EFFECTIVE PUBLIC HEALTH COMMUNICATION IN A POST-COVID-19 AMERICA: LESSONS FROM BEHAVIORAL SCIENCE

by
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As we emerge from the worst of the COVID-19 pandemic, Americans are still reeling from the loss of life, the financial fallout, and the deep divide that continues to characterize our social and political institutions. Public health experts who were tasked with communicating facts and advice to the American public faced a daunting challenge, particularly because three distinct groups of Americans received messages differently. One group of Americans was receptive to scientific findings and amenable to taking recommended precautions. A second group was skeptical about the safety and efficacy of available vaccines, and genuinely confused or suspicious about the source of public health recommendations. A third group can be characterized as hostile to masking and vaccines, and militantly opposed to restrictions on personal choice around measures designed to protect the public. In the wake of the pandemic, we have a clearer picture of missed opportunities for clear and persuasive communication that could have prevented confusion and reactance and may have saved lives. Data from psychological research suggests that strategic communication planning could improve understanding, promote healthy practices, lessen resistance to common-sense public health measures, and promote positive attitudes about precautions. This Article argues that COVID-19 presents a unique opportunity to conduct a post-mortem for purposes of planning for future public health crises. Specifically, we should design a multipronged approach to counteract biases stemming from cultural values, emotion, risk aversion, polarization, and reactance using understanding from behavioral research. Cognitive heuristics and biases can be harnessed to design targeted communication that clarifies choices and frames decisions to optimize behavior. Ultimately, our goal should be to use a data-driven approach to developing maximally effective public health communication to reach and teach all American citizens.

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INTRODUCTION

The COVID-19 pandemic has been the major health crisis of our time. As of February 3, 2024, it had killed over 1.1 million Americans,[1] crippled the economy,[2] and created a host of other associated epidemics, including an uptick in mental illness and suicidal ideation and attempts,[3] job loss,[4] and chronic health issues resulting from infection.[5] In addition to these immediate effects, the pandemic has exacerbated a long-festering problem stemming from a crisis of confidence in scientific developments, poor public health communication, and an erosion in trust of our leaders.[6] The novelty and scope of the virus's spread placed public health agencies in uncharted waters, where they floundered.[7] Initially, poor understanding of how the virus was transmitted led to bad advice and mixed messaging. Honest mistakes, bungled communication, and public health officials' failure to properly explain the process of scientific discovery created opportunities for those who had an agenda and a soapbox to spread misinformation.[8] For many Americans trying to wade

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[1] *COVID Data Tracker*, CDC, https://covid.cdc.gov/covid-data-tracker (Feb. 3, 2024).

[2] *See* Jiangzhuo Chen, Anil Vullikanti, Joost Santos, Srinivasan Venkatramanan, Stefan Hoops, Henning Mortveit, Bryan Lewis, Wen You, Stephen Eubank, Madhav Marathe, Chris Barrett & Achla Marathe, *Epidemiological and Economic Impact of COVID-19 in the US*, SCI. REPS., Oct. 2021, at 1, 1.

[3] *See* Leo Sher, *The Impact of the COVID-19 Pandemic on Suicide Rates*, 113 QJM 707 (2020); Yifei Yan, Jianhua Hou, Qing Li & Nancy Xiaonan Yu, *Suicide Before and During the COVID-19 Pandemic: A Systematic Review with Meta-Analysis*, INT. J. ENV'T RSCH. PUB. HEALTH, Feb. 14, 2023, at 1, 21–23.

[4] *See* Chen et al., *supra* note 2, at 1.

[5] After the initial acute COVID-19 infection, patients have reported a multitude of long-lasting symptoms. There are reports of a resulting lung condition and even a multi-organ syndrome. There is often damage to numerous other cells and organs, leading to an array of symptoms. Complications from COVID-19 lasting beyond four weeks is now referred to as post-COVID-19 syndrome. *See generally* Bryan Oronsky, Christopher Larson, Terese C. Hammond, Arnold Oronsky, Santosh Kesari, Michelle Lybeck & Tony R. Reid, *A Review of Persistent Post-COVID Syndrome (PPCS)*, 64 CLINICAL REVS. ALLERGY & IMMUNOLOGY 66 (2023); Janet D. Pierce, Qiuhua Shen, Samantha A. Cintron & John B. Hiebert, *Post-COVID-19 Syndrome*, 71 NURSING RSCH. 164 (2022); Jeannette Lechner-Scott, Michael Levy, Chris H. Hawkes, Ann Yeh & Gavin Giovannoni, *Long COVID or Post COVID-19 Syndrome*, 55 MULTIPLE SCLEROSIS & RELATED DISORDERS 1 (2021).

[6] *See The COVID-19 Infodemic*, 20 LANCET INFECTIOUS DISEASES 875, 875 (2020).

[7] *See* Lena H. Sun & Joel Achenbach, *CDC's Credibility Is Eroded by Internal Blunders and External Attacks as Coronavirus Vaccine Campaigns Loom*, WASH. POST (Sept. 28, 2020, 12:30 PM), https://www.washingtonpost.com/health/2020/09/28/cdc-under-attack.

[8] "Sean Hannity said the virus was a fraud by the 'deep state' trying to spread panic, manipulate the economy, and suppress dissent; Rush Limbaugh suggested the virus was a plot hatched by the Chinese to harm the U.S. economy; and Fox Business anchor Trish Regan told viewers that the worry over coronavirus 'is yet another attempt to impeach the president.'" Matt

through the sea of complex and changing information, it was hard to know which sources to trust. Even for Americans who sought advice from the CDC and Anthony Fauci, then Director of the National Institute of Allergy and Infectious Diseases (NIAID), recommendations were circumspect, inconsistent, and changing.[9] As a result, the public was left terrified, frustrated, confused, angry, and above all, divided.[10]

Although Americans are far from monolithic, three major groups emerged as the pandemic evolved. Members of the first group, initially dubbed "anti-maskers" and then later "anti-vaxxers" after a vaccine was developed, emerged as early opponents of epidemiologists' efforts to contain the disease. This group, which will be called "Deniers" in this Article,[11] characterized mask mandates as threats to freedom and rejected vaccines, citing a range of (fictitious) side effects, or asserting bizarre conspiracy theories.[12] The fact that the claims of Deniers were wholly unsupported by science did not seem to matter.[13] In fact, members of this group rarely framed their objections in health-outcome terms. Instead, they characterized their refusal to mask as an exercise of freedom, and the rejection of vaccines as a rejection of illegitimate efforts on the part of public health officials to impinge on their personal autonomy.[14] One individual who typified the Denier archetype was Justin Perrault,

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Motta, Dominik Stecula & Christina Farhart, *How Right-Leaning Media Coverage of COVID-19 Facilitated the Spread of Misinformation in the Early Stages of the Pandemic in the U.S.*, 53 CANADIAN J. POL. SCI. 335, 335–36 (2020) (quoting Jeremy W. Peters & Michael M. Grynbaum, *How Right-Wing Pundits Are Covering Coronavirus*, N.Y. TIMES (Mar. 11, 2020), https://www.nytimes.com/2020/03/11/us/politics/coronavirus-conservative-media.html).

[9] *See, e.g.*, Marie Fazio, *How Mask Guidelines Have Evolved*, N.Y. TIMES, https://www.nytimes.com/2021/04/27/science/face-mask-guidelines-timeline.html (July 9, 2021).

[10] *See* Sheryl Gay Stolberg & Michael D. Shear, *Americans Suffer Pandemic Whiplash as Leaders Struggle with Changing Virus*, N.Y. TIMES, https://www.nytimes.com/2021/08/02/us/politics/covid-pandemic-guidelines.html (Oct. 18, 2021); *A Year of U.S. Public Opinion on the Coronavirus Pandemic*, PEW RSCH. CTR. (Mar. 5, 2021), https://www.pewresearch.org/2021/03/05/a-year-of-u-s-public-opinion-on-the-coronavirus-pandemic.

[11] The label "Deniers" connotes members' tendency to deny science-based evidence and advice. *See* CASS R. SUNSTEIN, ON RUMORS 19–20 (2009) (introducing a similar way to describe different groups of people).

[12] *See* discussion *infra* Section II.A.2.

[13] *See, e.g.*, Brenna M. Moreno & Molly J. Walker Wilson, *The Psychology of Science Denialism and Lessons for Public Health Authorities*, 91 UMKC L. REV. 545, 550 (2023) ("When a denialist perceives that scientific consensus is a threat to his or her decision-making freedom, psychological reactance inspires him or her to rebel, seeking to maintain or regain that freedom.").

[14] Dennis Wagner, *The COVID Culture War: At What Point Should Personal Freedom Yield to the Common Good?*, USA TODAY (Aug. 2, 2021, 7:56 AM), https://www.usatoday.com/story/news/nation/2021/08/02/covid-culture-war-masks-vaccine-pits-liberty-against-common-good/5432614001. In the public health arena, the tension between making a personal choice and the fallout from certain choices that could harm others has long been a source of controversy. In 2014, for example, a case study of the measles outbreak reignited the debate. Lawrence O. Gostin, *Law,*

who attended a demonstration in Washington D.C. on January 23, 2022. Like other Deniers, Perrault refused to be vaccinated.[15] He lost his body therapy and spiritual counseling business because his clients were afraid to seek services from an unvaccinated practitioner. Having lost his business because of his anti-vaccine position, he became galvanized in his views. He subsequently traveled from Massachusetts to Washington, D.C. to protest vaccination mandates and to publicly dispute "the scientific consensus that the vaccines are safe."[16]

The second group of pandemic-era Americans were made up of individuals who can be characterized as "Skeptics." This group differed from Deniers in that these individuals were not primarily motivated by a commitment to personal freedom.[17] For the most part, members of this group had no objection to masking, but were reluctant to vaccinate themselves and their children without robust evidence of the efficacy and safety of the vaccine. Individuals in this group often sought out evidence about the safety and efficacy of the vaccine, but they tended to harbor a deep distrust of available information.[18] Perhaps because of a lack of familiarity about the process of scientific discovery, Skeptics desired an unrealistic amount of research findings before they were willing to get vaccinated.[19] Rather than viewing remaining unvaccinated as the riskiest option, they started with the premise that the vaccine could be harmful, and remained stubbornly committed to the notion that until they saw irrefutable evidence to the contrary, remaining unvaccinated was the safe route.[20] Research on psychological factors affecting how individuals assess risk

Ethics, and Public Health in the Vaccination Debates: Politics of the Measles Outbreak, 313 JAMA 1099, 1099–100 (2015).

[15] Katie Mettler, Lizzie Johnson, Justin Wm. Moyer, Jessica Contrera, Emily Davies, Ellie Silverman, Peter Hermann & Peter Jamison, *Anti-Vaccine Activists March in D.C. — A City That Mandates Coronavirus Vaccination — To Protest Mandates*, WASH. POST, https://www.washingtonpost.com/dc-md-va/2022/01/23/dc-anti-vaccine-rally-mandates-protest (Jan. 24, 2022, 11:35 AM).

[16] *Id.*

[17] *See* discussion *infra* Section IV.B.

[18] In a representative survey of vaccination attitudes of Americans, participants who answered, "not sure" in response to the question "When a vaccine for the coronavirus becomes available, will you get vaccinated?" expressed "concerns about the vaccine (such as safety or effectiveness)," needed additional information, and did not trust entities involved in vaccine development. Kimberly A. Fisher, Sarah J. Bloomstone, Jeremy Walder, Sybil Crawford, Hassan Fouayzi & Kathleen M. Mazor, *Attitudes Toward a Potential SARS-CoV-2 Vaccine: A Survey of U.S. Adults*, 173 ANNALS INTERNAL MED. 964, 967, 970 (2020).

[19] *See* Jackson G. Lu, *Two Large-Scale Global Studies on COVID-19 Vaccine Hesitancy Over Time: Uncertainty, Avoidance, and Vaccine Side-Effect Concerns*, 124 J. PERSONALITY & SOC. PSYCH. 683, 686 (2023).

[20] Jeffrey Kluger, *Too Many Americans Still Mistrust the COVID-19 Vaccines. Here's Why*, TIME (Jan. 5, 2021, 9:36 AM), https://time.com/5925467/covid-19-vaccine-hesitancy; *see also* Lu, *supra* note 19 ("People in higher (vs. lower) uncertainty avoidance countries might have had

provides a rich source of understanding about how to most effectively educate these individuals.[21] In particular, while judgments about risk have always been tainted by irrational tendencies, certain factors can exacerbate or mitigate these effects.[22] The prevalence of anti-vaccine propaganda, particularly in the months following the rollout of the vaccine when the push to get vulnerable Americans vaccinated was most critical,[23] only increased confusion and anxiety among Skeptics. Individuals purporting to be experts spread false information and engaged in fear-mongering, creating an additional hurdle for real experts attempting to convince Skeptics.[24] When multiple sources of information conflict, the one that seems most credible is often the one that truly understands and addresses head-on the fears of the audience.[25] Moreover, the speaker providing reassurance and education should meet the Skeptics where they are, avoid being dismissive of fears, and frame information in a way that is both comprehensible and relatable to the audience.[26] Behavioral science can provide guidance and lessons for how to communicate about potential sources of risk to maximize compliance with the latest public health knowledge.

The third and final group of Americans who lived through the pandemic are appropriately called "Receptives," indicating an openness to information and recommendations from public health experts. Receptives were characterized by at least a basic understanding of scientific inquiry, an active interest in the latest research findings, and a belief that health scientists and public health officials were in the best position to advise and lead through the pandemic. Members of this group typically acted according to advice from the Centers for Disease Control (CDC) regarding masking, social distancing, and hand-washing. Receptives looked forward to the development of a vaccine, and acted quickly to get vaccinated once it was

higher vaccine hesitancy because they were more concerned that COVID-19 vaccines would have unknown side effects, and preferred to wait and see whether early vaccine adopters would experience any unexpected side effects.").

[21] Noel T. Brewer, Gretchen B. Chapman, Alexander J. Rothman, Julie Leask & Allison Kempe, *Increasing Vaccination: Putting Psychological Science Into Action*, 18 PSYCH. SCI. PUB. INT. 149, 158 (2017) ("[R]isk appraisals and confidence in vaccination can increase motivation to get vaccinated, which in turn leads to increased vaccination.").

[22] For example, repeated exposure to alarming information (including inaccurate or misleading information) causes individuals to exhibit more risk aversion than they otherwise would. Molly J. Walker Wilson, *Adaptive Responses to Risk and the Irrationally Emotional Public*, 54 ST. LOUIS L.J. 1297, 1308, 1311 (2010).

[23] *See, e.g.*, Kelly McLaughlin & Yelena Dzhanova, *Experts Warn Anti-Vaxxer Concerns About a COVID-19 Vaccine Could Slow the End of the Pandemic*, BUS. INSIDER (Dec. 3, 2020, 3:23 AM), https://www.businessinsider.com/anti-vaxxers-concern-covid-19-vaccine-unhelpful-experts-say-2020-12.

[24] *See* discussion *infra* Section IV.B.

[25] *See* discussion *infra* Section I.B.

[26] *See* discussion *infra* Section V.A.

available.[27] Like Skeptics, Receptives sought out information about how to reduce risk. Unlike Skeptics, Receptives generally accepted information from scientific authorities without much difficulty.[28] For example, once the FDA had determined that the Moderna, Pfizer, and Johnson & Johnson vaccines were safe and effective and should be available, most Receptives got vaccinated as soon as they were able.[29] Once the FDA cleared the way for children five and under to be vaccinated, Receptives scheduled appointments at clinics and pediatricians' offices to vaccinate their children.[30] From a public health perspective, this group posed the lowest threat for spreading the virus and these individuals were the least likely to be hospitalized.[31] However, this group did not emerge unscathed from the pandemic.

Receptives suffered a particular set of challenges as a result of public health communication blunders. For some in this group, precautions became so en-

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[27] David Bauerlein, *Long Lines for First Day of City of Jacksonville COVID-19 Vaccine Rollout*, FLA. TIMES-UNION, https://www.jacksonville.com/story/news/local/2021/01/11/seniors-wait-long-lines-first-day-city-run-vaccinations/6630626002 (Jan. 12, 2021, 7:52 AM) ("The first round of vaccinations at two city-run sites kicked off . . . by delivering close to 1,000 injections . . . . [I]t was a slow trudge in lines with several hundred people waiting to reach the buildings where the vaccinations were given."). Some citizens showed up at 7:45 a.m. even though vaccinations were not scheduled to begin until 11:00 a.m. *Id.*

[28] In a New York Times survey conducted in mid-2020, "84 percent of voters said they trusted medical scientists to provide reliable information about the virus, with 90 percent of Democrats and 75 percent of Republicans trusting the experts. Overall trust in the C.D.C. was 77 percent — 71 percent among Republicans and 83 percent among Democrats." Margot Sanger-Katz, *On Coronavirus, Americans Still Trust the Experts*, N.Y. TIMES, https://www.nytimes.com/2020/06/27/upshot/coronavirus-americans-trust-experts.html (Sept. 18, 2020).

[29] *See, e.g.*, *We Asked, You Answered: Why Are You Looking Forward to Receiving the COVID-19 Vaccine?*, BRIGHAM BULL. (Dec. 17, 2020), https://bwhbulletin.org/2020/12/17/we-asked-you-answered-why-are-you-looking-forward-to-receiving-the-covid-19-vaccine; Ashley Kirzinger, Grace Sparks & Mollyann Brodie, *COVID-19 Vaccine Monitor: In Their Own Words, Six Months Later*, KFF (July 13, 2021), https://www.kff.org/coronavirus-covid-19/poll-finding/kff-covid-19-vaccine-monitor-in-their-own-words-six-months-later ("The vast majority (92%) of those who planned to get vaccinated 'as soon as possible' in early 2021 have received at least one dose of a COVID-19 vaccine [six months later].").

[30] *See* Nicole Leonard, *'It's a Big Deal': Eager Connecticut Families Line Up for COVID-19 Vaccines for Youngest Children*, CONN. PUB. RADIO (June 22, 2022, 10:42 AM), https://www.ctpublic.org/news/2022-06-22/its-a-big-deal-eager-connecticut-families-line-up-for-covid-19-vaccines-for-youngest-children.

[31] *See* Ibrahim Mohammed, Areej Nauman, Pradipta Paul, Sanjith Ganesan, Kuan-Han Chen, Syed Muhammad Saad Jalil, Shahd H. Jaouni, Hussam Kawas, Wafa A. Khan, Ahamed Lazim Vattoth, Yasmeen Alavi Al-Hashimi, Ahmed Fares, Rached Zeghlache & Dalia Zakaria, *The Efficacy and Effectiveness of the COVID-19 Vaccines in Reducing Infection, Severity, Hospitalization, and Mortality: A Systematic Review*, HUM. VACCINES & IMMUNOTHERAPEUTICS, Feb. 3, 2022, at 1, 17 (finding that "COVID-19 vaccines successfully reduced the rates of infections, severity, hospitalization, and mortality").

trenched that contemplating a return to "normal" activities created extreme anxiety.[32] Behavioral scientist Jacqueline Gollan studied individuals who experienced this lingering reluctance to reenter normalcy. Gollan noted that "[m]any of us . . . learned being around others was potentially catastrophic, so we perceived these scenarios with apprehension and vigilance."[33] Ironically, while Receptives were initially accepting of the CDC's instructions to exercise care, many were ambivalent about advice from the same source when it suggested easing up on precautions.[34] Gollan found that the long-term practice of social distancing eventually led to "'anxiety about resuming social activities,' . . . even while following federal Centers for Disease Control and Prevention guidelines."[35] Psychiatrist Aderonke Pederson remarked that healthy paranoia could turn into long-term trauma and "[t]he emotional impact . . . may linger with us for longer than we might expect."[36]

The unfortunate reality is that Americans, and indeed the world community, are likely to face another global health crisis. Climate change and the ease of travel, among other factors, threaten the well-being of Americans.[37] For public health officials to effectively manage health risks, they need the confidence and cooperation of the public. Engendering trust requires understanding the motivations and concerns of each of the three groups—Deniers, Skeptics, and Receptives—so as to facilitate the crafting of messaging that will appeal to each group. Psychological biases or predetermined tendencies to behave irrationally impact various cultural subgroups within the United States differently. For example, social scientists have learned that the degree to which an individual is receptive to information depends upon the extent to which the evoked value is consistent or inconsistent with the individual's

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[32] The 2021 "Stress in America" survey conducted by the American Psychological Association showed that "[n]early half of respondents (49%) said they feel uneasy about adjusting to in-person interaction [post-pandemic]." Press Release, Am. Psych. Ass'n, One Year On: Unhealthy Weight Gains, Increased Drinking Reported by Americans Coping with Pandemic Stress (Mar. 10, 2021), https://www.apa.org/news/press/releases/2021/03/one-year-pandemic-stress.

[33] Suzanne Ciechalski & Corky Siemaszko, *People Nervous to Give Up Masks After Being Vaccinated*, NBC NEWS (Mar. 12, 2021, 11:01 AM), https://www.nbcnews.com/news/us-news/people-nervous-give-masks-after-being-vaccinated-n1260917 (quoting Jacqueline Gollan).

[34] *See* Jack Healy & Ashley Wong, *After 2 Years of Pandemic Life, Turn Toward Normalcy Is a Shake-Up*, N.Y. TIMES (Mar. 12, 2022), https://www.nytimes.com/2022/03/12/us/covid-pandemic-vaccines-mandates.html.

[35] Ciechalski & Siemaszko, *supra* note 33 (quoting Jacqueline Gollan).

[36] *Id.* (quoting Aderonke Pederson).

[37] *See* Aliza Chasan, *Prepare for Next Pandemic, Future Pathogens with "Even Deadlier Potential" than COVID, WHO Chief Warns*, CBS NEWS (May 23, 2023, 5:45 PM), https://www.cbsnews.com/news/next-pandemic-threat-pathogen-deadlier-than-covid-world-health-organization.

belief system.[38] The social context in which the message is received is also vitally important. During the course of social cognition—the process by which human beings receive, encode, store, and interpret information in social, or culturally meaningful, situations—biases are often triggered.[39] Certain biases are triggered more easily in certain social situations than in others.[40] The term "bias" refers to patterns of receiving and interpreting information in ways that are irrational or produce suboptimal outcomes.[41] A bias can influence how the message is interpreted and whether or not the recipient "hears" a value-consistent message or a value-inconsistent message.[42] Finally, the extent to which the message evokes certain emotions triggers certain psychological biases and mental heuristics.[43]

The COVID-19 vaccine debate has brought into stark relief what has become a truism in American politics and society: we are a polarized country. We also tend to reside in our own echo chambers, preferring to receive information and opinion from news outlets and social media that reflect ideas that are consistent with our own social and political preferences.[44] This tendency is explained by a constellation of psychological biases related to the broader concept of motivated reasoning—the

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[38] Roger W. Cobb, *The Belief-Systems Perspective: An Assessment of a Framework*, 35 J. POL. 121, 132 (1973); Jeroen M. van Baar & Oriel FeldmanHall, *The Polarized Mind in Context: Interdisciplinary Approaches to the Psychology of Political Polarization*, 77 AM. PSYCH. 394, 398 (2022); Randall R. Kleinhesselink & Richard E. Edwards, *Seeking and Avoiding Belief-Discrepant Information as a Function of Its Perceived Refutability*, 31 J. PERSONALITY & SOC. PSYCH. 787, 790 (1975).

[39] Chris D. Frith, *Social Cognition*, 363 PHIL. TRANSACTIONS ROYAL SOC'Y 2033, 2033 (2008) ("[T]he term 'cognition' refers to the many different processes by which creatures understand and make sense of the world. . . . Perception, attention, memory and action planning would all be examples of cognitive processes. All these processes are important in social interactions and the study of information processing in a social setting is referred to as social cognition.").

[40] *See* Cobb, *supra* note 38, at 131; van Baar & FeldmanHall, *supra* note 38, at 397–98.

[41] Bias occurs in "cases in which human cognition reliably produces representations that are systematically distorted compared to some aspect of objective reality." Martie G. Haselton, Daniel Nettle & Damian R. Murray, *The Evolution of Cognitive Bias*, *in* 2 THE HANDBOOK OF EVOLUTIONARY PSYCHOLOGY 968 (David M. Buss ed., 2d ed. 2016).

[42] *See* Jason K. Clark, Duane T. Wegener & Leandre R. Fabrigar, *Attitude Accessibility and Message Processing: The Moderating Role of Message Position*, 44 J. EXPERIMENTAL SOC. PSYCH. 354, 354–55, 357, 359–60 (2008).

[43] Jennifer S. Lerner, Ye Li, Piercarlo Valdesolo & Karim S. Kassam, *Emotion and Decision Making*, 66 ANN. REV. PSYCH. 799, 807 (2015).

[44] Shanto Iyengar & Kyu S. Hahn, *Red Media, Blue Media: Evidence of Ideological Selectivity in Media Use*, 59 J. COMMC'N 19, 34 (2009); Silvia Knobloch-Westerwick & Jingbo Meng, *Looking the Other Way: Selective Exposure to Attitude-Consistent and Counterattitudinal Political Information*, 36 COMMC'N RSCH. 426, 443–44 (2009); David Tewksbury & Julius Matthew Riles, *Polarization as a Function of Citizen Predispositions and Exposure to News on the Internet*, 59 J. BROAD. & ELEC. MEDIA 381, 396 (2015).

human drive to selectively attend to information and engage in reasoning that leads to a conclusion that makes us feel competent, moral, and consistent.[45] An oft-cited example of the tendency of people to prefer communication that supports preexisting beliefs is the right-leaning Fox News channel, which is watched largely by Americans who self-identify as "conservative," in contrast to the left-leaning MSNBC, which is predominantly watched by those who espouse "progressive" ideals.[46]

When it comes to communicating information about scientific developments, there are several challenges. The first is that public health experts tend to be disease- and data-focused, meaning that their education and training does not prepare them to communicate effectively about risk.[47] Put simply, epidemiologists are not experts on human thought and behavior.[48] The goal of epidemiologists is to take "a systematic and unbiased approach to the collection, analysis, and interpretation of data. . . . such as the number of cases of disease in a particular area during a particular time period or the frequency of an exposure among persons with disease."[49] Because public health spokespeople rarely have the training necessary to create effective messaging, these individuals may inadvertently increase anxiety, uncertainty, and hostility through their communication.[50]

Even if epidemiologists are familiar with behavioral science principles, appealing to members of the public who hold a wide variety of beliefs about health, collective responsibility, and behavioral norms creates special challenges. Research has revealed that even before the COVID-19 outbreak, views on the safety of vaccines

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[45] *See* Tewksbury & Riles, *supra* note 44, at 396; Ziva Kunda, *The Case for Motivated Reasoning*, 108 PSYCH. BULL. 480, 483–84 (1990).

[46] Jay D. Hmielowski, Myiah J. Hutchens & Michael A. Beam, *Asymmetry of Partisan Media Effects?: Examining the Reinforcing Process of Conservative and Liberal Media with Political Beliefs*, 37 POL. COMMC'N 852, 855 (2020); Matthew Gentzkow & Jesse M. Shapiro, *Ideological Segregation Online and Offline*, 126 Q.J. ECON. 1799, 1813, 1815 (2011); Glen Smith & Kathleen Searles, *Who Let the (Attack) Dogs Out? New Evidence for Partisan Media Effects*, 78 PUB. OP. Q. 71, 71–74, 80 (2014); Gregory J. Martin & Ali Yurukoglu, *Bias in Cable News: Persuasion and Polarization*, 107 AM. ECON. REV. 2565, 2565, 2586–87, 2591, 2597 (2017).

[47] *See* Walker Wilson, *supra* note 22, at 1299–1300.

[48] *See* U.S. DEP'T OF HEALTH & HUM. SERVS., PRINCIPLES OF EPIDEMIOLOGY IN PUBLIC HEALTH PRACTICE: AN INTRODUCTION TO APPLIED EPIDEMIOLOGY AND BIOSTATISTICS 2 (3d ed. 2012) ("In fact, epidemiology is often described as the basic science of public health, and for good reason.").

[49] *Id.* According to the U.S. Department of Health & Human Services, "Epidemiology is the study of the distribution and determinants of health-related states or events in specified populations, and the application of this study to the control of health problems." *Id.* (emphases omitted).

[50] Moreno & Walker Wilson, *supra* note 13, at 549 n.32 ("[S]pokespeople who come from a public health background are not necessarily well-equipped to predict how lay members of the public are likely to receive, interpret, and react to public-health messages." (citing Walker Wilson, *supra* note 22, at 1299–1300)).

were wide-ranging and variable across the country.[51] After the pandemic changed the lives of Americans, deep divisions developed around questions of whether to mask, when to social distance, and the safety and effectiveness of vaccines.[52] Many members of an already polarized population are militantly defensive of their positions.[53] To complicate matters further, perspectives ranged and attitudes were sometimes complicated by identities and cultural history.[54] Particularly among Black and Brown communities, skepticism or outright hostility to the vaccine occurred simultaneously with the embracing of other risk-mitigation measures, such as masks.[55] Addressing the social and cultural reactions of so many sub-populations is tricky even if the messenger is skilled in the art of communication.

Finally, formulating clear recommendations when dealing with a novel health threat poses its own challenges. Epidemiological research findings change the state of human knowledge almost constantly. Early conclusions are tentative, and later

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[51] Jeff Levin & Matt Bradshaw, *Determinants of COVID-19 Skepticism and SARS-CoV-2 Vaccine Hesitancy: Findings from a National Population Survey of U.S. Adults*, BMC PUB. HEALTH, Dec. 2022, at 1, 3 ("COVID-19 skepticism and SARS-CoV-2 vaccine hesitancy are strongly associated with . . . conservative religious beliefs about the Bible and God."); *see also* William J. Sieber, Suraj Achar, Jivan Achar, Anish Dhamija, Ming Tai-Seale & David Strong, *COVID-19 Vaccine Hesitancy: Associations with Gender, Race, and Source of Health Information*, 40 FAMS., SYS., & HEALTH 252, 256–59 (2022).

[52] Austin Hegland, Annie Li Zhang, Brianna Zichettella, & John Pasek, *A Partisan Pandemic: How COVID-19 Was Primed for Polarization*, 700 ANNALS AM. ACAD. POL. & SOC. SCI. 55, 55–57 (2022); Hunt Allcott, Levi Boxell, Jacob Conway, Matthew Gentzkow, Michael Thaler & David Yang, *Polarization and Public Health: Partisan Differences in Social Distancing During the Coronavirus Pandemic*, J. PUB. ECON, Nov. 2020, at 1, 1–2; Dante Disparte, *Preparing for the Next Pandemic: Early Lessons from COVID-19*, BROOKINGS (Feb. 16, 2021), https://www.brookings.edu/research/preparing-for-the-next-pandemic-early-lessons-from-covid-19.

[53] Protests against COVID-19 restrictions around the United States included one in Michigan where some protesters were carrying assault-style weapons. Mara Liasson, *The Coronavirus Crisis Drives Some Americans Further Apart*, NPR (May 5, 2020, 4:06 PM), https://www.npr.org/2020/05/05/850964073/the-coronavirus-crisis-drives-some-americans-further-apart ("[W]e're a very polarized country, and there's a lot about this debate—about COVID—that falls right into those polarized lines.").

[54] For example, certain historically disadvantaged groups took eagerly to masking, but were reluctant to vaccinate as a result of having been mistreated by medical researchers in the past. Manuel E. Jimenez, Zorimar Rivera-Núñez, Benjamin F. Crabtree, Diane Hill, Maria B. Pellerano, Donita Devance, Myneka Macenat, Daniel Lima, Emmanuel Martinez Alcaraz, Jeanne M. Ferrante, Emily S. Barrett, Martin J. Blaser, Reynold A. Panettieri Jr., Shawna V. Hudson, *Black and Latinx Community Perspectives on COVID-19 Mitigation Behaviors, Testing, and Vaccines*, JAMA NETWORK OPEN, July 15, 2021, at 1, 8.

[55] *Id.* ("Vaccine skepticism among Black and Latinx communities has been well documented. Although experiences during the pandemic motivated intensive information seeking and precautions, paradoxically, participants remained skeptical about a COVID-19 vaccine." (internal citations omitted)).

developments can fundamentally change the understanding of how best to address the threat.[56] As a result, what appears to be sound advice at one point in time often is revised, updated, or even reversed as experts learn more about disease spread and as the health threat changes.[57]

Because public health spokespeople hoped to instill confidence and calm fears, communication about the science often omitted the true uncertainty of our knowledge.[58] As a result, when it was necessary to update findings and recommendations, the public perceived that public health experts were untrustworthy, the science was unreliable, or both.[59] In addition, most Americans likely misunderstood the scientific process and how discovery unfolds, creating opportunities for Deniers to seize on changing recommendations as "proof" that findings are suspect.[60] Clashing messages and the mystery surrounding the virus created intense anxiety for many Americans who were simply trying to understand how to best protect themselves and their loved ones.

When situations are ambiguous and fear is greatest, unconscious social and cognitive biases take root.[61] These biases often interfere with the ability of human beings to make logically sound, benefit-maximizing choices.[62] Ironically, the very situation that calls for clear-headed analysis can also generate the greatest potential for group and cultural bias, motivated reasoning, and various cognitive illusions.[63] A perfect storm of scientific uncertainty, ill-conceived or uncoordinated public com-

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[56] *See* Fazio, *supra* note 9.

