NBER WORKING PAPER SERIES

PERSUASION IN MEDICINE: MESSAGING TO INCREASE VACCINE DEMAND

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Working Paper 28593
http://www.nber.org/papers/w28593

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
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March 2021

We thank Minjeong Joyce Kim and Nikhil Shankar for excellent research assistance. We also thank Mackenzie Alston, Luca Braghieri, Amitabh Chandra, Stefano DellaVigna, Esther Duflo, Matthew Gentzkow, Damon Jones, Kosali Simon, MarianneWanamaker, Crystal Yang, JPAL North America Board and Reviewers as well as participants in seminars at ASSA, Brown University, Harvard/MIT/BU Health Economics, Stanford, UCSB, UCSD, andWashington University in St. Louis for comments. The study was approved by IRB at Harvard University (IRB19-1424) and registered at ClinicalTrials.gov (NCT04160975), AEA RCT registry (AEARCTR-0004796), and OSF (DOI 10.17605/OSF.IO/XJ5WP). Funding provided by J-PAL North America and Harvard Kennedy School. Research reported in this publication was also supported by the National Institute on Aging under award number P30AG064190. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health. The authors have no conflicts to disclose. The views expressed herein are those of the authors and do not necessarily reflect the views of the National Bureau of Economic Research.

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NBER Working Paper No. 28593
March 2021
JEL No. I1,I12,I14

ABSTRACT

High-value preventive care is often underutilized. We study persuasion regarding the medical benefits of influenza vaccination by experimentally varying race concordance between sender and receiver, and, among Black respondents, a discordant sender's acknowledgement of historical injustice and the expertise of a concordant sender. Race concordance improves ratings of the sender and signal among Black respondents but has no effect among White respondents. Acknowledgement of injustice improves signal ratings as much as concordance, though neither alters vaccine behavior except among those previously vaccinated. Non-expert concordant senders increase intended and self-reported vaccine take-up the most, particularly among individuals with no vaccination experience.

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Preventive health investments can yield considerable benefits for individuals and society, yet are often adopted at low rates (see Newhouse 2020). Immunization against infectious diseases is a leading example of a measure that improves health and reduces employee absenteeism (CDC 2020, Nichol et al. 2003).[1] However, despite near universal recommendation of the seasonal influenza vaccine for individuals over the age of 6 months in the United States and federally mandated zero cost-sharing under the Affordable Care Act, take-up rates among adults average only 45% (CMS 2010, CDC 2021a).[2] Take-up rates are particularly low among certain demographic groups, such as men, individuals without a four-year college degree, and non-Hispanic Black Americans (see Panel A of Appendix Figure A1, CDC 2018, Newhouse et al. 1993).

Among the groups with the lowest vaccination rates — Black and White lower socioeconomic status (SES) men — the reasons frequently reported for not taking up flu vaccines relate to pessimistic beliefs on the benefits or non-pecuniary costs of vaccinations, as opposed to financial costs or lack of recommendation by a health professional.[3] These findings echo prior research on higher levels of medical mistrust among Black Americans as well as among individuals with less education (Blendon et al. 2014, Kinlock et al. 2017, Nanna et al. 2018, Hammond et al. 2010, Idan et al. 2020). This mistrust likely has deep historical roots, including the government-led experiment in Tuskegee, Alabama, as well as contemporaneous medical racism (Alsan and Wanamaker 2018, Bajaj and Stanford 2021, Brandt 1978). The findings on beliefs also relate to growing scholarship on misperceptions in the net benefits of preventive care (i.e. behavioral hazard) leading to underutilization (Handel and Kolstad 2015, Bhargava et al. 2017, Ericson and Sydnor 2017, Handel and Schwartzstein 2018, Chandra et al. 2021). There is scope, then, to change individuals' views on vaccination through the provision of credible and accurate information (Kamenica and Gentzkow, 2011).

In this study, we aim to evaluate the effectiveness of messaging interventions designed to shift knowledge, beliefs and take-up behavior regarding vaccines. Our sample consists of White and Black men without a college education who had not received their seasonal influenza vaccine at the time of recruitment.[4] Understanding the determinants of demand for preventive health care, including vaccines, has been of great interest to researchers. Important experimental work has shown the effectiveness of cues and nudges (Milkman et al., 2011) or increased accessibility (Brewer et al. 2017, Banerjee et al. 2010), particularly among those planning to be vaccinated. There is limited evidence, however, on how to persuade those who are not already intending to be immunized (in our sample, nearly half of respondents report they are completely unwilling to receive an influenza vaccine) (see Rosenbaum (2021)). Which messages will resonate under such circumstances? And could some well-intentioned messages backfire? Will messaging alone induce behavior change?

[1] The seasonal influenza vaccine alone averts 3,500 to 12,000 deaths a year and reduces work loss due to the illness by nearly one-fifth (CDC 2020).

[2] Not all adult Medicaid enrollees receive no cost-sharing for vaccines (Granade et al., 2020).

[3] See Appendix Figure A2, which explores reasons for not vaccinating among our sample. Note that vaccination take-up among Hispanic men is also relatively low, but this population was not included in this study.

[4] The education cutoff still represents a substantial fraction of US men (approximately 50% of Black men and 35% of Non-Hispanic White men in the US population (Health Day News, 2021)).

The urgency of answering such questions is underscored by the disproportionate impact of COVID-19 on disadvantaged communities and the need for mass vaccination to quell the pandemic. We developed and distributed standardized video messages on the safety and effectiveness of the influenza vaccine, narrated by ten separate senders. The videos varied along three policy-relevant dimensions: (1) the perceived medical expertise of the sender ("expertise"), (2) the race of the sender ("concordance"), and (3) the admission/omission of acknowledgement of past injustice committed by the medical community by discordant senders ("acknowledgement"). We tailored the expertise and acknowledgement interventions to Black respondents since Black men continue to comprise less than three percent of the U.S. physician workforce, with their representation among admitted medical students stagnant since the late 1970s (AAMC 2016, 2019). Understanding the potential of concordant community members to substitute for medical experts, as well as the role acknowledgements of past injustice by discordant physicians may play in bridging trust gaps, holds relevance amidst challenges in diversifying the physician workforce and persistent racial health inequalities.

The layperson sender intervention was motivated by the ambiguous effects expertise may have on belief and behavior change. Medical doctors, the relevant experts in our study, have specialized training and experience, and may therefore be considered more credible sources of health information than peers, all else equal. They are, however, also more socially distant from those who are disadvantaged, and such class cleavages could engender skepticism (Gauchat 2012, Eichengreen et al. 2021). Recent research in economics has revisited the role of expertise: Sapienza and Zingales (2013) find that providing ordinary Americans with information on the consensus opinions of academic economists does not move their beliefs, while DellaVigna and Pope (2018) document that non-experts perform similar to experts in forecasting the rank of interventions. Representative surveys on trust and credibility indicate that respondents find "a person like yourself" as credible as academic experts, and show a growing gap in institutional trust between individuals of high and low socioeconomic status (Ries, 2016). Experimentally, the variation we induce is between senders wearing a white coat and stethoscope (expert condition) versus the *same* senders wearing a white short-sleeved shirt (peer condition), narrating the same script.[5] In a separate survey conducted on Amazon Mechanical Turk (MTurk), senders in layperson attire are rated by respondents as 1.7 standard deviation units less educated than those in a laboratory coat (Appendix Table B1), indicating that our experimental variation had the intended effect (i.e. a "first-stage").

The concordant expert arm was motivated by recent research showing that treatment by a race-concordant physician in an in-person setting can increase demand among Black Americans for preventive care as well as improve health outcomes (Alsan et al. 2019, Greenwood et al. 2018, Greenwood et al. 2020, Hill et al. 2020). Evidence is limited, however, on whether these effects exist in one-way communication settings. In a pair of randomized evaluations of video messages recorded by physicians regarding mask-wearing and social distancing during COVID-19, the first such messaging study (Alsan et al., 2020) found small but robust sender concordance effects among Black

[5]In the remainder of the paper, we refer to senders in the expert condition as expert senders.

respondents on information-seeking behavior. However, the second study, by the same set of authors and using a slightly more complicated design, failed to detect such effects (Torres et al., 2021). This paper builds on and extends the prior studies to include vaccination views and behavior.

