

The Impact of Racial Descriptive Norms on Vaccination against COVID-19

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Abstract Racial disparities have persisted in COVID-19 infection, hospitalization, and death rates in the United States. Differences in vaccination hesitancy have also emerged by race: communities of color and, particularly, African Americans have been more reluctant to get a vaccine to prevent COVID-19. Can racial descriptive norms provide a tool to increase confidence and reduce hesitancy within the US public? We conducted a survey experiment at the end of January 2021 on a sample of non-Hispanic white and Black American adults. The experiment varied whether information about uptake intent by race was provided, and what racial group was reported to be more likely to get a vaccine if one were available to them today. Our results show that the tendency to conform to one's racial ingroup can play a key role in improving vaccination attitudes across race. Indeed, whites become significantly more willing to get vaccinated now or in the near future after they learn that a majority of whites intend to do so. Furthermore, both Blacks with high science trust and whites with low science trust are more likely to accept multiple vaccine doses and yearly boosters if their racial ingroup plans on getting vaccinated. Finally, the desire for ingroup conformity leads Blacks with low science trust to be more willing to receive a vaccine when they are provided a choice among vaccine brands.

Throughout the COVID-19 pandemic, significant disparities emerged and persisted across racial groups in the United States. African Americans have experienced significantly higher hospitalization and death rates compared to non-Hispanic whites (CDC 2021). Importantly, attitudes toward vaccines

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vary by race (Mitchell 2020). Although willingness to take a vaccine to prevent COVID-19 has increased across race, skepticism and resistance have remained stronger in communities of color (KFF 2021b). This reflects a long history of racial inequities in US research and health care, including notorious examples such as the Tuskegee Study and Henrietta Lacks. Recently, Obermeyer et al. (2019) also found evidence of a racially biased algorithm widely used in health care systems.

Due to these COVID-related racial disparities and historical racial biases, racial groups can be expected to be particularly salient frames of reference when Americans consider getting a vaccine. Since it is estimated that between 70 and 90 percent of the population needs to become immune through infection or vaccination for the herd immunity threshold (Burger and Kelland 2020), vaccine uptake rates have to be high enough across race to reach immunity. Therefore, how different racial groups can be persuaded to get vaccinated is a critical issue. What types of public health communications can increase vaccination intention within and across racial groups?

We employ a survey experiment to investigate how summary information about racial ingroup versus outgroup members' vaccination attitudes can influence individual uptake intent. Specifically, we analyze the impact of the interplay of two countervailing social motives: individuals' need for inclusion through conformity to the behaviors of the majority of the racial group(s) with which they identify (i.e., their ingroup) and their need for differentiation through distinctions between those who are inside and those who are outside the group boundaries (i.e., the outgroup). We find that white Americans, but not Blacks, become significantly more willing to want a vaccine when they read that a majority of their racial ingroup intends to get one. Furthermore, Blacks with high science trust and whites with low science trust are more likely to decide to receive multiple vaccine doses and boosters if they believe that a majority of their ingroup will make the same decision. Finally, if they can choose among brands, Blacks with low science trust are more likely to get inoculated when a majority of Blacks plan on doing the same. Our results thus suggest that persuasion efforts aimed at increasing vaccine uptake rates and reaching herd immunity may have a better chance of being effective when they focus on racial communities and provide credible information that is disaggregated by race.

Descriptive Norms, Science Trust, and Vaccination

When it comes to vaccines, misperceptions and misinformation represent a major obstacle to widespread uptake (Wardle 2020). Among growing efforts to combat misinformation through fact-checking, corrective information has been found to be sometimes successful, but its effects are often heterogeneous

and conditional on several other factors and circumstances (e.g., Carey et al. 2020; Porter and Wood 2021; Walter et al. 2020, 2021). What tends to improve beliefs about vaccine safety and intent to vaccinate is inclusion in discussion networks that support vaccination (Nyhan, Reifler, and Richey 2012). Thus, pro-vaccine sentiment within a community can contribute to higher vaccine acceptance and help achieve the critical threshold of herd immunity (Pananos et al. 2017).