[57] In the COVID-19 context, for example, the CDC changed its advice on quarantine and isolation periods and changed testing guidelines to exclude people with no symptoms. *See CDC Updates and Shortens Recommended Isolation and Quarantine Period for General Population*, CDC (Dec. 27, 2021), https://www.cdc.gov/media/releases/2021/s1227-isolation-quarantine-guidance.html; Richard Harris, *CDC Changes Testing Guidelines to Exclude People with No COVID-19 Symptoms*, NPR (Aug. 26, 2020, 4:07 PM), https://www.npr.org/2020/08/26/906333399/cdc-changes-testing-guidelines-to-exclude-people-with-no-covid-19-symptoms.

[58] *See* Denise Chow, *CDC's Messaging Problem Highlights Pandemic's Uncertain Future*, NBC NEWS, https://www.nbcnews.com/science/science-news/cdcs-messaging-problem-highlights-pandemics-uncertain-future-rcna602 (Apr. 6, 2021, 2:31 PM).

[59] *See id.*

[60] *See id.*

[61] *See* Amos Tversky & Daniel Kahneman, *Judgment Under Uncertainty: Heuristics and Biases*, 185 SCI. 1124, 1124–25, 1130 (1974).

[62] Lerner et al., *supra* note 43, at 803.

[63] These biases include overoptimism bias, psychological reactance, in-group/out-group bias, forms of motivate reasoning such as self-serving bias, over-confidence bias, confirmation bias, and social communication biases stemming from availability cascades and cultural norms, among other biases and psychological irrationalities. *See generally* Tversky & Kahneman, *supra* note 61; RICHARDS J. HEUER, JR., CIA, PSYCHOLOGY OF INTELLIGENCE ANALYSIS 111–72 (1999).

munication, public fear, and motivated reasoning created fertile ground for confusion, distrust, and opportunistic behavior.[64] Each of these factors collectively hampered efforts to educate Americans and to effectively communicate the latest recommendations to the public. As we stand in the shadow of the greatest worldwide health crisis in recent history, it seems clear that the impact of the pandemic will be lasting. Hyper-politicization of health decisions and ongoing financial and mental health effects are among the issues Americans must address. Although COVID-19 has left an indelible mark, it presents the opportunity to examine our own missteps in order to improve. Using a behavioral and cultural lens to examine the unfolding of events and the response of the American public, we can develop new strategies for communicating about science and disease to the public. This moment presents a unique opportunity to forge a new path in the face of future evolving health threats.

In summary, a combination of historical and contextual factors, along with features of human cognition and behavior, created barriers for public health efforts. Efforts to educate Americans on ways to stay safe from the virus by taking precautions such as social distancing, masking, vaccinating, and boosting were largely successful among Receptives and moderately successful among Skeptics.[65] However, the profound disruption to normal life that accompanied these behavior modifications were most profound for these groups.[66] On the other hand, the pleas of epidemiologists to take precautions to prevent the spread of disease were met with hostility and derision by the Deniers.[67] In every instance, unconscious psychological factors interacted with situational and social factors in profound ways to shape human attitudes and behavior.

Part I of this Article provides some context, orienting decisions about risk in the social cognition framework, as opposed to a probabilistic or modeling framework. This Part argues that statistics and epidemiological risk calculation are superfluous if they do not account for human choice; it is the risks that human-beings *perceive* that will motivate behavior. In Part II, a range of psychological phenomena are described, along with the implications for human thought and behavior. Against this backdrop, Part III explains various historical and environmental features important to understanding the behaviors of the three groups during the pandemic. Part IV describes the attitudes and behaviors of the groups, in light of biases and contextual inputs. Finally, Part V provides specific and realistic methods for improving public health messaging in future health crises.

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[64] *See* discussion *infra* Section IV.B.

[65] *See* discussion *infra* Sections IV.B, IV.C.

[66] *See* discussion *infra* Section IV.C.

[67] *See* discussion *infra* Section IV.A.

I. DECISIONS ABOUT RISK—THE LANDSCAPE

At its most basic, the decisions that individuals make about how to behave in the context of a pandemic are decisions about how to weigh the costs of risk mitigation[68] against the benefits. Research and theory in the areas of sociology, psychology, and anthropology make it clear that the very act of perceiving and evaluating a danger is a complex, multi-faceted process. Although prominent thinkers such as Cass Sunstein, Richard Thaler, Paul Slovic, Roger Kasperson, Baruch Fischhoff, Sarah Lichtenstein, Ulrich Beck, Mary Douglas, and others have discussed how culture-based factors influence risk decisions,[69] these discussions have largely gone unheeded when policy decisions are made.

A. Characterizing Risk Decisions

A great deal has been written about how to manage risk.[70] Substantial time and resources are devoted to the study of probabilities of harm, efficacy and safety for

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[68] Risks are defined as the chance of physical harm (to person, property, or element of the natural world) due to technologies, diseases or other mechanisms. Scott Lash & Brian Wynne, *Introduction* to ULRICH BECK, RISK SOCIETY: TOWARDS A NEW MODERNITY 4 (Mark Ritter trans., Sage Publications 1992) (1986)

[69] *See generally* Baruch Fischhoff, Paul Slovic, Sarah Lichtenstein, Stephen Read & Barbara Combs, *How Safe Is Safe Enough? A Psychometric Study of Attitudes Towards Technological Risks and Benefits*, 9 POL'Y SCIS. 127 (1978); Roger E. Kasperson, Ortwin Renn, Paul Slovic, Halina S. Brown, Jacque Emel, Robert Goble, Jeanne X. Kasperson & Samuel Ratick, *The Social Amplification of Risk: A Conceptual Framework*, 8 RISK ANALYSIS 177 (1988); MARY DOUGLAS, RISKS AND BLAME: ESSAYS IN CULTURAL THEORY (1992); BECK, *supra* note 68; Christine Jolls, Cass R. Sunstein & Richard Thaler, *A Behavioral Approach to Law and Economics*, 50 STAN. L. REV. 1471 (1998); Timur Kuran & Cass R. Sunstein, *Availability Cascades and Risk Regulation*, 51 STAN. L. REV. 683 (1999).

[70] *See, e.g.*, John D. Graham, *Historical Perspective on Risk Assessment in the Federal Government*, TOXICOLOGY, Sept. 1995, at 29, 33–35 (explaining that carcinogens traditionally have been seen to lack safety "thresholds," and describing how this non-threshold view prompted regulatory agencies to adopt individual risk tests); Dennis J. Paustenbach, *Retrospective on U.S. Health Risk Assessment: How Others Can Benefit*, 6 RISK 283, 284 (1995) ("[O]ver 300 of about 5,000 chemicals routinely used in industry have been labelled carcinogens as a result of animal studies."); Lynn J. Frewer, Joachim Scholderer & Lone Bredahl, *Communicating About the Risks and Benefits of Genetically Modified Foods: The Mediating Role of Trust*, 23 RISK ANALYSIS 1117 (2003); Kuran & Sunstein, *supra* note 69 (discussing how their theory of availability cascades leads them to call for a smaller role for the public in risk management); DOUGLAS W. HUBBARD, THE FAILURE OF RISK MANAGEMENT: WHY IT'S BROKEN AND HOW TO FIX IT 10 (2009) (defining risk management as "the identification, assessment, and prioritization of risks followed by coordinated and economical application of resources to minimize, monitor, and control the probability and/or impact of unfortunate events"); Fischhoff et al., *supra* note 69 (discussing the psychometric method for risk management, used to derive a "cognitive map" for hazards that could serve as a tool for understanding and predicting risk responses); Kasperson et al., *supra* note 69, at 181

drug studies, costs and benefits of precautionary measures, and aggregate harm from sources such as pollutants and crime.[71] When public health researchers' proposed risk management strategies are developed, they are typically based upon probabilities and financial considerations.[72] Risk analysts attend to factors that create the potential for harm without accounting for the human reaction to specific inputs, such as social and environmental cues that influence human behavior.[73] However, behavioral scientists have noted, "the technical concept of risk is too narrow and ambiguous to serve as the crucial yardstick for policy making."[74] The human race is far too complex and culturally diverse for it to make sense to talk about data without studying and discussing the psychological lenses through which the data is perceived, interpreted, and acted upon.[75] Pandemic behavior, including vaccine reluctance and social anxiety, presents an opportunity to examine how psychological biases and cultural forces operate on risk decisions. Moreover, analysis-of-risk decisions tend to treat all, or most, members of society as homogenous.[76]

B. Measuring Risk Outcomes

If the American public was a monolith and individuals strictly followed risk researchers' recommendations, it might make sense to talk about measuring risk outcomes as if there was a single yardstick for such a purpose. Were this fictitious

(discussing social amplification of risk theory); Dan M. Kahan, *Two Conceptions of Emotion in Risk Regulation*, 156 U. PA. L. REV. 741, 748–49 (2008) (discussing "the cultural evaluator theory of risk perception").

[71] *See generally* Paustenbach, *supra* note 70; HUBBARD, *supra* note 70, at 13.

[72] Molly J. Walker Wilson, *Cultural Understandings of Risk and the Tyranny of the Experts*, 90 OR. L. REV. 113, 117 (2011); *see also* Kahan, *supra* note 70, at 746–47 (discussing the "rational weigher theory" for risk management strategy that is slow, deliberate, and more likely to include consideration of probabilities and careful weighing of costs and benefits).

[73] Walker Wilson, *supra* note 72, at 117 ("When risk management proposals are advanced, they are usually presented exclusively in terms of probabilities and costs. To a great extent, factors exogenous to the conscious decision task, such as human emotion and cognitive processes, are ignored.").

[74] Kasperson et al., *supra* note 69, at 178.

[75] Sociologist Ulrich Beck has pointed out that any analysis of risk that excludes consideration of human psychology "runs the risk of atrophying into a discussion of nature *without* people, without asking about matters of social and cultural significance." BECK, *supra* note 68, at 24. Although some cost-benefit risk analysts who have traditionally focused on economic issues have started to raise relevant questions about risk perception and preferences, they have done little to *answer* these questions. *See* Ian Savage, *An Empirical Investigation into the Effect of Psychological Perceptions on the Willingness-to-Pay to Reduce Risk*, 6 J. RISK & UNCERTAINTY 75, 76 (1993).

[76] Walker Wilson, *supra* note 72, at 139 (discussing anthropologist Mary Douglas's claim that "the risk researcher's 'method assumes that all humans have the same responses and preferences.'" (quoting DOUGLAS, *supra* note 69, at 13)).

circumstance to reflect reality, risk researchers could look at data from sources of harm and determine the most effective way to minimize the harm, issue instructions, and measure the consequences of the mitigation measures. At most, there would be noise from variability in exogenous factors relating to climate and geography. Instead, there is widespread disagreement with respect to the relative harm of different risks, and many risks are accompanied by rewards. For example, behaviors that pose risks, such as drinking alcohol, smoking, and engaging in athletic endeavors, feel good, and some risky behaviors are accompanied by physiological and social benefits. The value placed upon the benefits of these and other risky activities varies from individual to individual, and the associated harms are weighted according to inputs resulting from personal experiences, shared values, and preferences.[77] Because there is significant variability in terms of which risks are deemed tolerable and the relative value of benefits and cost of harms, when it comes to risk reduction, it is impossible to arrive at a perfect consensus with respect to what constitutes success, or even progress.

Epidemiologists' calculations about mitigating risk from disease diverge from that of most Americans for two reasons. First, there is an imperfect fit between the latest information on disease spread and what the typical American knows.[78] There are many reasons why this is true. Individuals have limited attentional capacity and memories. Daily life includes demands from many sources; employment and family care are time-consuming and human capacity to attend to multiple channels of information is finite. Moreover, legitimate information about epidemiological findings is obscured by noise from misinformation campaigns.[79] In short, there is an imperfect connection between legitimate sources of new information and members

[77] In 2024, smoking cigarettes is virtually taboo among certain socioeconomic groups in America, even while is it relatively common in others. Bridgette E. Garrett, Brandi N. Martell, Ralph S. Caraballo, & Brian A. King, *Socioeconomic Differences in Cigarette Smoking Among Sociodemographic Groups*, PREVENTING CHRONIC DISEASE, June 13, 2019, at 1, 2–3. Yet, in addition to health threats, one of the risks associated with smoking for members of one group is social ostracism, whereas for members of the other group, this is less true. *See* Christine L. Paul, Samantha Ross, Jamie Bryant, Wesley Hill, Billie Boneyski, & Nichola Keevy, *The Social Context of Smoking: A Qualitative Study Comparing Smokers of High Versus Low Socioeconomic Position*, BMC PUB. HEALTH, Apr. 27, 2010, at 1, 2–3, 11–12; *see also* Marie Helweg-Larsen & Callista Tjitra, *Does Ostracism Help Smokers Quit?*, STIGMA & HEALTH, Apr. 19, 2021, at 1, 6 (explaining that social exclusion for one's status as a smoker may increase the desire to quit smoking).

[78] Lauren A. McCormack, Linda Squiers, Alicia M. Frasier, Christine Bevc, Molly Lynch, Carla M. Bann & Pia D.M. MacDonald, *Gaps in Knowledge About COVID-19 Among US Residents Early in the Outbreak*, 136 PUB. HEALTH REPS. 107, 113 (2020); *see also* Melvin Blanchard, *Closing the Gap Between Medical Knowledge and Patient Outcomes Through New Training Infrastructure*, 133 TRANSACTIONS AM. CLINICAL & CLIMATOLOGICAL ASS'N 119, 120 (2023).

[79] *See* Heidi J. Larson, *Blocking Information on COVID-19 Can Fuel the Spread of Misinformation*, NATURE, Apr. 16, 2020, at 306, 306.

of the public, leaving room for information to be lost, distorted, obscured, "debunked," or improperly augmented. As a result, members of the public are not terribly good at making accurate judgments about which risks pose the greatest risk to health and well-being.[80]

The second reason for the disconnect between epidemiologists' risk calculations and human behavior is that professionals who study disease do not necessarily share the same values as all Americans.[81] Whether to take the burden of a precaution has famously been calculated in terms of whether the burden is lower than the probability of the harm occurring multiplied by the cost of the harm.[82] Risk analysis has relied on a purportedly value-neutral formula, but this assumption ignores the reality that all risk calculations involve making inherently human-oriented choices.[83] Elsewhere, I have argued that "affect-based responses to risk are properly viewed as expressions of individual values, world views, and personal preferences and, as such, achieve legitimacy as a basis for risk policy."[84] In less affluent societies, survival is a matter of accumulating sufficient resources and the primary focus is on scarcity, not anticipating and mitigating sources of risk.[85] This is just one example of how risk perceptions can vary depending upon context, resources, and preferences.

Importantly, scientists are themselves human beings who are subject to biases. Law scholar Donald Hornstein has pointed out that researchers are subject to inevitable uncertainties, flawed methods, and industry bias.[86] He further argues that subordination of public views to governmental risk assessments is undemocratic.[87] Finally, Hornstein stresses that there is a rational basis for citizens' risk evaluations;

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[80] Law scholar Cass Sunstein has made the point that people are subject to biases in evaluating risks. *See* Kuran & Sunstein, *supra* note 69, at 705–09.

[81] *See* Gary E. Machlis & Eugene A. Rosa, *Desired Risk: Broadening the Social Amplification of Risk Framework*, 10 RISK ANALYSIS 161, 163–65 (1990) (highlighting the importance of choice in assuming risks).

[82] United States v. Carroll Towing Co., 159 F.2d 169, 173 (2d Cir. 1947) produced the formula B < PxL, where B is the burden of precaution, P is the probability of damages, and L is the liability incurred in the event of damages.

[83] *See* Paul Slovic, *Trust, Emotion, Sex, Politics, and Science: Surveying the Risk Assessment Battlefield*, 1997 U. CHI. LEGAL F. 59, 61–62.

[84] Walker Wilson, *supra* note 22, at 1298; *see also* Walker Wilson, *supra* note 72, at 119 ("Risk decisions are never value neutral: they are determined by preferences, shaped by affective reactions, and influenced by cognitive and cultural biases, although that is not always acknowledged.").

[85] BECK, *supra* note 68, at 20 (pointing out that western civilizations have moved from a culture of scarcity to a culture of risk).

[86] Donald T. Hornstein, *Reclaiming Environmental Law: A Normative Critique of Comparative Risk Analysis*, 92 COLUM. L. REV. 562, 610–11 (1992).

[87] *Id.* at 611.

even where they might not comport with statistical probabilities, they reflect legitimate personal preferences.[88] Baruch Fischhoff, along with Paul Slovic and colleagues,[89] believed that the risk-benefit analysis was inadequate for answering those questions.[90] Specifically, they took issue with the "revealed preference" theory of risk-benefit analysis which assumes that, through trial and error, society has determined an optimum level of risk for a given activity.[91] The primary criticism of psychometric analysis is that it ignores the fact that society's preferences fluctuate.[92] "Revealed preferences" theory also assumes that the market correctly reflects the optimal risk level and discounts the possibility that the public is accepting a risk because it is ignorant of the potential for harm or the potential for elimination of harm.[93] In the early 2000s, a burgeoning effort to sidestep vaccine mandates for children led to outbreaks of measles and pertussis.[94]

> Distrustful parents had increased odds of thinking government sources of information about vaccines were unreliable, categorizing the CDC, the Food and Drug Administration (FDA), or local and state health departments as poor or very poor sources (distrust government vs trust government: 25.2% vs 11.7%; OR, 2.39; 95% CI, 1.70–3.36; P < 0.01; distrust healthcare providers vs trust healthcare providers: 24.4% vs 11.4%; OR, 2.44; 95% CI, 1.75–3.38; P < 0.01).[95]

In modern western societies, more people than ever before have their basic needs met.[96] Without attentional demands on searching for and gathering resources fundamental to survival, human attention turns elsewhere. And because most Americans have abundant choice about which risky behaviors to engage in and which to eschew, these choices become forms of personal expression. Operating a motor vehicle, a statistically risky endeavor,[97] is a perfect example of how Americans self-

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[88] *See id.* at 610–16. This view is similar to that of Dan Kahan, which is detailed *infra* note 144; *see also infra* note 113 and accompanying text; and discussion *infra* Section II.E.

[89] *See generally* Fischhoff et al., *supra* note 69.

[90] The work with which Fischhoff, Slovic, and colleagues took issue is Chauncey Starr, *Social Benefit Versus Technological Risk*, 165 SCI. 1232 (1969).

[91] *Compare* Fischhoff et al., *supra* note 69, at 128–29, *with* Starr, *supra* note 90, at 1232.

[92] Fischhoff et al., *supra* note 69, at 129.

[93] *Id.*

[94] Charlotte Lee, Kathryn Whetten, Saad Omer, William Pan & Daniel Salmon, *Hurdles to Herd Immunity: Distrust of Government and Vaccine Refusal in the US, 2002–2003*, 34 VACCINE 3972, 3972 (2016).

[95] *Id.*

[96] *See* KENNETH E. BOULDING, MICHAEL KAMMEN & SEYMOUR MARTIN LIPSET, FROM ABUNDANCE TO SCARCITY: IMPLICATIONS FOR THE AMERICAN TRADITION (1978).

[97] The National Highway Traffic Safety Administration showed 6,102,936 police-reported crashes in 2021, as well as the highest traffic fatality rate since 2005. U.S. DEP'T OF TRANSP., DOT-HS-813435, OVERVIEW OF MOTOR VEHICLE TRAFFIC CRASHES IN 2021, at 5, 7 (2023).

identify through choice. Whether to drive (as opposed to biking or walking), the type of car (a Volvo or Subaru versus a muscle car), the speed at which we drive, and the extent to which we avail ourselves of safety features (such as seatbelts) are decisions we make that serve to signal particular values. The choices about what and how we drive are direct examples of risk in an automobile, but even the act of riding in a car provides opportunities for social and political expression. Even the ubiquity of bumper stickers is evidence of Americans' desire to express and publicize moral and ethical commitments.[98]

II. PSYCHOLOGICAL BIASES INFLUENCING COVID-19 BEHAVIOR

Improving on the management of risk to be prepared for the next health crisis will require understanding how members of the public receive, interpret, and react to information from public health sources and from leaders. Psychological research provides a rich source of data from which theoretical models of human decision-making and behavior are drawn. There are a number of biases that have been identified that are particularly pertinent to the COVID-19 crisis. By examining the way these biases interact with various cultural and situational features, we can learn from the lessons of the past three years and derive a plan of action that will increase our chances of success in convincing people to take the right level of precautions and minimize negative physical and mental health outcomes.

A. Motivated Reasoning

The tendency for individuals to notice patterns that are consistent with preexisting understandings or beliefs is an automatic feature of human cognition. Motivated reasoning occurs when people make decisions in a way that reinforces preexisting preferences, even when the choices are counterproductive or inaccurate.[99] Psychologist Ziva Kunda has suggested that motivated reasoning occurs in two situations. The first is when people need to feel competent, and the second is when people are motivated to believe something because it fits their desired state of the world.[100]

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[98] For example, support for a politically "conservative" candidate can signal a lack of concern about the risk posed by Americans owning firearms but substantial concern about crime.

[99] Kunda, *supra* note 45, at 483. Kunda has argued that to avoid psychic discomfort, people maintain an "illusion of objectivity" that allows them to avoid the realization that their cognition has been tainted by their own preferences. *Id.* (quoting Tom Pyszczynski & Jeff Greenberg, *Toward an Integration of Cognitive and Motivational Perspectives on Social Inference: A Biased Hypothesis-Testing Model*, *in* 20 ADVANCES IN EXPERIMENTAL SOCIAL PSYCHOLOGY 297, 304 (Leonard Berkowitz ed., 1987)).

[100] *Id.*

1. Belief Perseverance and the Need for Consistency

Interpreting ambiguous information in a way that confirms one's beliefs is also a form of motivated reasoning.[101] Beliefs are "sticky." Once an individual has adopted an understanding of the world, it is difficult to convince them to alter the belief, even when there is overwhelming evidence that the original understanding is incorrect.[102] As psychologist Robert Cialdini has explained, human beings have a strong desire to be and to appear to be consistent.[103] Related to this need is the desire to be accurate.[104] It is easy to understand why one's self-image benefits from feeling consistent and accurate. Individuals seek to interpret information in a way that makes their preferred conclusions appear correct.[105] This goal is important because it satisfies the motivation to see oneself as knowledgeable, but it also permits a person to avoid changing course.[106] The need to stick with previously espoused views is important because people also prefer to hold attitudes that are consistent. Early social psychologists such as Leon Festinger, who studied how individuals make attributions about the self, theorized that a desire for consistency was an important motivator affecting behavior.[107]

2. Confirmation Bias

The confirmation bias is related to belief perseverance and the need for consistency. Confirmation bias is the tendency of people to unconsciously seek out information that confirms prior beliefs.[108] This bias also causes individuals to interpret ambiguous information in a way that supports previously formed attitudes and choices.[109] Confirmation bias can result in "tunnel vision," a predisposal to tune in

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[101] Moreno & Walker Wilson, *supra* note 13, at 562.

[102] Jana Siebert & Johannes Ulrich Siebert, *Effective Mitigation of the Belief Perseverance Bias After the Retraction of Misinformation: Awareness Training and Counter-Speech*, PLOS ONE, Mar. 8, 2023, at 1, 2–3.

[103] ROBERT B. CIALDINI, INFLUENCE: THE PSYCHOLOGY OF PERSUASION 57 (First Collins Bus. Essentials ed. 2007) ("It is . . . our nearly obsessive desire to be (and to appear) consistent . . . .").

[104] *See id.* at 58–59 (explaining how individuals convince themselves of their correctness in pursuit of the preservation and portrayal of consistency).

[105] *Id.*

[106] *Id.*

[107] *See* LEON FESTINGER, A THEORY OF COGNITIVE DISSONANCE (Stanford University Press, 3d prtg. 1965) (1957) [hereinafter FESTINGER, A THEORY OF COGNITIVE DISSONANCE]; *see also* LEON FESTINGER, HENRY W. RIECKEN & STANLEY SCHACHTER, WHEN PROPHECY FAILS 25–26 (1956).

[108] Molly J. Walker Wilson, *Legal and Psychological Considerations in Adolescents' End-of-Life Choices*, 109 NW. U. L. REV. ONLINE 203, 217 (2015).

[109] *Id.*

to that which supports one's own beliefs and tune out anything that could suggest that one's beliefs are incorrect.[110]

Confirmation bias plays a special role in risk assessments. This bias leads individuals to systematically seek out and interpret ambiguous evidence in a way that confirms a belief they hold. Confirmation bias is grounded in the unconscious need to be accurate and consistent. Because it is more comfortable to maintain a consistent view of the world than it is to incorporate new evidence and change one's worldview, this tendency reflects a form of motivated reasoning.[111] When individuals are confronted with new evidence that contradicts an attitude, psychic discomfort (cognitive dissonance) results.[112] In response, we can change our attitude to accommodate the new information, or we can interpret the new information to make the data fit our preferred worldview.[113]

During the pandemic, confirmation bias caused Deniers to selectively attend to sources of information that confirmed their belief that vaccines were dangerous or that mask mandates were unlawful infringements on their right to make their own personal choices.[114] In a similar vein, as vaccines and boosters became widely available, and the virus mutated and became less deadly, many Receptives adopted a precautionary mindset and organized their lives around COVID-19 mitigation measures. Having adopted habits that restored some sense of security in the midst of a frightening situation, many were loathed to relax precautions.[115] Like Deniers, Receptives were predisposed to selectively attend to signs of danger, perceiving the potential for new more deadly strains and an uptick in cases, even when the data suggested that the situation was improving.[116] Findings on the confirmation bias

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[110] *Id.*

[111] *See id.* at 217–18; Charles S. Taber & Milton Lodge, *Motivated Skepticism in the Evaluation of Political Beliefs*, 50 AM. J. POL. SCI. 755, 765, 767 (2006).

[112] Molly J. Walker Wilson, *The Rhetoric of Fear and Partisan Entrenchment*, 39 LAW & PSYCH. REV. 117, 147 (2015).

[113] Moreno & Walker Wilson, *supra* note 13, at 567–68.

[114] *See* Susan Milligan, *A Deadly Political Divide*, U.S. NEWS & WORLD REP. (July 23, 2021, 6:00 AM), https://www.usnews.com/news/the-report/articles/2021-07-23/coronavirus-vaccines-highlight-a-deadly-political-divide (noting that nearly a third of Republicans who were predisposed to distrust public health authorities viewed the push to get vaccinated as an effort on the part of the government to implant microchips in people).

[115] *See* Lydia Saad, *At Year Three, Americans Split on Whether Pandemic Is Over*, GALLUP (Mar. 9, 2023), https://news.gallup.com/poll/471734/year-three-americans-split-whether-pandemic.aspx.

[116] *Id.* The confirmation bias is related to priming, or the concept that exposure to a stimulus makes people particularly likely to respond in a particular way to a later stimulus. *See generally* Cherice Chan & Dillon Murphy, *Priming in Action: How We are Influenced Without Even Knowing*, PSYCH. IN ACTION, https://www.psychologyinaction.org/2020-11-25-priming-in-action-how-we-are-influenced-without-even-knowing [https://web.archive.org/web/20231208164724/

would suggest that for those individuals who are already wary of vaccines, any evidence that would suggest caution about the COVID-19 vaccine (such as the delay in FDA authorization and lack of approval for children under 12) is over-weighted relative to contradictory information about its safety.

3. Over-Optimism Bias

One of the simplest biases to explain, over-optimism bias, is the tendency for people to be overly optimistic when it comes to future outcomes. Over-optimism is ubiquitous and robust, affecting Americans from all walks of life.[117] Many empirical investigations have supported the prevalence of this bias.[118] For example, when asked about the probability that one's marriage will end in divorce, respondents greatly underestimate the likelihood of this event occurring.[119] This tendency to downplay the risk of poor outcomes extends to many areas of life, including job outcomes, avoiding natural disasters, and injury from accidents.[120] An exaggerated sense of invulnerability has dangerous behavioral implications during a pandemic. Research has shown that people have unrealistic expectations about their own ability to avoid disease.[121] Like other areas where scholars have written about the perils of the optimism bias,[122] the potential for this bias to interfere with rational decision-making during a pandemic has real and serious consequences. An unrealistic assessment of the probability of contracting COVID-19 and being hospitalized or dying

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https://www.psychologyinaction.org/2020-11-25-priming-in-action-how-we-are-influenced-without-even-knowing] (last visited Mar. 18, 2024).

[117] *See* Larry T. Garvin, *Disproportionality and the Law of Consequential Damages: Default Theory and Cognitive Reality*, 59 OHIO ST. L.J. 339, 404–05 (1998) ("The phenomenon is present in the inexpert—college students, consumers, and drivers, for instance. But over-optimism is prevalent in businesspeople and businesses as well. For example, a good many empirical studies have shown that entrepreneurs, particularly successful ones, are highly over-optimistic (or, put otherwise, have very low risk-aversion.) Nor is this behavior limited to individuals; businesses also display over-optimism." (internal citations omitted)).

[118] Cynthia T.F. Klein & Marie Helweg-Larsen, *Perceived Control and the Optimistic Bias: A Meta-Analytic Review*, 17 PSYCH. & HEALTH 437, 437 (2002); Garvin, *supra* note 117, at 404–05.

[119] Lynn A. Baker & Robert E. Emery, *When Every Relationship Is Above Average: Perceptions and Expectations of Divorce at the Time of Marriage*, 17 LAW & HUM. BEHAV. 439, 443 (1993).

[120] Neil D. Weinstein, *Unrealistic Optimism About Future Life Events*, 39 J. PERSONALITY & SOC. PSYCH. 806, 806, 810 (1980) (surveying subjects' optimism regarding various positive and negative events, such as losing a job); Craig Trumbo, Michelle A. Meyer, Holly Marlatt, Lori Peek & Bridget Morrissey, *An Assessment of Change in Risk Perception and Optimistic Bias for Hurricanes Among Gulf Coast Residents*, 34 RISK ANALYSIS 1013, 1014–16, 1022 (2014).

[121] John P. Kirscht, Don P. Haefner, S. Stephen Kegeles & Irwin M. Rosenstock, *A National Study of Health Beliefs*, 7 J. HEALTH & HUM. BEHAV. 248, 250–51 (1966).

[122] A common topic of discussion and concern among behavioral economists is the tendency of people to downplay risks associated with the stock market, saving for retirement, and buying insurance. *See, e.g.*, Melissa A. Z. Knoll, *The Role of Behavioral Economics and Behavioral Decision Making in Americans' Retirement Savings Decisions*, SOC. SEC. BULL., Nov. 2010, at 1.

from the disease caused tens of thousands of Americans to eschew masks and delay or reject vaccination.[123] The result was devastating for those individuals and for others around them who were at increased risk of contracting COVID-19 because their family members, friends, and colleagues failed to mitigate risk.[124]

4. Self-Serving & Over-Confidence Biases

In addition to striving to be accurate and consistent, people are motivated to maintain a positive self-image by meeting valued standards and goals. Dubbed the "self-serving bias," this tendency causes individuals to evaluate circumstances and outcomes in ways that reflect positively on themselves.[125] As a result, people tend to attribute negative outcomes to external causes and positive outcomes to internal attributes.[126] Research has supported the hypothesis that when people felt like they could do better, they attributed failure internally and their self-esteem declined as a result.[127] In contrast, when people perceived an inability to improve following a failure, they attributed the failure to external causes, resulting in protection to their self-esteem and ego maintenance.[128]

Similar to self-serving bias, and consistent with the need to maintain self-esteem, the over-confidence bias leads human beings to overestimate their own ability

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[123] Tobias Schlager & Ashley V. Whillans, *People Underestimate the Probability of Contracting the Coronavirus from Friends*, HUMANS. & SOC. SCIS. COMMC'NS, Feb. 2022, at 1, 9–10; *see also* Lindsay M. Monte, *Who Are the Adults Not Vaccinated Against COVID?*, U.S. CENSUS BUREAU (Dec. 28, 2021), https://www.census.gov/library/stories/2021/12/who-are-the-adults-not-vaccinated-against-covid.html; Megan Brenan, *Americans' Face Mask Usage Varies Greatly by Demographic*, GALLUP (July 13, 2020), https://news.gallup.com/poll/315590/americans-face-mask-usage-varies-greatly-demographics.aspx.

[124] The CDC announced that individuals who had received recommended vaccinations and vaccine boosters were 14 times less likely to die because of COVID-19 than unvaccinated individuals. Amelia G. Johnson et al., *COVID-19 Incidence and Mortality Among Unvaccinated and Vaccinated Persons Aged ≥ 12 Years by Receipt of Bivalent Booster Doses and Time Since Vaccination — 24 U.S. Jurisdictions, October 3, 2021–December 24, 2022*, 72 CDC MORBIDITY & MORTALITY WKLY. REP. 145, 145 (2023).

[125] Thomas Shelley Duval & Paul J. Silvia, *Self-Awareness, Probability of Improvement, and the Self-Serving Bias*, 82 J. PERSONALITY & SOC. PSYCH. 49, 49–50 (2002).

[126] Nancy A. Federoff & John H. Harvey, *Focus of Attention, Self-Esteem, and the Attribution of Causality*, 10 J. RSCH. PERSONALITY 336, 336–38, 344 (1976). This tendency is also reflected in the fundamental attribution error, whereby people attribute their own positive behaviors to internal traits and their negative behaviors to situational factors, but reverse this tendency when evaluating others. *See* Christopher Paul, *The Role of the Fundamental Attribution Error in the Context of Human Resource Management*, PSYCH. RSCH., Jan. 2021, at 8, 8; *see also* FRITZ HEIDER, THE PSYCHOLOGY OF INTERPERSONAL RELATIONS (Martino Publishing 2015) (1958) (providing the research basis for such theory).