The acknowledgement arm, in which some senders acknowledge past breaches of trust committed by the medical community, could provide an alternative, scalable way to increase trust in medical recommendations amidst a largely non-Black physician workforce. While acknowledgement of historical medical injustice can be expressed through a variety of approaches, we developed a short statement corresponding closely to one proposed for use by physicians in an *Annals of Internal Medicine* editorial on responding to vaccination concerns (Opel et al., 2021). The proposed script from *Annals* reads *"I understand why you have a lot of mistrust. The government and research systems have not always treated your community fairly,"* and can be compared to our script found in Section I. Before distributing this type of message at scale, however, it is imperative to test its effectiveness, as unintended negative consequences are also conceivable.

We establish three main results. First, we find concordance effects on sender and signal ratings are present exclusively among Black respondents, with no such effects evident among White respondents. We further find that acknowledgement of past breaches of trust by a race-discordant expert sender increases ratings of the signal by approximately the same magnitude as a race-concordant expert sender providing the standard message without acknowledgement (an increase of 0.14 standard deviation units). Neither intervention, however, significantly affects self-reported influenza vaccine take-up as measured in the follow-up survey, although coefficient estimates on intent to vaccinate against influenza and COVID-19 are weakly positive in both arms.

Second, when comparing layperson to expert senders, we find that lay senders are rated by respondents as substantially *less* qualified (0.54 standard deviation units) to give medical advice. However, individuals in the non-expert condition exhibit greater recall of factual message content and increase their willingness to receive the COVID-19 vaccine by 8.8 percentage points (20%). Furthermore, respondents assigned to lay senders were 15 percentage points (39%) more likely to report that a household member had received the flu vaccine in the weeks between the baseline and follow-up surveys.

Third, we find striking heterogeneity by treatment arm across respondents with different levels of prior experience with flu vaccination. Viewing previous flu vaccination experience as a proxy for distance from a take-up "threshold," we divided the sample into never-takers, ever-takers, and recent-takers based on the date of a respondent's last influenza vaccine. We find that both the concordance and acknowledgement interventions demonstrated significant effects on flu and COVID-19 vaccination intent among recent takers, those who had received seasonal flu vaccines within the past two years (about a quarter of the sample). In sharp contrast, the effectiveness of non-experts was strongest among those who had *never* previously received a flu vaccine (another quarter of the sample), with individuals in this group rating the non-expert message significantly higher than respondents who had previously taken up the flu vaccine, and exhibiting substantial increases in flu and COVID-19 vaccination intent (by 47% and 49%, respectively).

Taken together, these findings represent a step towards identifying effective ways to influence immunization views and behaviors. While messages from concordant and empathetic experts may resonate most among individuals familiar with vaccination, our study suggests that peer figures, such as community health workers or citizen ambassadors, could play an important role in communicating benefits and dispelling myths about vaccines among those least inclined to receive one.

I Experimental Design

We collected data in two flu seasons: 2019-2020 and 2020-2021. Respondents were recruited via survey panels from Qualtrics, Lucid, CloudResearch, and Facebook, and participated in the experiment through an online survey on Qualtrics.[6] We timed the experiment so that it would fall into the middle of the flu season (between December to February in 2019-2020 and between late October to January in 2020-2021), so as ensure recruitment of participants who would be unlikely to get the flu vaccine in the absence of our intervention.[7] Upon completing the consent process, participants answered a set of questions to determine eligibility based on self-identified gender (male), race (non-Hispanic Black or non-Hispanic White), age (25-51), education (no college), and flu vaccine status (had not yet been vaccinated for influenza in the current season).[8] Within each treatment condition, subjects were randomly assigned in equal proportion to one of five recorded senders of the assigned race. The randomization was stratified by season and platform.

Eligible respondents continued to answer basic demographic questions, reported their baseline attitudes and beliefs about the flu vaccine, and then watched the video infomercial. After the infomercial, we gathered the main survey-based outcome measures and distributed a coupon for a free flu shot. At least two weeks later, participants were invited to complete a follow-up survey to measure medium-term impacts of our video treatment, and to measure respondents' self-reported flu vaccination status. See Appendix Figure A3 for an overview of the study design. Participants received a financial incentive for completing the baseline and follow-up survey (between $5 and $20), in the form of an electronic gift card.

In order to test whether expertise of the messenger, race concordance, and acknowledgement statements influence the key outcomes of interest, we aimed to produce videos that held all other factors precisely constant. This required tight control over key features of the video, such as the lighting, script, intonation, speaking rate, and sender appearance (such as age, height, facial hair, and clothes). Ensuring such consistency necessitated the use of a professional recording studio, as well as the use of actors for the recording of the videos.[9]

[6]We recruited via several platforms because each had difficulty meeting the sample specifications.

[7]By the fourth week of October 2020, flu shot distribution was on par with the first week of December 2019 (165 and 169 million doses, respectively), likely accelerated by the pandemic (CDC 2021b).

[8]We did not recruit participants older than 51, because a different vaccine than the one covered by our flu shot coupon is advised for older individuals. Since we aimed to recruit individuals without a college education, we excluded those between 18 and 24 since they may still be in college.

[9]In prior work (Alsan et al. (2019), Alsan et al. (2020) and Torres et al. (2021)), our team used licensed medical doctors for messaging. However, given the fine titration of all elements of the messaging and the need for the same person to play multiple roles, we used actors in this instance. Note that the same person who delivered the message as

We produced videos with a total of five Black and five White male actors ("senders"), recruited from the same casting agency. Each sender recorded the video in four variations, representing the experimental variation in expertise (expert vs. non-expert layperson) and signal content (standard vs. including an acknowledgement statement).[10] All senders wore the exact same clothes, provided by the research team. In the expert role, the senders wore a button-down blue shirt, striped tie, laboratory coat and stethoscope. In the layperson role, they wore a white short-sleeved shirt.

The standard signal (video script S1) was 40 seconds long and read:[11] *The Centers for Disease Control and Prevention, or CDC, recommends everyone 6 months and older get the flu shot. The shot protects you from getting sick by cutting your chance of catching the flu in half. It's also very safe: less than 1 in 100 vaccinated people experiences a side effect such as fever or chills. The flu shot does not contain an active flu virus, so you cannot get the flu virus from the shot. I get the flu shot every year to protect myself, my family, and my community. I recommend you look into getting vaccinated as soon as possible.*[12]

The script of signal 2 (S2) was identical to the above, except that three sentences were added acknowledging historical injustices committed by the medical establishment. They were placed in between the first and second sentence of script S1, and read: *I know some people are nervous to follow medical advice about vaccines. In the past, there may have been times when the medical community broke your trust. But I hope that sharing some information with you can help you understand how important the flu shot is.*

We aimed for the two groups of actors to have a similar distribution of age and training in acting. We validated the former criterion via external Mturk ratings of each actor (in each role) on age and also collected perceptions of attractiveness and educational attainment from the Mturk sample. There are no statistically significant differences in perceived age and education between concordant and discordant expert senders among Black Mturk respondents (Appendix Table B1, columns 1-2). Black respondents do, however, rate Black expert senders as 0.35 standard deviation units more attractive (column 3).

Consistent with bias, White Mturkers perceive Black expert senders wearing a white coat as 0.53 standard deviations younger and 2.84 standard deviations less educated than White senders in a lab coat. These differences are statistically significant. They should be kept in mind when interpreting the (null) results from this arm. Appendix Figure A4 presents perceived *within-sender* education differences (white coat vs. casual attire for Black vs. White senders). We observe that the penalty for a Black male wearing casual attire is much greater than for a White male, as they are perceived to be significantly less educated. These findings connect to a broader literature about

an expert recorded as a non-expert too, thus either doctors would have had to have acted as non-experts or vice-versa. We debriefed respondents about the use of non-expert actors in the influenza infomercials as well as the tracking of coupons, per IRB guidance, at the end of the follow-up survey.

[10]Because of the low marginal cost of recording additional videos, we had each actor record all four video variations; however, for power considerations and because pipeline issues for medical professionals are not as relevant for White respondents, nor the shameful history of medical exploitation, we only used the standard lay and standard expert videos for Black actors, and the standard expert and acknowledgement expert videos for White actors, in the experiment.

[11]See Appendix Section D for links to two examples of the videos we recorded.

[12]In the layperson video, we replaced the word "cannot" with "can't" in the script.

stereotypes and the profiling of Black men in the U.S. (Hester and Gray 2018, Oliver 2003).

Columns (7) through (9) of Appendix Table B1 reveal that Black Mturkers rate lay senders as less educated, less attractive, and younger than the same set of senders wearing white coats. Such results support the notion that the senders in casual attire were perceived as less advantaged than expert senders.