Analogously, Self-Categorization Theory (SCT; Turner et al. 1987) and Optimal Distinctiveness Theory (ODT; Brewer 1991) identify two opposing social identity dynamics: individuals' tendency to conform to their ingroup norm (i.e., majority), thereby minimizing intragroup differences, on the one side, and their tendency to positively differentiate their ingroup from the relevant outgroup(s) and avoid conforming to the outgroup norm, thus maximizing intergroup differences, on the other side. The literature on descriptive norms further posits that individuals are most likely to conform by relying on information about other people's behavior when the situation is "novel, ambiguous, or uncertain" (Goldstein et al. 2008, p. 473), as in the case of COVID-19 vaccines.

Descriptive norms are more influential when they refer to groups that individuals perceive as relevant to the targeted behavior (Tankard and Paluck 2016). Racial groups are indeed likely to be viewed as particularly relevant frames of reference in relation to COVID vaccines due to the persistent racial inequities in US research and health care. Thus, information about whether the majority of one's racial ingroup intends to get a vaccine and how that proportion compares to racial outgroups can be expected to enable individuals to both conform to the ingroup majority and compare favorably to the outgroup. This provides several benefits: reducing uncertainty about how to think and act accurately or effectively, gaining others' approval, and maintaining a positive self-image (e.g., Cialdini and Trost 1998; Hogg 2000). Specifically, SCT predicts the two dynamics will be mutually reinforcing: individuals conform even more strongly to ingroup behaviors when the relevant outgroup behaves oppositely from the ingroup norm.

Furthermore, although it does not need to be accurate, information related to group norms has to be considered sufficiently credible to meaningfully impact and shift individual behavior (e.g., Tankard and Paluck 2016). Accordingly, we measure whether participants believe the information they read about the pandemic and vaccines. We expect that trust in the information provided about COVID-19 vaccines will moderate the effect of racial descriptive norms: as trust increases, subjects will become more responsive to those norms. Specifically, we operationalize trust in the information within the manipulation as trust in the scientific method, thus capturing baseline attitudes toward vaccines while avoiding concerns about posttreatment bias or endogeneity. Accounting for science trust is particularly important in the

context of COVID-19. Indeed, around the time we fielded our study, mis- and disinformation about the pandemic and myths about the vaccines were widely spreading (e.g., Pullan and Dey 2021), thereby likely influencing whether our participants were open to new information.

Thus, we test two hypotheses:

H1 (Conformity Effect): Conditional on having high trust in science, willingness to take a COVID-19 vaccine will be stronger when compliance within the racial ingroup is reported to be high.

H2 (Conformity and Differentiation Combined Effect): Conditional on having high trust in science, willingness to take a COVID-19 vaccine will be strongest when compliance within the racial ingroup is reported to be high and compliance within the racial outgroup is reported to be lower.

Data and Research Design

We conducted a survey-based experiment on a national sample of US adults. Subjects were drawn from online panels of respondents recruited by the company Cint through convenience sampling methods. Participants were invited through emails, push notifications, and in-app pop-ups. Responses were collected from January 27 to 31, 2021.¹ Quotas by race were applied in order to include roughly equal proportions of unvaccinated Black ($n = 1,129$) and non-Hispanic white Americans ($n = 1,065$). The sample thus includes 2,194 participants.² Respondents read an excerpt from a fictitious article by the Associated Press about the availability of COVID-19 vaccines authorized for emergency use and their benefits for achieving herd immunity. Subjects were then randomly assigned to one of four experimental conditions. The conditions varied whether information about uptake intent by race was provided and when such information was provided, what racial group was reported to be more likely to get a vaccine if one were made available to them today. While in the control condition subjects did not read any information about uptake intent by race, across all treatments they read about different proportions of Black and non-Hispanic white Americans who intended to get vaccinated. From an ethical perspective, no condition was expected to decrease vaccination intent.

In particular, Treatment 1 (“T1”) reports that a majority (about 70 percent) of subjects’ racial ingroup—Blacks or non-Hispanic whites—would get a vaccine if it were available to them today. In other words, African Americans are informed that 70 percent of Blacks intend to get a vaccine, whereas non-Hispanic whites read that 70 percent of whites want a vaccine.

1. The study protocol is in [Supplementary Material section C](#).

2. The study-specific response rate was 89.23 percent (this represents the percent of panel members who were invited to participate in this study who did so).

