to testing that leads to disproof is a hallmark of scientific theories.

Loss Framing: Presentation of a prospective action as taking away something that one values or already has. Perceived negative consequences generally have more persuasive impact than potential gains.

Minimal Group Paradigm: The criteria that group members use to determine who counts as part of the group and who counts as an outsider. These conditions defining group membership can be incidental, trivial, or fictitious but still carry weight in setting boundaries between groups.

Nature Heuristic: The belief that whatever is natural or "the will of nature" must be preferable.

Social Identity Theory: The tendency for people to readily classify themselves and others into groups, finding ways to distinguish between their own preferred group members (in-group) and less desirable non-members (out-group).