II Outcome Variables

We group the outcome variables into seven families described below. Appendix Section F presents survey question text and descriptive statistics for each outcome variable. For each family, we constructed one index that combines outcome variables within each family, weighting by the inverse of the covariance between variables, as described in Anderson (2008). The index is our main outcome of interest from each family.[13]

Rating of sender: We elicited three dimensions of respondent ratings of the sender. *Trust I* captures interest in further medical advice from the sender, and *Trust II* captures trust in the medical advice of the sender. *Qualification* measures a respondent's assessment of the sender's qualification to give the respondent medical advice.

Rating of signal: We have three variables measuring a respondent's rating of the signal itself. *Endorsement I* measures the self-reported likelihood of recommending the video to friends and family. *Endorsement II* measures the self-reported likelihood to recommend the flu shot to friends and family. *Relevance* captures a respondent's assessment of the extent to which the information contained in the video applies to people like themselves.

Signal content recall: In order to test whether our treatment variations impact attention to the video, and thus content recall, we asked participants to recall two pieces of information relayed in the video. The variable *Recall Age* measures whether respondents recall the age group for whom the flu vaccine is recommended as reported in the video, whereas *Recall Ingredient* captures respondent recall of the ingredients of the flu shot as reported in the video.[14]

Safety beliefs: We measured both the point belief and the certainty around a respondent's belief, using a Likert scale and ball and bin method, respectively. We focused on one specific dimension of flu vaccine safety: the likelihood to contract the flu from the flu shot. We chose this dimension because it is a salient, well-defined safety concern that is entirely ruled out by science and directly addressed in our video message. The outcomes in this family were elicited twice, once before and once after the video message treatment.

[13]Secondary outcomes are listed in Appendix Section E.

[14]Note that we specifically asked respondents to recall what the person in the video said, and *not* what the respondent himself believes to be true.

Coupon interest: We elicited two revealed preference measures of demand for the flu vaccine coupon: willingness to pay (WTP) for the coupon and demand for information regarding locations to redeem the coupon. *WTP* for a flu shot coupon was elicited using a multiple price list. A $0 price point was drawn with a probability $\frac{999}{1000}$ to facilitate measurement of redemption in the majority of the sample without introducing selection in who received a coupon. *Pharmacy Lookup* is a "yes/no" question regarding interest in a website with information about where the flu shot coupon could be redeemed.

Flu vaccination intent: A participant's likelihood to receive the flu vaccine by the end of the flu season (*Flu Vaccination Intent*) was elicited on a 11-point Likert scale, once before the video treatment and once afterwards. We re-scaled this outcome to have support 0 to 1.

COVID-19 vaccination intent: To study potential spillovers of our treatment on attitudes towards the COVID-19 vaccine in the 2020-21 season, we elicited a respondent's self-reported likelihood to take up the COVID-19 vaccine (*COVID-19 Vaccination Intent*), for the hypothetical scenario that it would be made available to the respondent at no cost. Measurement was identical to the flu vaccination intent outcome.

Coupon distribution and tracking: Upon completion of the baseline survey, participants received a coupon for a free flu vaccine by email. The coupon was valid until March of the given flu season and could be redeemed at major pharmacies nationwide. The research team tracked who redeemed the coupon via serial numbers assigned to each coupon. We have reason to believe that coupon redemption does not provide an accurate measure of flu vaccine receipt. The realized redemption rate, as per our administrative records, is well below 1%. This statistic stands in contrast to self-reported redemption rates of 15.3% as measured in our follow-up survey. We cannot disentangle whether the discrepancy is from demand bias in reporting, technical glitches, use of a non-study coupon, or participants offering the pharmacist the coupon but the vaccine being billed to insurance instead. Based on our personal experience in redeeming the coupon, it is plausible that pharmacists kept with their usual routine of billing insurers instead of entering the coupon code. However, if we recode all inconsistencies as *not* having been vaccinated, the conclusions reported herein are unchanged. For completeness, we report the results on coupon redemption in the results section.

Follow-up survey and self-reported flu vaccine take-up: We conducted a follow-up survey at least two weeks after the main survey. The median response time was 23 days. The purpose of this survey was to measure medium-term impacts on attitudes towards the flu vaccine and to measure flu vaccinations that were received without using our flu shot coupon. In the follow-up survey, we re-elicited safety beliefs (point belief and safety certainty) and elicited flu vaccination status of the respondent as well as others in the household. The response rate to the follow-up survey is modest but comparable to other remotely-administered surveys at 23% (Henderson and Rosenbaum, 2020). As noted below, there is not differential responsiveness to the follow-up survey across treatment conditions.

III Descriptive Statistics, Balance and Attrition

Our main sample includes all respondents who fulfilled our eligibility criteria (see Section I), passed our quality check, and completed the survey. Attrition after randomization was low: among all respondents who arrive at the video treatment stage of the survey, 89% completed the survey. Appendix Table B2 tests for imbalance in attrition by treatment status. The only statistically significant differential attrition we detect is among White respondents who were assigned to a Black sender: they exited the baseline survey at a higher rate (2.3 percentage points, p-value 0.09), suggesting those who remained were not as averse to discordant senders.

Summary statistics are presented in Appendix Table B3. We recruited approximately 400 Black respondents for each of the interventions (concordant expert, concordant lay, discordant expert, discordant expert plus acknowledgement) and approximately 600 White respondents for each of the two interventions to which White respondents were assigned (concordant expert, discordant expert). Respondents were on average 37 years old and about 53% reported a household income below $30,000. Approximately 27% of the sample had never received a flu vaccine, while 28% received one in the past two years and the remainder more than two years ago. Among the latter group, the majority (66%) received the flu vaccine more than five years ago. Before viewing the infomercial, respondents report a mean likelihood of receiving the flu vaccine of 2.57 on the 0-10 point scale.

We detect differences across racial groups that reflect broader social inequality: Black respondents report lower incomes, rates of high school completion, and health insurance coverage rates, although they express slightly higher average subjective health status. The relationship between COVID-19 vaccination intent and flu vaccination intent (as measured following the video intervention) is strongly positive (Appendix Figure A5). Interestingly, COVID-19 vaccination intent is higher than flu vaccination intent among those with the lowest flu vaccination intent.

Observable characteristics and pre-intervention views are well-balanced across treatment assignment in the baseline survey (Appendix Table B4).[15] As noted above, there was a lower response rate for the follow-up survey, though we do not detect differential response rates across study arms. Characteristics are generally well-balanced across arms in the follow-up survey although a handful of exceptions are observed (see Appendix Table B5); thus we interpret those results with caution.

[15] The joint F-statistic is less than 4 for all four treatment comparisons.

IV Results

Results are organized corresponding to the four study arms (i.e. concordance vs. discordant expert senders for Black respondents, concordance vs. discordant expert senders for White respondents, acknowledgement vs. standard signal among Black respondents, and lay vs. expert sender among Black respondents). We report estimates with robust standard errors obtained from a linear regression of the variables described in Section II on treatment indicators. We include the stratifying variables of recruitment season and survey platform (combining the Facebook and CloudResearch platforms given their lower respondent numbers) in all regressions. Appendix Tables B6 to B8 report coefficient estimates of treatment effects and associated p-values including post-double-selection (PDS) lasso control variables.

We present our main results from the baseline survey in Table 1. The columns correspond to the main outcome families: columns 1-5 are index outcomes normalized to mean zero and standard deviation one, while columns 6-7 are binary outcomes of flu and COVID-19 vaccination intent. Results from the follow-up survey are presented in Table 2.[16]

A Main Treatment Effects

For Black respondents (Panel A), race concordance has a positive, sizeable effect on respondent ratings of the sender (0.18 standard deviation units), and on the rating of the signal itself (0.14 standard deviation units). By contrast, we do not detect concordance effects on sender or signal ratings among White respondents (Panel B).

Among both Black and White individuals, we find no meaningful effects of concordance on content recall, safety beliefs, or flu vaccination coupon interest. Concordance is associated with weak positive effects on flu and COVID-19 vaccination intent for Black respondents, but these are not statistically significant.[17] As mentioned above, some participants assigned a discordant sender attrited, which we view as a relevant *outcome*. It does, however, suggest that estimates reported in Panel B are biased towards the (reported) null effect of concordance.[18] The p-values provided at the bottom of Panel B test whether the concordance estimates are statistically different between White and Black respondent samples. Only for the ratings outcomes are the coefficients between the two samples statistically distinguishable.

Table 2 presents results for three outcomes on actual flu vaccine receipt: flu coupon redemption, and self-report of receipt of the flu vaccine at the individual or among household members. The first two columns are estimated only on the follow-up survey sample. The last two columns assume all those who did not respond to the survey did not obtain the flu vaccine. We find no effects of

[16]Appendix Figure A6 presents effects for each individual primary outcome. Appendix Figure A7 reports results for secondary outcomes.