Treatment 2 (“T2”) reports that a majority (70 percent) of non-Hispanic whites but a lower proportion (50 percent) of Blacks would get vaccinated. Conversely, in Treatment 3 (“T3”), a lower proportion (50 percent) of whites but a majority (70 percent) of Blacks are reported to be willing to get vaccinated. In sum, T1 has been designed to test the relative impact of ingroup conformity (H1), while T2 and T3 are meant to assess the combined effect of ingroup conformity and outgroup differentiation (H2) among white and Black Americans, respectively. Although the article was fictitious, the summary information about racial groups being presented was similar and reflective of the reports by major polling companies at the time, thus making it credible (e.g., [KFF 2021a](#)).

Consistent with our theoretical framework, we also included a moderator measuring trust in science. Specifically, participants were asked, “Which of the following best describes what you think about the scientific method?” They answered by choosing between two options: “The scientific method generally produces accurate conclusions” or “The scientific method can be used to produce any conclusion the research wants.” A majority of the sample (64.6 percent) selected the former option and has therefore been operationalized as the high science trust group. The respondents who chose the latter response option are classified as low science trust. Importantly, this variable highlights a difference by race: the proportion with high science trust is significantly larger among non-Hispanic whites than Blacks, namely 68.8 percent as compared to 60.6 percent, respectively.

The outcome variables capture uptake intention across different time frames and scenarios. Following the vignette, participants were asked to indicate how willing they would be to get a vaccine as soon as it became available to them as well as after it has been available to them for a while. Indeed, a large proportion of the US public reported having concerns over side effects and wanting to wait and see effects on other people. These two items were combined into an additive scale (“Intent timing scale”) with strong reliability ($\alpha = 0.95$). Subjects were also asked to what extent they would be more or less likely to get a vaccine across different scenarios: 1) if the vaccine required multiple doses, 2) if it required a yearly booster shot, and 3) if there was the option of choosing among different companies or brands. As they both refer to the intention to receive repeated vaccine shots, whether in terms of doses or boosters, the first two questions (1 and 2) were combined into a scale (“Repeated shots scale”) with good internal consistency ($\alpha = 0.77$).³ Scenario 3 is our third dependent variable. Finally, participants were debriefed.⁴

3. See [Supplementary Material section A](#) for summary statistics for all variables and comparisons of covariates across conditions, [Supplementary Material section B](#) for experimental stimuli wording, and [Supplementary Material section C](#) for survey question wording.

4. See [Supplementary Material section C](#) for debrief.

Results

First, we examine the impact of the interaction of each experimental condition and science trust on willingness to get vaccinated as soon as possible or after the vaccine has been available for a while (i.e., “Intent timing scale”). [Figure 1](#) shows average marginal effects by race (among Black and non-Hispanic white Americans) and science trust level (low versus high).⁵ This and the following figures display 84 percent confidence intervals. As we aim to identify statistical differences in vaccination willingness between each treatment and the control, 84 percent confidence intervals are appropriate to attain a Type I error rate of 5 percent (e.g., [Arceneaux et al. 2016](#)).⁶

Black subjects do not display significantly stronger vaccination intent in any treatment as compared to the control across science trust levels. Moreover, as we would expect, African Americans’ willingness to get vaccinated is higher among those who have high science trust. In contrast, white Americans’ vaccination intentions are significantly impacted by two treatments. Specifically, learning that 70 percent of non-Hispanic whites will get a vaccine (i.e., T1) leads to a significant ($p = .042$) increase—7 percentage points (95 percent CI [0.002, 0.138])—in vaccination intent among white participants who trust the scientific method, thus providing support for H1. Additionally, white subjects who have low science trust become significantly ($p = .046$) more likely to take a vaccine after reading that a majority of their ingroup, but a lower proportion of the Black outgroup, intend to be inoculated (i.e., T2). This is associated with a 10.5 percent increase (95 percent CI [0.002, 0.209]) in uptake intentions compared to the control. This result is partially consistent with H2: the combination of the need to conform to the behavior of the ingroup majority and to distinguish themselves from the outgroup leads white Americans to become more motivated toward vaccination. Interestingly and in contrast to our expectations, however, this finding refers to whites who distrust science, thus suggesting that meeting both inclusion and differentiation needs may enable individuals to overcome their lack of trust in science.