[127] Duval & Silvia, *supra* note 125, at 54–55, 57–58.

[128] *Id.* at 57.

to perform well and to make accurate judgments.[129] Hence, they are overly confident when determining their skill and accuracy.[130] Together with the optimism and self-serving biases, this tendency means that individuals are unlikely to test their own theories and question their assumptions and understandings, disincentivizing a systematic testing of already-formed judgments.[131]

The implication of the research above is that when people are faced with information that shows that they made a mistake or that their judgment was incorrect, whether they attribute the failure to external sources or to internal sources (the self) is moderated by their sense for whether they can improve the situation. When individuals feel helpless to change or improve the situation, they are more likely to attribute the negative situation to external sources.[132] In that case, individuals maintain a high self-esteem and are unlikely to feel motivated to change. The pandemic created a situation in which many people reported feeling a lack of control and an inability to improve their situation.[133] This situation created the potential for very strong and lasting motivation to engage in self-protective behavior.[134] For Americans who were predisposed to follow the science and to heed public health warnings, there was a sense of comfort from behaving in a way that was consistent with public health messages.[135] In this instance, motivated reasoning worked to favor positive health behavior. For Americans who supported Trump and sympathized with science deniers, information that was in any way ambiguous—and in fact, almost *any* information—was interpreted to cast their favored politicians in a positive light and to be consistent with ideas they had previously professed to be true and accurate.[136]

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[129] Molly J. Walker Wilson, *Defense Attorney Bias and the Rush to the Plea*, 65 U. KAN. L. REV. 271, 286–87 (2016); *see also* HUBBARD, *supra* note 70, at 102.

[130] HUBBARD, *supra* note 70, at 102; *see also* Walker Wilson, *supra* note 129, at 287.

[131] *See* Walker Wilson, *supra* note 129, at 287.

[132] Moreno & Walker Wilson, *supra* note 13, at 566.

[133] A feeling of a loss of control was a dominant emotion during the pandemic. *See, e.g.*, Yunus Hacimusalar, Aybeniz Civan Kahve, Alisan Burak Yasar & Mehmet Sinan Aydin, *Anxiety and Hopelessness Levels in COVID-19 Pandemic: A Comparative Study of Healthcare Professionals and Other Community Sample in Turkey*, 129 J. PSYCHIATRIC RSCH. 181, 181 (2020).

[134] *See generally* Darlene M. Hunt, David Lester, & Nancy Ashton, *Fear of Death, Locus of Control and Occupation*, 53 PSYCH. REPS. 1022 (1983) (showing a connection between fear of dying and encounters with risky situations); David H. Barlow, Bruce F. Chorpita & Julia Turovsky, *Fear, Panic, Anxiety, and Disorders of Emotion*, 43 NEB. SYMP. ON MOTIVATION 251 (1996).

[135] *See* Moreno & Walker Wilson, *supra* note 13, at 574.

[136] *See id.* at 553–54, 556–57, 559.

B. *Culture & Group Factors*

1. *Cultural Norms*

The human need to establish an identity, maintain a belief system, and act in ways that are consistent with the chosen belief system is powerful.[137] Maintenance of self-concept and affiliation with an in-group are deeply rooted human drives with an evolutionary basis.[138] For early humans, acting in ways that were consistent with one's beliefs was adaptive because it kept individuals from engaging in behaviors that could be harmful, either because the behaviors posed a direct threat to the health and well-being of the individual, or because the individual risked suffering repercussions from the social group upon which they relied for safety and support.[139] Informational benefits also flowed from developing connections with an in-group and behaving in ways that were consistent with group values.[140] Group consensus was likely to be more informed than conclusions derived from a single person's experience.[141] Learning was aggregated and passed down to future generations, particularly as technologies and methods of communicating became more sophisticated.[142]

Cultural norms interact with motivational biases in a way that supports cultural commitments. Dan Kahan, who studies cultural cognition, has pointed out the curious phenomenon of "ideological conflicts over *facts* that turn on empirical evidence."[143] Kahan provides the examples of the debate over the source of global warming, the safety of nuclear power, the wisdom of vaccinating girls against the human papillomavirus, and the limits set on private gun ownership as examples of areas of conflict between conservatives and progressives.[144] He points out that

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[137] *See* Michelle R. Nario-Redmond, Monica Biernat, Scott Eidelman & Debra J. Palenske, *The Social and Personal Identities Scale: A Measure of the Differential Importance Ascribed to Social and Personal Self-Categorizations*, 3 SELF & IDENTITY 143, 144, 167 (2004).

[138] *See id.*

[139] Filipe Nobre Faria & André Santos Campos, *Social Evolution as Moral Truth Tracking in Natural Law*, 41 POL. & LIFE SCIS. 76, 76, 80 (2022).

[140] *Id.* at 85.

[141] *See id.* at 80.

[142] *See id.* at 76, 79, 85.

[143] Dan M. Kahan, *Ideology, Motivated Reasoning, and Cognitive Reflection*, 8 JUDGMENT & DECISION MAKING 407, 407 (2013).

[144] *Id.* ("Democrats (by and large) fervently believe that human activity is responsible for global warming, Republicans (by and large) that it is not. Conservatives are confident that the wastes generated by nuclear power plants can be safely disposed of by deep geologic isolation; liberals dispute that. People who value equality and community believe that vaccinating schoolgirls against the human papillomavirus is essential to protecting women's health—and that permitting private citizens to carry concealed hand guns increases crime. Those who value hierarchy and individualism, in contrast, reply that universal HPV vaccination will *undermine*

"[p]olitical polarization on empirical issues . . . . persists despite apparent scientific consensus on the answers to many of these disputed questions."[145] If scientific findings that have been widely studied cause cultural clashes, one can only imagine the potential for a novel virus to create division and conflict.

2. In-Group/Out-Group Bias & Group Polarization

Like motivated reasoning, association with members of particular groups is identity-confirming and ego-protective.[146] Kahan and colleagues have noted that motivational biases cause "individuals selectively to credit or dismiss evidence of risk in patterns that fit values they share with others."[147] Particularly when people are evaluating ideas about what constitutes the biggest threat, they are influenced by the commitments they share with others who have a similar worldview.[148] By creating and reinforcing common ideas, individuals avoid dissonance and protect social standing.[149]

Our need to affiliate with others in society who hold similar views causes us to seek these others out. "[S]imilarity [b]reeds [l]iking."[150] When human beings choose to select others with similar attitudes for community, the result is often group polarization.[151] Group polarization occurs when "members of a deliberating group move toward a more extreme point in whatever direction is indicated by the members' predeliberation tendency."[152] When like-minded individuals discuss an issue, particularly a controversial issue, the individuals' attitudes become more extreme.[153]

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young girls' health by lulling them into unprotected sex, and that gun *control* increases crime by making it harder for law-abiding citizens to protect themselves." (internal citations omitted)).

[145] *Id.*; *see also* Stephan Lewandowsky, Gilles E. Gignac & Samuel Vaughan, *The Pivotal Role of Perceived Scientific Consensus in Acceptance of Science*, 3 NATURE CLIMATE CHANGE 399, 399 (2013); Dan M. Kahan, Hank Jenkins-Smith & Donald Braman, *Cultural Cognition of Scientific Consensus*, 14 J. RISK RSCH. 147 (2011).

[146] Group membership creates identity-protective motivations to conform one's beliefs to those of like-minded others in order to avoid dissonance and protect social standing. Dan M. Kahan, Donald Braman, John Gastil, Paul Slovic & C. K. Mertz, *Culture and Identity-Protective Cognition: Explaining the White-Male Effect in Risk Perception*, 4 J. EMPIRICAL LEGAL STUD. 465, 470, 491, 497–98 (2007); *see also* Geoffrey L. Cohen, *Party Over Policy: The Dominating Impact of Group Influence on Political Beliefs*, 85 J. PERSONALITY & SOC. PSYCH. 808, 821 (2003).

[147] Kahan et al., *supra* note 145, at 148.

[148] *See* Dan M. Kahan, *Cultural Cognition as a Conception of the Cultural Theory of Risk*, *in* HANDBOOK OF RISK THEORY 740–41 (S. Roeser, R. Hillerbrand, P. Sandin & M. Peterson eds., 2008).

[149] Kahan et al., *supra* note 146, at 470; *see also* Cohen, *supra* note 146, at 821.

[150] Brian Collisson & Jennifer L. Howell, *The Liking-Similarity Effect: Perceptions of Similarity as a Function of Liking*, 154 J. SOC. PSYCH. 384, 385 (2014).

[151] Cass R. Sunstein, *The Law of Group Polarization* 15 (Univ. of Chi. L. Sch., John M. Olin L. & Econ. Working Paper No. 091, 1999).

[152] *Id.* at 3–4.

[153] *See* Cass R. Sunstein, *The Law of Group Polarization*, 10 J. POL. PHIL. 175, 176 (2002).

Ultimately, when subgroups within society hold opposing views on issues, "[p]olarization of views and escalation of rhetoric by partisans typically occur and new recruits are drawn into the conflicts."[154] As time goes on, fewer and fewer neutral parties exist, and the ideological chasm widens.[155]

Often groups are motivated to collectively adopt certain positions based upon shared interests and motivations.[156] The costs of risk prevention are rarely born equally by all members of society. If individuals perceive that they will have to make personal sacrifices in order to reduce the chance of a potential danger materializing, they may well profess less concern about the danger.[157] The importance of realized benefits to the acceptability of risks may be captured at least indirectly by the measure of voluntariness.[158] As Frank Cross points out:

> The voluntary acceptance of risk helps ensure that the same group incurs both the risk and the benefit of an activity (otherwise the community bearing the risk is unlikely to voluntarily accept it). An involuntarily borne risk, by contrast, may compel one group to accept the risk, while others benefit.[159]

C. Social Cognition Factors

1. The Availability Heuristic

The "availability heuristic" is the tendency of people to judge the frequency or pervasiveness of an event based upon the ease with which that event can be brought to mind.[160] This heuristic is an example of a simplifying error or heuristic; overweighting memorable information rather than assigning weight to information according to its relevance to the decision task. Research shows that the perceived danger of various risks tends to correlate with irrelevant features such as the frequency that a given event is reported in various news outlets or the vividness of the language

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[154] Kasperson et al., *supra* note 69, at 185.

[155] *See* Sunstein, *supra* note 151, at 30.

[156] Kahan, *supra* note 148, at 740; *see also* Sunstein, *supra* note 151, at 4.

[157] Cass R. Sunstein, *On the Divergent American Reactions to Terrorism and Climate Change*, 107 COLUM. L. REV. 503, 532 (2007) ("To the extent that people understand that they are themselves contributors to climate change, they are inclined to diminish the magnitude of the threat.").

[158] SUSAN G. HADDEN, A CITIZEN'S RIGHT TO KNOW: RISK COMMUNICATION AND PUBLIC POLICY 137 (1989) (noting the public's use of the word "risk" as "a much richer concept that involves balancing benefits against unwanted outcomes and also involves some sense of the fairness of the activities that create the risk"); *see also* Frank B. Cross, *The Public Role in Risk Control*, 24 ENV'T L. 887, 926 (1994) ("An activity with substantial perceived benefits will, on balance, be considered to be less risky. Because the risk appears more worthwhile, it consequently seems less great.").

[159] Cross, *supra* note 158, at 915.

[160] Thorsten Pachur, Ralph Hertwig & Florian Steinmann, *How Do People Judge Risks: Availability Heuristic, Affect Heuristic, or Both?*, 18 J. EXPERIMENTAL PSYCH. 314, 315 (2012).

used to report the event. As a result, individuals misconstrue the relative dangerousness of potential hazards.[161] This phenomenon played out during the pandemic in uneven ways, disproportionately affecting people who sought out certain types of information about mitigation measures. For example, someone who searched for information on the side effects and poor outcomes of a vaccine had no trouble finding narratives (many of which were exaggerated or false) about dangers associated with the vaccine.[162] Selective attention to this kind of story, rather than random sampling of all of the information about the vaccine, would create the impression that the risks from the vaccine were significant. During the height of the pandemic, information about hospitalization and death from the virus was hard to avoid. Ironically, the more common this information became, the more likely it was to go unnoticed for those who were predisposed to downplay the need for mitigation measures.[163] Research has shown that people tend to underestimate the frequencies of causes of death that are most common such as diabetes, heart disease, and cancers, in part because the characteristic of being common makes stories of these illnesses less remarkable, and so less memorable.[164] In contrast, fantastical reports of various supposed harms resulting from the vaccine are striking, vivid, and alarming, evoking emotion and creating an indelible memory of the event.[165]

2. Social Amplification & Availability Campaigns

The cognitive availability of risk outcomes is impacted by the way information travels through society. Roger Kasperson and his colleagues have offered a theoretical model describing the dynamic processes of risk communication called "social

[161] *Id.*; *see also* Christina E. Wells, *Questioning Deference*, 69 MO. L. REV. 903, 929 (2004) (pointing out that "the public may fall prey to skewed risk assessment as a result of private availability entrepreneurs' attempts to fan fear regarding particular threats").

[162] *See, e.g.*, *Why Were U.S. Media Silent on Pfizer Vaccine Deaths?*, GLOB. TIMES (Jan. 15, 2021, 8:00 PM), https://www.globaltimes.cn/page/202101/1212939.shtml.

[163] Kiki de Bruin, Yael de Haan, Rens Vliegenthart, Sanne Kruikemeier & Mark Boukes, *News Avoidance During the COVID-19 Crisis: Understanding Information Overload*, 9 DIGIT. JOURNALISM 1286, 1289 (2021) (discussing how information overload led to avoiding the news); *see also* Kunda, *supra* note 45, at 495 (noting that "people are more likely to search spontaneously for hypothesis-consistent evidence than for inconsistent evidence," creating possible suppression of contrary evidence).

[164] Garvin, *supra* note 117, at 399; *see also* Paul Slovic, Baruch Fischhoff & Sarah Lichtenstein, *Facts Versus Fears: Understanding Perceived Risk*, *in* JUDGMENT UNDER UNCERTAINTY: HEURISTICS AND BIASES 463, 466–68 (Daniel Kahneman, Paul Slovic & Amos Tversky eds., 1982) (highlighting the difference between the public's perception of the prevalence of risks and reality); *see also* Kuran & Sunstein, *supra* note 69, at 723 n.162 (discussing that the more a person is exposed to a view, the easier it is retrieved from memory and, hence, the less doubtful it appears).

[165] *See, e.g.*, Garvin, *supra* note 117, at 399 (noting that sudden, unusual disasters are vastly overestimated in frequency, in comparison to common illnesses due to the memorable features of the event).

amplification of risk" (SAR).[166] SAR posits that individuals experience increasing (amplifying) or decreasing (attenuating) concern depending upon how information about threats travels through groups in society.[167] In addition to describing outcomes, social amplification theory also seeks to explain the characteristics of information flow and how patterns of social exchange and the very nature of communication can impact perceptions of risk. SAR identifies four aspects of communication about risk that can affect risk judgments: the volume of information about the risk, the degree to which the information is controversial, the sensationalistic nature of the information, and the "symbolic connotations" inherent in the information.[168] Several of these characteristics implicate certain so-called amplification stations.[169] For example, the media's interest in a particular risk is likely to result in repeated, highly-sensationalized reports that increase the public's attention to the risk.[170]

The COVID-19 pandemic met all of the criteria for amplification. The sheer magnitude of the threat meant that Americans were bombarded with information from news outlets, health care workers, lawmakers and community leaders, educational institutions, celebrities, and virtually anyone who had an opinion to share on social media. The appropriate response to the pandemic became controversial almost immediately. In fact, even before the first case surfaced in the United States, then-President Trump's characterization of the disease as the "China virus," unproblematic for some Americans, was offensive to many others.[171] The portrayal of COVID-19-related information was also sensationalized.[172] Communication that is sensational is often characterized as that which is designed to elicit emotional responses.[173]

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[166] *See* Kasperson et al., *supra* note 69.

[167] *Id.* at 185.

[168] *Id.* at 184–85.

[169] *Id.* at 181; *see also* van Baar & FeldmanHall, *supra* note 38, at 398 (discussing how polarization may be amplified by overexposure or selective engagement with information sources); Cobb, *supra* note 38 (discussing how individuals insulate themselves from information that conflicts with their beliefs).

[170] Kasperson et al., *supra* note 69, at 184 (pointing out that repeated coverage of a particular hazard can result in public "scares").

[171] Becky Little, *Trump's 'Chinese' Virus Is Part of a Long History of Blaming Other Countries for Disease*, TIME (Mar. 20, 2020, 1:57 PM), https://time.com/5807376/virus-name-foreign-history.

[172] *See* Lauren Jodi Van Scoy, Bethany Snyder, Erin L. Miller, Olubukola Toyobo, Ashmita Grewel, Giang Ha, Sarah Gillespie, Megha Patel, Jordyn Reilly, Aleksandra E. Zgierska & Robert P. Lennon, *Public Anxiety and Distrust Due to Perceived Politicization and Media Sensationalism During Early COVID-19 Media Messaging*, 14 J. COMMC'N HEALTHCARE 193, 198 (2021).

[173] *See* Hank Davis & S. Lyndsay McLeod, *Why Humans Value Sensational News: An Evolutionary Perspective*, 24 EVOLUTION & HUM. BEHAV. 208, 208 (2003).

A decade after the SAR paper, Timur Kuran and Cass Sunstein wrote a paper discussing "availability campaigns."[174] According to Kuran and Sunstein, these campaigns occur through social discourse amplifying the cognitive availability of risks, independent of these risks' true danger. The result is a "snowball" effect, resulting in mushrooming concern among members of the public. While a cultural evaluator model[175] would indicate that culturally based risk preferences should drive policy, availability cascades indicate that the factual premises that serve as a foundation for risk preferences can be significantly distorted.[176] Admittedly, there is some debate over the extent to which individuals should be able to engage in risky behaviors.[177]

D. Emotions

Fear was a prevalent emotion associated with COVID-19, as is true when there is any large-scale threat to human health.[178] As the politics around the pandemic heated up, anger became another common emotion as groups on both sides of the masking question polarized and encountered opposing rhetoric.[179] News outlets reported the spread of the disease and the rising death toll along with stories about overwhelmed hospitals, exhausted health care workers, and families grieving lost loved ones.[180] Opinion pieces and social media posts often reflected fear, confusion,

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[174] Kuran & Sunstein, *supra* note 69, at 733–35 (explaining that when actors behave strategically to create availability cascades for specific purposes, they become "availability campaigns").

[175] Dan Kahan's cultural evaluator theory draws on the work of Mary Douglas, who viewed emotional (i.e., nonrational) reactions to risk as manifestations of culturally shaped (and valuable) expressions of underlying worldviews. Kahan, *supra* note 70, at 748–52; *see also* DOUGLAS, *supra* note 69.

[176] Kuran & Sunstein, *supra* note 69, at 734.

[177] *Compare, e.g.*, Kim Witte, Kenzie A. Cameron, Janet K. McKeon & Judy M. Berkowitz, *Predicting Risk Behaviors: Development and Validation of a Diagnostic Scale*, 1 J. HEALTH COMMC'N 317 (1996) (discussing guidelines for health care professionals to convey health risk to patients), *with* LIBERTARIAN PARTY, PLATFORM § 1.1 (2022), https://www.lp.org/platform (reflecting a belief that "[i]ndividuals have the freedom and responsibility to decide . . . what risks they accept to their own health").

[178] *See* Lorena García-Fernández, Verónica Romero-Ferreiro, Sergio Padilla, Guillermo Lahera & Roberto Rodriguez-Jimenez, *Different Emotional Profile of Health Care Staff and General Population During the COVID-19 Outbreak*, 14 PSYCH. TRAUMA: THEORY, RSCH., PRAC., & POL'Y 266, 268–69 (2022).

[179] *See id.*

[180] *See, e.g.*, Arelis R. Hernández & Alexandra Hinojosa, *El Paso Was Still Grieving When the Coronavirus Arrived. Now, Death Has Overwhelmed It,* WASH. POST (Nov. 27, 2020, 3:58 PM), https://www.washingtonpost.com/nation/2020/11/27/el-paso-coronavirus.

and anger, fueling similar emotions in readers and prompting responses, resulting in precisely the conditions ripe for amplification.[181]

1. Emotions as Shortcuts

Values, or cultural norms, are only one part of the risk-decision equation. Emotions are shortcuts to decisions that are particularly prevalent in risk decisions.[182] Fear, anger, and disgust signal "bad." It is alarmingly clear that while emotional reactions to triggers started as adaptive, in a more complex and nuanced decision-making situation, emotion has more force than is merited.[183] Emotions are also characterized as part of "System 1," the automatic and effortless reaction to a stimulus.[184] Therefore, although often cognitive shortcuts (heuristics) and emotions have been discussed as distinct,[185] emotion is part of heuristic processing, and both are features of System 1.[186] Among Deniers, Skeptics, and Receptives alike, emotions provided powerful incentives to pursue actions consistent with those emotions.[187]

An individual will experience more emotion when evaluating a risk that feels particularly self-relevant.[188] Emotions, in turn, play an important role not only in how much people care about addressing harms, but also in how they evaluate future outcomes.[189] Anger, for instance, is correlated with an optimistic view, while sadness is correlated with pessimism.[190] To the extent that emotions are heightened in stakeholders, existing predilections will be exaggerated.[191] Interestingly, however, when

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[181] Shuguang Zhao & Xuan Wu, *From Information Exposure to Protective Behaviors: Investigating the Underlying Mechanism in COVID-19 Outbreak Using Social Amplification Theory and Extended Parallel Process Model*, FRONTIERS PSYCH., May 2021, at 1, 1–2.

[182] *See* Hye-Jin Paek, Sang-Hwa Oh & Thomas Hove, *How Fear-Arousing News Messages Affect Risk Perceptions and Intention to Talk about Risk*, 31 HEALTH COMMC'N 1051, 1052 (2016).

[183] *See* Hans-Rüdiger Pfister & Gisela Böhm, *The Multiplicity of Emotions: A Framework of Emotional Functions in Decision Making*, 3 JUDGMENT & DECISION MAKING 5, 6 (2008).

[184] Daniel Kahneman, *Maps of Bounded Rationality: Psychology for Behavioral Economics*, 93 AM. ECON. REV. 1449, 1451 (2003).

[185] *See* Kahan, *supra* note 143.

[186] Walker Wilson, *supra* note 72, at 174 (discussing how emotions trigger "instinctive" choices).

[187] *See id.* (arguing that emotions trigger powerful drives to act in ways that are congruent with the triggered emotion).

[188] *See, e.g.*, Jeremy A. Blumenthal, *Emotional Paternalism*, 35 FLA. STATE U. L. REV. 1, 70 (2007) (suggesting that strong emotional reactions to self-relevant risks might lead legislators to take action to prevent affected members of the public from making hasty, ill-advised decisions).

[189] Jennifer S. Lerner, Roxana M. Gonzalez, Deborah A. Small & Baruch Fischhoff, *Effects of Fear and Anger on Perceived Risks of Terrorism: A National Field Experiment*, 14 PSYCH. SCI. 144, 148 (2003).

[190] *Id.* ("Experiencing more anger triggered more optimistic beliefs; experiencing more fear triggered greater pessimism.").

[191] Kahan, *supra* note 70, at 757 ("[P]erceptions of danger naturally feed upon one another among persons who share cultural commitments. This form of group polarization in risk

there is uncertainty as to the scope and direction of a risk, respondents are significantly more likely to see others as at risk than they are to see themselves as potential victims.[192]

2. Emotions and Judgments

"The rational and the experiential systems [of individuals] operate in parallel and each seems to depend on the other for guidance."[193] Studies have demonstrated that reasoning is rarely free of affect, and emotions can be helpful cues for decision-makers.[194] Even if emotions do not consistently serve as optimal cues for risk-decision purposes, they may serve as signals for personal beliefs that have enormous value to the human being who holds them.[195] The value of affective reactions is explicit in the "cultural evaluator" model advanced by Dan Kahan. The cultural evaluator model of risk perception views emotional responses to risk as reflective of an individual's culturally defined, expressive evaluation of potential dangers.[196] According to Kahan, "[w]hen people draw on their emotions to judge the risk that such an activity poses, they form an expressively rational attitude about what it would mean for their cultural worldviews for society to credit the claim that that activity is dangerous and worthy of regulation."[197] The cultural evaluator model rejects both the

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perceptions, then, is another dynamic that can be explained consistently with the view that emotion is a form of expressive perception and not a cognitive bias." (internal citations omitted)).

[192] Lerner et al., *supra* note 189, at 148–50. Lerner also found that the effects of emotion on risk perception generalizes from the perceived likelihood of self-relevant outcomes ("will it happen to me?") to other-relevant outcomes. *See id.* at 145, 147. This tendency is related to the optimism bias, the tendency to attribute superior traits to oneself and to predict positive outcomes for one's own future. *See, e.g.*, Laurie Larwood & William Whittaker, *Managerial Myopia: Self-Serving Biases in Organizational Planning*, 62 J. APPLIED PSYCH. 194, 195–96 (1977) (reporting that management students overestimated the likelihood that they will outperform competitors); K. Patricia Cross, *Not Can, But Will College Teaching Improve?*, NEW DIRECTIONS FOR HIGHER EDUC., Spring 1977, at 1, 10 (citing a study indicating that 94% of college professors think that their work is above average); John R. Chambers & Paul D. Windschitl, *Biases in Social Comparative Judgments: The Role of Nonmotivated Factors in Above-Average and Comparative-Optimism Effects*, 130 PSYCH. BULL. 813 (2004) (claiming that "[a]bove-average effects and comparative-optimism effects are perhaps the two most robust and widely replicated phenomena"). Over-optimism bias can also lead to systematic underestimations about the likelihood that one will catch a disease. *See* Klein & Helweg-Larsen, *supra* note 118, at 437–38.

[193] Paul Slovic, Melissa L. Finucane, Ellen Peters & Donald G. MacGregor, *Risk as Analysis and Risk as Feelings: Some Thoughts About Affect, Reason, Risk, and Rationality*, 24 RISK ANALYSIS 311, 311 (2004).

[194] *See id.*

[195] *See* MARTHA C. NUSSBAUM, UPHEAVALS OF THOUGHT: THE INTELLIGENCE OF EMOTIONS 19 (2001) ("Emotions . . . involve judgments about important things, judgments in which, appraising an external object as salient for our own well-being, we acknowledge our own neediness and incompleteness before parts of the world that we do not fully control.").

[196] *See* Kahan, *supra* note 70, at 748–51.

[197] *Id.* at 750–51 (emphasis omitted).

neoclassical economic rational actor model (which claims that risk decisions involve analytical optimization strategies) and the behavioral-decision model (which views emotions as biases).[198] As this author has argued elsewhere:

> Emotions are highly dependent upon other features of the risk context.[199] When there is a known, hated perpetrator or when there is an act that is outrageous, there will be more agitation, perhaps not out of *fear per se*, but out of a hybrid of fear and loathing for the source of the fear.[200]

A central feature of the culture-based theories is the notion that culturally-derived values have legitimate influences over risk preferences.[201] The membership of an individual in a certain class—hierarchical, egalitarian, individualistic, or fatalistic—is believed to help gauge that individual's risk tolerance and preferences.[202]

The notion that emotional reactions to risk should be heeded and accounted for by those in the position to influence policy for others does not mean that emotion-driven reactions to risk are always "correct" in the sense that they provide the best guidance for decisions. Philosopher Joshua Greene argues that our dual system of decision processing that involves emotion and reasoning can be explained in deontological and consequentialist terms.[203] The "fast" and "frugal" route to a decision is the emotional one, as evidenced by the fact that putting people under cognitive load or diminishing their ability to think through a problem leads them to deontological decisions.[204]

Scholarship rooted in affective intelligence theory and other theories of emotion points to the idea that fear can lead people to withdraw, seek more information,

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[198] *See id.* at 749 (suggesting that cultural evaluator theory, as opposed to irrational weigher theory, "offers a very different account of how" emotions "enter[] into the cognition of risk").

[199] Walker Wilson, *supra* note 72, at 176 (citing Kahan, *supra* note 70, at 741).

[200] *Id.* (citing Kahan, *supra* note 70, at 746).

[201] *See* Claire Marris, Ian Langford & Timothy O'Riordan, Integrating Sociological and Psychological Approaches to Public Perceptions of Environmental Risks: Detailed Results From a Questionnaire Survey 11–12 (Ctr. for Soc. & Econ. Rsch., Working Paper No. GEC 96-07, 1996).

[202] *See* MICHAEL THOMPSON, RICHARD ELLIS & AARON WILDAVSKY, CULTURAL THEORY 5 (1990). Thompson and colleagues have discussed the variables as follows: "*Group* refers to the extent to which an individual is incorporated into bounded units. The greater the incorporation, the more individual choice is subject to group determination. *Grid* denotes the degree to which an individual's life is circumscribed by externally imposed prescriptions." *Id.*

[203] Joshua D. Greene, *Beyond Point-and-Shoot Morality: Why Cognitive (Neuro)Science Matters for Ethics*, 124 ETHICS 695, 698–99 (2014) (explaining the "central tension" as the conflict between the rights and duties based in emotional responses on the one hand, and cost-benefit analysis that tends to be grounded in effortful reasoning and outcome-based principles on the other).

[204] Kahneman, *supra* note 184, at 1451, 1453–54; Paul Conway & Bertram Gawronski, *Deontological and Utilitarian Inclinations in Moral Decision Making: A Process Dissociation Approach*, 104 J. PERSONALITY & SOC. PSYCH. 216, 218, 224–25 (2013).

and carefully consider how they might respond.[205] In this context, new information regarding threats might help individuals to identify the source of the threat, decide what to do, and determine how to behave.[206] One team of political scientists noted: "Fear leads voters, on balance to avoid risks."[207] This team goes on to explain that in contrast to fear, anger "displays distinct and powerful effects on politics," and "can lead individuals to take risks that they would otherwise avoid."[208] Moreover, anger can increase an individual's reliance on moral, social, and cultural commitments.[209] For Americans, engaging with controversial topics typically triggers anger, rather than fear.[210] Communication during the pandemic amply illustrated this principle. As discussion around COVID-19 heated up, partisans on both sides of the political spectrum resorted to inflammatory rhetoric and finger-pointing, and a common emotional byproduct was anger.[211]

E. Additional Biases Hampering Public Health Messaging

In addition to the biases described above, a number of other features of human decision-making create barriers to effective public health messaging. Each of the following exacerbated the problems created by motivated reasoning and emotional reactions to communication during a pandemic.

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[205] Nicholas A. Valentino, Carly Wayne & Marzia Oceno, *Mobilizing Sexism: The Interaction of Emotion and Gender Attitudes in the 2016 US Presidential Election*, 82 PUB. OP. Q. 799, 802 (2018). That is to say: "Fear orients the brain to new information regarding threats, and away from habits of mind, including group-based predispositions like sexism and authoritarianism." *Id.*

[206] For example, voting decisions have been reflected in this behavior pattern. *Id.*

[207] *Id.* (citing Jennifer S. Lerner & Dacher Keltner, *Fear, Anger and Risk*, 81 J. PERSONALITY & SOC. PSYCH. 146, 149 (2001)). Thus, Valentino, Wayne, and Oceno conclude that fear about the various threats discussed during the 2016 election "was not likely to galvanize support for Trump at all, especially among sexists, ethnocentrists, and authoritarians." *Id.*

[208] *Id.* (citing Lerner & Keltner, *supra* note 207). Anger mobilizes political participation while fear and anxiety often depress it. *See* Nicholas A. Valentino, Ted Brader, Eric W. Groenendyk, Krysha Gregorowicz & Vincent L. Hutchings, *Election Night's Alright for Fighting: The Role of Emotions in Political Participation*, 73 J. POL. 156, 168 (2011).

[209] *See* Valentino et al., *supra* note 205, at 802 ("[A]nger triggers a reliance on predispositions and habits of mind, including group identities and partisan attachments." (citing Michael MacKuen, Jennifer Wolak, Luke Keele & George E. Marcus, *Civic Engagements: Resolute Partisanship or Reflective Deliberation*, 54 AM. J. POL. SCI. 440, 441, 453 (2010); Eric W. Groenendyk & Antoine J. Banks, *Emotional Rescue: How Affect Helps Partisans Overcome Collective Action Problems*, 35 POL. PSYCH. 359, 363, 375 (2014))).

[210] *See id.* at 802–03.

[211] *See* Ali Haif Abbas, *Politicizing COVID-19 Vaccines in the Press: A Critical Discourse Analysis*, 35 INT'L J. FOR SEMIOTICS L. 1167, 1183 (2022).

1. The Status Quo Bias

Inertia and the status quo bias create additional hurdles for risk assessors.[212] The status quo bias is the preference for inaction over action.[213] Although failure to act is, itself, a choice with accompanying consequences, this is often not how human beings experience choices.[214] Status quo bias is a form of risk aversion—people are more discouraged by risks than they are motivated by gains, even when the chance of gain would suggest that the risk was a sensible gamble.[215] This bias leads people to resist change, particularly when that change is accompanied by situational features that are personally unfamiliar.[216] Status quo bias and the resulting inertia occurs when people fear pursuing a course of action that may result in harms. It is preferable for harms to result from failure to act because, in this case, people do not feel as much agency and resulting regret.[217]

2. Psychological Reactance

Psychological reactance, the process by which an individual reacts against perceived threats to one's own freedom,[218] can play an important role in resistance to public health messages. When an expert dictates a particular course of action or a lawmaker mandates a behavior, members of the public sometimes experience resentment and resist the advice or dictate. This type of reaction is particularly likely among individuals who are primed to be suspicious of certain sources of information or for whom personal choice is more important than the collective good.[219] Dominance motivation is both a desire to coerce others into submission or obedience, and a fear of being so coerced.[220] For individuals motivated by a desire to dominate the

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[212] Rob Henderson, *How Powerful Is Status Quo Bias?*, PSYCH. TODAY (Sept. 29, 2016), https://www.psychologytoday.com/us/blog/after-service/201609/how-powerful-is-status-quo-bias.