[17]Appendix Table B9 uses sender fixed effects. We fail to reject the null that individual Black sender effects are the same. We do reject the null that individual White sender effects are the same for one out of the seven main outcomes; relabeling one large positive White sender fixed effect as a Black sender reduces the F-statistic to 2.53, which is marginally significant.

[18]Estimates with Lee (2009) bounds, available on request, also fail to find an effect.

the concordance treatment on these outcome measures for Black or White respondents.

Panel C of Table 1 reports the main effect of the acknowledgement signal intervention among Black respondents. Recall this signal was only provided by White expert senders. On average, Black respondents assigned to the acknowledgement statement condition rate the statement 0.14 standard deviation units higher than the default statement conveyed by the same set of senders. They are also 5.4 percentage points more likely to intend to take up the COVID-19 vaccine. We do not detect statistically significant effects of the acknowledgement statement on flu vaccine take-up (Panel C of Table 2).

Results comparing concordant non-expert to concordant expert senders are displayed in Panel D of Table 1. Respondents randomized to the non-expert condition provide less favorable ratings of the sender, by 0.54 standard deviation units. The large negative effect on the rating of the sender lends credence to participants paying attention: the measure includes a rating of the sender's qualification to give general medical advice. This finding also accords with the perception that senders wearing a white short-sleeved shirt are less educated and younger than those wearing a white coat (Appendix Table B1 Columns 7-9). Despite their lower perceived expertise, however, respondents absorbed more information on the flu vaccine from lay senders, as reflected by a sizable positive effect of the lay treatment on content recall (0.12 standard deviation units). The lower rating of lay sender qualifications, moreover, did not translate into significantly less favorable beliefs or attitudes, such as on the perceived safety of the flu vaccine, interest in a flu vaccine coupon, or stated interest in receiving the flu vaccine, compared to individuals provided an expert sender.

Assignment to a non-expert sender significantly increased intent to receive the COVID-19 vaccine by 8.8 percentage points relative to an expert sender. Further, a non-expert sender was the only condition to increase take-up of the vaccine: respondents assigned to lay senders were 15 percentage points more likely in our follow-up survey to report that a household member received the flu vaccine in the weeks since the baseline survey (a 39% increase).

Figure 1 displays means of sender ratings, flu and COVID-19 vaccination intent, and household vaccine receipt, as well as 95% confidence bands by treatment condition. Across all outcomes except sender ratings, the layperson treatment condition performs the best among Black respondents (dark blue bars), whereas discordant expert senders fare poorly among Black individuals. White respondent averages (light blue bars) across concordant and discordant treatment conditions do not meaningfully differ. Soberingly, household flu vaccine take-up and COVID-19 vaccination intent are significantly lower among Black respondents paired with a discordant expert sender than among White respondents paired with a concordant expert sender. As 85% of White patients in the U.S. have a concordant physician yet nearly 75% of Black patients do not, such a comparison mirrors the experience of many Black Americans in the U.S. healthcare system (Blewett et al., 2018). We find, however, that layperson senders shift Black respondents to levels of vaccination intent and take-up comparable to White respondents.

An assessment of the overall effect of any one signal on outcomes, relative to no signal at all, is of interest in itself as well. However, since the focus of this study is on testing the *differential* effectiveness of signal frames aimed at bridging trust gaps relative to a standard signal from a typical expert sender, we did not include a no-signal control group. Therefore, we cannot assess the impact of any one signal relative to a no-signal counterfactual directly, but differences between posterior and prior flu vaccination intent do provide some suggestive evidence (Appendix Figure A8). Reassuringly, we observe an increase or no change in flu vaccine intent among the vast majority (approximately 90%) of respondents.

B Heterogeneity

Responses to messaging may depend upon past experience with medical experts and vaccination. Those who elected to receive an influenza vaccine at some point in their lifetime may be less opposed to vaccines than those who never evinced a willingness to do so, all else equal.[19] We divided the sample into never-takers, ever-takers and recent-takers of the flu vaccine based on whether the respondent reported never receiving a flu vaccine, receiving a flu vaccine over two years ago (with the majority of these individuals receiving their last vaccine over five years ago), or receiving a flu vaccine recently (within the past two years exclusive of current season).

We fully interact our treatment effects with never, ever and recent-taker indicator variables and report the results for each study arm in Table 3. We also test the null hypothesis that treatment effects for never- and recent-takers are equal. Panel A demonstrates that among Black respondents, concordance effects on signal ratings and flu vaccination intent are positive and statistically significant only among those that have recently taken up the vaccine. There is no such heterogeneity among White respondents in Panel B. Similar to Panel A, the positive effect of the acknowledgement intervention on signal ratings is driven by those who have ever received a vaccine, with the coefficient estimate among recent-takers large but imprecise (Column 2 of Panel C). The acknowledgement signal increases flu and COVID-19 vaccination intent substantially among recent-takers of the flu vaccine, while effects on intent among never-takers are muted and significantly different from respondents with recent immunization experience.

Turning to Column 1 of Panel D, non-experts are consistently judged as unqualified to provide medical advice and this does not vary by prior flu vaccination experience. However, the rating of the non-expert signal is *positive* and statistically significant among the never-takers, a result strikingly different from the perception among recent-takers (Column 2).[20] Moreover, the effect of non-expert senders on both influenza and COVID-19 vaccine intent is large, significant, and positive for never-takers, and in the former case statistically different from recent-takers.[21]

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[19]Indeed, we find that 69% of never-takers state prior to the video treatment that they are "not at all likely" to receive the flu vaccine in the current season, compared to 54% of ever-takers and 20% of recent-takers. Appendix Figure A9 provides a histogram of prior flu vaccine intent by respondent vaccination experience.

[20]We assess heterogeneity in treatment effects by income in Appendix Table B10, finding that income moderates the effect of concordance on sender and signal ratings among Black but not White men. Concordance effects are larger among low-income Black men. We present heterogeneity results along additional margins in Appendix Figure A10.

[21]We examine differences between never- and recent-takers in reported flu vaccine take-up using our follow-up survey. They both evince strong positive effects, although cell sizes are small.

V Discussion

Low demand for high-value preventive care is of interest to policymakers and a puzzle for researchers. In this paper, we examine the effect of various sender and signal combinations on vaccination outcomes in a sample of lower socioeconomic status men. Although race-concordant expert senders and race-discordant expert senders acknowledging past medical injustice earned higher ratings from Black individuals, we find that messages on vaccination delivered by a race-concordant non-expert lead to the greatest increases in health knowledge recall, intent to be vaccinated against influenza and COVID-19, and reported household-level take-up of the flu vaccine. The effects of non-expert senders were concentrated among respondents with the least prior experience with vaccination, a group that may be particularly difficult to persuade, whereas experts move vaccination intent most among those immunized in recent years.

These results are important in understanding how best to improve vaccination take-up rates and reduce health inequality. The effectiveness of non-expert messengers relates to work by Larson (2020), who notes that individuals reluctant to vaccinate may be more moved by "heard truths" from proximate community members than elite experts. An alternative explanation is that medical doctors discussing the benefits of vaccination are viewed as agents not solely of the individual patient, but also of broader social interests or private interests such as insurers or pharmaceutical companies.[22] Through such a lens, professionals, though qualified, may also appear conflicted, whereas laypersons do not. More broadly, our results suggest a role for communicating information on preventive care through senders diverse both in racial background as well as level of expertise.

[22] One such comment from respondents was "*Medical industry using mind games to get people to buy their nonsense.*" We thank Keith Ericson for the interpretation of doctors as agents acting on behalf of potentially multiple principals.