Next, we examine attitudes toward repeated vaccine shots. After being asked about the likelihood to get vaccinated over time, respondents were asked if they would be more or less likely, compared to their baseline willingness, to get a COVID-19 vaccine if it required multiple doses and an annual booster. Average marginal effects on the resulting “Repeated shots scale” by race and level of trust in science are displayed in [figure 2](#).⁷

5. Main regression results are in [Supplementary Material section D](#). See [Supplementary Material section E](#) for main effects and conditional effects by science trust.

6. When comparing the means of two groups, the two 95 percent confidence intervals may overlap while the two means are still statistically different at an $\alpha = .05$ level. A common practice is to adjust the confidence intervals to 83.5 percent.

7. See [Supplementary Material section D](#) for regression results.

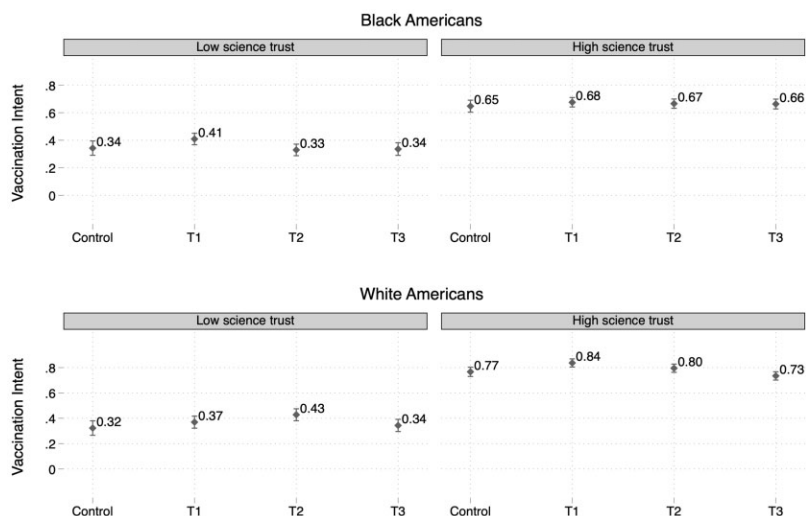


Figure 1. Predicting vaccination willingness over time by race and science trust. The figure shows average marginal effects from unweighted OLS regressions among Black (top) and non-Hispanic white Americans (bottom) by low science trust (left) and high science trust (right) and by experimental condition. The outcome variable is a two-item scale measuring willingness to get a COVID vaccine either as soon as it becomes available to them or after it has been available to them for a while. Error bars display 84 percent confidence intervals.

Consistent with H1, uptake intentions are significantly ($p = .018$) stronger in T1 than in the control among Black subjects with high science trust. When a majority (i.e., 70 percent) of Black Americans report wanting a vaccine, the desire to conform to the ingroup norm increases Blacks' willingness to receive multiple doses and boosters by 15.5 percentage points (95 percent CI [0.026, 0.284]). Furthermore, informing African Americans with high science trust about whites' comparatively lower vaccination intent in T3 leads to significantly ($p = .034$) stronger vaccination intent toward multiple shots as compared to the control. In other words, the combination of conformity and differentiation improves Blacks' willingness to receive multiple shots by 14 percentage points (95 percent CI [0.010, 0.272]). However, in contrast to H2, the difference in effect between T1 and T3 in the high science group is not statistically significant ($p = .813$), thus suggesting that differentiation does not add to the impact of conformity.

Similarly, whites' attitudes are positively impacted by conformity in T1. However, in contrast to African Americans and contrary to our expectations, that is the case among whites who distrust the scientific method: reading that