[213] *Id.*

[214] *See id.*

[215] *Id.*

[216] *Id.*

[217] *See, e.g.*, *id.* (explaining that individuals feel "twice as much psychological pain" from losses as they do from gains).

[218] Christina Steindl, Eva Jonas, Sandra Sittenthaler, Eva Traut-Mattausch & Jeff Greenberg, *Understanding Psychological Reactance: New Developments and Findings*, 223 ZEITSCHRIFT FÜR PSYCHOLOGIE 205, 205–06 (2015).

[219] *See* Claude H. Miller, Lindsay T. Lane, Leslie M. Deatrick, Alice M. Young & Kimberly A. Potts, *Psychological Reactance and Promotional Health Messages: The Effects of Controlling Language, Lexical Concreteness, and the Restoration of Freedom*, 33 HUM. COMMC'N RSCH. 219, 220–24 (2007).

[220] Felix Suessenbach & Adam B. Moore, *Dominance Desires Predicting Conspiracy Beliefs and Trump Support in the 2016 U.S. Election*, 6 MOTIVATION SCI. 171, 172 (2020).

conversation or exert control over others, psychological reactance is particularly likely.[221]

> According to cognitive dissonance theory, one powerful reduction mechanism is negating challenging information . . . . This can be achieved by giving credence to election conspiracies in order to (preemptively) adjust outcomes (i.e., we haven't really lost; we were cheated), group identity (i.e., we are still great; the other side was unfair), or worldview (i.e., most Americans are like me; the statistics are rigged).[222]

3. Psychological Impacts of Weathering Pandemic Times

Rejection can result in individuals experiencing diminished ability to reason and effectively regulate their behavior.[223] When people feel excluded or unwanted, they exhibit higher levels of aggression and hostility.[224] Entrenched beliefs about masking, vaccinating, and mandates exacerbated hostility in individuals who held divergent beliefs about out-group members. During the pandemic, people were weary, wary, anxious, isolated, hit financially, cramped in small spaces, bored, lonely, and sick of their family members. These factors exacerbated other effects. Family and friends got sick, and some died. When businesses were forced to send employees home, many people became isolated and resources such as medical treatment, mental health services, goods, and money became scarce. Moreover, as social and economic resources dwindled, people became increasingly cognitively taxed.[225] The emergence of the pandemic brought with it a fresh array of choices about how to protect oneself and loved ones, which activities to give up, when and where to wear a mask, and with whom to associate—an array of decision tasks that were largely absent before COVID-19. The simple act of making decisions has been shown to decrease individuals' ability to exhibit self-control.[226] Furthermore, when individuals experience emotional distress, they tend to engage in pleasure-seeking to

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[221] *Id.*

[222] *Id.* (internal citations omitted).

[223] Roy F. Baumeister, Lauren E. Brewer, Dianne M. Tice & Jean M. Twenge, *Thwarting the Need to Belong: Understanding the Interpersonal and Inner Effects of Social Exclusion*, 1 SOC. & PERSONALITY PSYCH. COMPASS 506, 514–15 (2007).

[224] Jean M. Twenge, Roy F. Baumeister, Dianne M. Tice & Tanja S. Stucke, *If You Can't Join Them, Beat Them: Effects of Social Exclusion on Aggressive Behavior*, 81 J. PERSONALITY & SOC. PSYCH. 1058, 1066 (2001).

[225] *See* Andrea Banovcinova, Jana Levicka & Martin Veres, *The Impact of Poverty on the Family System Functioning*, 132 PROCEDIA 148, 152 (2014) (discussing how families living in poverty experience stress that can lead to instability within familial relationships).

[226] Kathleen D. Vohs, Roy F. Baumeister, Brandon J. Schmeichel, Jean M. Twenge, Noelle M. Nelson & Dianne M. Tice, *Making Choices Impairs Subsequent Self-Control: A Limited-Resource Account of Decision Making, Self-Regulation, and Active Initiative*, 94 J. PERSONALITY & SOC. PSYCH. 883, 895 (2008).

relieve the unpleasant feelings.[227] Unfortunately, pleasurable activities are not always healthy, and many Americans turned to self-destructive behaviors.

III. THE SOCIO-POLITICAL LANDSCAPE

A. History of the Pandemic

As of early September 2021, the United States had witnessed the loss of nearly 651,000 Americans to the COVID-19 pandemic.[228] A light at the end of the tunnel emerged when three variants of a vaccine received emergency status approval and gradually became widely available.[229] On April 19, 2021, all adults in the United States were eligible to receive the vaccine.[230] The positive impact of immunizing a nation's population has been well-documented.[231] In late August 2021, the CDC released a study reporting that unvaccinated people were roughly 29 times more likely to be hospitalized with COVID-19 than those who are fully vaccinated.[232] The CDC also found that unvaccinated people were almost five times more likely to be infected with COVID-19 than those who were vaccinated.[233] Yet, despite ample supply and evidence that the vaccine was efficacious and safe, many Americans remained willfully, and sometimes resolutely, unvaccinated.[234] As late as spring of 2022, vaccine hesitancy was still a problem. A Washington Post article from March 25, 2022, reported that rates of vaccination for the coronavirus had plummeted to their lowest levels since the shots were rolled out in December 2020, even as some infectious disease experts feared another case surge. The Post noted that

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[227] Dianne M. Tice, Ellen Bratslavsky & Roy F. Baumeister, *Emotional Distress Regulation Takes Precedence Over Impulse Control: If You Feel Bad, Do It!*, 80 J. PERSONALITY & SOC. PSYCH. 53, 65 (2001).

[228] *Coronavirus in the U.S.: Latest Map and Case Count*, N.Y. TIMES, https://www.nytimes.com/interactive/2021/us/covid-cases.html [https://web.archive.org/web/20210909012219/https://www.nytimes.com/interactive/2021/us/covid-cases.html] (Sept. 8, 2021).

[229] *See COVID-19 Vaccines*, U.S. DEPT. HEALTH & HUM. SERVS., https://www.hhs.gov/coronavirus/covid-19-vaccines/distribution/index.html (last visited Mar. 24, 2024).

[230] *Id.*

[231] *E.g.*, Jenifer Ehreth, *The Global Value of Vaccination*, 21 VACCINE 596, 597–99 (2003).

[232] Jennifer B. Griffin, Meredith Haddix, Phoebe Danza, Rebecca Fisher, Tae Hee Koo, Elizabeth Traub, Prabhu Gounder, Claire Jarashow, & Sharon Balter, *SARS-CoV-2 Infections and Hospitalizations Among Persons Aged ≥16 Years, by Vaccination Status—Los Angeles County, California, May 1–July 25, 2021*, 70 MORBIDITY & MORTALITY WKLY. REP. 1170, 1170 (2021).

[233] *Id.* at 1170–71.

[234] *See* Tamara Keith, *The Share of U.S. Adults Willing to Get Vaccinated Ticks Up, A New Poll Finds*, NPR (Sept. 3, 2021, 12:00 PM), https://www.npr.org/2021/09/03/1033750072/the-share-of-u-s-adults-willing-to-get-vaccinated-ticks-up-a-new-poll-finds (discussing how even after the FDA granted full approval to a COVID-19 vaccine, 19% of American adults still said they do not intend to be vaccinated).

"the seven-day average of vaccinations fell to fewer than 182,000 per day," indicating that many have been reluctant to get a third shot.[235]

The CDC's new recommendations to mask up even if vaccinated came in July 2021, after a new strain, the Delta variant, contributed to a spike in cases and all-time high numbers of new infections in areas of Florida and Louisiana.[236] In response to record-number new cases, some local officials implemented a statewide indoor mask mandate as hospitals returned to delaying elective surgeries and limiting visitors.[237] In the areas around Jacksonville and Orlando, Florida, COVID-19 hospital admissions also surged, prompting theme parks such as Disney World to reinstate mask mandates.[238] Local and state officials responded to the surge differently, with some governors and mayors trying to jump out in front of the resurgence by reinstating mask mandates before their communities got hit hard.[239] Others were refusing to take measures or were proactively passing measures to prohibit businesses from requiring masks.[240]

A Kaiser Family Foundation (KFF) poll released in early August 2021 reported that masking recommendations and mandates were likely to miss the mark for the very Americans at greatest risk—those who were still unvaccinated.[241] The KFF poll indicated that "vaccinated adults were more likely to report wearing a mask at least 'most of the time,'" and far more often than unvaccinated adults.[242] It also found

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[235] Brittany Shammas, Dan Keating, Salvador Rizzo & Lenny Bernstein, *Covid Vaccinations - Including Boosters - Fall to Lowest Levels Since 2020*, WASH. POST (Mar. 25, 2022, 6:00 AM), https://www.washingtonpost.com/health/2022/03/25/covid-boosters-vaccines.

[236] Fenit Nirappil & Ashley Cusick, *When Delta Strikes: Latest Coronavirus Surges Grow Faster, Hit Record Heights in Louisiana, Florida*, WASH. POST (Aug. 3, 2021, 12:20 PM), https://www.washingtonpost.com/health/2021/08/03/covid-delta-surge-south; *see also* Derek Hawkins & Bryan Pietsch, *New CDC Mask Guidance Confuses and Frustrates Some Americans as Delta Variant Surges*, WASH. POST (July 28, 2021, 6:04 PM) https://www.washingtonpost.com/health/2021/07/28/mask-mandate-nevada-vegas.

[237] *See, e.g.*, Adela Suliman, *Masks Are Back at Disney World Amid Political Tensions Over Coronavirus Restrictions in Florida*, WASH. POST (Jul. 29, 2021, 8:44 AM), https://www.washingtonpost.com/nation/2021/07/29/disney-world-masks-florida (referencing Orange County Mayor Jerry Demings' imposition of an indoor mask mandate).

[238] *Id.*

[239] *See generally* Yurira Avila, Barbara Harvey, Jasmine C. Lee & Julie Walton Shaver, *See Mask Mandates and Guidance in Each State*, N.Y. TIMES, https://www.nytimes.com/interactive/2021/us/cdc-mask-guidance-states.html (Feb. 25, 2022); David J. Sencer, *CDC Museum COVID-19 Timeline*, CDC, https://www.cdc.gov/museum/timeline/covid19.html (Mar. 15, 2023).

[240] *See* Avila et al., *supra* note 239.

[241] Ashley Kirzinger, Grace Sparks, Liz Hamel, Lunna Lopes, Audrey Kearney, Mellisha Stokes & Mollyann Brodie, *COVID-19 Vaccine Monitor: July 2021*, KFF (Aug. 4, 2021), https://www.kff.org/coronavirus-covid-19/poll-finding/kff-covid-19-vaccine-monitor-july-2021.

[242] *Id.*

that "[m]ajorities of Republicans . . . 'never' [wore] a mask outdoors in crowded places, outdoors with friends and household members, at work, or in a grocery store." Democrats, who were most likely to be vaccinated, were "more likely to report wearing a mask in each of these locations, except when outdoors with household members and friends."[243]

Each of the three groups of Americans—Deniers, Skeptics, and Receptives—were affected by the profound events of early 2020 and the two years that followed, although in different ways. At the outset, Americans received conflicting messages about the likelihood that the virus would impact them, the preparedness of the U.S. government to respond quickly and effectively should a pandemic ensue, and which mitigation measures were effective.[244] This inauspicious start set the stage for an evolution of attitudes and behaviors that would play out very differently for each of the groups.[245] Other factors exogenous to the public health management effort had profound effects as well.

B. The Trump Factor

1. Trump and Early Messaging

From the beginning, former President Donald Trump contributed to the spread of misinformation about COVID-19, its origins, and its potential impact on Americans. President Trump made his first public comments about COVID-19 on January 22, 2020, on CNBC.[246] When asked whether he was concerned about the virus, President Trump said, "No. Not at all. And we have it totally under control. It's one person coming in from China, and we have it under control. It's going to be just fine."[247] In contrast, on January 22, 2020, a former CDC Director "wrote an op-ed for [a] health care publication" and "warned that the virus would continue spreading."[248] On January 24, 2020, President Trump tweeted, "It will all work out

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[243] *Id.*

[244] For example, Americans were initially told that masking increased the chance that disease would spread. Jacqueline Howard, *Masks May Actually Increase Your Coronavirus Risk if Worn Improperly, Surgeon General Warns*, CNN, https://www.cnn.com/2020/03/02/health/surgeon-general-coronavirus-masks-risk-trnd/index.html (Mar. 2, 2020, 1:28 PM).

[245] *See* discussion *infra* Part IV.

[246] David Leonhardt, Opinion, *A Complete List of Trump's Attempts to Play Down Coronavirus*, N.Y. TIMES (Mar. 15, 2020), https://www.nytimes.com/2020/03/15/opinion/trump-coronavirus.html.

[247] *Id.* (quoting President Donald Trump).

[248] *Id.* Former Trump administration officials also published a warning in the Wall Street Journal. Luciana Borio & Scott Gottlieb, Opinion, *Act Now to Prevent an American Epidemic*, WALL ST. J. (Jan. 28, 2020, 6:48 PM), https://www.wsj.com/articles/act-now-to-prevent-an-american-epidemic-11580255335.

well,"[249] and on January 30, 2020, in a speech, he said: "We have it very well under control. We have very little problem [sic] in this country at the moment—five. And those people are all recuperating successfully."[250] On the "same day, the World Health Organization declared coronavirus to be a 'public health emergency of international concern.'"[251]

As the potential for a pandemic in the United States increased, President Trump continued to spread misinformation about the virus. On February 24, 2020, President Trump tweeted: "The Coronavirus is very much under control in the USA. We are in contact with everyone and all relevant countries. CDC & World Health have been working hard and very smart. Stock Market starting to look very good to me!"[252] The tweet came out "as the Dow Jones and S&P 500 saw their worst daily declines since 2018."[253] On March 9, 2020, after the New York Stock Exchange took a steep drop, President Trump sidestepped the influence COVID-19 was having on Americans' decisions about the stock market and tweeted: "Saudi Arabia and Russia are arguing over the price and flow of oil. That, and the Fake News, is the reason for the market drop!"[254]

On February 26 and 27, 2020, CNN reported that Trump was reassuring the nation that the virus is "going to go away," and is "very well under control."[255] CNN reported that the president predicted that the warmer weather would "snuff out the

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[249] Donald Trump (@realDonaldTrump), TWITTER (Jan. 24, 2020, 1:18 PM), https://twitter.com/realDonaldTrump/status/1220818115354923009?s=20; *see also* Tucker Higgins, *Trump Thanks China's Xi Jinping for Handling of Coronavirus*, CNBC (Jan. 24, 2020, 5:05 PM), https://www.cnbc.com/2020/01/24/trump-thanks-chinas-xi-jinping-for-handling-of-coronavirus.html.

[250] Leonhardt, *supra* note 246 (quoting President Donald Trump).

[251] *Id.*

[252] Donald J. Trump (@realDonaldTrump), TWITTER (Feb. 24, 2020, 1:42 PM), https://twitter.com/realDonaldTrump/status/1232058127740174339.

[253] Andrew Naughtie, *Coronavirus: Five Tweets that Prove Trump Didn't Take the Outbreak Seriously*, INDEPENDENT (Mar. 18, 2020, 5:08 PM), https://www.independent.co.uk/news/world/americas/trump-coronavirus-us-response-tweets-a9409436.html.

[254] Donald J. Trump (@realDonaldTrump), TWITTER (Mar. 9, 2020, 7:36 AM), https://twitter.com/realDonaldTrump/status/1237024551294382081; *see also* Zack Beauchamp, *Trump's Denialist Tweets Are the Coronavirus Reaction We Feared*, VOX (Mar. 9, 2020, 11:50 AM), https://www.vox.com/policy-and-politics/2020/3/9/21171582/coronavirus-trump-tweets-stock-market-denial.

[255] Stephen Collinson, *Jarring Contradictions Cast Doubt on Trump's Ability to Handle Coronavirus*, CNN, https://www.cnn.com/2020/02/26/politics/coronavirus-donald-trump-politics-us-health/index.html (Feb. 26, 2020, 9:36 AM) (quoting President Donald Trump); *see also* Christian Paz, *All the President's Lies About the Coronavirus*, ATLANTIC (Nov. 2, 2020, 2:20 PM), https://www.theatlantic.com/politics/archive/2020/11/trumps-lies-about-coronavirus/608647 (quoting President Trump's claim that "[i]t's going to disappear. One day it's like a miracle—it will disappear," despite Dr. Anthony Fauci's warning only days later that he was concerned about an increase in cases).

virus."[256] On February 26, the president said, "We're going down, not up. We're going very substantially down, not up."[257] On February 27, the president said, "It's going to disappear. One day—it's like a miracle—it will disappear."[258] In contrast to Trump's statements about the virus being under control, on February 25, a CDC "expert warned . . . that the virus could bring severe disruption to American life, affecting schools, and businesses, and told people to get ready now."[259] "Dr. Anne Schuchat, principal deputy director of the CDC . . . told ABC News that the way the epidemic was spreading could soon challenge US efforts to contain it," saying, "We recognize that our very strong measures here in the United States to contain the virus, to keep it limited to very low numbers, may not hold for the long haul."[260]

2. Trump and Mitigation Measures

During the week of March 27, 2020, the New York Times reported that, "with the United States now leading the world in confirmed coronavirus cases, Americans finally agree across party lines that the threat can't be ignored."[261] That same month, Trump urged Americans not to change their habits, tweeting: "WE CANNOT LET THE CURE BE WORSE THAN THE PROBLEM ITSELF."[262] After the CDC issued recommendations to avoid gatherings, Trump made a show of being cavalier and breaking the rules, modeling the behavior he was advocating publicly.[263] The White House Coronavirus Task Force also failed to follow the CDC's guidelines about gatherings and social distancing; when the group met for the daily briefings,

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[256] Collinson, *supra* note 255. On February 10, 2020, President Trump "repeatedly said . . . that warm spring weather could kill the virus," saying, "Looks like by April, you know, in theory, when it gets a little warmer, it miraculously goes away," at a campaign rally. Leonhardt, *supra* note 246. The president made similar comments about warm spring weather killing the virus at "a speech to governors . . . and in an interview with Trish Regan of Fox Business." *Id.*

[257] Leonhardt, *supra* note 246.

[258] *Id.*; *see also* Yasmeen Abutaleb, Ashley Parker & Josh Dawsey, *Inside Trump's Frantic Attempts to Minimize the Coronavirus Crisis*, WASH. POST (Feb. 29, 2020, 6:13 PM), https://www.washingtonpost.com/politics/inside-trumps-frantic-attempts-to-minimize-the-coronavirus-crisis/2020/02/29/7ebc882a-5b25-11ea-9b35-def5a027d470_story.html.

[259] Collinson, *supra* note 255.

[260] *Id.* (quoting Anne Schuchat).

[261] Giovanni Russonello, *Can Trump Break a 50 Percent Approval Rating?*, N.Y. TIMES, https://www.nytimes.com/2020/03/27/us/politics/trump-polls-coronavirus.html (June 28, 2020).

[262] Donald J. Trump (@realDonaldTrump), TWITTER (Mar. 22, 2020, 8:50 PM), https://twitter.com/realDonaldTrump/status/1241935285916782593.

[263] Grace Hauck & Joshua Bote, *President Trump and His Staff Defied CDC Coronavirus Guidelines 27 Times Since Sept. 1*, USA TODAY, https://www.usatoday.com/story/news/health/2020/10/06/trump-covid-19-24-times-trump-administration-violated-cdc-guidelines/3636834001 (Oct. 7, 2020, 3:57 PM).

the officials were close together in the briefing room.[264] Further, President Trump perpetuated a false comparison to the common flu and spread misinformation. On March 9, 2020, the president tweeted: "So last year 37,000 Americans died from the common Flu. It averages between 27,000 and 70,000 per year. Nothing is shut down, life & the economy go on. At this moment there are 546 confirmed cases of CoronaVirus [sic], with 22 deaths. Think about that!"[265] Trump urged Americans to be wary of canceling events, saying, "I wouldn't be generally inclined to do it."[266] During the press conference at the CDC, President Trump indicated that he was not changing "his personal behavior . . . because of the spread of the illness, saying he's 'not at all' refusing to shake hands and also not considering canceling any political rallies."[267]

Conservative commentators also downplayed fears about the virus. Sean Hannity shared on his show that it "[m]ay be true" that the coronavirus is a "fraud."[268] Rush Limbaugh said in early March on his show, "This coronavirus? . . . Nothing like wiping out the entire U.S. economy with a biothreat from China, is there?"[269] A Fox News anchor said that the coronavirus "is yet another attempt to impeach

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[264] Robin Givhan, Perspective, *Why Won't Trump Practice Social Distancing at His Daily Briefings?!*, WASH. POST (Mar. 18, 2020, 8:34 PM), https://www.washingtonpost.com/lifestyle/2020/03/18/why-wont-trump-practice-social-distancing-his-daily-briefings.

[265] Donald J. Trump (@realDonaldTrump), TWITTER (Mar. 9, 2020, 7:47 AM), https://twitter.com/realDonaldTrump/status/1237027356314869761. The problem with comparing the coronavirus to the flu is that the U.S. healthcare system is equipped to deal with the seasonal flu, but it is not equipped to deal with the flu plus another deadly, contagious disease. *See, e.g.*, Christopher Rowland & Peter Whoriskey, *U.S. Health System Is Showing Why It's Not Ready for a Coronavirus Pandemic*, WASH. POST (Mar. 4, 2020), https://www.washingtonpost.com/business/economy/the-us-health-system-is-showing-why-its-not-ready-for-a-coronavirus-pandemic/2020/03/04/7c307bb4-5d61-11ea-b29b-9db42f7803a7_story.html (discussing the lack of ventilators in the United States to meet COVID-19 needs). Another issue is related to immunities: people had immunities to the flu, but not to coronavirus due to the novelty of the virus.

[266] Greg Bluestein, *Trump Defends Administration's Coronavirus Approach in Atlanta Visit*, ATLANTA J.-CONST. (Mar. 6, 2020), https://www.ajc.com/news/state—regional-govt—politics/trump-defends-administration-coronavirus-approach-atlanta-visit/GjOWBAahrFU6TCgGrFzdkJ (quoting President Donald Trump); *see also* Peter Baker, *Trump Says 'People Have to Remain Calm' Amid Coronavirus Outbreak*, N.Y. TIMES, https://www.nytimes.com/2020/03/06/us/politics/trump-coronavirus-cdc.html (July 14, 2020).

[267] Bluestein, *supra* note 266 (quoting President Donald Trump).

[268] Jeremy W. Peters & Michael M. Grynbaum, *How Right-Wing Pundits Are Covering Coronavirus*, N.Y. TIMES (Mar. 11, 2020), https://www.nytimes.com/2020/03/11/us/politics/coronavirus-conservative-media.html. However, a later show by Mr. Hannity featured Dr. Anthony S. Fauci, who wanted to "'make sure' viewers knew that the coronavirus 'is ten times more lethal than the seasonal flu.'" *Id.* (quoting Dr. Anthony Fauci). Mr. Hannity also said in a later show, "Sadly, these viruses pop up time to time . . . . Pandemics happen, time to time." *Id.* (quoting Sean Hannity).

[269] *Id.* (quoting Rush Limbaugh).

the president."[270] One conservative leader, Matt Schlapp, the president of Conservative Political Action Committee (CPAC), said "[i]t's actually hard to get," (referring to the coronavirus) in an interview with Fox News in early March.[271] On March 4, President Trump said in an interview with Sean Hannity, "It's very mild."[272] In early March, "Trump said the country would soon have zero cases" of COVID-19.[273] Meanwhile, public health sources were issuing warnings that painted a very different picture of the threat level. Early on, "public health officials warned Americans to prepare for more coronavirus cases."[274]

Information about the availability of therapies also conflicted. In March 2020, Trump opined that pharmaceutical companies would "have vaccines, I think, relatively soon," despite White House experts telling him "earlier the same day that a vaccine could take a year to 18 months to develop."[275] Shortly after, Trump announced that "the FDA had approved the antimalarial drug chloroquine to treat COVID-19," claiming that it was available without a prescription.[276] Meanwhile,

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[270] *Id.* (quoting Trish Regan). "Fox News viewers and talk radio listeners . . . tend to be older than the general population, [and] the danger of downplaying the [virus] . . . . [is that] older people [are] at higher risk [for] serious complications if they contract the virus." *Id.* In contrast, other Fox News commentators, such as Tucker Carlson, have said, "People you trust, people you probably voted for, have spent weeks minimizing what is clearly a very serious problem, . . . [p]eople you know will get sick, some may die. This is real." *Id.* (quoting Tucker Carlson); *see also* Naughtie, *supra* note 253 (reporting that Trish Regan's show was "moved from its prime-time slot after . . . complaints" about her accusations against "Democrats of engineering a 'mass hysteria to encourage a market sell-off' and trying to stage a second impeachment").

[271] Peters & Grynbaum, *supra* note 268 (quoting Matt Schlapp). It is worth nothing that, at the time, Mr. Schlapp was in a self-imposed quarantine after attending the Conservative Political Action Conference. *Id.*

[272] Leonhardt, *supra* note 246.

[273] Carolyn Y. Johnson & William Wan, *Trump Is Breaking Every Rule in the CDC's 450-Page Playbook for Health Crisis*, WASH. POST (Mar. 14, 2020, 9:50 AM), https://www.washingtonpost.com/health/2020/03/14/cdc-manual-crisis-coronavirus-trump. President Trump's downplaying of the virus continued into late March. He retweeted Kayleigh McEnany's (@kayleighmcenany) March 30, 2020, tweet, which contained a link to live CNN footage of a White House press briefing and commentary and read: "BOOM: @realDonaldTrump obliterates CNN[.] 'I want to keep the country calm.' The coronavirus 'will go away.' 'We're going to have a great victory!' 'People don't want to listen to CNN anymore…'" Donald J. Trump (@realDonaldTrump), TWITTER (Mar. 30, 2020), https://twitter.com/realDonaldTrump/status/1245005512367910913.

[274] Jeff Mason & Jonathan Allen, *Trump Says Coronavirus Risk in U.S. Is Low; CDC Confirms First Case of Unknown Origin*, REUTERS (Feb. 26, 2020, 5:54 AM), https://www.reuters.com/article/china-health-usa-idINKCN20K21L. The same day, the CDC "confirmed an infection of the new coronavirus in California in someone who had not traveled outside the United States or been exposed to a person known to have the virus." *Id.*

[275] Paz, *supra* note 255.

[276] *Id.*

the FDA Commissioner announced "that the drug still had to be tested in a clinical setting" and "ha[d] not been approved [by the FDA] for COVID-19 use."[277] Dr. Anthony Fauci later announced that, at the time, there were "no proven safe and effective therapies for the coronavirus."[278]

3. Post-2020-Election Fomenting

When Trump left office after being defeated by Joe Biden in the 2020 presidential election, he did so amid claims that the election had been "stolen" from him.[279] He not only failed to cooperate with the peaceful and smooth transition to a new presidency,[280] he fueled anger among his supporters and spread misinformation about the election process, the integrity of the voting process, the success of

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[277] *Id.* On March 21, 2020, in a string of tweets, President Trump said:

> HYDROXYCHLOROQUINE & AZITHROMYCIN, taken together, have a real chance to be one of the biggest game changers in the history of medicine. The FDA has moved mountains - Thank You! Hopefully they will BOTH (H works better with A, International Journal of Antimicrobial Agents). . ...
>
> ….be put in use IMMEDIATELY. PEOPLE ARE DYING, MOVE FAST, and GOD BLESS EVERYONE!

Donald J. Trump (@realDonaldTrump), TWITTER (Mar. 21, 2020, 7:13 AM), https://twitter.com/realDonaldTrump/status/1241367239900778501; Donald J. Trump (@realDonaldTrump), TWITTER (Mar. 21, 2020, 7:13 AM), https://twitter.com/realDonaldTrump/status/1241367245143642113.

[278] Paz, *supra* note 255. Despite Dr. Fauci's statement to the press, President Trump retweeted a March 23, 2020 tweet by Andy McCarthy (@AndrewCMcCarthy) that said: "Our experience suggests that hydroxychloroquine should be a first-line treatment for Covid-19. We can use it to save lives and prevent others from becoming infected, write [sic] @DrJeffColyer and Daniel Hinthorn." Donald J. Trump (@realDonaldTrump), TWITTER (Mar. 23, 2020, 7:04 AM), https://twitter.com/realdonaldtrump/status/1242302644498108416. McCarthy's tweet featured an opinion article from the Wall Street Journal titled "These Drugs Are Helping Out Coronavirus Patients." Andy McCarthy (@AndrewCMcCarthy), TWITTER (Mar. 23, 2020,7:04 AM), https://twitter.com/AndrewCMcCarthy/status/1242089842063933441. *See also* Katie Thomas & Denise Grady, *Trump's Embrace of Unproven Drugs to Treat Coronavirus Defies Science*, N.Y. TIMES (Mar. 20, 2020), https://www.nytimes.com/2020/03/20/health/coronavirus-chloroquine-trump.html (pointing out that in a press conference in mid-March 2020, President Trump again referenced hydroxychloroquine, saying, "I'm a smart guy, . . . I feel good about it. And we're going to see. You're going to see soon enough." In the same press conference, Dr. Fauci "explain[ed] that there was only anecdotal evidence that the drugs, chloroquine and hydroxychloroquine, may be effective [against coronavirus]." Dr. Fauci said, "The president feels optimistic about something, has feelings about it . . . I'm saying it may be effective.").

[279] *See* Larry Buchanan, Karen Yourish, Ainara Tiefenthäler, Jon Huang & Blacki Migliozzi, *Lie After Lie: Listen to How Trump Built His Alternate Reality*, N.Y. TIMES (Feb. 9, 2021), https://www.nytimes.com/interactive/2021/02/09/us/trump-voter-fraud-election.html.

[280] The Associated Press reported, "The Trump administration threw the presidential transition into tumult on Monday, with President Donald Trump blocking government officials from cooperating with President-elect Joe Biden's team and Attorney General William Barr

his administration, and specifically, the state he left a COVID-ravaged nation.[281] As a result, he planted seeds of doubt about the legitimacy of the new administration and primed a segment of the American population to be suspicious of messaging from the Biden leadership and the CDC.[282] He also left amid claims that the election results would be reversed and Trump, along with his vaccine skepticism, would return to reclaim the White House.[283] All of this, taken together, helped to create a segment of Trump-supporting zealots whose allegiance to a set of conservative ideals became so firmly entrenched that some observers concluded that "[w]hat used to be the conservative movement in this country is becoming a death cult."[284]

In July 2021, during the Conservative Political Action Convention, conservative writer Alex Berenson mocked public health officials and applauded Americans

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authorizing the Justice Department to probe unsubstantiated allegations of voter fraud." Jonathan Lemire & Zeke Miller, *Refusing to Concede, Trump Blocks Cooperation on Transition*, ASSOCIATED PRESS (Nov. 9, 2020, 4:03 PM), https://apnews.com/article/joe-biden-donald-trump-virus-outbreak-elections-voting-fraud-and-irregularities-2d39186996f69de245e59c966d4d140f.

[281] *Id.*; *see also* Maggie Haberman & Michael S. Schmidt, *A President Unhappy, Unleashed and Unpredictable*, N.Y. TIMES, https://www.nytimes.com/2020/12/23/us/politics/trump-end-of-presidency.html (Jan. 15, 2021); Linda Qiu, *In Farewell Video, Trump Repeats Familiar Falsehoods*, N.Y. TIMES (Jan. 19, 2021), https://www.nytimes.com/2021/01/19/us/politics/farewell-video-trump-fact-check.html; Shweta Sharma, *Trump Claims Covid Was 'Over' When He Left Office When There Was Actually More than 4,000 Deaths on His Last Day*, INDEPENDENT (Aug. 19, 2021, 3:32 AM), https://www.independent.co.uk/news/world/americas/us-politics/donald-trump-covid-claims-president-b1905044.html; Matthew J. Hornsey, Matthew Finlayson, Gabrielle Chatwood & Christopher T. Begeny, *Donald Trump and Vaccination: The Effect of Political Identity, Conspiracist Ideation and Presidential Tweets on Vaccine Hesitancy*, J. EXPERIMENTAL SOC. PSYCH., May 2020, at 1, 1–2 ("https://www.independent.co.uk/news/world/americas/us-politics/donald-trump-covid-claims-president-b1905044.htmlIn recent years, President Trump has composed over two dozen Twitter messages that are anti-vaccination in nature, frequently linking the measles, mumps and rubella (MMR) vaccinations to diagnoses of autism. This position is part of a broader willingness for Trump to endorse unsubstantiated accounts of reality, including the notion that Barack Obama was born outside the U.S., that climate change was a hoax developed by the Chinese to limit American economic competitiveness, and that Ted Cruz's father was implicated in a conspiracy to murder John F. Kennedy." (internal citation omitted)).

[282] *See How President Trump's Rhetoric Has Affected U.S. Politics*, NPR (Jan. 19, 2021, 4:07 PM), https://www.npr.org/2021/01/19/958472423/how-president-trumps-rhetoric-has-affected-u-s-politics (discussing Trump's propaganda regarding vaccines and President Biden with Jennifer Mercieca, a historian of American political rhetoric).