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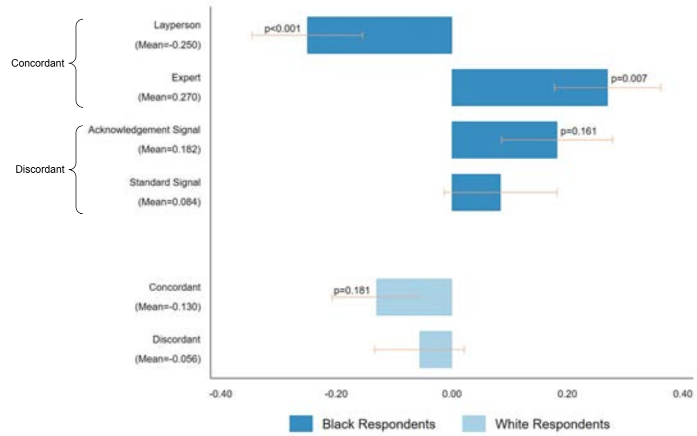
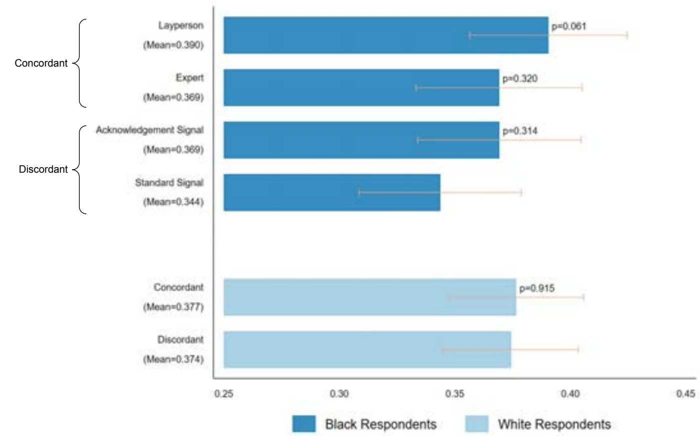
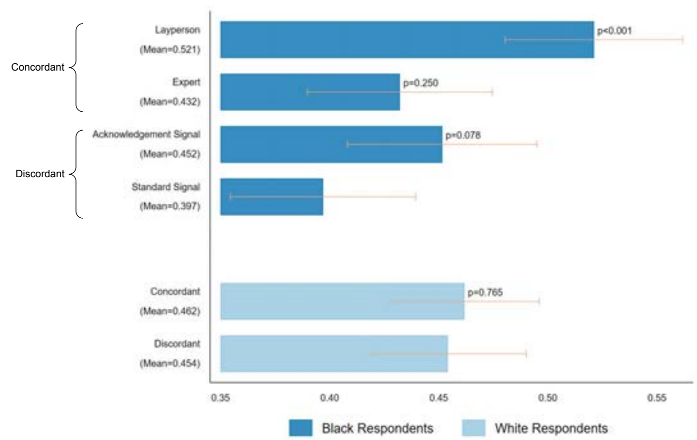
Tables and Figures



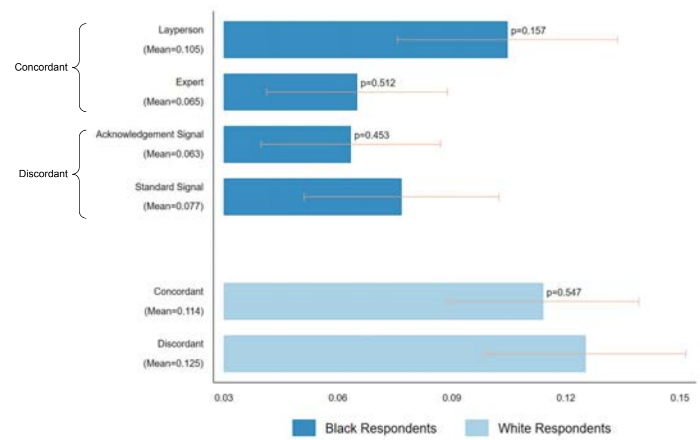
Panel (A): Sender Rating



Panel (B): Flu Vaccine Intent



Panel (C): COVID-19 Vaccine Intent



Panel (D): Household Flu Vaccine Take-up

Notes: Figure shows the mean of each outcome by treatment condition among the sample of Black respondents (dark blue bars), as well as among the sample of White respondents (light blue bars). Outcomes are ratings of the sender (Panel (A)), flu vaccine intent (Panel (B)), COVID-19 vaccine intent (Panel (C)), and household flu vaccine take-up (Panel (D)). Sender rating is an inverse-covariance-weighted index as described in Anderson (2008). For dark blue bars, *p*-values test the null hypotheses that the concordant expert, concordant non-expert (standard signal condition), and discordant expert (acknowledgement condition) means each differ from the discordant expert (standard signal condition) mean among Black respondents. For light blue bars, *p*-values test the null hypothesis that the concordant expert (standard signal condition) mean differs from the discordant expert (standard signal condition) mean among White respondents. 95% confidence intervals using robust standard errors are shown.

Figure 1: Treatment Effects on Sender Ratings, Vaccine Intent and Take-up

Table 1: Treatment Effects on Ratings, Knowledge and Intent

	(1) Rating Sender	(2) Rating Signal	(3) Recall Content	(4) Safety Beliefs	(5) Coupon Interest	(6) Flu Vacc. Intent	(7) COVID-19 Vacc. Intent
PANEL A: Concordant vs. Discordant Expert Sender (Standard Signal Condition) - Black Respondents							
Concordance Treat	0.183	0.139	-0.006	-0.098	-0.008	0.026	0.035
	(0.067)	(0.070)	(0.069)	(0.069)	(0.067)	(0.025)	(0.031)
	[0.007]	[0.049]	[0.928]	[0.155]	[0.907]	[0.302]	[0.254]
Mean in control	0.00	0.00	0.00	0.00	0.00	0.34	0.40
Observations	832	832	832	832	831	832	587
PANEL B: Concordant vs. Discordant Expert Sender (Standard Signal Condition) - White Respondents							
Concordance Treat	-0.075	-0.009	0.019	-0.028	-0.083	0.003	0.009
	(0.057)	(0.057)	(0.057)	(0.058)	(0.056)	(0.021)	(0.025)
	[0.189]	[0.876]	[0.734]	[0.631]	[0.139]	[0.868]	[0.719]
Mean in control	0.00	0.00	0.00	0.00	0.00	0.37	0.45
Observations	1221	1221	1221	1221	1221	1221	866
p-value	0.004	0.097	0.774	0.437	0.388	0.487	0.512
PANEL C: Standard vs. Acknowledgement Signal (Discordant, Expert Condition) - Black Respondents							
Acknowledgement Signal Treat	0.100	0.142	0.004	-0.107	0.028	0.027	0.054
	(0.068)	(0.069)	(0.069)	(0.069)	(0.069)	(0.025)	(0.031)
	[0.145]	[0.040]	[0.952]	[0.124]	[0.683]	[0.287]	[0.080]
Mean in control	0.00	0.00	0.00	0.00	0.00	0.34	0.40
Observations	827	827	827	827	825	827	581
PANEL D: Lay person vs. Expert (Concordant, Standard Signal Condition) - Black Respondents							
Layperson Treat	-0.540	-0.081	0.117	-0.024	-0.016	0.019	0.088
	(0.071)	(0.067)	(0.067)	(0.068)	(0.069)	(0.025)	(0.030)
	[0.000]	[0.231]	[0.082]	[0.722]	[0.813]	[0.455]	[0.003]
Mean in control	0.00	0.00	0.00	0.00	0.00	0.37	0.43
Observations	845	845	845	845	845	845	592
p-value	0.000	0.021	0.241	0.396	0.647	0.819	0.433

Notes: Table reports OLS estimates. Each dependent variable in columns (1) to (5) is an inverse-covariance-weighted index as described in Anderson (2008) and standardized to a mean of 0 and standard deviation of 1. Dependent variables in columns (6) to (7) are on a scale of 0 to 1. COVID-19 Vacc. Intent was asked during the 2020-2021 flu season only. Outcome variables are described in Section II and in Appendix Section F. The *p*-value in Panel (B) tests the null hypothesis that the concordance treatment effects are the same across Black and White respondents. The *p*-value in Panel (D) tests the null hypothesis that the acknowledgement signal treatment and layperson treatment effects are equal. Stratifying variables (platform and season) are included but not reported. Robust standard errors are in parentheses. *p*-values are in brackets.