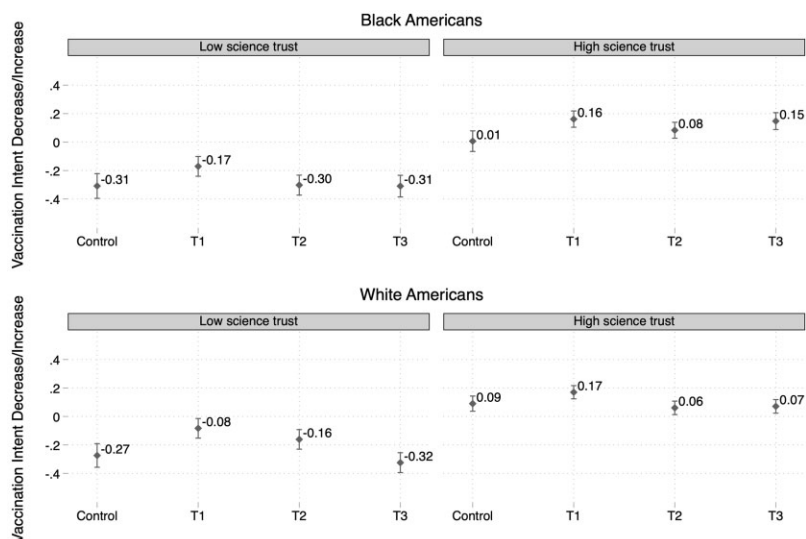


Figure 2. Predicting likelihood of getting vaccinated with repeated shots by race and science trust. The figure shows average marginal effects from unweighted OLS regressions among Black (top) and non-Hispanic white Americans (bottom) by low science trust (left) and high science trust (right) and by experimental condition. The outcome variable is a two-item scale measuring the extent to which participants would become willing to get a COVID vaccine if it required multiple doses and/or a yearly booster. This scale ranges from -1 (much less likely) to 1 (much more likely). Error bars display 84 percent confidence intervals.

a majority of their ingroup will get a vaccine (i.e., T1) is associated with a significant ($p = .013$) improvement in vaccination intentions over multiple doses/boosters—by 19 percent (95 percent CI [0.041, 0.341])—among whites with low science trust. This further suggests that addressing racial ingroup conformity motivations may offer an opportunity to overcome low levels of trust in science among white Americans.

Finally, participants were asked if they would be more or less likely, compared to their baseline willingness, to receive a vaccine if there was the option to choose among different brands. Average marginal effects by race and science trust level are displayed in figure 3.⁸ Within the low science trust group, being informed that 70 percent of Blacks intend to get vaccinated in T1 significantly ($p = .009$) increases Black subjects' likelihood to be vaccinated by nearly 23 percentage points (95 percent CI [0.057, 0.398])

8. See [Supplementary Material section D](#) for regression results.

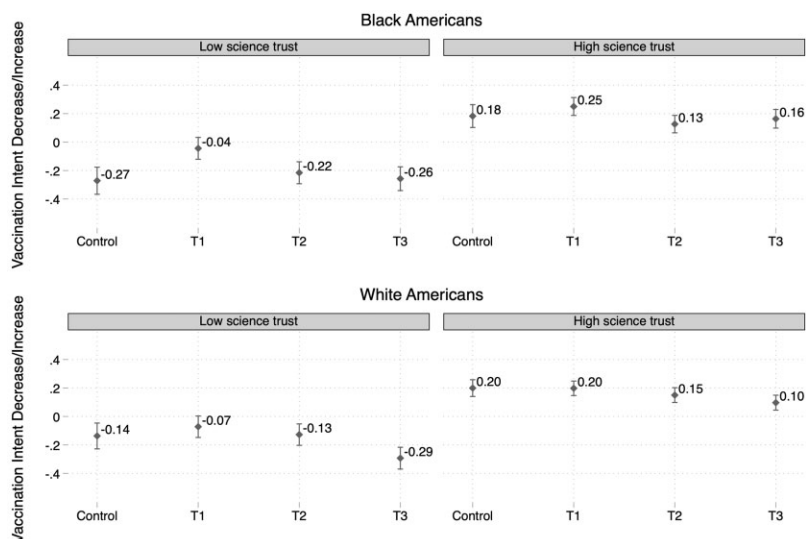


Figure 3. Predicting likelihood of getting vaccinated with brand choice by race and science trust. The figure shows average marginal effects from unweighted OLS regressions among Black (top) and non-Hispanic white Americans (bottom) by low science trust (left) and high science trust (right) and by experimental condition. The outcome variable is the extent to which participants would become willing to get a COVID vaccine if there was the option to choose among different brands. This outcome ranges from -1 (much less likely) to 1 (much more likely). Error bars display 84 percent confidence intervals.

compared to the control. In other words, learning that members of their racial group are receptive to the vaccine is highly persuasive for African Americans with low trust in science while they are offered the opportunity to choose among brands. In contrast, information about the white outgroup has little bearing on Blacks' decision to take a vaccine, even when such information implies that Blacks are doing relatively better than whites (i.e., T3). On the other hand, white participants' vaccination intentions can hardly be shifted under a scenario of brand choice: no treatment significantly strengthens their willingness to get vaccinated.