[283] Marshall Cohen, *Justice Department Says Trump's Reinstatement Talk Could Fuel More Violence from His Supporters*, CNN, https://www.cnn.com/2021/07/09/politics/justice-department-trump-warning/index.html (July 9, 2021, 1:46 PM).

[284] Eugene Robinson, Opinion, *Republicans Refusing to Get Vaccinated Are Owning No One But Themselves*, WASH. POST (July 12, 2021, 3:11 PM), https://www.washingtonpost.com/opinions/2021/07/12/gop-death-cult-attitude-toward-coronavirus-vaccines-isnt-just-lethal-its-stupid.

who refused to be vaccinated. "They were hoping, the federal government was hoping, they could sucker 90 percent of the population into getting vaccinated," Berenson said to "uproarious applause from the conservative audience."[285] For Trump devotees, rejecting the vaccine has symbolic and expressive significance.[286] Like other threats to a particular vision of government and society, the takeover of the Biden team and the shift in rhetoric is deeply threatening. Exercising the ability to reject masking and reject getting the vaccine provides a method of reestablishing some measure of power and rejecting what some see as a hostile and illegitimate effort to subvert the will of a segment of the population to which they belong.[287]

C. The Media Effect

Knowledge of the coronavirus vaccine and its origin tracks closely with main news source, and consequently, with political party affiliation. In a survey conducted from March 10 to March 16, 2020, the Pew Research Center found that 51% of Fox News watchers and 78% of MSNBC watchers believed that a vaccine would be available in a year or more; 66% of MSNBC watchers and 37% of Fox News watchers believed that the virus came about naturally (as opposed to being created in a

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[285] Benjamin Fearnow, *Fauci Deplores 'Horrifying' Moment at CPAC When Crowd Applauded Anti-Vaccine Speech*, NEWSWEEK (July 11, 2021, 11:07 AM), https://www.newsweek.com/fauci-deplores-horrifying-moment-cpac-when-crowd-applauded-anti-vaccine-speech-1608617. When Dr. Fauci, Director of the National Institute of Allergy and Infectious Diseases, was asked by CNN's Jake Tapper about Berenson's remarks, he said:

> It's horrifying. I mean, they are cheering about someone saying that it's a good thing for people not to try and save their lives. . . . Everybody starts screaming and clapping. I just don't get that. I mean, I—and I don't think that anybody who is thinking clearly can get that. What is that all about?

Interview by Jake Tapper with Anthony Fauci, Dir., Nat'l Inst. of Allergy & Infectious Diseases (July 11, 2021), http://edition.cnn.com/TRANSCRIPTS/2107/11/sotu.01.html.

[286] Hornsey et al., *supra* note 281, at 2 (pointing out that rejecting vaccines was a way of identifying with a president who held populist views: "The social identity model of leadership further argues that the influence of leaders will be particularly pronounced when they are located within a salient and divisive intergroup context . . . . From a self-categorization theory perspective, salient intergroup contexts lead to a perceived enhancement of ingroup similarities and outgroup differences. Through this process, strongly identified group members act through the lens of their group identities, modifying their behaviors, beliefs, and attitudes to assimilate to the perceived prototypical group member." (internal citation omitted)).

[287] Dominic-Madori Davis & Nick Lichtenberg, '*I Really Don't Care, Do U?': How the Act of Refusing to Wear a Mask Became the New Symbol of American Fear*, BUS. INSIDER (Aug. 16, 2020, 8:20 AM), https://www.businessinsider.com/not-wearing-mask-becomes-stronghold-for-class-losing-power-analysis-2020-8; *see also* Michele Gelfand, Ren Li, Eftychia Stamkou, Dylan Pieper, Emmy Denison, Jessica Fernandez, Virginia Choi, Jennifer Chatman, Joshua Jackson & Eugen Dimant, *Persuading Republicans and Democrats to Comply with Mask Wearing: An Intervention Tournament*, J. EXPERIMENTAL SOC. PSYCH., July 2022, at 1, 14–16.

laboratory).[288] Those who watch CNN fit somewhere in between.[289] Those who mainly get their news from MSNBC were more likely (92%) than those who get their news from Fox News (58%) to say that the media covered the outbreak somewhat or very well.[290] Further, MSNBC viewers were "much less likely than those who name Fox News as their main source to say the media exaggerated the risks posed by the pandemic (35% of the MSNBC group vs. 79% of the Fox News group)."[291]

How people viewed the coronavirus appeared to be related to where they get their news and how closely they were following the pandemic. For example, of those who use cable television as their main source of news, 65% said they are following the pandemic very closely, and 30% said they are following the pandemic fairly closely.[292] In contrast, 37% of people who said they use social media for their main source of news said they are following the virus very closely, and another 43% said they are following the virus fairly closely.[293] Overall, about 18% of American adults get their political news primarily on social media, while 25% use a news website or app; 16% rely on cable television, 16% rely on local television, and 13% rely on network television.[294] About 3% of American adults use print media sources and 8% rely primarily on the radio.[295] Of those who rely on social media for news, 57% said they have encountered at least some false news about the coronavirus.[296] While 53% of Fox News watchers "said they had seen a lot or some made-up news," 46% of CNN and MSNBC watchers reported seeing fake news.[297]

Trump urged Americans to rely upon conservative news outlets rather than progressive news sources. For example, on February 26, 2020, the president tweeted: "Low Ratings Fake News MSDNC (Comcast) & @CNN are doing every-

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[288] Mark Jurkowitz & Amy Mitchell, *Cable TV and COVID-19: How Americans Perceive the Outbreak and View Media Coverage Differ by Main News Source*, PEW RSCH. CTR. (Apr. 1, 2020), https://www.pewresearch.org/journalism/2020/04/01/cable-tv-and-covid-19-how-americans-perceive-the-outbreak-and-view-media-coverage-differ-by-main-news-source.

[289] *Id.*

[290] *Id.*

[291] *Id.*

[292] Mark Jurkowitz & Amy Mitchell, *Americans Who Primarily Get News Through Social Media Are Least Likely to Follow COVID-19 Coverage, Most Likely to Report Seeing Made-Up News*, PEW RSCH. CTR. (Mar. 25, 2020), https://www.pewresearch.org/journalism/2020/03/25/americans-who-primarily-get-news-through-social-media-are-least-likely-to-follow-covid-19-coverage-most-likely-to-report-seeing-made-up-news.

[293] *Id.*

[294] *Id.*

[295] *Id.*

[296] *Id.*

[297] Jurkowitz & Mitchell, *supra* note 288.

thing possible to make the Caronavirus [sic] look as bad as possible, including panicking markets, if possible. Likewise, their incompetent Do Nothing Democrat comrades are all talk, no action. USA in great shape!"[298] For their part, left-leaning news sources carried rebuttals of Trump's rhetoric, emphasizing the seriousness of the COVID-19 pandemic and providing evidence to disprove Trump's claims.[299] Responses to the various sources of information were divided from the outset. As of March 27, 2020, 74% of Democratic voters gave Trump's response to the crisis negative marks, according to a Fox News poll, while the same poll reported that 86% of Republican voters said the opposite.[300] The battle between conservative politicians and influencers and mainstream news media had profound effects. The Pew Research Center found that roughly "two-thirds of Democrats (66%) say the media's COVID-19 coverage has been largely accurate," compared with "three-in-ten Republicans (31%)"—a 35-percentage point difference.[301] Further, "there is a 47-percentage-point gap between . . . Republicans and Democrats who have at least a 'fair amount' of confidence in journalists."[302] Meanwhile, "the public is somewhat more likely to think that journalists have 'low' or 'very low' ethical standards (56%) than 'high' or 'very high' standards (43%)."[303]

It is difficult to talk about polarization in political and risk decisions without exploring the role of social media. One study of YouTube watchers found that watchers of the same YouTube videos tend to share similar emotions about various

[298] Donald J. Trump (@realDonaldTrump), TWITTER (Feb. 26, 2020, 5:03 AM), https://twitter.com/realDonaldTrump/status/1232652371832004608. On February 27, the president tweeted: "'Anti-Trump Network @CNN doing whatever it can to stoke a national Coronavirus panic. The far left Network pretty much ignoring anyone who they interview who doesn't blame President Trump.' @trish_regan @FoxNews Media refuses to discuss the great job our professionals are doing!" Donald J. Trump (@realDonaldTrump), TWITTER (Feb. 27, 2020, 5:53 PM), https://twitter.com/realDonaldTrump/status/1233208695099666433. This tweet is meant to convey a quote by Fox News anchor Trish Regan, who was defending President Trump against CNN's coverage of the crisis.

[299] *See, e.g.*, Alexander Burns, *In Final Election Sprint, Trump Runs as if Virus Were Already Defeated*, N.Y. TIMES, Oct. 29, 2020, at A1.

[300] *Fox News Poll March 21–24, 2020*, FOX NEWS, https://www.foxnews.com/politics/fox-news-poll-march-21-24-2020 (Mar. 27, 2020, 5:59 PM). In the same poll, most voters said the federal government had done a poor or fair job of responding quickly to the virus. By a 19-point margin, voters said a stronger government response could have helped to quell the spread of the virus, and 54% of moderate voters agreed. *Id.*

[301] Jeffrey Gottfried, Mason Walker & Amy Mitchell, *Americans' Views of the News Media During the COVID-19 Outbreak*, PEW RSCH. CTR. (May 8, 2020), https://www.pewresearch.org/journalism/2020/05/08/americans-views-of-the-news-media-during-the-covid-19-outbreak.

[302] *Id.*

[303] *Id.*

situations.[304] The authors of the study tested two potential factors that could influence this shared emotion. One was contagion, the idea that simply seeing others express emotions can trigger those emotions in the observer.[305] The second is homophily, the idea that people who are similar "flock together."[306] They found that both homophily and contagion were responsible for shared emotional responses to content.[307] When individuals encounter novel information about risks, there are two primary reasons why they often will use the information to update their preferences. First, people who are unfamiliar with forms of complex information are less likely to use the information to make decisions.[308] Conversely, people who are accustomed to processing complex information may use it to bolster their own opinions because, as previously noted, accuracy is not the only goal when individuals interpret information; attitude formation is also affected by a need to fit in with one's social in-group.[309]

IV. BEHAVIORS OF THE THREE GROUPS

The progression of COVID-19 and the sociopolitical landscape influenced Deniers, Skeptics, and Receptives differently. Arguably, the most remarkable reaction to the progression of scientific discovery with respect to the disease was seen in the Deniers. Deniers came to be characterized by a commitment to an anti-science agenda, a call for freedom from mandates, and a willingness to accept risks posed by the virus, in spite of mitigation measures that could have reduced the risk.[310]

A. The Deniers' Behavior and Biases

Among Americans who remained willfully unvaccinated, one group consisted of individuals who were hostile toward the vaccine.[311] These individuals shared common characteristics; they tended to resist masking and a large percentage identified as Republican, supported President Donald Trump, and were deeply cynical

[304] Hannes Rosenbusch, Anthony M. Evans & Marcel Zeelenberg, *Multilevel Emotion Transfer on YouTube: Disentangling the Effects of Emotional Contagion and Homophily on Video Audiences*, 10 SOC. PSYCH. & PERSONALITY SCI. 1028, 1034 (2019).

[305] *Id.* at 1032.

[306] *Id.* at 1028, 1032.

[307] *Id.* at 1032.

[308] Kahan, *supra* note 143, at 407.

[309] *See* discussion *supra* Section II.B.1.

[310] *See* discussion *infra* Section IV.A.

[311] Julie Bosman, Jan Hoffman, Margot Sanger-Katz & Tim Arango, *Who Are the Unvaccinated in America? There's No One Answer*, N.Y. TIMES, https://www.nytimes.com/2021/07/31/us/virus-unvaccinated-americans.html (Oct. 24, 2021).

of scientific research and findings.[312] For many in this group, the vaccine debate was less about judging the relative risks of vaccinating than it was about defending a worldview that saw science as a threat to preferred policies.[313] Like other Americans searching for support during a time of isolation, Deniers experienced a desire to affiliate with like-minded thinkers.[314] Deniers were often met with public disapproval from out-group members—a majority of whom were Receptives, although they were joined by masking Skeptics—who viewed Deniers as risking the health of "cooperative" Americans.[315] Because Deniers felt like they were under attack from out-group members, they experienced a heightened sense of in-group salience and an increased need to affiliate with like-minded individuals.[316] Accordingly, during this period of time, politically conservative Deniers were especially likely to strongly identify with their own group and to reject appeals from members of an out-group.[317]

Suspicion of, and distrust in, scientific inquiry and findings have been a hallmark of Republican platforms for topics from evolution to climate change.[318] Industries traditionally championed by Republican lawmakers, such as the fossil fuel

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[312] *See id.* (noting that this adamant group is "disproportionately white, rural, evangelical Christian and politically conservative" and some members of the group view vaccines as a government plot, with studies indicating that "Republican Party affiliation is among the best predictors" of vaccine hostility); Milligan, *supra* note 114 (discussing Republican conspiracy theory polling: "(32%) of Republicans believe the vaccine is a tool for the government to implant microchips"); David R. Jones & Monika L. McDermott, *Partisanship and the Politics of COVID Vaccine Hesitancy*, 54 POLITY 408, 412, 430 (2022).

[313] *See* Bosman et al., *supra* note 311 (quoting an unvaccinated libertarian saying, "[Vaccine refusal] has to do with my civil rights. The United States government's main job is to protect me from foreign and domestic enemies. Not my health. I'm in charge of my health."); *see also* Colin Dickey, *We're Talking About Vaccines All Wrong*, ATLANTIC (July 30, 2021), https://www.theatlantic.com/ideas/archive/2021/07/freedom-is-the-only-argument-that-might-work-with-vaccine-holdouts/619609 (noting that freedom-focused anti-maskers and anti-vaxxers want the freedom to not comply with public health precautions, while at the same time want assurance that they will receive care if they do get sick).

[314] *See* David Farmer, *Managing the Emotional Impact of Isolation in Remote Work*, UNIV. N. TEX. HEALTH SCI. CTR. (Mar. 19, 2020), https://www.unthsc.edu/newsroom/story/managing-the-emotional-impact-of-isolation-in-remote-work.

[315] *See, e.g.*, Tressie McMillan Cottom, Opinion, *The Limits of My Empathy for Covid Deniers*, N.Y. TIMES (Sept. 10, 2021), https://www.nytimes.com/2021/09/10/opinion/covid-empathy-grief.html.

[316] *See* Moreno & Walker Wilson, *supra* note 13, at 575–76 (describing how "in-group bias is self-reinforcing, causing individuals to preferentially value the views of politically aligned others while discounting the conclusions of the political out-group").

[317] *See* discussion *supra* Section II.B.2.

[318] Dylan Bugden, *Denial and Distrust: Explaining the Partisan Climate Gap*, CLIMATIC CHANGE, Feb. 2022, at 1, 5.

industry, have benefitted from this skepticism of science.[319] More than a decade before Trump took office, Republican President George W. Bush took a strong position against acceptance of scientific evidence of climate change. He publicly questioned reports generated by the National Academy of Science, the American Geophysical Union, and his own State Department,[320] and he directed White House officials to tell the EPA to alter a report on climate change.[321] When Trump took office, he embraced an anti-science agenda with fervor, taking steps such as withdrawing from the Paris Climate Accord[322] after stating that, when it comes to whether human activity is a source of global climate change, "[n]obody really knows."[323] Climate change was an early indicator of Trump thwarting scientific efforts to minimize harms. Trump's presidency was an era during which the Republican party became more militantly suspicious of scientific findings than ever before. Several values cherished by the conservative wing of the Republican party are advanced by distrusting science.[324]

Conservatives' values and preferences may help to explain suspicion of scientific inquiry. Conservatives tend to favor a smaller role for the federal government,[325] less regulation,[326] fewer entitlements,[327] a dominant military, strong gun rights, and

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[319] Alvin Powell, *Tracing Big Oil's PR War to Delay Action on Climate Change*, HARV. GAZETTE (Sept. 28, 2021), https://news.harvard.edu/gazette/story/2021/09/oil-companies-discourage-climate-action-study-says (discussing how ExxonMobil's public communications denied climate science, despite its knowledge of climate change effects since as early as the 1950s); *see also* Geoffrey Supran & Naomi Oreskes, *The Forgotten Oil Ads that Told Us Climate Change Was Nothing*, GUARDIAN (Nov. 18, 2021, 5:00 PM), https://www.theguardian.com/environment/2021/nov/18/the-forgotten-oil-ads-that-told-us-climate-change-was-nothing.

[320] *Climate Change Research Distorted and Suppressed*, UNION OF CONCERNED SCIENTISTS (June 30, 2005), https://www.ucsusa.org/resources/climate-change-research-distorted-and-suppressed#6_2005.

[321] Andrew C. Revkin & Katharine Q. Seelye, *Report by E.P.A. Leaves Out Data on Climate Change*, N.Y. TIMES (June 19, 2003), https://www.nytimes.com/2003/06/19/us/report-by-epa-leaves-out-data-on-climate-change.html.

[322] Brady Dennis, *Trump Makes It Official: U.S. Will Withdraw from the Paris Climate Accord*, WASH. POST (Nov. 4, 2019, 7:17 PM), https://www.washingtonpost.com/climate-environment/2019/11/04/trump-makes-it-official-us-will-withdraw-paris-climate-accord.

[323] Juliet Eilperin, *Trump Says 'Nobody Really Knows' if Climate Change Is Real*, WASH. POST (Dec. 11, 2016, 3:14 PM), https://www.washingtonpost.com/news/energy-environment/wp/2016/12/11/trump-says-nobody-really-knows-if-climate-change-is-real (quoting President Donald Trump).

[324] *See* Gordon Gauchat, *Politicization of Science in the Public Sphere: A Study of Public Trust in the United States, 1974 to 2010*, 77 AM. SOCIO. REV. 167, 182 (2012).

[325] Andrew E. Busch, *Social Conservatives and Economic Conservatives*, 49 SOC'Y 13, 14 (2012).

[326] *Id.* at 18.

[327] *Id.*

a return to traditional family values.[328] Against this set of preferences, there has been a sense that conservative ideals have come under attack, including by those entrenched in academies and research institutes. For example, Bobby Jindal, former congressman and governor of Louisiana, wrote: "Liberals have been remarkably successful in transforming America's culture from within, dominating the media, universities, and the entertainment industry, where so many ideas originate."[329] The sentiment expressed by conservative politicians and commentators appears to have influenced conservative Americans. A 2021 Gallup poll revealed that the edge Republicans had over Democrats when it came to confidence in science in 1975 has vanished, with Republican confidence plummeting by 27 percentage points.[330] The poll also found that Democrats' confidence in science was up by 12 percentage points, as compared to 1975. The Gallup report noted that the findings were likely attributable to "many Republican political leaders' statements and policies [which] have been critical of COVID-19 guidance put forth by health experts."[331] The report drew a comparison between a lack of faith in health science and other areas where Republicans have historically disputed findings, including climate change[332] and evolutionary theory.[333]

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[328] For example, the conservative website National Review features pieces by politicians such as Bobby Jindal, who wrote:

> America's culture is its greatest asset — and the one under the greatest threat. I believe in American exceptionalism. America truly is the greatest country in the history of the world — but not for the reasons many suppose. America is not great merely because of our mighty military, free-market capitalism, or representative democracy. Don't get me wrong; I am incredibly grateful to the men and women who serve our nation in uniform, and I want our armed services to continue to be stronger than any other. I strongly prefer our systems of economics and government, which empower individuals rather than centralized authority. What has truly set America apart, however, has been something much more foundational — our culture. Our Founding Fathers created a limited government dedicated to protecting, not creating, our God-given rights, and thus enshrined freedom into our foundational documents and ethos. That freedom presupposes a healthy culture and particular values, our civic religion derived from but not limited to our particular Western Judeo-Christian heritage.

Bobby Jindal, *From Sister Souljah to Black Lives Matter*, NAT'L REV. (July 7, 2016, 8:00 AM), https://www.nationalreview.com/2016/07/american-culture-war-traditional-values.

[329] *Id.*

[330] Jeffrey M. Jones, *Democratic, Republican Confidence in Science Diverges*, GALLUP (July 16, 2021), https://news.gallup.com/poll/352397/democratic-republican-confidence-science-diverges.aspx.

[331] *Id.*

[332] Lydia Saad, *Global Warming Attitudes Frozen Since 2016*, GALLUP (Apr. 5, 2021), https://news.gallup.com/poll/343025/global-warming-attitudes-frozen-2016.aspx. According to Gallup polling, while 82% of Democrats think that global warming has already begun, only 29% of Republicans and 59% of Independents say the same. The percentage of Republicans who believe that global warming will "never" occur was 23%, in contrast to 10% for Independents and 1% for Democrats. *Id.*

[333] Frank Newport, *Four in 10 Americans Believe in Strict Creationism*, GALLUP (Dec. 17, 2010), https://news.gallup.com/poll/145286/Four-Americans-Believe-Strict-Creationism.aspx. A

Harvard historian Naomi Oreskes and her colleague Erik M. Conway have argued that public positions taken by conservative leaders and media personalities have not rejected public health policies because they doubted the science altogether, rather, they feared that these public health policies would fuel policies restricting commerce and expanding governmental power over individuals.[334] Oreskes and Conway have argued that conservatives' resistance to scientific findings is tied to hostility toward market regulation and what they perceive as governmental overreach.[335] Oreskes and Conway conclude that "patterns of partisan polarization confirm an argument we have already made elsewhere: the sources of science rejection lay not in the science itself, but in prior political and ideological beliefs and commitments."[336]

The link between scientific discovery and regulation is established; in contexts where conservatives have resisted the science, data has often implicated a need for stricter controls. Research on use of resources and outputs from human activities suggests a need to limit use of natural resources and curb the creation of human pollutants.[337] Data on a warming planet has led to calls to regulate industry.[338] Findings on workplace safety have demonstrated the need for safety measures, which are a tax on business. In other areas, conservative policies have been challenged by data. For example, most Americans believe the death penalty does not have a deterrent effect,[339] and mass incarceration can be counterproductive.[340]

2010 Gallup poll found that 52% of Republicans, but only 34% of Democrats, were strict creationists, rejecting the theory of evolution. *Id.* "The significantly higher percentage of Republicans who choose a creationist view of human origins reflects in part the strong relationship between religion and politics in contemporary America." *Id.*

[334] Naomi Oreskes & Erik M. Conway, *From Anti-Government to Anti-Science: Why Conservatives Have Turned Against Science*, 151 DAEDALUS 98, 100 (2022).

[335] *See generally* NAOMI ORESKES & ERIK M. CONWAY, MERCHANTS OF DOUBT: HOW A HANDFUL OF SCIENTISTS OBSCURED THE TRUTH ON ISSUES FROM TOBACCO SMOKE TO GLOBAL WARMING (2010).

[336] Oreskes & Conway, *supra* note 334, at 100.

[337] *See* Samer Fawzy, Ahmed I. Osman, John Doran & David W. Rooney, *Strategies for Mitigation of Climate Change: A Review*, 18 ENV'T CHEMISTRY LETTERS 2069, 2070–71, 2073 (2020).

[338] *See, e.g.*, Jeffrey A. Smith, *The Implications of the Kyoto Protocol and the Global Warming Debate for Business Transactions*, 1 N.Y.U. J.L. & BUS. 511, 511–12 (2005).

[339] John Gramlich, *10 Facts About the Death Penalty in the U.S.*, PEW RSCH. CTR., (July 19, 2021), https://www.pewresearch.org/fact-tankshort-reads/2021/07/19/10-facts-about-the-death-penalty-in-the-u-s.

[340] David Cole, *Turning the Corner on Mass Incarceration?*, 9 OHIO ST. J. CRIM. L. 27, 35 (2011) (arguing that "without significant efforts to rehabilitate, . . . with more than 700,000 prisoners released from prison each year, . . . about two-thirds of them will be re-arrested").

Like policy preferences, religion is a predictor of an individual's position regarding science, and the COVID-19 vaccine specifically.[341] Republicans are more likely than Democrats to be evangelical Christians.[342] Meanwhile, demographic trends reveal a decline in Christianity,[343] leading some to predict an impending "identity crisis" for many evangelicals and conservative Protestants as they faced the prospect of "struggl[ing] to determine the relevance and function of the church."[344] Religious rhetoric and ideas are often at odds with science.[345] Conservative politicians, leaders, and voters tend to adhere to a literal interpretation of the Bible, including concepts such as a six-day creation story, which clashes with evolution and Darwinism.[346] Sociologists have noted that religious conservative voters and leaders

[341] *See* Eve Dubé, Dominique Gagnon, Emily Nickels, Stanley Jeram & Melanie Schuster, *Mapping Vaccine Hesitancy—Country-Specific Characteristics of a Global Phenomenon*, 32 VACCINE 6649, 6650 (2014); *see also* Radosław Trepanowski & Dariusz Drążkowski, *Cross-National Comparison of Religion as a Predictor of COVID-19 Vaccination Rates*, 61 J. RELIGION & HEALTH 2198, 2204–05 (2022) (noting that Christianity is negatively correlated with vaccination rates).

[342] John Gramlich, *What the 2020 Electorate Looks Like by Party, Race and Ethnicity, Age, Education and Religion*, PEW RSCH. CTR. (Oct. 26, 2020), https://www.pewresearch.org/short-reads/2020/10/26/what-the-2020-electorate-looks-like-by-party-race-and-ethnicity-age-education-and-religion; *see also* Victor J. Blue, Opinion, *Why 'Evangelical' Is Becoming Another Word for 'Republican,'* N.Y. TIMES (Oct. 26, 2021), https://www.nytimes.com/2021/10/26/opinion/evangelical-republican.html.

[343] *In U.S., Decline of Christianity Continues at Rapid Pace*, PEW RSCH. CTR. 3 (Oct. 17, 2019), https://www.pewresearch.org/religion/2019/10/17/in-u-s-decline-of-christianity-continues-at-rapid-pace ("In Pew Research Center telephone surveys conducted in 2018 and 2019, 65% of American adults describe themselves as Christians when asked about their religion, down 12 percentage points over the past decade. Meanwhile, the religiously unaffiliated share of the population, consisting of people who describe their religious identity as atheist, agnostic or 'nothing in particular,' now stands at 26%, up from 17% in 2009.").

[344] Darrius Hills, *Back to a White Future: White Religious Loss, Donald Trump, and the Problem of Belonging*, 16 BLACK THEOLOGY 38, 41 (2018).

[345] Christianity is based upon the idea of faith, or a belief in that which cannot be tested and proven. While some Christian faiths manage to reconcile faith and scientific evidence of evolution, weather patterns, astronomy, and other phenomena, for some Christian groups, knowledge gleaned from human discovery is threatening to their belief system. John H. Evans, *Epistemological and Moral Conflict Between Religion and Science*, 50 J. FOR SCI. STUDY RELIGION 707, 708, 721, 723 (2011) (arguing that epistemological conflicts lead some religious people to oppose scientific methods because such methods are logically incompatible with their beliefs).

[346] *See* Ruth Braunstein, *A (More) Perfect Union? Religion, Politics, and Competing Stories of America*, 79 SOCIO. RELIGION: Q. REV. 172, 178 (2018); Carl T. Bogus, *Fighting Over the Conservative Banner*, *in* 56 AM. CONSERVATISM 347 (Sanford V. Levinson, Joel Parker & Melissa S. Williams eds., 2016); *see also* Andrew L. Whitehead & Samuel L. Perry, *Is a "Christian America" a More Patriarchal America? Religion, Politics, and Traditionalist Gender Ideology*, 56 CAN. REV. SOCIO. 151, 155 (2019) (drawing a parallel between the devotion of Christian nationalists to an originalist interpretation which "sacralize[s] the individual freedoms guaranteed in America's founding documents, rendering them beyond revision or reinterpretation").

tend to embrace the notion of an American exceptionalism, seeing a divine influence in its creation.[347] This view is consistent with foundational institutions and ideas, and its followers are therefore resistant to scientific inquiry with its focus on refining and pushing the boundaries of human knowledge.[348]

Exposure to scientific inquiry and higher learning more generally has also been shown to be negatively correlated with a conservative resistance to scientific findings. Although CEOs, who tend to be more educated than the average American voter, are disproportionately conservative, this is atypical.[349] On average, conservative voters have less education than voters who identify as liberal.[350] Research on the correlation between education level and attitudes about vaccination found that more than half of Americans who said they would not be vaccinated or let their children be vaccinated had a high school education or less.[351] "Democrats are more inclined than Republicans to think scientists should have an active role in science policy matters."[352] Most Democrats (86%) with high levels of science knowledge say the scientific method generally produces accurate conclusions, while fewer (52%) Democrats with low science knowledge say this. "But science knowledge has little bearing on Republicans' beliefs about the scientific method," with Republicans expressing far less confidence than Democrats in scientific studies.[353] Some research has suggested that a conservative perspective and associated personality traits may foster a

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[347] Braunstein, *supra* note 346, at 185, 187.

[348] *Id.* at 187; *see also* Bogus, *supra* note 346, at 364.

[349] A 2019 Harvard study found that CEOs, who tend to be very well-paid, are overwhelmingly Republican. Alma Cohen, Moshe Hazan, Roberto Tallarita & David Weiss, *The Politics of CEOs*, 11 J. LEGAL ANALYSIS 1, 40 (2019).

[350] *A Wider Ideological Gap Between More and Less Educated Adults*, PEW RSCH. CTR. (Apr. 26, 2016), https://www.pewresearch.org/politics/2016/04/26/a-wider-ideological-gap-between-more-and-less-educated-adults.

[351] Jo Napolitano, *New Research: Low Education Levels Strongly Tied to Being Unvaccinated, Major Contributor to Ongoing Hesitancy*, 74 NEWSL. (Jan. 25, 2022), https://www.the74million.org/article/new-research-low-education-levels-strongly-tied-to-being-unvaccinated-major-contributor-to-ongoing-hesitancy; *see also* Lindsay M. Monte, *Household Pulse Survey Shows Many Don't Trust COVID Vaccine, Worry About Side Effects*, U.S. CENSUS BUREAU (Dec. 28, 2021), https://www.census.gov/library/stories/2021/12/who-are-the-adults-not-vaccinated-against-covid.html ("[Unvaccinated individuals] had lower levels of education, on average, than those who were vaccinated. Survey respondents who had received at least one dose were twice as likely as the unvaccinated to have a college degree or higher.").

[352] Cary Funk, *Key Findings About Americans' Confidence in Science and Their Views on Scientists' Role in Society*, PEW RSCH. CTR. (Feb. 12, 2020), https://www.pewresearch.org/fact-tank/2020/02/12/key-findings-about-americans-confidence-in-science-and-their-views-on-scientists-role-in-society.

[353] *Id.*

particular style of information processing.[354] Research has suggested that intolerance for uncertainty and a desire for hierarchical and institutional structure are traits positively associated with conservative ideology and negatively associated with liberal ideology.[355] In their 2009 book *Authoritarianism and Polarization in American Politics*, political scientists Marc Hetherington and Jonathan Weiler found that those groups scoring highest on the authoritarian scale were Protestant churchgoers, residents of small towns, Southerners, and people with a high school education or less.[356] Authoritarian voters have been particularly receptive to conspiracy theories and political candidates who espouse conspiracy theories.[357] Researchers Felix Suessenbach and Adam Moore similarly found a relationship between belief in conspiracy theories and a dominance motivation.[358]

Another difference between conservatives and progressives during the pandemic was the frequency with which each group attended COVID-related gatherings.[359] Rallies and protests often cement and expand anti-vaccine notions.[360] Such

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[354] John T. Jost, Jack Glaser, Arie W. Kruglanski & Frank J. Sulloway, *Political Conservatism as Motivated Social Cognition*, 129 PSYCH. BULL. 339, 344–45, 347–48 (2003); *see also* Bethany Lassetter & Rebecca Neel, *Malleable Liberals and Fixed Conservatives? Political Orientation Shapes Perceived Ability to Change*, 82 J. EXPERIMENTAL SOC. PSYCH. 141 (2019).

[355] *See, e.g.*, John T. Jost, Jaime L. Napier, Hulda Thorisdottir, Samuel D. Gosling, Tibor P. Palfai & Brian Ostafin, *Are Needs to Manage Uncertainty and Threat Associated with Political Conservatism or Ideological Extremity?*, 33 PERSONALITY & SOC. PSYCH. BULL. 989, 990 (2007).

[356] MARC J. HETHERINGTON & JONATHAN D. WEILER, AUTHORITARIANISM AND POLARIZATION IN AMERICAN POLITICS 59–60 (2009).

[357] See Zachary J. Goldberg & Sean Richey, *Anti-Vaccination Beliefs and Unrelated Conspiracy Theories*, 183 WORLD AFFS. 105 (2020), for a general discussion of the relationship between anti-vaxxers and conspiracy theories about Obama's birth certificate, that Obama is a Muslim, and that the Bush Administration knew about the 9/11 attacks before they happened. Goldberg and Richey show that anti-vaccination beliefs are best explained as an extension of common psychological predisposition for conspiracy beliefs, and that anti-vaccination beliefs correlate strongly with conspiracy beliefs about Barack Obama and the 9/11 "truther" movement. Goldberg and Richey found that the primary predictor of belief in these conspiracy beliefs was the strong negative correlation with political trust—political distrust explains a large portion of all three conspiracy beliefs.