Table 2: Treatment Effects on Flu Vaccine Take-up

	Follow-up Sample		Full Sample		
	(1)	(2)	(3)	(4)	(5)
	Self Flu Vacc. Take-up	Household Flu Vacc. Take-up	Flu Vacc. Coupon Redemption	Self Flu Vacc. Take-up	Household Flu Vacc. Take-up
PANEL A: Concordant vs. Discordant Expert Sender (with Standard Signal) - Black Respondents					
Concordance Treat	-0.049	-0.077	-0.005	-0.002	-0.010
	(0.082)	(0.087)	(0.004)	(0.015)	(0.018)
	[0.548]	[0.378]	[0.157]	[0.884]	[0.580]
Mean in control	0.30	0.48	0.00	0.05	0.08
Observations	139	139	832	832	832
PANEL B: Concordant vs. Discordant Expert Sender (Standard Signal Condition) - White Respondents					
Concordance Treat	0.007	-0.014	-0.005	-0.007	-0.012
	(0.043)	(0.049)	(0.006)	(0.015)	(0.018)
	[0.864]	[0.776]	[0.425]	[0.631]	[0.520]
Mean in control	0.23	0.38	0.01	0.08	0.13
Observations	377	377	1221	1221	1221
p-value	0.533	0.520	0.952	0.809	0.936
PANEL C: Standard vs. Acknowledgement Signal (Discordant, Expert Condition) - Black Respondents					
Acknowledgement Signal Treat	-0.092	-0.120	0.003	-0.008	-0.012
	(0.076)	(0.085)	(0.006)	(0.014)	(0.018)
	[0.225]	[0.159]	[0.654]	[0.570]	[0.510]
Mean in control	0.30	0.48	0.00	0.05	0.08
Observations	137	137	827	827	827
PANEL D: Lay person vs. Expert (Concordant, Standard Signal Condition) - Black Respondents					
Layperson Treat	0.082	0.150	0.002	0.018	0.037
	(0.078)	(0.083)	(0.002)	(0.016)	(0.019)
	[0.296]	[0.075]	[0.318]	[0.241]	[0.051]
Mean in control	0.26	0.38	0.00	0.05	0.07
Observations	151	151	845	845	845
p-value	0.102	0.021	0.983	0.210	0.060

Notes: Table reports OLS estimates based on those who replied to the follow-up survey (columns (1) to (2)) and full sample (columns (3) to (5)). Columns (4) and (5) assume non-responders to the follow-up survey did not receive the vaccine. Outcome variables are described in Section II and in Appendix Section F. The *p*-value in Panel (B) tests the null hypothesis that the concordance treatment effects are the same across Black and White respondents. The *p*-value in Panel (D) tests the null hypothesis that acknowledgement signal treatment and layperson treatment effects are the same. Stratifying variables (platform and season) and an indicator (=1) if the respondent is married are included but not reported. Robust standard errors are in parentheses. *p*-values are in brackets.

Table 3: Heterogeneity by Vaccination Experience on Ratings, Knowledge and Intent

	(1) Rating Sender	(2) Rating Signal	(3) Recall Content	(4) Safety Beliefs	(5) Coupon Interest	(6) Flu Vacc. Intent	(7) COVID-19 Vacc. Intent
PANEL A: Concordant vs. Discordant Expert Sender (Standard Signal Condition) - Black Respondents							
Concordance Treat × Never Taker	0.283	-0.148	0.189	-0.164	0.001	-0.063	0.005
	(0.126)	(0.129)	(0.131)	(0.127)	(0.130)	(0.041)	(0.056)
	[0.025]	[0.251]	[0.149]	[0.196]	[0.992]	[0.120]	[0.925]
Concordance Treat × Ever Taker	0.132	0.148	-0.135	-0.030	-0.065	0.017	-0.016
	(0.094)	(0.101)	(0.098)	(0.102)	(0.112)	(0.036)	(0.046)
	[0.160]	[0.145]	[0.170]	[0.766]	[0.561]	[0.636]	[0.721]
Concordance Treat × Recent Taker	0.101	0.294	0.026	-0.131	0.017	0.086	0.111
	(0.122)	(0.118)	(0.124)	(0.134)	(0.140)	(0.047)	(0.053)
	[0.408]	[0.013]	[0.835]	[0.327]	[0.903]	[0.070]	[0.038]
p-value: Never Taker=Recent Taker	0.297	0.012	0.365	0.861	0.934	0.017	0.174
Mean in control	0.00	0.00	0.00	0.00	0.00	0.23	0.29
Observations	832	832	832	832	831	832	587
PANEL B: Concordant vs. Discordant Expert Sender (Standard Signal Condition) - White Respondents							
Concordance Treat × Never Taker	-0.012	0.155	-0.109	-0.065	-0.044	-0.016	0.009
	(0.108)	(0.111)	(0.114)	(0.107)	(0.107)	(0.033)	(0.047)
	[0.912]	[0.163]	[0.341]	[0.548]	[0.683]	[0.623]	[0.855]
Concordance Treat × Ever Taker	-0.159	-0.088	0.106	-0.067	0.006	-0.012	0.025
	(0.088)	(0.085)	(0.083)	(0.091)	(0.095)	(0.029)	(0.037)
	[0.070]	[0.300]	[0.201]	[0.464]	[0.949]	[0.690]	[0.495]
Concordance Treat × Recent Taker	-0.006	-0.038	0.010	0.072	-0.305	0.050	-0.000
	(0.107)	(0.092)	(0.113)	(0.106)	(0.127)	(0.037)	(0.044)
	[0.953]	[0.677]	[0.932]	[0.496]	[0.016]	[0.176]	[1.000]
p-value: Never Taker=Recent Taker	0.970	0.181	0.459	0.366	0.115	0.182	0.893
Mean in control	0.00	0.00	0.00	0.00	0.00	0.22	0.36
Observations	1221	1221	1221	1221	1221	1221	866
PANEL C: Standard vs. Acknowledgement Signal (Discordant, Expert Condition) - Black Respondents							
Acknowledgement Signal Treat × Never Taker	0.155	0.015	0.029	-0.097	0.015	-0.013	0.006
	(0.122)	(0.120)	(0.128)	(0.133)	(0.128)	(0.041)	(0.053)
	[0.202]	[0.900]	[0.821]	[0.467]	[0.907]	[0.744]	[0.915]
Acknowledgement Signal Treat × Ever Taker	0.013	0.204	-0.025	-0.063	-0.034	0.011	0.055
	(0.098)	(0.103)	(0.098)	(0.104)	(0.114)	(0.037)	(0.046)
	[0.895]	[0.049]	[0.796]	[0.546]	[0.767]	[0.756]	[0.235]
Acknowledgement Signal Treat × Recent Taker	0.193	0.200	0.078	-0.173	0.172	0.101	0.154
	(0.126)	(0.126)	(0.128)	(0.125)	(0.153)	(0.048)	(0.057)
	[0.127]	[0.113]	[0.540]	[0.168]	[0.259]	[0.034]	[0.007]
p-value: Never Taker=Recent Taker	0.830	0.287	0.786	0.681	0.432	0.069	0.057
Mean in control	0.00	0.00	0.00	0.00	0.00	0.23	0.29
Observations	827	827	827	827	825	827	581
PANEL D: Lay person vs. Expert (Concordant, Standard Signal Condition) - Black Respondents							
Layperson Treat × Never Taker	-0.618	0.234	0.068	-0.051	-0.096	0.080	0.148
	(0.141)	(0.141)	(0.137)	(0.139)	(0.135)	(0.042)	(0.058)
	[0.000]	[0.097]	[0.621]	[0.716]	[0.479]	[0.054]	[0.011]
Layperson Treat × Ever Taker	-0.628	-0.226	0.092	-0.029	-0.064	0.002	0.070
	(0.107)	(0.109)	(0.095)	(0.116)	(0.111)	(0.035)	(0.046)
	[0.000]	[0.039]	[0.334]	[0.802]	[0.561]	[0.963]	[0.126]
Layperson Treat × Recent Taker	-0.385	-0.199	0.179	-0.022	0.093	-0.022	0.061
	(0.127)	(0.118)	(0.119)	(0.130)	(0.140)	(0.043)	(0.047)
	[0.002]	[0.092]	[0.134]	[0.864]	[0.506]	[0.613]	[0.192]
p-value: Never Taker=Recent Taker	0.217	0.019	0.541	0.881	0.332	0.089	0.247
Mean in control	0.00	0.00	0.00	0.00	0.00	0.17	0.30
Observations	845	845	845	845	845	845	592

Notes: Table reports OLS estimates. Each dependent variable in columns (1) to (5) is an inverse-covariance-weighted index as described in Anderson (2008) and standardized to a mean of 0 and standard deviation of 1. Dependent variables in columns (6) to (7) are on a scale of 0 to 1. COVID-19 Vacc. Intent was asked during the 2020-2021 flu season only. Outcome variables are described in Section II and in Appendix Section F. *Never Taker* is a binary variable equal to 1 if the respondent has never received the flu shot. *Ever Taker* is a binary variable equal to 1 if the respondent received the flu shot more than 2 years ago. *Recent Taker* is a binary variable equal to 1 if the respondent received the flu shot within the past 2 years, not including the current season. The *p-value: Never Taker=Recent Taker* tests the null hypothesis that [*treatment*] × *Never Taker* = [*treatment*] × *Recent Taker*. Stratifying variables (platform and season) are included but not reported. Robust standard errors are in parentheses. *p*-values are in brackets.