As a robustness check, we ran the models including controls: partisanship, gender, children, age, rural residence, essential worker status, education, income, and evangelical Christianity.⁹ These controls may indeed differentially

9. See [Supplementary Material section C](#) for question wording and [Supplementary Material section G](#) for regressions including controls.

affect white and Black Americans' attitudes toward COVID-19 infection and/or vaccines. The results remain highly consistent. Furthermore, we ran the same models by party ID among white subjects, which show that the positive and statistically significant impact of conformity among whites is similar across parties.¹⁰

Discussion

This study builds upon the literature on descriptive norms and social identity to analyze how the divides and dynamics between racial groups can enhance individuals' motivation to get a COVID-19 vaccine. Overall, we find support for H1: conditional on trusting science, racial ingroup conformity can play a key role in improving vaccination intentions. First, white Americans, but not Blacks, become more likely to get vaccinated in the near future if they believe that a high proportion of other whites plan to do so as well. Second, the racial ingroup conformity treatment makes both African Americans with high science trust and whites with low science trust more likely to accept a vaccine under situations implying additional hurdles, such as the need for multiple doses and yearly boosters. Finally, the desire for conformity to the racial ingroup leads Blacks with low science trust to be more willing to receive a vaccine when offered a choice among brands. In contrast to H2, the desire for differentiation is generally unnecessary to improve vaccination attitudes across race. As our manipulation included descriptions of COVID-19 risk and severity, future research should address the impact of ingroup conformity motivations with different messages (e.g., Slater, Peter, and Valkenberg 2015).

These findings suggest that Americans' confidence in getting vaccinated is enhanced when they know that others from their racial community, who more closely share their concerns and reasons for skepticism, intend to do the same. Looking ahead, the tendency to conform to others from one's racial ingroup may therefore be used to encourage the US public to get vaccinated. Public health communications may have a better chance of being persuasive when they provide targeted information by race and focus on increasing awareness while decreasing misinformation within those communities.

Supplementary Material

Supplementary Material may be found in the online version of this article: <https://doi.org/10.1093/poq/nfad017>.

10. See **Supplementary Material section G** for regressions by party ID among whites.

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Data Availability

Replication data and documentation are available at: <https://doi.org/10.7910/DVN/GIPGXH>.

References

- Arceneaux, Kevin, Martin Johnson, René Lindstädt, and Ryan J. Vander Wielen. 2016. "The Influence of News Media on Political Elites: Investigating Strategic Responsiveness in Congress." *American Journal of Political Science* 60:5–29.
- Brewer, Marilynn B. 1991. "The Social Self: On Being the Same and Different at the Same Time." *Personality and Social Psychology Bulletin* 17:475–82.
- Burger, Ludwig, and Kate Kelland. 2020. "Analysis: Can First COVID-19 Vaccines Bring Herd Immunity? Experts Have Doubts." *Reuters*, November 18. <https://www.reuters.com/article/us-health-coronavirus-immunity-analysis-idUSKBN27Y124>.
- Carey, John M., Victoria Chi, D. J. Flynn, Brendan Nyhan, and Thomas Zeitzoff. 2020. "The Effects of Corrective Information about Disease Epidemics and Outbreaks: Evidence from Zika and Yellow Fever in Brazil." *Science Advances* 6:eaaaw7449.
- Centers for Disease Control (CDC). 2021. "Risk for COVID-19 Infection, Hospitalization, and Death by Race/Ethnicity." Updated December 28, 2022. <https://www.cdc.gov/coronavirus/2019-ncov/covid-data/investigations-discovery/hospitalization-death-by-race-ethnicity.html>.
- Cialdini, Robert B., and Melanie R. Trost. 1998. "Social Influence: Social Norms, Conformity, and Compliance." In *The Handbook of Social Psychology*, edited by D. T. Gilbert, S. T. Fiske, and G. Lindzey. Vol. 2, 151–92. New York: McGraw.
- Goldstein, Noah J., Robert B. Cialdini, and Vidas Griskevicius. 2008. "A Room with a Viewpoint: Using Social Norms to Motivate Environmental Conservation in Hotels." *Journal of Consumer Research* 35:472–82.
- Hogg, Michael A. 2000. "Subjective Uncertainty Reduction through Self-Categorization: A Motivational Theory of Social Identity Processes." *European Review of Social Psychology* 11: 223–55.
- Kaiser Family Foundation (KFF). 2021a. "KFF COVID-19 Vaccine Monitor: February 2021." February 26. <https://www.kff.org/coronavirus-covid-19/poll-finding/kff-covid-19-vaccine-monitor-february-2021/>.
- Kaiser Family Foundation (KFF). 2021b. "KFF COVID-19 Vaccine Monitor: Profile of the Unvaccinated." June 11. <https://www.kff.org/coronavirus-covid-19/poll-finding/kff-covid-19-vaccine-monitor-profile-of-the-unvaccinated/>.