[358] Suessenbach & Moore, *supra* note 220, at 172, 174. Those with a dominance motivation support requiring "deference to the United States from other states or [promoting] certain subgroups' superiority over others (e.g., 'Caucasian' and 'Men' over 'Mexicans.'") *Id.* at 174. Trump voters and men had higher levels of dominance motivation and were significantly more accepting of conspiracy theories as compared to Clinton voters and women. *Id.*

[359] *See, e.g.*, Mettler et al., *supra* note 15; Nathan Bernard, *GOP Lawmakers Headline Conspiracy-Laden Vaccine Mandate Protest*, ME. BEACON (Aug. 19, 2021), https://mainebeacon.com/gop-lawmakers-headline-conspiracy-laden-vaccine-mandate-protest.

[360] *See, e.g.*, LEE C. MCINTYRE, POST-TRUTH 38 (2018) (claiming that "'irrational' tendencies tend to be reinforced when we are surrounded by others who believe the same thing we do").

large gatherings involve discussing topics with like-minded individuals. Group polarization is a common phenomenon. According to Lisa Fazio, a misinformation researcher with Vanderbilt University, when Deniers gather together to protest vaccine mandates, "[i]n a lot of ways they're forming this community of belief."[361] Fazio notes that the thrust of much of the conversation is essentially, "[p]eople like us, believe these things."[362] "[S]ome people may show up to this conference for one conspiracy theory and learn about another, giving misinformation the opportunity to cross-pollinate. 'You can't believe some of it and not others,' Fazio says. 'If you're part of this community, you believe the entire pot.'"[363] For example, one COVID-related "march was billed as a protest of mandates rather than the medicines themselves. But similar rhetoric—emphasizing individual autonomy rather than untenable scientific ideas—has long characterized the broader anti-vaccine movement."[364] "[T]he march's speakers included movement veterans such as Robert F. Kennedy Jr. and Del Bigtree, founder of the anti-vaccine group Informed Consent Action Network."[365]

B. Skeptics

The second group, the Skeptics, were characterized by a different set of goals. Members of this group were, like Receptives, mostly engaged in information-seeking. Although public health authorities have widely condemned Deniers, some have argued that skepticism was a healthy place to start.[366] According to sociologist Stephan Lewandowsky, "The dividing line between denial and skepticism may not always be apparent to the public, but existing research permits its identification with relative ease because denial expresses itself with considerable homogeneity irrespective of which scientific fact is being targeted."[367] In contrast, Skeptics remain open to being convinced of the safety of a therapy like a vaccine, provided that they receive

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[361] Paige Pfleger, *While COVID Still Rages, Anti-Vaccine Activists Will Gather for a Big Conference*, NPR (Oct. 22, 2021, 5:00 AM), https://www.npr.org/2021/10/22/1048162253/while-covid-still-rages-anti-vaccine-activists-will-gather-for-a-big-conference (quoting Lisa Fazio).

[362] *Id.* (quoting Lisa Fazio).

[363] *Id.* (quoting Lisa Fazio).

[364] Mettler et al., *supra* note 15.

[365] *Id.*

[366] *See* Stephan Lewandowsky, Michael E. Mann, Nicholas J. L. Brown & Harris Friedman, *Science and the Public: Debate, Denial, and Skepticism*, 4 J. SOC. & POL. PSYCH. 537, 538 (2016) ("Public debate and skepticism are essential to a functioning democracy."); *see also* David Klepper, *Surgeon General Urges US Fight Against COVID Misinformation*, ASSOCIATED PRESS (July 15, 2021, 12:54 PM), https://apnews.com/article/technology-joe-biden-business-coronavirus-pandemic-misinformation-50d081bad2f76f097b6de57356ef8ab0 (describing how the U.S. surgeon general criticized misinformation spread by Deniers as "undermining efforts to end the coronavirus pandemic").

[367] Lewandowsky et al., *supra* note 366, at 538.

evidence that is sufficiently comprehensible and compelling to overcome their fear of risks.[368] For this second group of vaccine-hesitant Americans, distrust of public health communication was less about self-identity, and more about lack of understanding or concern over conflicting messages.[369] In short, Skeptics needed to be convinced that the risks of remaining unvaccinated are greater than the risks of being vaccinated. While Deniers typically promote conspiracy theories specifically designed to promote false beliefs, Skeptics may be convinced by such theories, but they rarely create and promulgate such theories.[370]

Skeptics were reluctant to trust the science for myriad reasons, ranging from the novelty of the virus and the newness of related scientific knowledge to the speed with which vaccine development and testing occurred.[371] Some Skeptics were wary of the vaccine's "emergency approval" status.[372] Many skeptics were influenced by false information, spread by Deniers. For example, at an anti-vaccine conference in Tennessee, Nashville's mayor downplayed the possible public health impacts, while Alex Jahangir, leader of the city's coronavirus task force, worried that people who came to get reliable information would leave having been misled.[373]

The reluctance of people to receive safe and recommended available vaccines was already a growing concern before the COVID-19 pandemic.[374] Research done in high-income countries has developed a framework "called 'the 5C model of the

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[368] *See* Dan Diamond, *The Coronavirus Vaccine Skeptics Who Changed Their Minds*, WASH. POST. (May 3, 2021), https://www.washingtonpost.com/health/2021/05/03/vaccine-hesitant-americans-change-minds-debeaumont-foundation.

[369] *See* Rusi Jaspal & Brigitte Nerlich, *Social Representations of COVID-19 Skeptics: Denigration, Demonization, and Disenfranchisement*, 11 POL., GRPS. & IDENTITIES 750, 763–65 (2023).

[370] *See* Lewandowsky et al., *supra* note 366, at 538–39 ("A second common feature of denial, which differentiates it further from skepticism and legitimate debate, involves personal and professional attacks on scientists both in public and behind the scenes. . . . A further target for contrarian activity involves preliminary results or unpublished data."); *see also id.* at 543 ("People who deny scientific facts that they find challenging or unacceptable, by contrast, are by and large not skeptics.").

[371] Gianmarco Troiano & Alessandra Nardi, *Vaccine Hesitancy in the Era of COVID-19*, 194 PUB. HEALTH 245, 250 (2021).

[372] Cary Funk & Alec Tyson, *Intent to Get a COVID-19 Vaccine Rises to 60% as Confidence in Research and Development Process Increases*, PEW RSCH. CTR. (Dec. 3, 2020), https://www.pewresearch.org/science/2020/12/03/intent-to-get-a-covid-19-vaccine-rises-to-60-as-confidence-in-research-and-development-process-increases (showing that 62% of respondents in a study concerning vaccine adoption during emergency use status indicated that they would be uncomfortable being among the first to get the vaccine).

[373] Pfleger, *supra* note 361.

[374] *See, e.g.*, Mariam Siddiqui, Daniel A. Salmon & Saad B. Omer, *Epidemiology of Vaccine Hesitancy in the United States*, 9 HUM. VACCINES & IMMUNOTHERAPEUTICS 2643 (2013) (presenting evidence that parents were putting off or refusing vaccinations for their children prior to the COVID-19 pandemic).

drivers of vaccine hesitancy' [which] provides five main individual person-level determinants for vaccine hesitancy: confidence, complacency, convenience (or constraints), risk calculation, and collective responsibility."[375] The study looked at whether people are willing to be vaccinated, the reasons for their decision, and which sources of information were most trusted. Machingaidze & Wiysonge investigated vaccination status and attitudes in Africa, South Asia, Latin America, Russia, and the United States. The authors compared findings "from two countries at the forefront of vaccine research and development: Russia and the United States" with findings from the countries with less wealth.[376] Overall, they found that:

> the acceptance rate in every sample from [lower and middle-income countries] was higher than that of samples from the United States (64.6%) and Russia (30.4%). The data show that vaccine acceptance is explained mainly by an interest in personal protection against COVID-19, whereas concerns about side effects are the most common reasons for hesitancy, and health workers are the most trusted sources of guidance about vaccines against COVID-19.[377]

For those who care about minimizing risk of serious illness, long-term complications, and possibly death, available information would appear to lean heavily in favor of getting vaccinated.[378] However, the vaccine development history and actions of the FDA present a more nuanced picture.[379] The process by which the Pfizer, Moderna, and Johnson & Johnson vaccines were tested and approved was expedited, and the period of time researchers have had to observe long-term side effects has been shorter than is typical for other vaccines.[380] The "emergency use" status first granted by the FDA was interpreted by some to suggest that the agency lacked complete confidence in the safety of the vaccine.[381] Moreover, the lag in approval for children

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[375] Shingai Machingaidze & Charles Shey Wiysonge, *Understanding COVID-19 Vaccine Hesitancy*, 27 NATURE MED. 1338, 1338 (2021).

[376] *Id.*

[377] *Id.*

[378] *See 10 Reasons to Get Vaccinated*, NAT'L FOUND. FOR INFECTIOUS DISEASES, https://www.nfid.org/immunization/10-reasons-to-get-vaccinated (July 2023).

[379] *See generally* Rachel Lance, *How COVID-19 Vaccines Were Made So Quickly Without Cutting Corners*, SCI. NEWS (June 29, 2021, 6:00 AM), https://www.sciencenews.org/article/covid-coronavirus-vaccine-development-speed.

[380] *Id.*

[381] Doug Most, *Myths v. Facts: Making Sense of COVID-19 Vaccine Misinformation*, BRINK (Aug. 13, 2021), https://www.bu.edu/articles/2021/myths-vs-facts-covid-19-vaccine; *see also Emergency Use Authorization for Vaccines Explained*, FDA, https://www.fda.gov/vaccines-blood-biologics/vaccines/emergency-use-authorization-vaccines-explained (Nov. 20, 2020) ("Under an [Emergency Use Authorization], FDA may allow the use of unapproved medical products, or unapproved uses of approved medical products in an emergency to diagnose, treat, or prevent

under the age of 12 caused some to infer that the vaccine may have undisclosed harmful consequences down the road.[382] The COVID-19 vaccine was hardly the first vaccine to be met with distrust. Vaccines have historically presented special problems from a public trust perspective.[383] Layers of past vaccine misinformation campaigns, sometimes bolstered by faulty research reports that had to be retracted, have created a foundation of distrust.[384] The very idea that a healthy person would willingly be injected with a virus seems counterintuitive to many.[385]

For this group, the reasons for resisting being vaccinated center on the vaccine itself.[386] If vaccinated members of society can effectively change the way these individuals perceive the vaccine, the battle will largely be won.[387] However, in the effort to change these minds, the "persistence" urged by many healthcare professionals may not be enough.[388] Hammering away with the same message and data is unlikely to persuade someone who has already seen the data and heard the message dozens of

serious or life-threatening diseases or conditions when certain statutory criteria have been met, including that there are no adequate, approved, and available alternatives.").

[382] *See* Daniella Silva, *After FDA Approves Pfizer Vaccine, Several Steps Remain Before Kids Under 12 Can Be Vaccinated*, NBC NEWS (Aug. 23, 2021, 2:57 PM), https://www.nbcnews.com/news/us-news/after-fda-approves-pfizer-vaccine-several-steps-remain-kids-under-n1277476 (explaining that clinical trials for children still needed to be completed); Celia B. Fisher, Elise Bragard, Rimah Jaber & Aaliyah Gray, *COVID-19 Vaccine Hesitancy Among Parents of Children Under Five Years in the United States*, 10 VACCINES 1313, 1314, 1318, 1321 (2022).

[383] *See* Alicia Ault, *History Shows Americans Have Always Been Wary of Vaccines*, SMITHSONIAN MAG. (Jan. 26, 2021), https://www.smithsonianmag.com/smithsonian-institution/history-shows-americans-have-always-been-wary-vaccines-180976828.

[384] *See, e.g.*, Laura Eggertson, *Lancet Retracts 12-Year-Old Article Linking Autism to MMR Vaccines*, CANADIAN MED. ASS'N J. (Mar. 9, 2010), https://www.cmaj.ca/content/182/4/E199; Jeff Karoub, *Vaccine Hesitancy, Rooted in Institutional Mistrust, Could Stand in Way of COVID-19 Herd Immunity*, U. MICH. NEWS (May 12, 2021), https://news.umich.edu/vaccine-hesitancy-rooted-in-institutional-mistrust-could-stand-in-way-of-covid-19-herd-immunity (explaining that "reluctance is due to longstanding mistrust in technical, health and government institutions").

[385] *See* Angela N. Baldwin, *Injecting Healthy Adults with Live Coronavirus Provides Moral Dilemma, Faster Path to Vaccine*, ABC NEWS (Apr. 27, 2020, 3:48 AM), https://abcnews.go.com/Health/injecting-healthy-adults-live-coronavirus-moral-dilemma-faster/story?id=70331610; *see also* Justine Coleman, *Spotify's Joe Rogan Says 'Healthy' Young People Don't Need to Worry About Getting COVID-19 Vaccine*, THE HILL (Apr. 27, 2021, 3:45 PM), https://thehill.com/homenews/media/550532-spotifys-joe-rogan-says-healthy-young-people-dont-need-to-worry-about-getting.

[386] *See* Baldwin, *supra* note 385; Coleman, *supra* note 385.

[387] *See, e.g.*, *Building Confidence in COVID-19 Vaccines*, CDC, https://www.cdc.gov/vaccines/covid-19/vaccinate-with-confidence.html (Oct. 18, 2023) (listing ways to build confidence in COVID-19 vaccines, including addressing vaccine misinformation).

[388] *See* Sabrina Tavernise, *Vaccine Skepticism Was Viewed as a Knowledge Problem. It's Actually About Gut Beliefs*, N.Y. TIMES, https://www.nytimes.com/2021/04/29/us/vaccine-skepticism-beliefs.html (May 6, 2021).

times.[389] Instead, efforts to "educate" must be carefully crafted with an understanding of human psychology.[390] The psychology of risk assessment is special; human beings behave in specific ways in response to perceived threats to their health and well-being.[391] Accounting for these patterns of human thought is the best way to formulate an approach that, rather than risking alienation, meets the individual where they are and satisfies the psychological drive to self-protect.[392]

Although social scientists sometimes characterize the fear of novel technologies as "irrational," in a real way,[393] this tendency is adaptive.[394] If our ancient ancestors didn't exhibit a healthy dose of skepticism about things that were unfamiliar, they would have been more likely to eat poisonous plants or venture into rocky, uncharted waters.[395] Tested is good; tested is safe.[396] Risks that are hard to comprehend and calculate—even when evidence suggests they are minimal—are particularly frightening.[397] Because the way in which vaccines trigger an immune response is not well-understood by most members of the public, vaccines have been targeted by Skeptics.[398] The COVID-19 vaccine felt particularly risky because it has been in use for a relatively short time.[399] More than three years after the first vaccine rollout, the

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[389] Ullrich K. H. Echer, Briony Swire & Stephan Lewandowsky, *Correcting Misinformation—A Challenge for Education and Cognitive Science*, *in* PROCESSING INACCURATE INFORMATION 20 (David N. Rapp & Jason L. G. Braasch eds., 2014).

[390] Tavernise, *supra* note 388; Stephanie Pappas, *Social Science and the COVID-19 Vaccines*, MONITOR PSYCH., Mar. 2021, at 36, 38.

[391] *See* Hye-Jin Paek & Thomas Hove, *Risk Perceptions and Risk Characteristics*, OXFORD RSCH. ENCYCLOPEDIAS (Mar. 29, 2017), https://doi.org/10.1093/acrefore/9780190228613.013.283.

[392] Pappas, *supra* note 390, at 40–41 (explaining that individuals have unique, personal reasons behind why they are hesitant, and therefore, tailoring messaging to specific individuals and communities is important).

[393] Sara Gorman, *How Do We Perceive Risk?: Paul Slovic's Landmark Analysis*, PUMP HANDLE (Jan. 16, 2013), http://www.thepumphandle.org/2013/01/16/how-do-we-perceive-risk-paul-slovics-landmark-analysis.

[394] *See* RÜDIGER M. TRIMPOP, THE PSYCHOLOGY OF RISK TAKING BEHAVIOR, *in* 107 ADVANCES IN PSYCHOLOGY 12–14 (G. E. Stelmach & P. A Vroon eds., 1994).

[395] *See id.* at 11.

[396] *See* Kluger, *supra* note 20 (noting individuals have indicated that more data and testing would give them more confidence in the vaccine).

[397] Gorman, *supra* note 393 (explaining that a low-risk activity that is unfamiliar and unknowable induces more fear than a higher risk activity that is familiar and knowable).

[398] *See* Ross S. Federman, *Understanding Vaccines: A Public Imperative*, 87 YALE J. BIOLOGY & MED. 417, 418 (2014); *see also Vaccine Myths Debunked*, PUB. HEALTH, https://www.publichealth.org/public-awareness/prenatal-care/vaccine-myths-debunked (last visited Mar. 24, 2024) (explaining that "U.S. public health officials and physicians have been combating misconceptions about vaccine safety for over twenty years" with "mixed success").

[399] Kluger, *supra* note 20.

data has been mounting, but the COVID-19 vaccine is still in its infancy in the minds of many.[400]

C. *Receptives*

Receptives, who had little trouble embracing public health messages urging masking and vaccinating, were statistically less likely to catch the virus.[401] However, because this group was the most likely to adopt cautionary measures, they were also more reluctant to abandon protective measures, even when the danger was ebbing following the distribution of highly effective vaccines. Having embraced advice from the CDC initially, some Receptives were slow to embrace the message that it was safe to begin to return to normalcy.[402] This pattern of behavior was sufficiently prevalent that it was dubbed "cave syndrome."[403] Many Receptives who embraced the CDC's instructions to mask and social distance were reluctant to follow advice from the same source when the CDC suggested a gradual return to normalcy.[404] Psychologists and psychiatrists have noted the trauma that can result when isolation and anxiety mount over an extended period of time.[405] The resulting impact has been equated to agoraphobia—an extreme fear of going outside.[406]

Part of the issue for Receptives may have been a natural reluctance to change from the position they had adopted and for which they had sacrificed so much. The motivation to affirm past attitudes and behaviors stems from a need to reduce cognitive dissonance—an unpleasant psychological state that occurs when our beliefs

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[400] Killian Meara, *COVID-19, Flu, and RSV Vaccine Skepticism Still an Issue Among Many Americans*, DRUG TOPICS (Oct. 7, 2023), https://www.drugtopics.com/view/covid-19-flu-and-rsv-vaccine-skepticism-still-an-issue-among-many-americans.

[401] *See* Mohammed et al., *supra* note 31; Ashwin Aravindakshan, Jörn Boehnke, Ehsan Gholami & Ashutosh Nayak, *The Impact of Mask-Wearing in Mitigating the Spread of COVID-19 During the Early Phases of the Pandemic*, PLOS GLOB. PUB. HEALTH, Sept. 15, 2022, at 1, 2, 10, 14.

[402] Ciechalski & Siemaszko, *supra* note 33.

[403] Amanda Plasencia, *People With 'Cave Syndrome' Are Reluctant to Return to Normal Life After COVID*, NBC 6 S. FLA., https://www.nbcmiami.com/news/local/people-with-cave-syndrome-are-reluctant-to-return-to-normal-life-after-covid (Mar. 9, 2021, 2:09 PM). Arthur Bregman, a psychiatrist in Miami, coined the term to describe a growing number of patients who refused to leave their homes and rejoin society following COVID-19. *Id.*

[404] Healy & Wong, *supra* note 34.

[405] Ciechalski & Siemaszko, *supra* note 33 (noting that Dr. Aderonke Pederson predicted that the psychological impact of the pandemic would last far longer than anyone would have believed).

[406] Plasencia, *supra* note 403. Dr. Bregman remarked, "Even people that didn't have agoraphobia, which is the fear of open spaces, people have it now." *Id.*

and our actions do not match.[407] Research has shown that there is a motivational dimension to dissonance reduction, which prompts individuals to behave in ways that reduce the psychic tension.[408] The motivation to perceive oneself and to be thought of by others as consistent is unconscious and powerful.[409] Research on the impact of public commitments suggests that public commitments are particularly likely to engender a desire to behave consistently.[410] These findings suggest that the highly visible way in which people signaled their commitment to social distancing and masking likely contributed to their subsequent reluctance to return to normalcy.[411]

Prolonging the practice of social isolation came at a cost. While Deniers who did not social distance enjoyed the benefit of each other's company, Receptives who stayed out of public experienced greater social isolation.[412] The health benefits of social distancing became attenuated after the advent of effective vaccines to combat the virus while the psychological costs of sheltering in place remained significant.[413]

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[407] *See generally* FESTINGER, A THEORY OF COGNITIVE DISSONANCE, *supra* note 107 (positing that when people act in ways that are inconsistent with their attitudes, they experience psychic discomfort).

[408] Andrew J. Elliot & Patricia G. Devine, *On the Motivational Nature of Cognitive Dissonance: Dissonance as Psychological Discomfort*, 67 J. PERSONALITY & SOC. PSYCH. 382, 382, 387, 390–91 (1994) (demonstrating that "dissonance is experienced as psychological discomfort and that this psychological discomfort is alleviated on implementation of a dissonance-reduction strategy").

[409] *See* CIALDINI, *supra* note 103, at 60.

[410] Jeff Stone & Nicholas C. Fernandez, *To Practice What We Preach: The Use of Hypocrisy and Cognitive Dissonance to Motivate Behavior Change*, 2 SOC. & PERSONALITY COMPASS 1024, 1024–25, 1030–31 (2008) (explaining that being perceived as inconsistent motivates people to correct this impression).

[411] *See id.* at 1046.

[412] Hunt Allcott, Levi Boxell, Jacob Conway, Matthew Gentzkow, Michael Thaler & David Yang, *Polarization and Public Health: Partisan Differences in Social Distancing During the Coronavirus Pandemic*, J. PUB. ECON, Nov. 2020, at 1, 2 (finding that "[c]ompared to Republicans . . . Democrats believe the pandemic is more severe and report a greater reduction in contact with others"); Justin McCarthy, *Three in Four in U.S. Have Self-Isolated in Their Household*, GALLUP (Apr. 8, 2020), https://news.gallup.com/poll/307760/three-four-self-isolated-household.aspx (discussing isolation).

[413] *See* Mike Stobbe & Collin Binkley, *CDC Relaxes COVID-19 Guidelines, Drops Quarantine and Social Distancing Recommendations*, PBS (Aug. 11, 2022, 5:21 PM), https://www.pbs.org/newshour/health/cdc-relaxes-covid-19-guidelines-drops-quarantine-and-social-distancing-recommendations; Mark É. Czeisler, Rashon I. Lane, Emiko Petrosky, Joshua F. Wiley, Aleta Christensen, Rashid Njai, Matthew D. Weaver, Rebecca Robbins, Elise R. Facer-Childs, Laura K. Barger, Charles A. Czeisler, Mark E. Howard & Shantha M.W. Rajaratnam, *Mental Health, Substance Use, and Suicidal Ideation During the COVID-19 Pandemic — United States, June 24–30, 2020*, 69 MORBIDITY & MORTALITY WKLY. REP. 1049, 1049 (2020) ("The coronavirus disease 2019 (COVID-19) pandemic has been associated with mental health

Ironically, the continuation of behaviors that at one time were considered best practice for health became risky. Prolonged social withdrawal led to an increased risk of weight gain, substance abuse, and depression.[414] Prolonged periods of sheltering in place and the resulting social isolation were associated with an increase in mental and physical health complications.[415]

V. SOLUTIONS

Public health officials, community leaders, lawmakers, and even celebrities have used a variety of different communication channels to urge Americans to get vaccinated.[416] Lawmakers have devised incentive programs to entice constituents to get immunized.[417] Health providers who have direct contact with patients discussed strategies for finding routes to persuade the reluctant.[418] Those in charge of outreach and education about the issue have called upon members of the community to be partners in the education effort, asking vaccinated people to reach out to friends, family, and neighbors to urge them to get the life-saving shot.[419] In spite of these

challenges related to the morbidity and mortality caused by the disease and to mitigation activities, including the impact of physical distancing and stay-at-home orders. Symptoms of anxiety disorder and depressive disorder increased considerably in the United States during April–June of 2020, compared with the same period in 2019." (internal citations omitted)).

[414] *See* Press Release, Am. Psych. Ass'n, *supra* note 32.

[415] Jeffrey A. Woods, Noah T. Hutchinson, Scott K. Powers, William O. Roberts, Mari Carmen Gomez-Cabrera, Zsolt Radak, Istvan Berkes, Anita Boros, Istvan Boldogh, Christiaan Leeuwenburgh, Hélio José Coelho-Júnior, Emanuele Marzetti, Ying Cheng, Jiankang Liu, J. Larry Durstine, Junzhi Sun & Li Ji, *The COVID-19 Pandemic and Physical Activity*, 2 SPORTS MED. & HEALTH SCI. 55, 56–58 (2020).

[416] *E.g.*, Christi Carras, *Olivia Rodrigo Collaborates with Dr. Fauci for a 'Mean Tweets'-Inspired Vaccine PSA*, L.A. TIMES (July 16, 2021, 1:03 PM), https://www.latimes.com/entertainment-arts/music/story/2021-07-16/covid-19-vaccine-olivia-rodrigo-white-house-joe-biden; Marianne Garvey, *Howard Stern to Anti-Vaxxers: 'You Had the Cure and You Wouldn't Take It,'* CNN, https://www.cnn.com/2021/09/10/entertainment/howard-stern-vaccine-comments (Sept. 10, 2021, 11:39 AM); *Community Leaders Urge Vaccination at Thursday Clinic*, JOPLIN GLOBE, https://www.joplinglobe.com/coronavirus/community-leaders-urge-vaccination-at-thursday-clinic/article_57f864f8-f54c-11eb-bae2-53880d8ceae8.html (Aug. 5, 2021).

[417] *E.g.*, Memorandum from Brittney Roy & Michelle LeBlanc, Nat'l Governors Ass'n, to Governors and Staff (July 30, 2021), https://www.nga.org/wp-content/uploads/2021/05/Vaccine-Incentives-Memo-6.23.2021.pdf.

[418] *E.g.*, Andrea Y. Henderson, *St. Louis Health Officials Face an Uphill Battle to Persuade Black People to Get the COVID-19 Vaccine*, ST. LOUIS PUB. RADIO (Dec. 10, 2020, 5:13 AM), https://news.stlpublicradio.org/coronavirus/2020-12-10/after-history-of-mistreatment-doctors-must-persuade-black-people-to-get-covid-19-vaccine (urging the medical community to acknowledge the systemic racism that exists within healthcare, as it may have contributed to vaccine hesitancy).

[419] *See* Amy B. Wang, *Fauci Says Trump Should Push Supporters to Get Covid Vaccine After 'Disturbing' Poll Results Show They Won't*, WASH. POST (Mar. 14, 2021, 6:03 PM), https://www.

efforts, however, even in the face of rising numbers of hospitalizations due to the more contagious Delta variant of COVID-19, progress toward a 100% vaccinated public has been slow.[420] The campaign to save lives and protect the public could use a boost from social science. By leveraging research findings on how human beings receive information and form attitudes about issues, those who craft messages can optimize the chance of breaking down anti-vaccine bias.[421] Below are targeted recommendations about how to address the public during future public health crises.

A. Harnessing a Variety of Information Streams

Anecdotal evidence suggests that private conversations with trusted others can sometimes lead vaccine-hesitant individuals to change their minds.[422] When it comes to large-scale strategic campaigns, the most common way for public health officials and leaders to communicate with the public is through "official" channels. These include press briefings, official statements, mainstream media, and print journalism.[423] However, many Americans report that they get their information from social media, including TikTok, Facebook, Twitter, Instagram, and YouTube. A recent survey indicated that about 36% of Americans access news on Facebook, 23% on YouTube, and 15% on Twitter, while 33% of Americans access news on some other form of social media.[424] Because these media sources are frequently accessed

washingtonpost.com/nation/2021/03/14/fauci-trump-supporters-vaccine (quoting President Biden as saying, "Talk to your family, friends, your neighbors. . . . We need everyone to get vaccinated").

[420] *See* Brianna Abbott, *Covid-19 Vaccination Rates Rise Where Delta Variant Is Spreading*, WALL ST. J. (Aug. 5, 2021, 2:46 PM), https://www.wsj.com/articles/covid-19-vaccination-rates-rise-where-delta-variant-is-spreading-11628189168 (discussing several states with vaccination rates "lower than the national rate of about 58% for eligible people age 12 and above").

[421] Katherine Kricorian, Rachel Civen & Ozlem Equils, *COVID-19 Vaccine Hesitancy: Misinformation and Perceptions of Vaccine Safety*, 18 HUM. VACCINES & IMMUNOTHERAPEUTICS, no. 1, 2022, at 1, 6–7.

[422] *E.g.*, Natasha S. Alford, *Why My Father Changed His Mind About Getting a COVID-19 Vaccine*, GRIO (Aug. 24, 2021), https://thegrio.com/2021/08/24/natasha-alford-dad-covid-19-vaccine-parents.

[423] Many details and statistics surrounding the COVID-19 pandemic were communicated via "dashboards." These were created by government entities such as the CDC, as well as mainstream media outlets like the New York Times. *See, e.g.*, *COVID-19*, CDC, https://www.cdc.gov/coronavirus/2019-nCoV/index.html (last visited Mar. 24, 2024); *Coronavirus in the U.S.: Latest Map and Case Count*, *supra* note 1.

[424] Elisa Shearer & Amy Mitchell, *News Use Across Social Media Platforms in 2020*, PEW RSCH. CTR. (Jan. 12, 2021), https://www.pewresearch.org/journalism/2021/01/12/news-use-across-social-media-platforms-in-2020; *see also* Ryan M. Walters, *How to Tell a Fake: Fighting Back Against Fake News on the Front Lines of Social Media*, 23 TEX. REV. L. & POL. 111, 115 (2018) (indicating that in 2016 "roughly 45% of Americans access news on Facebook while roughly 62% obtain news on some form of social media").

by the public, individuals encounter the same information, often in multiple formats on various different social media platforms, and then false information becomes cognitively available.[425] For example, if the rumor that the vaccine alters a person's DNA[426] is reported on someone's Twitter feed and also on Instagram, the individual might retweet that information and post it on Facebook. The more people the rumor reaches, the more likely it is to be reposted and the further it will spread. In this way, social media serves as a vehicle for availability.[427]

False reports have sometimes started with traditional media reporting on rare or coincidental occurrences of health outcomes and have been picked up, exaggerated, or sensationalized through social media channels.[428] In other cases, rumors were born on social media channels entirely independent from traditional news sources.[429] They may also be presented in more memorable, vivid ways, and may be enforced by "likes" or "dislikes" and comments that follow, creating a community of like-minded people who reinforce the information presented through these channels.[430] If scientifically valid information is primarily presented through other channels, and not through these popular forms of social media, the risk is that it is

[425] *See* Aumyo Hassan & Sarah J. Barber, *The Effects of Repetition Frequency on the Illusory Truth Effect*, COGNITIVE RSCH, no. 6, 2021, at 1, 1.

[426] *10 Rumors About the COVID-19 Vaccines that Aren't True*, HENRY FORD HEALTH (Aug. 3, 2021), https://www.henryford.com/blog/2021/08/vaccine-myths (reporting that one common myth about the vaccine is that it will alter a person's DNA).

[427] *See* Arkaitz Zubiaga, Maria Liakata, Rob Procter, Geraldine Wong Sak Hoi & Peter Tolmie, *Analysing How People Orient to and Spread Rumours in Social Media by Looking at Conversational Threads*, PLOS ONE (Mar. 4, 2016), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4778911/pdf/pone.0150989.pdf.

[428] Katie Attwell & Tauel Harper, *Social Media Spreads Rumors About COVID Vaccine Harms, But It Doesn't Always Start Them*, PHYS ORG (June 3, 2022), https://phys.org/news/2022-06-social-media-rumors-covid-vaccine.html ("For example, a Tennessee nurse fainted on television shortly after receiving the Pfizer vaccine. Traditional media reports included the nurse's own disclosure of a history of fainting and cautioned against attributing it to the vaccine. Likewise, elderly baseball legend Hank Aaron died from natural causes two weeks after receiving a COVID vaccine on camera. . . . These two incidents were widely reported in traditional media and soon flowed into social media posts attributing them to the vaccine.").

[429] *Id.* (stating that, with respect to false rumors that the COVID vaccine caused infertility, "two internet stories misrepresenting the work, and words of scientists were shared widely on social media. Traditional media only picked up the story to report on the misinformation occurring.").

[430] Alessandro Bessi, *Personality Traits and Echo Chambers on Facebook*, 65 COMPUTS. HUM. BEHAV. 319, 319 (2016) ("In online social networks, users tend to select information that adhere to their system of beliefs and to form polarized groups of like minded people. . . . Being influenced by confirmation bias and selective exposure, [people] join virtual echo chambers—i.e. polarized communities populated by like-minded users."); *see also* Daphna Shwartz-Asher, Soon Chun, Nabil R. Adam & Keren LG. Snider, *Knowledge Sharing Behaviors in Social Media*, 63 TECH. SOC'Y, Nov. 2020, at 1, 1 (noting that "social media platforms easily and quickly create virtual

drowned out by the information on social media, which is often presented in a more palatable or entertaining format.[431] For example, horror stories about the vaccine's potential to scramble a person's DNA are more sensational and entertaining than scientific reports that the vaccine is safe and effective.[432]

Not only is there potential for more information to reach private citizens through social media platforms, but it is also more likely that these sources will feature anecdotal evidence, rather than aggregate data that has been controlled and synthesized by experts.[433] While anecdotal evidence is a poor source for understand-

communities of interest, where the range of interests are limitless. The interpersonal communication in the physical space targets the immediate audience to achieve some purpose, . . . but communication on social media platforms is made to either real targeted, imagined or unknown audiences, and its purpose is unclear other than denoting an intention to share."); Filippo Menczer & Thomas Hills, *Information Overload Helps Fake News Spread, and Social Media Knows It*, SCI. AM. (Dec. 1, 2020), https://www.scientificamerican.com/article/information-overload-helps-fake-news-spread-and-social-media-knows-it.