Appendix

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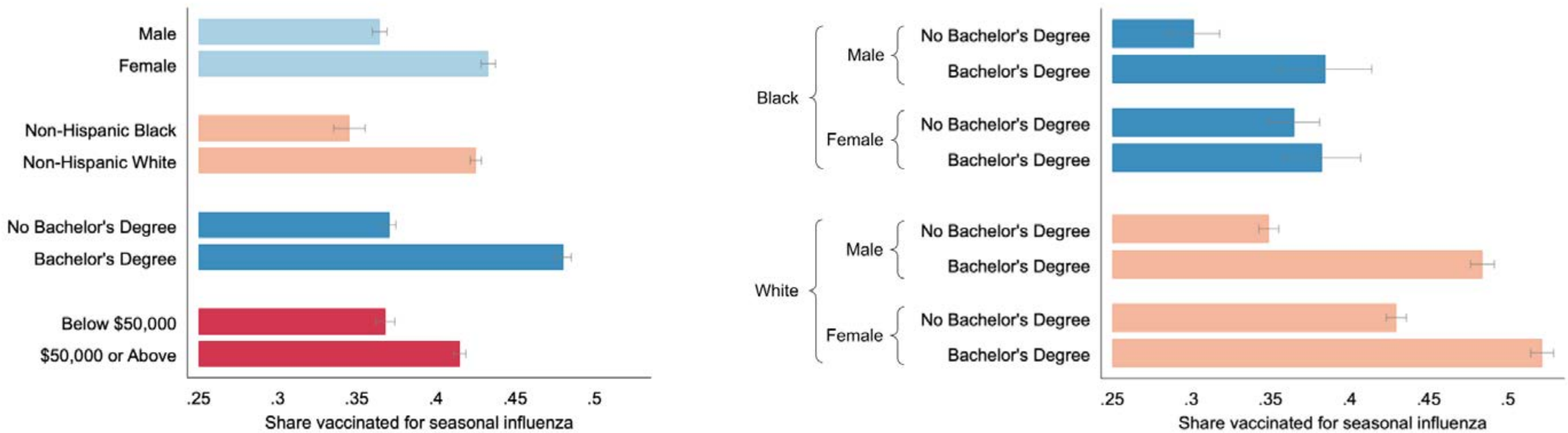
A Appendix Figures

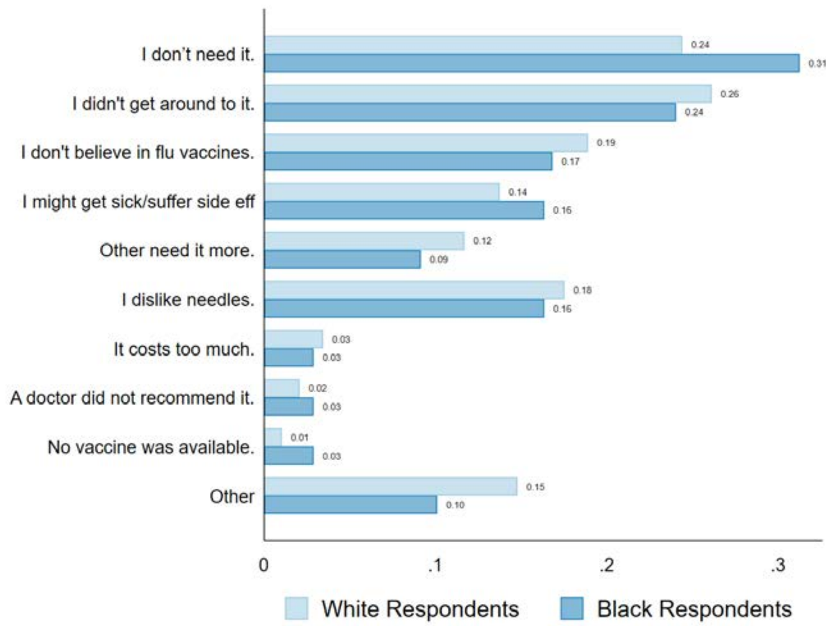


Panel (A): By Sex, Race, Education and Household Income

Panel (B): Intersectionality of race, sex and education

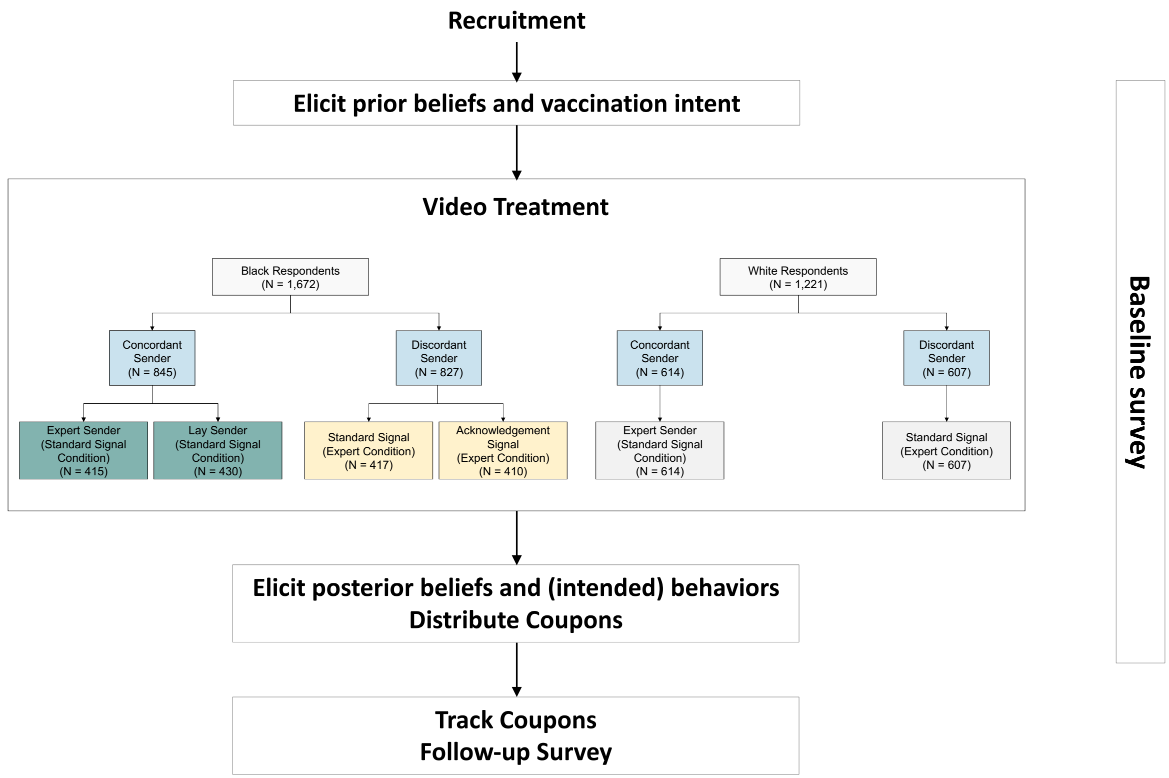
Notes: Data from the 2017 Behavioral Risk Factor Surveillance System survey (Centers for Disease Control and Prevention, 2018). Panel A reports means by sex, race, education level, and household income. Panel B reports the intersectionality of race, sex and education. Observations are weighted using survey sample weights. 95% confidence intervals are shown.