- Mitchell, David. 2020. "Survey Reveals Common Misconceptions About Flu, Vaccination." American Academy of Family Physicians (AAFP). January 22. <https://www.aafp.org/news/health-of-the-public/20200122flusurvey.html>.
- Nyhan, Brendan, Jason Reifler, and Sean Richey. 2012. "The Role of Social Networks in Influenza Vaccine Attitudes and Intentions among College Students in the Southeastern United States." *Journal of Adolescent Health: Official Publication of the Society for Adolescent Medicine* 51:302–4.
- Obermeyer, Ziad, Brian Powers, Christine Vogeli, and Sendhil Mullainathan. 2019. "Dissecting Racial Bias in an Algorithm Used to Manage the Health of Populations." *Science* 366:447–53.
- Pananos, A. Demetri, Thomas M. Bury, Clara Wang, Justin Schonfeld, Sharada P. Mohanty, Brendan Nyhan, Marcel Salathé, and Chris T. Bauch. 2017. "Critical Dynamics in Population Vaccinating Behavior." *Proceedings of the National Academy of Sciences of the United States of America* 114:13762–67.
- Porter, Ethan, and Thomas J. Wood. 2021. "The Global Effectiveness of Fact-Checking: Evidence from Simultaneous Experiments in Argentina, Nigeria, South Africa, and the United Kingdom." *Proceedings of the National Academy of Sciences* 118:e2104235118.
- Pullan, Samuel, and Mrinalini Dey. 2021. "Vaccine Hesitancy and Anti-Vaccination in the Time of COVID-19: A Google Trends Analysis." *Vaccine* 39:1877–81.
- Slater, Michael D., Jochen Peter, and Patti M. Valkenberg. 2015. "Message Variability and Heterogeneity: A Core Challenge for Communication Research." *Communication Yearbook* 39:3–31.
- Tankard, Margaret E., and Elizabeth L. Paluck. 2016. "Norm Perception as a Vehicle for Social Change." *Social Issues and Policy Review* 10:181–211.
- Turner, John C., Michael A. Hogg, Penelope J. Oakes, Stephen D. Reicher, and Margaret S. Wetherell. 1987. *Rediscovering the Social Group: A Self-Categorization Theory*. New York: Blackwell.
- Walter, Nathan, John J. Brooks, Camille J. Saucier, and Sapna Suresh. 2021. "Evaluating the Impact of Attempts to Correct Health Misinformation on Social Media: A Meta-Analysis." *Health Communication* 36:1776–84.
- Walter, Nathan, Jonathan Cohen, R. Lance Holbert, and Yasmin Morag. 2020. "Fact-Checking: A Meta-Analysis of What Works and for Whom." *Political Communication* 37:350–75.
- Wardle, Claire. 2020. "The Drip, Drip, Drip of Misinformation on COVID-19 Vaccine." *Boston Globe*, November 12. <https://www.bostonglobe.com/2020/11/12/opinion/drip-drip-drip-misinformation-covid-19-vaccine/>.