[431] Johanzynn Gatewood, Sheryl L. Monks, Camelia R. Singletary, Elena Vidrascu & Justin B. Moore, *Social Media in Public Health: Strategies to Distill, Package, and Disseminate Public Health Research*, 26 J. PUB. HEALTH MGMT. & PRAC. 489, 489 (2020) ("Passive methods of dissemination, such as publication of consensus conferences in professional journals, are generally ineffective and produce little change in practice. [But,] [s]ocial media has become a cost-effective way for public health practice to inform audiences of health issues . . . ."); Peter Dizikes, *Study: On Twitter, False News Travels Faster than True Stories*, MIT NEWS (Mar. 8, 2018), https://news.mit.edu/2018/study-twitter-false-news-travels-faster-true-stories-0308. In a study conducted by Sinan Aral, a professor at MIT Sloan School of Management, it was discovered that false news spread more quickly because it is more novel, and on social networks, people can gain attention by being the first to share previously unknown information. They are seemingly seen as being "in the know" about what they share. *Id.*

[432] *See, e.g.*, Most, *supra* note 381 (discussing the myth that messenger RNA scrambles a person's DNA); *Fact Check: RFID Microchips Will Not Be Injected with the COVID-19 Vaccine, Altered Video Features Bill and Melinda Gates and Jack Ma*, REUTERS (Dec. 4, 2020, 12:52 PM), https://www.reuters.com/article/uk-factcheck-vaccine-microchip-gates-ma/fact-check-rfid-microchips-will-not-be-injected-with-the-covid-19-vaccine-altered-video-features-bill-and-melinda-gates-and-jack-ma-idUSKBN28E286 (noting that "[a] video shared over 27,100 times on Facebook implie[d] that the COVID-19 vaccine [would] contain a tracking microchip that [would] be injected in the individuals that receive the COVID-19 vaccine").

[433] *See* CLAIRE WARDLE, FIRST DRAFT, UNDERSTANDING INFORMATION DISORDER 6–7 (2019) (ebook). Most of the fake content is usually genuine information that has been altered. "Agents of disinformation have learned that using genuine content—reframed in new and misleading ways—is less likely to get picked up by AI systems." *Id.* at 7. *See also* J. Scott Brennen, Felix Simon, Philip N. Howard & Rasmus Kleis Nielsen, *Types, Sources, and Claims of COVID-19 Misinformation*, REUTERS INST. (Apr. 7, 2020), https://reutersinstitute.politics.ox.ac.uk/types-sources-and-claims-covid-19-misinformation (finding from a study on coronavirus misinformation shows that 59% of such information is reconfigured, whereas 38% is fabricated).

ing public health trends and epidemiological information, it is also often more compelling.[434] Human beings respond to and remember narratives in a way they do not understand probabilities.[435] Because accounts given through social media are more likely to be engaging, better understood, and more relatable, they are more likely to persuade, even when they contradict the latest data.[436]

People also choose which sources of information they follow. They are likely to return to sources that reinforce the ideas they already believe.[437] Motivated reasoning causes people to selectively attend to, notice, and remember information that fits their own beliefs.[438] So, for example, someone who is inclined to doubt science

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[434] Audrey L. Michal, Yiwen Zhong & Priti Shah, *When and Why Do People Act on Flawed Science? Effects of Anecdotes and Prior Beliefs on Evidence-Based Decision-Making*, COGNITIVE RSCH.: PRINCIPLES & IMPLICATIONS, Dec. 2021, at 1, 2 ("[T]he presence of anecdotal evidence can serve as a powerful barrier for scientific reasoning and evidence-based decision-making."). Many studies show that people tend to be more persuaded by anecdotal, rather than statistical, evidence. For example, Angela Fagerlin and colleagues found that "[p]eople's treatment decisions are often influenced by anecdotal rather than statistical information," which has the potential of leading patients to make decisions based on what others have gone through, rather than on the evidence from the medicine itself. Angela Fagerlin, Catharine Wang & Peter A. Ubel, *Reducing the Influence of Anecdotal Reasoning on People's Health Care Decisions: Is a Picture Worth a Thousand Statistics?*, 25 MED. DECISION MAKING 398, 398, 399 (2005); *see also* Michael Shermer, *How Anecdotal Evidence Can Undermine Scientific Results*, SCI. AM. (Aug. 1, 2008), https://www.scientificamerican.com/article/how-anecdotal-evidence-can-undermine-scientific-results.

[435] Tversky & Kahneman, *supra* note 61, at 1124 (proposing that "people rely on a limited number of heuristic principles which reduce the complex tasks of assessing probabilities and predicting values to simpler judgmental operations").

[436] *See* Benedict Carey, *How Fiction Becomes Fact on Social Media*, N.Y. TIMES (Oct. 20, 2017), https://www.nytimes.com/2017/10/20/health/social-media-fake-news.html.

[437] Sachin Modgil, Rohit Kumar Singh, Shivam Gupta & Denis Dennehy, *A Confirmation Bias View on Social Media Induced Polarisation During Covid-19*, INFO. SYS. FRONTIERS (Nov. 2021), https://link.springer.com/article/10.1007/s10796-021-10222-9 ("In the context of [Social Media Induced Polarization], echo chambers refer to situations where users consume content and engage in discourse that predominantly supports the same point of view that users hold and believe themselves." (internal citation omitted)); Yanmengqian Zhou & Lijiang Shen, *Confirmation Bias and the Persistence of Misinformation on Climate Change*, 49 COMMC'N RSCH. 500, 503 (2022) (discussing that a form in which confirmation bias manifests is selective exposure and attention to information that is consistent with their prior belief); Julia Simkus, *Confirmation Bias in Psychology: Definition & Examples*, SIMPLY PSYCH., https://www.simplypsychology.org/confirmation-bias.html (June 22, 2023).

[438] *See* Richard Patterson, Joachim T. Operskalski & Aron K. Barbey, *Motivated Explanation*, FRONTIERS HUM. NEUROSCIENCE, Oct. 2015, at 1, 2 (proposing that explanations originate from three generative processes: (1) "[a]ctivation of a general sense of what is explanatory"; (2) "[m]emory search for candidate 'off the shelf' explanations, and for potentially relevant events or associations of various sorts"; and (3) "[c]ognitive updating" which is "[n]ormally studied in laboratory settings as the ability to change or add to representations being held in working memory").

and to believe in conspiracies is likely to return to sources of information that reinforce these ideas.[439] This tendency means that the very people who most need persuading of the safety and efficacy of vaccines are the very people most likely to end up on fringe social media sites that serve as echo chambers for like-minded individuals.[440]

Self-serving bias and confirmation bias create almost intractable problems when members of society can selectively attend to inaccurate sources of information that confirm their own inaccurate or distorted ideas.[441] If other features of the situation make the false information attractive because it reinforces prior beliefs, is easy to digest, or because the shared belief creates affinity with other like-minded individuals in the community, then the accuracy of the information becomes unimportant to the recipient.[442] Data from studies of social media use suggest that one important factor is the feeling of community that individuals enjoy from others in the virtual community.[443]

The solution may well be to meet the reluctant where they meet in the virtual space.[444] If reputable sources of information can infiltrate these social media platforms and present valid information, there is an opportunity to launch direct attacks

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[439] Zhou & Shen, *supra* note 437, at 503 (stating that "[i]ndividuals are likely to perceive attitude-consistent messages as more factual and more effective compared to attitude-inconsistent messages" and are therefore more likely to reject attitude-inconsistent information); *see also* Miriam J. Metzger, Ethan H. Hartsell & Andrew J. Flanagin, *Cognitive Dissonance or Credibility? A Comparison of Two Theoretical Explanations for Selective Exposure to Partisan News*, 47 COMMC'N RSCH. 3, 5–6 (2020). A survey conducted to see how liberals and conservatives get the news showed that there was "little overlap in the news sources they turn to and trust." Amy Mitchell, Jeffrey Gottfried, Jocelyn Kiley & Katerina Eva Matsa, *Political Polarization & Media Habits*, PEW RSCH. CTR. (Oct. 21, 2014), https://www.pewresearch.org/journalism/2014/10/21/political-polarization-media-habits. The study found that among consistent conservatives, 47% cited Fox News as their main news source for government and politics, and 88% trust Fox News' perspective, whereas among consistent liberals, there was high preference for news sources like NPR and the New York Times. *Id.*

[440] *See* Menczer & Hills, *supra* note 430.

[441] Bessi, *supra* note 430, at 319 ("[D]iscussion within like-minded people seems to influence negatively users emotions and to enforce group polarization. Moreover, experimental evidence shows that confirmatory information gets accepted even if containing deliberately false claims, while dissenting information are mainly ignored or might even increase group polarization." (internal citations omitted)); *see also* Simkus, *supra* note 437.

[442] *See* Zhou & Shen, *supra* note 437, at 502–03.

[443] Catherine M. Ridings & David Gefen, *Virtual Community Attraction: Why People Hang Out Online*, J. COMPUT.-MEDIATED COMMC'N (Nov. 1, 2004), https://doi.org/10.1111/j.1083-6101.2004.tb00229.x ("Existing literature theorizes that people join virtual communities to exchange information and/or social support. Theories of broader Internet use have indicated both entertainment and searching for friendship as motivational forces.").

[444] Calum Thornhill, Quentin Meeus, Jeroen Peperkamp & Bettina Berendt, *A Digital Nudge to Counter Confirmation Bias*, FRONTIERS BIG DATA, June 2019, at 1, 3.

on false claims while reinforcing accurate information with support presented in a simple, easy-to-digest, and familiar format. Importantly, the information should be presented in a way that is value-consistent and avoids being condescending or overbearing.[445] Ideally, public health professionals with sound advice based upon the latest data would be present in a variety of different social media platforms, providing information in a manner as consistent as possible with the norms and preferences of the users.[446]

B. Addressing Fake News

Social media sites are more than a place to exchange ideas with like-minded people. Social media, which goes largely un-fact-checked, is "a key vector for the transmission of fake news."[447] "Once uploaded [to an internet source], fake news is easily spread through social media to large numbers of people who . . . believe and share" the information.[448] Even small acts, such as "[f]ollowing, liking, tweeting,

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[445] *See id.* at 4.

[446] Haiping Zhao, Shaoxiong Fu & Xiaoyu Chen, *Promoting Users' Intention to Share Online Health Articles on Social Media: The Role of Confirmation Bias*, INFO. PROCESSING & MGMT., Nov. 2020, at 1, 10–11 (proposing that "health information providers are encouraged to serve the consumers based on their respective eHealth literacy and the assessment of their initial beliefs about a certain topic"); *see also* Gatewood et al., *supra* note 431, at 491–92.

[447] Nir Grinberg, Kenneth Joseph, Lisa Friedland, Briony Swire-Thompson & David Lazer, *Fake News on Twitter During the 2016 U.S. Presidential Election*, 363 SCI. 374, 374 (2019); *see also* Laura Gordon-Murnane, *The Intentional Misleading of the American Public: Political Misinformation*, *in* WEB OF DECEIT: MISINFORMATION AND MANIPULATION IN THE AGE OF SOCIAL MEDIA 107, 107 (Anne P. Mintz ed., 2012) ("Political misinformation is alive and well on the internet, where a large percentage of Americans now get their news."). Social media has "exacerbated the influence of misinformation," but it also "offer[s] unique opportunities to immediately correct misinformation." Emily K. Vraga, Sojung Claire Kim & John Cook, *Testing Logic-Based and Humor-Based Corrections for Science, Health, and Political Misinformation on Social Media*, 63 J. BROAD. & ELEC. MEDIA 393, 394 (2019). For example, many people maintain ties (albeit weak ones) with those who disagree with their views, "creating opportunities for correction to occur," both for individuals "as well as for the community seeing the interaction." *Id.*

[448] Bonnie Brennen, *Making Sense of Lies, Deceptive Propaganda, and Fake News,* 32 J. MEDIA ETHICS 179, 180 (2017). Government leaders, journalists, politicians, and ordinary citizens contribute to the political information available on the internet, and "the traditional media's news stream is fueled by blogs, social networks, Twitter, YouTube, [and] stories from news aggregators such as Google News." Gordon-Murnane, *supra* note 447, at 107. If misinformation enters the news stream by one of these sources, "this misinformation receives additional visibility and credibility" as it is retweeted, reposted, or simply shared via the internet in some other way, meaning that misinformation "remains mostly unchecked along the way, [and] it is readily accepted as legitimate news [by readers] and becomes difficult to correct." *Id.* at 108. However, "[l]abeling Facebook misinformation as 'fake news' [has] led to increased sharing of the[se] article[s] and a surge in traffic" in terms of people clicking the link and looking at the

retweeting, [and] sharing text or images . . . are tiny acts of political participation" that send signals to anyone looking at a user's profile or page.[449] "What distinguishes fake news in the digital age is the volume, ease, and speed with which it can spread," as opposed to historical printing of fake news in newspapers and the "Penny Press," which took far more time to spread throughout groups of people.[450] Instead of relying on "top down" communication from major outlets or leaders to people, fake news relies on horizontal structures of communication among a global network.[451] According to Stephen Jukes, "[t]oday's fake news is often propagated by individuals who can command large audiences cheaply."[452] Social media hosts and sites such as Facebook, Google, and Twitter can assist readers, viewers, and listeners in ferreting out the truth if the companies have a commercial reason to do so.[453] However, it is not clear that citizens can use consumer pressure to force them to remove fake news when the prevalence of fake news seems to be making money for shareholders.[454]

There has been a decline in the trust and confidence Americans have in the mainstream news media, with particularly sharp drops in trust among Republicans

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article. Vraga et al., *supra* note 447, at 395–96. Additionally, labeling some posts as "fake news" creates "an 'implied truth' effect for any stories *not* labeled, even when inaccurate." *Id.* at 396.

[449] Helen Margetts, *Rethinking Democracy with Social Media*, *in* RETHINKING DEMOCRACY 108 (Andrew Gamble & Tony Wright eds., 2019). Margetts asserts that "[e]ven tweeting about a demonstration or political event that you have not attended" has a role in sending out signals about the particular issue and increases the likelihood that the reader will act. *Id.* These "tiny acts of participation can scale up dramatically and rapidly. But they almost always don't." *Id.* at 109.

[450] Kate Farhall, Andrea Carson, Scott Wright, Andrew Gibbons & William Lukamto, *Political Elites' Use of Fake News Discourse Across Communications Platforms*, 13 INT'L J. COMMC'N 4353, 4356 (2019).

[451] *Id.* (citing W. Lance Bennett & Steven Livingston, *The Disinformation Order: Disruptive Communication and the Decline of Democratic Institutions*, 33 EUR. J. COMMC'N 122 (2018)); *see also* Walters, *supra* note 424, at 114 ("Because of technological advances, anyone with a mouse, keyboard, and enough ambition can now become a minor celebrity. . . . Tens of millions of consumers listen to this new generation of celebrities for entertainment and news." (internal citations omitted)).

[452] Stephen Jukes, *Back to the Future: How UK-Based News Organisations Are Rediscovering Objectivity*, 12 JOURNALISM PRAC. 1029, 1031 (2018).

[453] For example, Meta, Facebook's parent company, says that their fact-checking policy "partners with independent third-party fact-checkers that are certified through the non-partisan International Fact-Checking Network" to help fight misinformation. *How Meta's Third-Party Fact-Checking Program Works*, META: PROGRAM IMPACT BLOG (Jun. 1, 2021), https://www.facebook.com/formedia/blog/third-party-fact-checking-how-it-works.

[454] Tom Huddleston Jr., *It's Getting Harder to Trust What You Read Online—A Google Exec Explains Why, and What You Can Do About It*, CNBC, https://www.cnbc.com/2023/05/22/google-exec-how-to-fight-fake-news-online-misinformation.html (May 23, 2023, 10:26 AM); *see also* Jukes, *supra* note 452, at 1030–31.

in 2016.[455] This is consistent with research "showing that individuals evaluate belief-incongruent information more critically than belief-congruent information."[456] So while reporting about new scientific findings can reach and educate a broad audience, Deniers, Skeptics, and Receptives alike are increasingly likely to discount the reporting, particularly if the conclusions are inconsistent with their existing beliefs. Moreover, individuals spread information through social channels, regardless of the validity of the information. Overall, research has revealed that both liberals and conservatives consistently share information from both fake and non-fake sources.[457] Hence, addressing false reports is a strategy that will improve the likelihood that all groups—Deniers, Skeptics, and Receptives—will follow practices supported by science.

The rampant attacks on the mainstream media as well as the wealth of sources that spread misinformation about the virus, elections, protest activity, and the validity of media reports have served to build distrust of all sources of information among Americans.[458] These attacks are most likely to distort the choices of Deniers, who tend to comprise the audience for sources that denigrate mainstream media. One of the most common methods of promulgating fake news is to cast doubt on all sources of news, and in particular, mainstream news sources. For example, the Trump administration retweeted the following: "Fact: Under President Trump, the process of getting a coronavirus vaccine into testing has occurred at one of the FASTEST rates in history[.] I wonder if CNN will report this?"[459] On other occasions, President Trump has called the mainstream media "Fake News,"[460] and has referred to "CNN, MSDNC, ABC, NBC, CBS," and "some of FOX (desperately & foolishly pleading to be politically correct)," and "@nytimes, & the @washingtonpost" as only being out to hate him "at any cost."[461] On March 21, 2020, President Trump retweeted

[455] Hunt Allcott & Matthew Gentzkow, *Social Media and Fake News in the 2016 Election*, J. ECON. PERSPS., Spring 2017, at 211, 215.

[456] Grinberg et al., *supra* note 447, at 376.

[457] *Id.*

[458] *See* Christina Pazzanese, *Battling the 'Pandemic of Misinformation,'* HARV. GAZETTE (May 8, 2020), https://news.harvard.edu/gazette/story/2020/05/social; Van Scoy et al., *supra* note 172, at 199–200.

[459] Donald J. Trump (@realDonaldTrump), TWITTER (Mar. 21, 2020, 11:20 PM), https://twitter.com/realdonaldtrump/status/1241565348765347841 (retweeting Ryan Fournier (@RyanAFournier)).

[460] *See, e.g.*, Donald J. Trump (@realDonaldTrump), TWITTER (Jan. 3, 2021, 7:11 AM), https://twitter.com/realDonaldTrump/status/1345749709592342530. President Trump also used the term "LameStream Media" in discussing the response to COVID-19. *Id.*

[461] Donald J. Trump (@realDonaldTrump), TWITTER (Mar. 22, 2020, 8:28 PM), https://twitter.com/realDonaldTrump/status/1241929664987148289; *see also* Michael D. Shear, *Trump Extends Social Distancing Guidelines Through End of April*, N.Y. TIMES, https://www.nytimes.com/2020/03/29/us/politics/trump-coronavirus-guidelines.html (Apr. 1, 2020) (reporting that, at a press conference, President Trump declared, "CNN is not trusted

another user's quotations of his press briefing and characterization that CNN was "Fake News."[462] On March 25, 2020, President Trump tweeted:

> The LameStream Media is the dominant force in trying to get me to keep our Country closed as long as possible in the hope that it will be detrimental to my election success. The real people want to get back to work ASAP. We will be stronger than ever before![463]

As of March 2024, this tweet has been retweeted 41,000 times and received 150,000 likes.[464]

Now that social media platforms have created a multitude of spaces for information exchange, a new strategy is required. According to one communication expert, "fake news likely will always circulate in the marketplace of ideas. Educating people how to ferret it out is key."[465] Several "pathologies" related to social media platforms have the potential to affect contemporary democracy, including echo chambers, fake news, highly-targeted political advertising (personalized based on data), computational propaganda (which is created by "automated social media accounts (bots) which mimic real people through dissemination of information or fake news across [social media and] a range of platforms and networks, with the intention of manipulating opinion"), and hate speech.[466]

A historical example of fake news around public health threats and vaccines is the news around the H1N1 ("swine flu") pandemic. When it came to the H1N1 vaccine and media coverage, a study by Matthew Baum found that Democrats were more likely than Republicans to follow the pandemic closely, and by November 2009, "Republicans were nearly 2.5 times more likely (49 vs. 21 percent) to believe that news reports about the swine flu were overstating the danger of the swine flu."[467] The gap expanded when considering only "respondents who indicated that

anymore. They are fake news," and "attacked the 'Lamestream media' on Twitter, even as he repeatedly trumpeted the high ratings for his coronavirus briefings, which have rivaled 'Monday Night Football' and the season finale of 'The Bachelor.'").

[462] Donald J. Trump (@realDonaldTrump), TWITTER (Mar. 21, 2020, 11:33 PM), https://twitter.com/realdonaldtrump/status/1241568622528598018 (retweeting Kayleigh McEnany (@kayleighmcenany), who wrote: "'It's unprecedented what we've done. Many, many doctors can't believe the great job we've done:' 'By closing the country down so early, we saved tens of thousands of lives.' 'You might want to report that!' – President @realDonaldTrump tells Fake News CNN.").

[463] Donald J. Trump (@realDonaldTrump), TWITTER (Mar. 25, 2020, 1:04 PM), https://twitter.com/realDonaldTrump/status/1242905328209080331.

[464] *Id.*

[465] Clay Calvert & Austin Vining, *Filtering Fake News Through a Lens of Supreme Court Observations and Adages*, 16 FIRST AMEND. L. REV. 153, 172 (2018).

[466] Margetts, *supra* note 449, at 111–12.

[467] Matthew A. Baum, *Red State, Blue State, Flu State: Media Self-Selection and Partisan Gaps in Swine Flu Vaccinations*, 36 J. HEALTH POL., POL'Y & L. 1021, 1033–34 (2011).

they were following the swine flu story *very* closely"—39% of Republicans indicated that the news coverage was overstating the danger, while only 5% of Democrats believed the same.[468] Additionally, "partisan gaps in concern over the flu" were "highly correlated with news consumption preferences"—for example, Baum found that Republicans who relied on "new media" like cable news channels such as Fox News, conservative talk radio, and conservative internet sites, "for news about the swine flu [were] substantially less concerned about the flu, less attentive to it, and more skeptical of press coverage of the flu than their counterparts who relied on traditional news sources, or Democrats regardless of news sources."[469]

False information has enormous potential to distort reasoning because it can continue to distort people's memory and decision-making, even after it has been unambiguously and clearly retracted.[470] That is to say, even if information is revealed to be inaccurate, it continues to impact how people interpret the situation involved in the decision task.[471] Individuals are unconsciously predisposed to disbelieve or ignore a retraction: they "have preexisting opinions and attitudes and process

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[468] *Id.* at 1034.

[469] *Id.* at 1054. Baum describes traditional media as the "big three" television broadcast networks—ABC, CBS, and NBC. *Id.* at 1024. The rise of "new media" includes "cable news channels and the Internet . . . [and] political talk radio," which are different than traditional media because new media outlets "self-consciously seek to appeal to relatively narrow, and hence more loyal, niches of the public." *Id.* Additionally, instead of being "all things to all people" like the bigger network news sites, the "new media outlets try to provide a product that more closely fits the preferences of a particular subset of the public." *Id.*; *see also* Richard L. Hasen, *Cheap Speech and What It Has Done (To American Democracy)*, 16 FIRST AMEND. L. REV. 200, 200–01 (2017). Hasen points out that "cheap speech would usher in radical new opportunities for readers, viewers, and listeners to custom design what they read, see, and hear, while concomitantly undermining the power of intermediaries including publishers and bookstore owners." *Id.* at 200. Hasen further argues:

> [C]heap speech has increased convenience, dramatically lowered the costs of obtaining information, and spurred the creation and consumption of content from radically diverse sources. But the economics of cheap speech have also undermined mediating and stabilizing institutions of American democracy including newspapers and political parties, with negative social and political consequences.

Id. at 201.

[470] Ullrich K. H. Ecker, Stephan Lewandowsky, Olivia Fenton & Kelsey Martin, *Do People Keep Believing Because They Want to? Preexisting Attitudes and the Continued Influence of Misinformation*, 42 MEMORY & COGNITION 292, 292 (2014).

[471] *Id.*; John. G. Bullock, Experiments on Partisanship and Public Opinion: Party Cues, False Beliefs, and Bayesian Updating 48–88 (June 2007) (Ph.D. dissertation, Stanford University) (ProQuest). Bullock's dissertation concerns a series of experiments examining the effect of false information in contemporary political debates. The experiments found that when a treatment group is presented with a factual claim that is subsequently discredited, there was evidence of belief perseverance and people became more confident in their beliefs. *Id. See also* Brendan Nyhan & Jason Reifler, *When Corrections Fail: The Persistence of Political Misperceptions*, 32 POL. BEHAV. 303, 304 (2010). *But see* William G. Howell & Martin R. West, *Educating the Public*, EDUC.

information in relation to what they already know and believe."[472] Partisan attitudes have a general impact on the number of times a study participant tends to reference false information after it's been retracted—retractions may reduce the number of references, but they don't eliminate it.[473] Further, "partisan attitudes strongly influenced the effectiveness of a misinformation retraction when the misinformation was of a general nature and thus more directly []relevant" to the attitudes a person already had.[474] "[I]f the misinformation was attitude-incongruent, the retraction was clearly effective, and if the misinformation was attitude-congruent, the retraction was clearly ineffective (and backfired in participants with reasonable memory for the [misinformation]."[475] In politics, retractions have been "found to be effective only when they were attitude-congruent."[476] Some scholars assert that "[m]isinformation that supports one's attitudes will be consistent with existing personal knowledge and other beliefs, will be familiar and therefore easy to process and more readily believed, and will often come from a trusted source and be shared by others in one's social

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NEXT, Summer 2009, at 41, 41 (finding that providing relevant information about education policy alters public preferences on school spending, teacher salaries, and charter schools).

[472] Ecker et al., *supra* note 470, at 293; *see also* Nyhan & Reifler, *supra* note 471 at 323 ("We find that responses to corrections . . . differ significantly according to subjects' ideological views. As a result, the corrections fail to reduce misperceptions for the most committed participants. Even worse, they actually *strengthen* misperceptions among ideological subgroups in several cases. . . . The backfire effects that we found seem to provide further support for the growing literature showing that citizens engage in 'motivated reasoning.'"); Charles S. Taber & Milton Lodge, *Motivated Skepticism in the Evaluation of Political Beliefs*, 50 AM. J. POL. SCI. 755, 767 (2006).

[473] Ullrich K. H. Ecker & Li Chang Ang, *Political Attitudes and the Processing of Misinformation Corrections*, 40 POL. PSYCH. 241, 249 (2019).

[474] *Id.*

[475] *Id.*

[476] Ecker et al., *supra* note 470, at 294. For example, in their study, Ecker and colleagues found that "people use race-related information in their inferential reasoning when this information is congruent with their attitudes"—those who had racial prejudice mentioned race as a factor in their responses to a crime scenario, even after a retraction about a suspect of a particular race. *Id.* at 300–02. Similarly, those in the study who had positive views of the particular minority mentioned the minority hero more often, even after a retraction about the hero. *Id.* at 300–01. "Retractions reduced reliance on the critical information, but they did so equally for people in [both] the high- and low-prejudice groups." *Id.* at 301. This is a somewhat different outcome than other literature suggests and may be attributed to the fact that Ecker and colleagues used a factual scenario that was a one-time crime and was unrelated to ongoing, real-world events; thus, the retraction only had to do with the one-time crime that occurred in the scenario, not with a political figure or a widespread social issue. *Id.* This is also consistent with the process known as stereotype subtyping, where "people can accommodate exceptions to stereotypes and thus maintain them." *Id.* at 302. In this study, that would mean that people with a racial prejudice would hear the retraction (that the minority did not commit the crime), and would accept it, believing that a non-criminal minority is an exception to the stereotype. *Id.*

network."[477] Partisanship only strengthens the power of political misinformation, and when partisan people are presented with direct factual corrections, instead of changing their minds, this information causes partisans to hold onto their preferred positions.[478] In general, retractions are most effective if the person already disagrees with the asserted fact.[479]

C. Finding the Right Way to Talk About Science

Early in the pandemic, knowledge about how to control the spread of the novel coronavirus was changing almost continuously.[480] The way scientific research findings were channeled into recommendations left Americans confused and made room for misinformation campaigns.[481] Uncertainty about how the virus was transmitted led to conflicting messages.[482] Specifically, in early 2020, public health authorities advised the public not to mask, asserting that masking increased the risk of contracting the disease.[483] The advice was soon turned on its head, and masking was thenceforth

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[477] *Id.* at 293 (internal citations omitted).

[478] Gordon-Murnane, *supra* note 447, at 114–15; Vraga et al., *supra* note 447, at 408 (noting that certain preexisting political attitudes, such as one's opinions on climate change or gun control, are the hardest to change, even when individuals are presented with logic-based or humor-based corrections on social media).

[479] Ecker & Ang, *supra* note 473, at 253. There is at least some evidence that "partisan attitudes generally affect the processing of misinformation retractions, but the partisan attitude effects seem somewhat stronger on the political right, where attitude-dissonant retractions were found consistently ineffective. . . . [C]onservative minds are particularly prone to worldview effects when processing contentious information." *Id.*

[480] *See COVID-19 Infodemic*, *supra* note 6, at 875 ("A pandemic is a rapidly evolving setting, in which researchers and medical professionals are constantly learning and contributing to dynamic adjustments in government policy.").

[481] *Id.* ("[I]ncoherent government messaging and reversals in recommendations on the basis of newly emerging evidence, for example on whether masks are protective against transmission, can be misconstrued as incompetence.").

[482] *See* Katherine J. Igoe, *How Do You Communicate Uncertainty and Promote Public Health — During COVID-19 and Beyond?*, HARV. SCH. PUB. HEALTH (July 20, 2021), https://www.hsph.harvard.edu/ecpe/how-to-communicate.

[483] Howard, *supra* note 244; Matt Apuzzo, Selam Gebrekidan & David D. Kirkpatrick, *How the World Missed Covid-19's Silent Spread*, N.Y. TIMES, https://www.nytimes.com/2020/06/27/world/europe/coronavirus-spread-asymptomatic.html (Feb. 2, 2021) ("'Seriously people — STOP BUYING MASKS!' Surgeon General Jerome M. Adams tweeted on Feb. 29."); *see also* Naomi Oreskes, *Scientists Failed to Use Common Sense Early in the Pandemic*, SCI. AM. (Nov. 1, 2020), https://www.scientificamerican.com/article/scientists-failed-to-use-common-sense-early-in-the-pandemic.

widely recommended.[484] Public health spokespeople revised and updated recommendations in keeping with new knowledge.[485] While changing understandings of the virus made revising advice appropriate, it also made epidemiologists ripe for attack on their methods and understanding of the disease.[486] The fact that early advice was revised and even directly contradicted by later information had the effect of eroding public confidence early in the game.[487] Because this flip-flop happened at an early stage, it created an early and indelible impression of incompetence or untrustworthiness among those trying to navigate the pandemic with the help of public health spokespeople.[488] If members of the public had been warned that the advice might change as our knowledge evolved, they might have been more accepting of changes in our understanding. If the public had been educated that scientific inquiry is tentative in the early days of discovering a scientific problem, they would have had less belief perseverance towards the changing information at the beginning of the pandemic because changes could have been implemented before beliefs became concrete.[489] Instead, overconfidence on the part of people who professed to know that the vaccine was dangerous led others to put misplaced faith in those sources of information.[490] The heuristic that information that is presented forcefully or confidently must be correct leads many to assign value to overly confident assertions while devaluing more reliable tentative sources of information.[491] Ironically,

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[484] Oreskes, *supra* note 483.

[485] *See id.*

[486] *See COVID-19 Infodemic*, *supra* note 6, at 875 (noting that "reversals in recommendations on the basis of newly emerging evidence, for example on whether masks are protective against transmission, can be misconstrued as incompetence").

[487] Zeynep Tufekci, Opinion, *Why Telling People They Don't Need Masks Backfired*, N.Y. TIMES (Mar. 17, 2020), https://www.nytimes.com/2020/03/17/opinion/coronavirus-face-masks.html.

[488] *See* Apuzzo et al., *supra* note 483; Oreskes, *supra* note 483.

[489] *See* Rakoen Maertens, Frederik Anseel & Sander van der Linden, *Combatting Climate Change Misinformation: Evidence for Longevity of Inoculation and Consensus Messaging Effects*, J. ENV'T PYSCH., June 2020, at 1, 2 (explaining that inoculation theory allows people to construct an understanding of the world that prepares them for later information).

[490] *See* Jonathan Jarry, *A Dozen Misguided Influencers Spread Most of the Anti-Vaccination Content on Social Media*, MCGILL OFF. SCI. & SOC'Y (Mar. 31, 2021), https://www.mcgill.ca/oss/article/covid-19-health/dozen-misguided-influencers-spread-most-anti-vaccination-content-social-media; Sheera Frenkel, *The Most Influential Spreader of Coronavirus Misinformation Online*, N.Y. TIMES, https://www.nytimes.com/2021/07/24/technology/joseph-mercola-coronavirus-misinformation-online.html (Nov. 25, 2022).

[491] *See, e.g.*, Elizabeth Mumper, *How Will We Know That a COVID-19 Vaccine is Safe?*, CHILD'S HEALTH DEF., https://childrenshealthdefense.org/protecting-our-future/covid-vaccine-safety-concerns (last visited Mar. 24, 2024) (making claims like the vaccines contain bio-chip implants, AstraZeneca used "a chimp adenovirus spliced with other proteins" like simian virus 40 which can cause cancer, and that the vaccines contain dangerous adjuvants, which are substances that facilitate the body's immune response); Weaver, *FDA Nears Approval of Injectable Biochip*

the traditionally tentative way that scientists present findings is both more reliable and less inspiriting of confidence.[492]

Priming the public for an evolving landscape would have accomplished several goals. First, it might have made members of the public—at least Skeptics and Receptives—more accepting of new advice stemming from changes in our understanding of the threat level and the most appropriate approach as the public health landscape changed. Preparing Skeptics for the possibility of changing recommendations might have combatted the potential for changes in public health advice to be construed as meaning that science is unreliable or that epidemiological studies are worthless. For example, in response to false claims promulgated by Deniers that changes in understanding should cause individuals to distrust all public health advice, Skeptics could have countered that change is a positive sign that knowledge is being updated as understanding improves and as the threat evolves. For Receptives, it would have improved chances that members of this group were ready to hear that the threat had diminished to the point where it was safe to modify precautions.

At the outset, it was clear that there was much we did not know about the disease and how it would affect the human body in the short- and long-term. However, there was basic information that we had about how these types of viruses operated that could have been shared in a format that was palatable and comprehensible to people outside the medical and public health fields.[493] Conveying the message that we were not starting from ground zero could have instilled confidence in science, and prepared members of the public to follow new or revised public health recommendations as they became available. Priming Skeptics, by educating them about the way scientific discovery unfolds, could have helped inoculate them against messages from Deniers who would claim that any change in recommendations should inspire suspicion.

Implants for COVID Detection, Linked to Computers, TAP NEWS (Aug. 30, 2020, 10:19 AM), https://tapnewswire.com/2020/08/fda-nears-approval-of-injectable-biochip-implants-for-covid-detection-linked-to-computers.

[492] Good scientific methods mandate that scientists proceed cautiously because findings are always subject to updates following subsequent data-gathering and analysis. This can create a lack of confidence in these sources of information. *See* John Wilkins (@evolvingthoughts), *The Tentative Nature of Science,* SCIENCEBLOGS (Oct. 13, 2006), https://scienceblogs.com/evolvingthoughts/2006/10/13/the-tentative-nature-of-scienc (discussing this phenomenon).

[493] Even though it was known that N95 masks were the most effective in mitigating the spread of COVID-19, this was not effectively communicated to the public until relatively late, resulting in a period wherein much of the public was not as protected as they could have been. Eric Ruble, *USC Price Professors Share How Experts Can Better Communicate with the Public About COVID*, USC PRICE (Mar. 28, 2022), https://priceschool.usc.edu/news/how-experts-can-better-communicate-about-covid.

D. Harnessing the Power of Self Attribution

Motivated reasoning leads individuals to form inferences about themselves in ways that are both predictable and malleable. In a very true sense, human beings are on a lifelong quest to understand themselves, and they are predisposed to understand themselves as having certain qualities. Although normative goals and preferences vary from one person to another, at base, people strive to be consistent, in control, correct, and good.[494] Another important strategy is to get people to commit to the position that will be most beneficial.

According to psychologist Robert Cialdini, "[i]t is, quite simply, our nearly obsessive desire to be (and to appear) consistent with what we have already done."[495] Once a stand is taken, there is a natural tendency to behave in ways that are stubbornly consistent with the position one has taken.[496] Cialdini provides an example involving American prisoners of war who were held during the Korean War.[497] These prisoners were targets of an organized campaign by the Chinese to change their hearts and minds. The captives were initially "asked to make statements so mildly anti-American or pro-Communist as to seem inconsequential ('The United States is not perfect.' 'In a Communist country, unemployment is not a problem.')"[498] After having complied with these minor requests, the men were encouraged to agree to increasingly substantive requests. Eventually, an American captive "might be asked to make a list of these 'problems with America' and to sign his name to it."[499] This strategy of starting with a minor request and later making a larger demand is called "foot-in-the-door technique."[500] It works because of the consistency principle. The initial favor or compliant act seems so minor as to be inconsequential. The later request is significant, but consistent with the initial act. Because the target has already agreed to behave in a way that is supportive of the initial ask, they feel compelled to agree to the later and more significant request.[501]

The foot-in-the door technique suggests avenues for gaining support for actions deemed most helpful during a public health crisis. Small commitments by public figures who exert influence, particularly those who are supportive of a conservative or skeptical approach, may lead to more substantial, and public, displays of support for measures that data suggests will curb the spread of disease and maximize the public good.

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[494] *See* discussion *supra* Section II.A.

[495] CIALDINI, *supra* note 103, at 57.

[496] *See id.* at 57–59.

[497] *Id.* at 70–71.

[498] *Id.*

[499] *Id.*

[500] Jerry M. Burger, *The Foot-in-the-Door Compliance Procedures: A Multiple-Process Analysis and Review*, 3 PERSONALITY & SOC. PSYCH. REV. 303, 303 (1999).

[501] *Id.* at 303, 317–18.

E. Minimizing the Hostile Environment Created by Extreme Divisiveness

Anxiety and isolation resulting from COVID-19 hit all Americans, regardless of their political or cultural beliefs. Schools were shut down, businesses shuttered, playgrounds covered in hazard tape, public transportation and socializing became fraught with difficulty.[502] The pandemic hit people's wallets and kept them from loved ones. The dramatic and sudden loss of a sense of normalcy had a significant impact on the mood of the average citizen.[503] When mood is depressed, people become more combative. This is because negative affective states tend to be linked.[504] Hence, someone who is unhappy is more likely to be angry and someone who is anxious tends to be irritable. The extreme polarization, with pro-maskers and anti-maskers and pro-vaccine and anti-vaccine individuals pitted against each other, increased the negative affect. The more Americans felt attacked by members of opposing groups, the less able they were to think logically about how to navigate the frightening new world they found themselves in.[505] Research suggests that negative affect leads to a diminished ability to reason and effectively regulate behavior.[506] Moreover, when people feel excluded or unwanted, they exhibit higher levels of aggression and hostility.[507]

Particularly for the Receptives and the Skeptics, day-to-day living became fraught with difficulty. Fear of contracting the virus led many to go to extreme lengths to secure basic necessities without coming into contact with others, and the

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[502] McCarthy, *supra* note 412; Hailey Branson-Potts, *Angry Parents Won't Let Officials Slide Over Closed Playgrounds, Packed Malls*, L.A. TIMES (Dec. 3, 2020, 5:00 AM), https://www.latimes.com/california/story/2020-12-03/covid-19-la-parents-anger-closed-playgrounds; Alexander W. Bartik, Marianne Bertrand, Zoe Cullen, Edward L. Glaeser, Michael Luca & Christopher Stanton, *The Impact of COVID-19 on Small Business Outcomes and Expectations*, 117 PNAS 17656, 17661, 17666 (2020); Alejandro de la Garza, *COVID-19 Has Been 'Apocalyptic' for Public Transit. Will Congress Offer More Help?*, TIME (July 21, 2020, 5:03 PM), https://time.com/5869375/public-transit-coronavirus-covid.

[503] *See* Hacimusalar et al., *supra* note 133, at 181, 187.

[504] Jiajin Yuan, Jie Chen, Jiemin Yang, Enxia Ju, Greg J. Norman & Nanxiang Ding, *Negative Mood State Enhances the Susceptibility to Unpleasant Events: Neural Correlates from a Music-Primed Emotion Classification Task*, PLOS ONE, Feb. 28, 2014, at 1, 1, 11; *see also* Craig N. Sawchuk, *Depression and Anxiety: Can I Have Both?*, MAYO CLINIC (June 2, 2017), https://www.mayoclinic.org/diseases-conditions/depression/expert-answers/depression-and-anxiety/faq-20057989.

[505] AKM AHSAN ULLAH & JANNATUL FERDOUS, THE POST-PANDEMIC WORLD AND GLOBAL POLITICS 90–92 (2022); *see also* Mansour Javidan, Rick Cotton, Anirban Kar, Medha Satish Kumar & Peter W. Dorfman, *A New Leadership Challenge: Navigating Political Polarization in Organizational Teams*, 66 BUS. HORIZONS 729, 737 (2023).

[506] *See* Baumeister et al., *supra* note 223, at 506 ("Self-regulation and intelligent thought are also impaired as a direct result of being rejected.").

[507] Twenge et al., *supra* note 224, at 1066.

hypervigilance became exhausting.[508] The effort necessary to protect self and family increased cognitive load, also making all tasks more challenging.[509] People were weary, wary, anxious, isolated, financially strapped, cramped by small spaces, bored, lonely, and afraid. Every day, choices had to be made about how to live under pandemic circumstances; the simple act of making choices has been shown to decrease individuals' ability to exhibit self-control.[510] Experiencing emotional distress results in individuals seeking out ways to resolve the distress. This can lead to pleasure-seeking, but ultimately self-destructive behaviors.[511] Examples include withdrawing from all social contact, self-medicating with drugs or alcohol, and indulging in other unhealthy behaviors, including overeating or developing obsessive habits.[512] In addition to pursuing self-soothing activities that might be maladaptive, simply being constantly on guard can lead to extreme risk fatigue, which can have depressive effects or can lead people to abandon efforts to protect their own health.[513]

Fortunately, pandemics are rare.[514] The infrequency with which we find ourselves in a COVID-19-type situation makes it difficult to know how to address the associated challenges when they occur. In the wake of the pandemic, it is easy to breathe a sigh of relief and try to forget the worst moments as quickly and completely as possible. However, to do so would be a missed opportunity. In addition to developing strategies to combat misinformation, apathy, and fear of science, we should contemplate ways of combating typical mental health struggles that come with the fear and isolation that accompany serious public health crises. Finding creative ways

[508] *See* Doreen Dodgen-Magee, *Covid Related Decision Fatigue, Hypervigilance, and Burnout*, PSYCH. TODAY (Jan. 11, 2022), https://www.psychologytoday.com/us/blog/deviced/202201/covid-related-decision-fatigue-hypervigilance-and-burnout; Caitlin Gibson, *A Hypervigilant Mom Followed Every Health Guideline. She Still Caught the Coronavirus.*, WASH. POST (June 29, 2020, 9:00 AM), https://www.washingtonpost.com/lifestyle/on-parenting/a-hypervigilant-mom-followed-every-health-guideline-she-still-caught-the-coronavirus/2020/06/27/fa119ce2-b654-11ea-a8da-693df3d7674a_story.html.

[509] *See* Christian Jarrett, *Cognitive Load Theory: Explaining Our Fight for Focus*, BBC (Nov. 12, 2020, 4:00 PM), https://www.bbc.com/worklife/article/20201103-cognitive-load-theory-explaining-our-fight-for-focus.

[510] Vohs et al., *supra* note 226, at 895.

[511] Tice et al., *supra* note 227, at 65.

[512] *Id.* at 53–54.

[513] *See* H. AARON COHL, ARE WE SCARING OURSELVES TO DEATH?: HOW PESSIMISM, PARANOIA, AND A MISGUIDED MEDIA ARE LEADING US TOWARD DISASTER (1997).

[514] Marco Marani, Gabriel G. Katul, William K. Pan & Anthony J. Parolari, *Intensity and Frequency of Extreme Novel Epidemics*, PNAS, Aug. 31, 2021, at 1, 1–2 (finding that the chance of a COVID-19 magnitude pandemic is only about 5.7% a year, with the last comparable event being the Spanish Flu, which occurred over a century ago).

of restoring positive affect can help individuals deal with ego depletion.[515] Simple pleasures like spending time in natural environments, cultivating new hobbies, honing novel skills, and connecting with friends and family in virtual settings can renew positive outlook, improve psychological well-being, and prevent destructive behaviors.[516] Potentially harmful places can also be beneficial. For example, message boards and online groups, often sources of misinformation, can also be places to form new friendships and develop affinity for like-minded individuals. Avid cyclists, hikers, and climbers can share information about favorite routes and trails. Burgeoning young fishermen can watch YouTube videos of anglers catching curious and unfamiliar fish in far-away tropical paradises. Homeowners can trade tips and techniques for accomplishing those household handy tasks that may have been put off when life was "normal." Although public health crises come with many challenges, they can also provide opportunities for new methods and practices. One important positive change that came with the COVID-19 pandemic was the move to at-home work for many employees. Employers saw that employees who stayed home *could* be productive, and that realization led many employers to decide to maintain a flexible work environment.[517] The ability to skip the commute increased efficiency for many workers, leading to more free time that could be devoted to exercise, family togetherness, or new hobbies.[518]

The benefits and costs stemming from the pandemic were unevenly and inequitably distributed. Essential workers, particularly first responders and those working in the healthcare industry, were pressed into long hours and dangerous conditions as they triaged patients and struggled to keep up with staggering numbers of COVID-19 patients while staying healthy themselves.[519] Historically disadvantaged populations, and particularly those struggling to make ends meet, working multiple

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[515] *See generally* Dianne M. Tice, Roy F. Baumeister, Dikla Shmueli & Mark Muraven, *Restoring the Self: Positive Affect Helps Improve Self-Regulation Following Ego Depletion*, 43 J. EXPERIMENTAL SOC. PSYCH. 379 (2007).

[516] Sarah D. Pressman, Karen A. Matthews, Sheldon Cohen, Lynn M. Martire, Michael Scheier, Andrew Baum & Richard Schulz, Association of Enjoyable Leisure Activities with Psychological and Physical Well-Being (July 10, 2009) (author manuscript) (on file with the National Institutes of Health). One silver lining of the pandemic was the normalization and increase in communication surrounding mental health issues and access to mental health care. *See* Jim Dhrymes, *3 Positive Mental Health Outcomes from the COVID-19 Pandemic*, PSYCH. TODAY (July 17, 2022), https://www.psychologytoday.com/us/blog/reports-the-front-lines/202207/3-positive-mental-health-outcomes-the-covid-19-pandemic.

[517] Kazi Turin Rahman & Md. Zahir Uddin Arif, *Working from Home During the COVID-19 Pandemic: Satisfaction, Challenges, and Productivity of Employees*, 9 INT'L J. TRADE & COM. 282, 290, 292 (2020).

[518] Rui Colaço, Laísa Braga Kappler & João de Abreu e Silva, *Pandemic Immobilities and Consequences for Commuting: Implications for Mobility of COVID-19 Mandatory Telecommuting*, J. TRANSP. GEOGRAPHY, Dec. 16, 2023, at 1, 2.

[519] García-Fernández et al., *supra* note 178, at 267, 269.

jobs, or with children engaged in at-home learning, were most profoundly affected.[520] Individuals with underlying health conditions were particularly vulnerable and, for some, the possibility of infection became the possibility of a death sentence.[521] For Americans falling into one or more of these groups, the financial, physical, and mental health effects of the pandemic were particularly profound. These individuals also found themselves championing masking, distancing, and vaccinating, which could put them in the crosshairs of Deniers.[522] Being unwittingly thrust onto the frontlines of a national debate about the appropriateness of public health mandates could make daily survival for folks in these precarious situations even more onerous.

Before a major health crisis arises, the possibility seems remote, impossible even. In the wake of the COVID-19 pandemic, the world has woken up to the potential for pandemics in the modern age. Brainstorming ways to promote healthy coping and education about and for more vulnerable and overburdened members of society should be ongoing. Support groups for particular groups, as well as education and outreach for those supporting those individuals, could have immediate and long-term effects, and could at least blunt some of the most traumatizing effects of future public health crises. Task forces should be assembled to formulate specific recommendations and strategies so that the nation is better prepared to handle future emergencies.

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[520] *See* Hacimusalar et al., *supra* note 133, at 183, 185, 187.

[521] *See* Matthew Lee, Yung Chang, Navid Ahmadinejad, Crista Johnson-Agbakwu, Celeste Bailey & Li Liu, *COVID-19 Mortality Is Associated with Pre-Existing Impaired Innate Immunity in Health Conditions*, PEERJ, May 6, 2022, at 1, 1–12.

[522] *See* Ruth Igielnik, *Most Americans Say They Regularly Wore a Mask in Stores in the Past Months; Fewer See Others Doing It*, PEW RSCH. CTR. (June 23, 2020), https://www.pewresearch.org/short-reads/2020/06/23/most-americans-say-they-regularly-wore-a-mask-in-stores-in-the-past-month-fewer-see-others-doing-it (noting that individuals at greater risk, either through geographical location or personal health conditions, were found to be more likely to consistently mask); Nirmita Panchal, Heather Saunders, Robin Rudowitz & Cynthia Cox, *The Implications of COVID-19 for Mental Health and Substance Use*, KFF (Mar. 20, 2023), https://www.kff.org/mental-health/issue-brief/the-implications-of-covid-19-for-mental-health-and-substance-use (discussing how, in regards to mental health and substance use, the pandemic "disproportionately affected some populations, particularly communities of color and youth"); *see also* Amy Harmon, *The Last Holdouts: What It's Like to Wear Masks for Covid When Most Others Have Long Since Moved On*, N.Y. TIMES (Dec. 26, 2022), https://www.nytimes.com/2022/12/26/us/covid-masks-risk.html; Jeanine Santucci, *A Letter to My Loved Ones About COVID-19: You've Moved On, But I'm Still Here*, USA TODAY (Mar. 19, 2023, 5:00 AM), https://www.usatoday.com/story/opinion/voices/2023/03/19/covid-pandemic-not-over-high-risk/11472097002.

F. Easing Back into Normalcy

For Receptives who embraced precautionary measures but later experienced extreme anxiety about returning to normal life, small steps may be the key. Yale psychologist Marney White notes that one strategy to reduce anxiety is a treatment called "fading."[523] Fading involves slowly encountering situations that cause anxiety, starting with those that feel least threatening, and building up to more significant social encounters.[524] For an individual who experiences a phobia of social situations, White recommends starting with a walk outside, eventually tackling being in small social groups while masked, and finally resuming normal activities. According to White, the goal is to "continue to approximate normal by taking gradual steps . . . . Once you get used to a setting again then you can take the next step toward the next setting."[525]

CONCLUSION

Much lamenting has occurred due to the sluggish rate at which certain segments of America have taken advantage of available vaccinations. Clinicians and public health experts have urged persistence and education.[526] Many have called for prominent figures, from politicians to celebrities to publicly announce support for the vaccine.[527] Others have suggested that personal relationships can provide avenues for conversation and education.[528] Healthcare providers have described their efforts to persuade patients of the safety of vaccines and have recounted stories of

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[523] Salvador Rodriguez, *As the Pandemic Fades, Some Americans Are Anxious About a Return to Normal*, CNBC, https://www.cnbc.com/2021/03/20/why-some-are-averse-to-return-to-normal-post-covid.html (Mar. 21, 2021, 12:06 PM).

[524] *Id.*

[525] *Id.* (quoting Marney White).

[526] *See* Emily Shapiro, *Dr. Fauci Reflects on the Pandemic's 1-Year Mark and How to Get Back to 'Normality,'* ABC NEWS (Mar. 11, 2021, 6:08 AM), https://abcnews.go.com/US/dr-fauci-reflects-pandemics-year-mark-back-normality/story?id=76385967. Multiple professionals push messages of continued caution, saying, "[w]e are better together, and together, we will endure." *Id.* (quoting CDC Director Rochelle Walensky); *see also* Allison Frost, *Oregon Doctor Sees Rising Exemption Requests for Childhood Vaccines, Says More Education Needed*, OPB (Sept. 17, 2023, 6:00 AM), https://www.opb.org/article/2023/09/17/oregon-high-rate-vaccine-exemptions-for-children; Jennifer Lubell, *CDC: Physicians "the Lynchpin" for Boosting Low Vaccination Rates*, AM. MED. ASS'N (Jan. 3, 2024), https://www.ama-assn.org/delivering-care/public-health/cdc-physicians-lynchpin-boosting-low-vaccination-rates.

[527] Zeke Miller, *Biden Calls on Celebrity Partners, Community Leaders to Boost COVID Vaccinations*, PBS (Apr. 1, 2021, 1:54 PM), https://www.pbs.org/newshour/nation/biden-calls-on-celebrity-partners-community-leaders-to-boost-covid-vaccinations.

[528] *See* Alford, *supra* note 422; Debra Umberson & Jennifer Karas Montez, *Social Relationships and Health: A Flashpoint for Health Policy*, 51 J. HEALTH & SOC. BEHAV. S54, S56, S62–63 (2010).

having to refuse treatment to patients who refused to mask despite policies mandating this precaution.[529] On the other end of the spectrum, many Americans who embraced masking and vaccinating are having trouble figuring out how to return to normalcy, and Americans of all stripes have suffered long-term psychological and financial fallout from the pandemic.[530]

Contributing to the shared trauma is the divisive nature of the debate over the appropriateness of public mandates.[531] It seems clear that bolstering the collective effort to fight the spread of the disease would have positive effects not only for those on the front lines and vulnerable people, but also for the country more broadly. However, the United States is a populous and diverse country. For public health actors and public officials struggling to convey the urgent necessity of getting vaccinated, it can be challenging to know how to convince reluctant members of the community. Social and cognitive biases create barriers to effective communication. Misinformation and motivated reasoning fuels distrust of public health messages.[532] Research is poorly understood, and data is misconstrued and confusing.

Psychological biases are tremendously difficult to counteract. They are infamously immune to strategies upon which we typically rely, such as education and emotional pleas.[533] The good news is that there is a potential for making inroads by harnessing the very biases that lead to harmful patterns in the first place. Armed with knowledge of common cognitive biases, public health officials and those in

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[529] Eliyahu Y. Lehmann & Lisa Soleymani Lehmann, *Responding to Patients Who Refuse to Wear Masks During the Covid-19 Pandemic*, 36 J. GEN. INTERNAL MED. 2814 (2021).

[530] Ciechalski & Siemaszko, *supra* note 33; Plasencia, *supra* note 403; Juliana Menasce Horowitz, Anna Brown & Rachel Minkin, *A Year Into the Pandemic, Long-Term Financial Impact Weighs Heavily on Many Americans*, PEW RSCH. CTR. (Mar. 5, 2021), https://www.pewresearch.org/social-trends/2021/03/05/a-year-into-the-pandemic-long-term-financial-impact-weighs-heavily-on-many-americans.

[531] *See, e.g.*, Mohamed Younis, *Americans Divided on Face Masks When Flying*, GALLUP (May 16, 2022), https://news.gallup.com/poll/392597/americans-divided-face-masks-flying.aspx; Eric A. Feldman, *The Divisive Conflict Over Campus Covid-19 Vaccination*, BLOOMBERG L. (Sept. 3, 2021, 1:01 AM), https://news.bloomberglaw.com/us-law-week/the-divisive-conflict-over-campus-covid-19-vaccination; *New PH Wins Data: De Beaumont And ASTHO Find That Public Health Workers Are Stressed, Burned Out, and Considering Leaving*, DE BEAUMONT FOUND. (Mar. 29, 2022), https://debeaumont.org/news/2022/new-ph-wins-data-de-beaumont-and-astho-find-that-public-health-workers-are-stressed-burned-out-and-considering-leaving; Elisa Brietzke, *Political Polarization Is Affecting Mental Health*, QUEEN'S GAZETTE (Mar. 8, 2022), https://www.queensu.ca/gazette/stories/political-polarization-affecting-mental-health.

[532] Van Scoy et al., *supra* note 172, at 199–200.

[533] *See* J.E. (Hans) Korteling, Jasmin Y. J. Gerritsma & Alexander Toet, *Retention and Transfer of Cognitive Bias Mitigation Interventions: A Systematic Literature Study*, FRONTIERS PSYCH., Aug. 2021, at 1, 1, 7–10 (finding that "there is currently insufficient evidence that bias mitigation interventions will substantially help people to make better decisions in real life conditions").

positions to influence members of the public can exploit psychological tendencies in a number of ways.

Among the most challenging aspects of communicating with the public during an evolving pandemic situation is being honest about the limits of our understanding while simultaneously providing clear recommendations based upon what is known. The emergence of the Delta variant of the virus increased the risk of breakthrough infections among vaccinated individuals and increased the chance that unvaccinated individuals would become infected and hospitalized.[534] This development posed the dilemma: if the vaccine was the key to being safe and resuming normalcy, why are public health officials urging steps like masking even for those who are vaccinated? Skeptics point out that the vaccine is not the panacea that was promised—if the message about the efficacy of the vaccine was incorrect, why should we trust public health officials, and how good is the science?[535] Clear and simple representations of the data in visual form have been demonstrated to be effective in communicating messages to a wide segment of a population. People can understand numbers far better than probabilities.[536] Research has indicated that even medical professionals sometimes misunderstand risk that is presented in probabilities.[537] Public health officials should present the latest data in numbers in salient ways; the messages should be consistent and should appear in many different places and formats.

It is ironic that the more common threats can sometimes seem less frightening than those that are rare. A well-meaning attempt to downplay rare negative outcomes may serve to shroud novel potential preventions in mystery. Failure to inform the public can also engender distrust and allow Deniers to control the dialogue.[538] Rather than hiding facts, health professionals should provide clear information about the number and nature of adverse incidents.[539] In the case of the COVID-19

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[534] *See generally* Ralf Duerr, Dacia Dimartino, Christian Marier, Paul Zappile, Samuel Levine, Fritz Francois, Eduardo Iturrate, Guiqing Wang, Meike Dittmann, Jennifer Lighter, Brian Elbel, Andrea B. Troxel, Keith S. Goldfeld & Adriana Heguy, *Clinical and Genomic Signatures of SARS-CoV-2 Delta Breakthrough Infections in New York*, LANCET, Aug. 2022, at 1–5.

[535] *See* Allysia Finley, Opinion, *Why Vaccine Skepticism Is Growing on the Right*, WALL ST. J. (Feb. 5, 2023, 5:03 PM), https://www.wsj.com/articles/why-vaccine-skepticism-is-growing-on-the-right-anthony-fauci-misinformation-public-health-covid-pandemic-virus-11675625341.

[536] *See* Peter S. Houts, Cecelia C. Doak, Leonard G. Doak & Matthew J. Loscalzo, *The Role of Pictures in Improving Health Communication: A Review of Research on Attention, Comprehension, Recall, and Adherence*, 61 PATIENT EDUC. & COUNSELING 173 (2006).

[537] Nicolai Bodemer & Wolfgang Gaissmaier, *Risk Communication in Health*, *in* HANDBOOK OF RISK THEORY: EPISTEMOLOGY, DECISION THEORY, ETHICS, AND SOCIAL IMPLICATIONS OF RISK 638 (Sabine Roeser, Rafaela Hillerbrand, Per Sandin & Martin Peterson eds., 2012).

[538] *See* Lee et al., *supra* note 94, at 3975–76.

[539] *See* Attwell & Harper, *supra* note 428 (recommending health care providers open up about true events they are seeing instead of remaining silent and allowing social media's stories to

vaccines, this information should be accompanied by parallel information about outcomes for unvaccinated patients who contract COVID-19 after failing to be vaccinated. Minimizing speculation and providing contrasting data in clear and simple terms should eliminate some of the fear and confusion that can lead to suboptimal choices.

Moving people from their entrenched position can be challenging. The most effective method of combating inertia has been to default people into the optimal choice.[540] Some countries have experimented with this strategy for organ donation.[541] Some businesses, knowing that saving for retirement is a key to later financial security, have created a default asset allocation system whereby a portion of each paycheck is automatically placed into a retirement fund, along with employer matching contributions.[542] This strategy has proven highly effective.[543] Hence, one potentially effective strategy is to automatically register community members to receive the vaccine at a clinic, urgent care center, or conveniently located community center as soon as they qualify and quantities are available. Although defaulting people into vaccinated status in this way would overcome the problems of apathy and inertia, other levers are available. The move on the part of businesses to require employees to be vaccinated provides an unequivocal mandate that imposes clear costs on those who would otherwise remain unvaccinated. The message and the consequences are clear; public health is not an individual choice. To remain unvaccinated is to opt out of employment. Few things motivate action as powerfully as the potential loss of livelihood.[544] These employer mandates are powerful antidotes to inertia.[545]

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take over with information that is not true or makes things more unclear to the public); Chana Davis & Sarah Coles, *Confronting Medical Misinformation: Tips From the Trenches*, AAMC (Aug. 11, 2022), https://www.aamc.org/news/confronting-medical-misinformation-tips-trenches.

[540] Gabriel D. Carroll, James J. Choi, David Laibson, Brigitte C. Madrian & Andrew Metrick, *Optimal Defaults and Active Decisions*, 124 Q.J. ECON. 1639, 1640–42 (2009).

[541] Alberto Abadie & Sebastien Gay, *The Impact of Presumed Consent Legislation on Cadaveric Organ Donation: A Cross-Country Study*, 25 J. HEALTH ECON. 599, 600 (2006).

[542] Brigitte C. Madrian, *Making It Easy: How Defaults and Design Can Improve Retirement Savings Outcomes*, GEO. UNIV. CTR. FOR RET. INITIATIVES (Mar. 4, 2020), https://cri.georgetown.edu/making-it-easy-how-defaults-and-design-can-improve-retirement-savings-outcomes.

[543] *See, e.g.*, Abadie & Gay, *supra* note 541, at 613 (concluding, based on their study results, that implied consent legislation was the most effective method for creating an increase in number of organ donations).

[544] *See* Megan Cerullo, *Fired for Refusing the Vaccine? Don't Count on Unemployment Benefits*, CBS NEWS, https://www.cbsnews.com/news/vaccine-mandate-unemployment-benefits (Oct. 15, 2021, 9:22 AM).

[545] *See* Maddalena Ferranna, Lisa A. Robinson, Daniel Cadarette, Michael R. Eber & David E. Bloom, *The Benefits and Costs of U.S. Employer COVID-19 Vaccine Mandates*, 43 RISK ANALYSIS 2053, 2061–62 (2023).

The consequences of vaccination can literally be life or death. Over a period of ten days in late July and early August 2021, six unvaccinated members of a church in Jacksonville, Florida died of COVID-19. "Four of them were healthy and younger than 35."[546] In response, pastor Rev. George Davis hosted a vaccine drive after Sunday services. His efforts drew attention to the loss of lives, and members of the public learned about the vaccination drives over social media and through other avenues.[547] NBC affiliate WFLA of Tampa picked up the story, and more than 800 people were vaccinated as a result of the pastor's efforts.[548] When he planned a second vaccination drive, he received pushback from members of the public. He responded on Twitter, saying: "'Why is your church holding another vaccination event?' BECAUSE…6 church members have died in the last 10 days. . . . And I'm tired of crying about and burying people I love. So take the political & religious games somewhere else!!"[549] The response from the public was overwhelmingly positive, and pastors from other churches reached out through Twitter with praise and words of thanks.[550] Members of the local media sought interviews, which garnered more support for the vaccination drives.[551] Numerous members of the community showed up to receive their vaccination and thanked the pastor over social media.[552] The poignancy of the pastor's calls to action in light of the tragic loss of young people is an example of how attention for events can influence judgment about their frequency. Hearing about the rapid death of six people—four of them young and healthy—from one small parish over a short period of time challenged the widely held assumption that COVID-19 only kills aging and otherwise vulnerable people. The more stories like that of Pastor Davis are shared and repeated, the more likely it is that individuals who are weighing the relative risks will make a decision that is consistent with the safest course of action.

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[546] María Luisa Paúl, *Florida Church Reeling After Six Members Die Within 10 Days Amid Spike in Cases*, WASH. POST (Aug. 8, 2021, 10:03 PM), https://www.washingtonpost.com/health/2021/08/08/jacksonville-church-covid.

[547] *See id.*

[548] *Id.*

[549] George Davis (@GeorgeLDavis), TWITTER (Aug. 6, 2021, 4:30 AM), https://twitter.com/GeorgeLDavis/status/1423607508543971330; *see also* Wilson Wong, *6 Unvaccinated Florida Church Members Die of Covid Within 10 Days, Pastor Says*, NBC NEWS (Aug. 9, 2021, 7:11 AM), https://www.nbcnews.com/news/us-news/6-unvaccinated-florida-church-members-die-covid-within-10-days-n1276322.

[550] *See, e.g.*, Chad Burgbacher (@ChadBurgbacher), TWITTER (Aug. 7, 2021, 10:21 AM), https://twitter.com/ChadBurgbacher/status/1424058165562388483 (replying to Davis, *supra* note 549).

[551] *See, e.g.*, Haley Harrison (@HaleyHarrisonTV), TWITTER (Aug. 6, 2021, 10:59 AM), https://twitter.com/HaleyHarrisonTV/status/1423705396343152645 (replying to Davis, *supra* note 549).

[552] *See* Davis, *supra* note 549.

> Sandro Galea, a physician and epidemiologist at Boston University's School of Public Health, likens the effort to the struggle to get Americans to quit smoking. . . . "We know that a culture shift is required," including "a change in the conversation, reinforced and influenced by a change in the rules," Galea says. While governments may be slower to impose rules, "private businesses will start creating barriers for the unvaccinated. Those efforts will have the effect of pushing people to get vaccinated, and at the same time, change the culture to make being vaccinated more acceptable," he says.[553]

Several simple strategies can increase the effectiveness of the messaging. Communicating stories about the risks of remaining unvaccinated and presenting information in formats that are easy for individuals to digest and remember can increase the impact of education efforts. By harnessing lessons from social science research on human cognition and behavior, we can begin to win the war against misinformation and can make significant inroads toward a fully vaccinated public.

[553] Susan Milligan, *No Shot, No Shoes, No Service*, U.S. NEWS & WORLD REP. (July 30, 2021, 6:00 AM), https://www.usnews.com/news/the-report/articles/2021-07-30/public-private-vaccine-requirements-threaten-to-create-back-door-mandate (quoting Sandro Galea).