Appendix Figure A1: Seasonal Flu Vaccination Rates

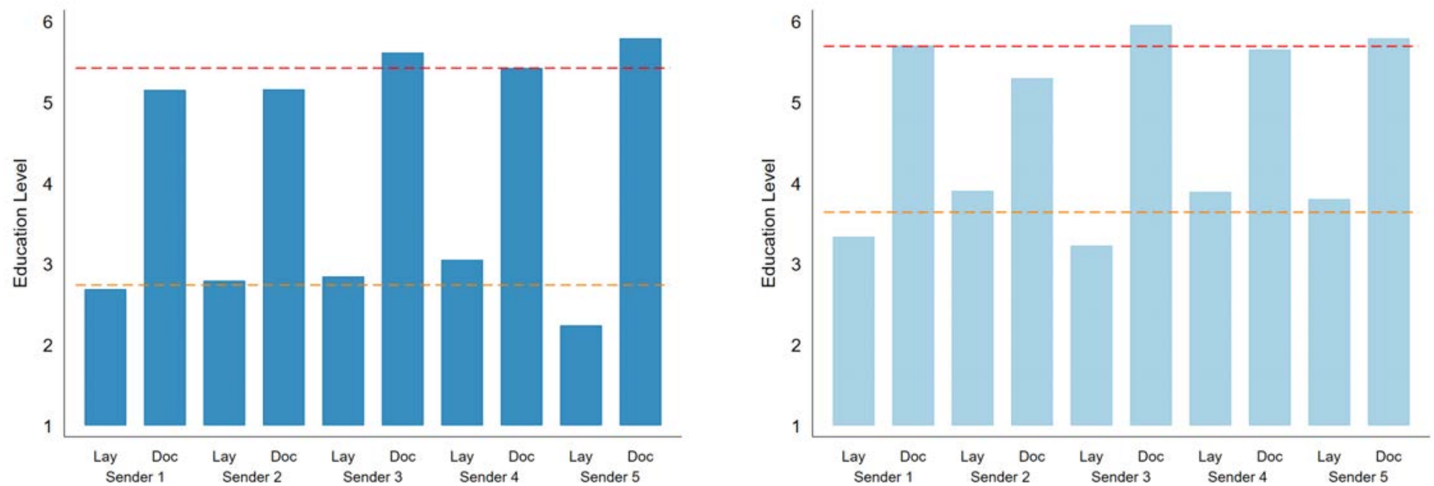


Notes: Data are from the study. Respondents were asked the following question: *"You said that you did not get the flu shot. Why is that? Please see list below and check all reasons that apply."* The question on and list of reasons for not wanting an influenza vaccination were adopted from a 2010 RAND survey (Harris et al., 2010).

Appendix Figure A2: Reasons for Not Vaccinating



Appendix Figure A3: Study Design

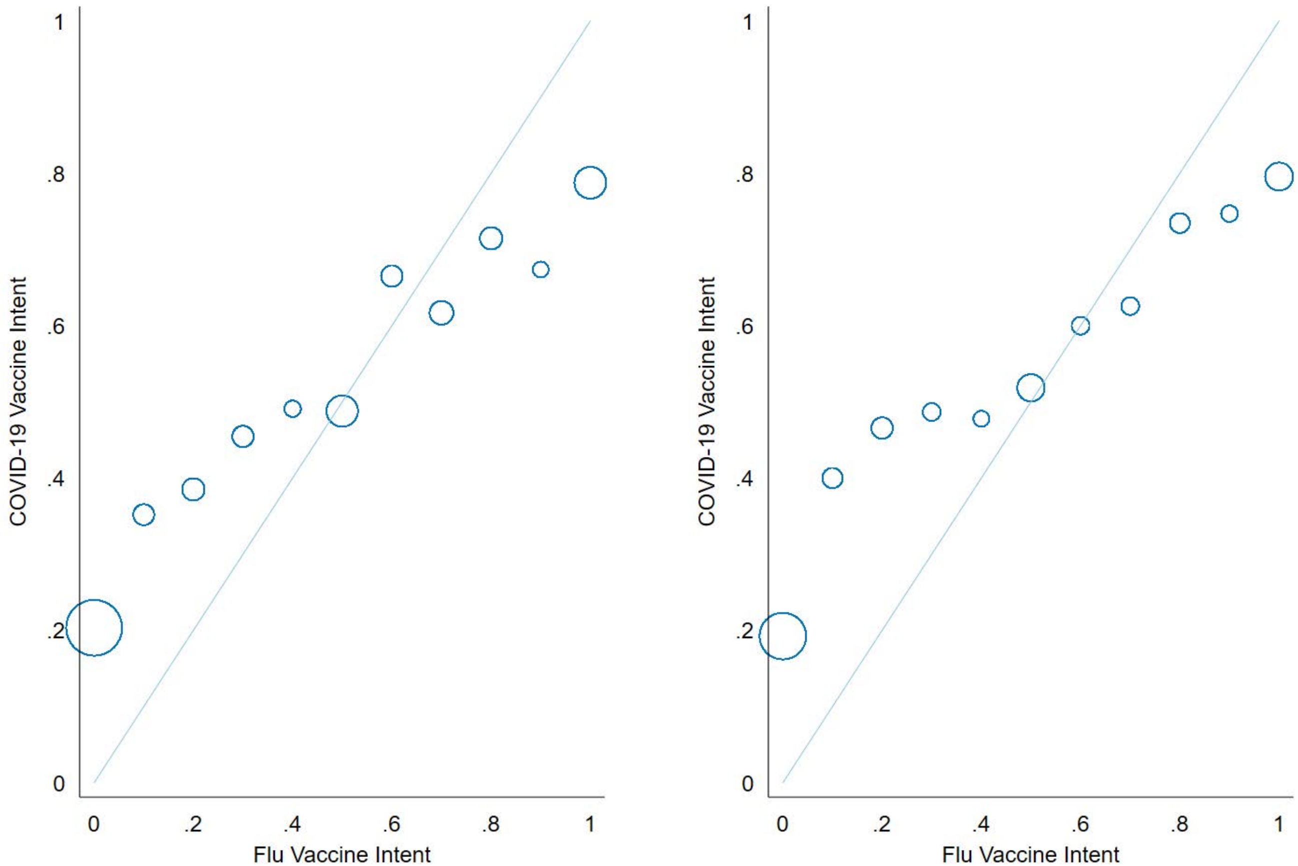


Panel (A): Black Senders

Panel (B): White Senders

Notes: Figure displays the mean of MTurker ratings of sender education by race and role of senders. Each sender was rated on their level of education on a scale of 1 (lowest; less than high school education) to 6 (highest; a graduate degree), in both a layperson and expert role. The red lines represent the mean education rating in an expert role for all Black senders (Panel (A)) and White senders (Panel (B)). The orange lines represent the mean education rating in a layperson role for all Black senders (Panel (A)) and White senders (Panel (B)).

Appendix Figure A4: MTurkers Ratings of Black and White Senders

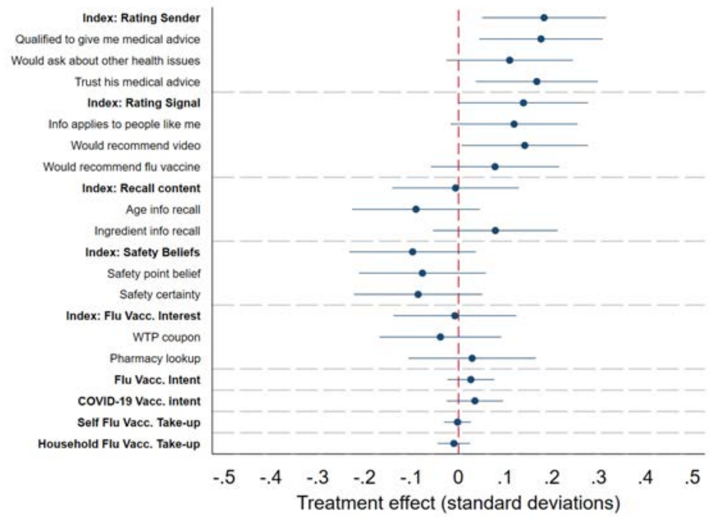


Panel (A): Black Respondents

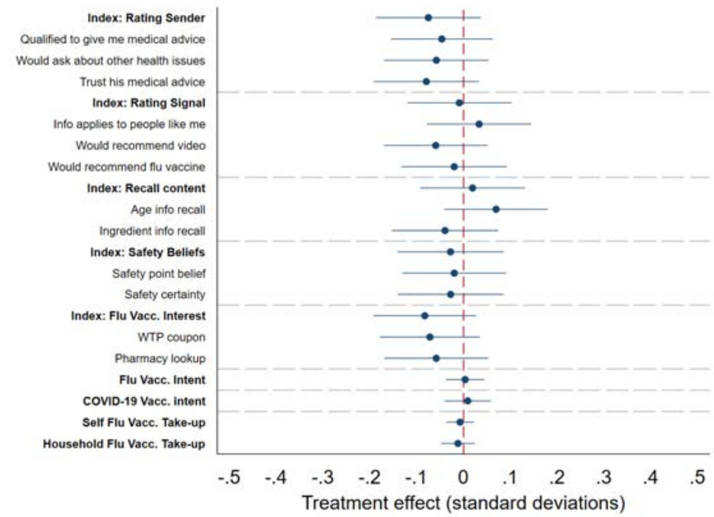
Panel (B): White Respondents

Notes: Figure shows the relationship between Flu Vaccine Intent (on a scale of 0 to 1) and COVID-19 Vaccine Intent (on a scale of 0 to 1). The size of dots represents the number of respondents in each bin of Flu Vaccine Intent. The figure is based on the sample of respondents from the 2020-2021 flu season, as the question about COVID-19 Vaccine Intent was not asked during the 2019-2020 flu season.

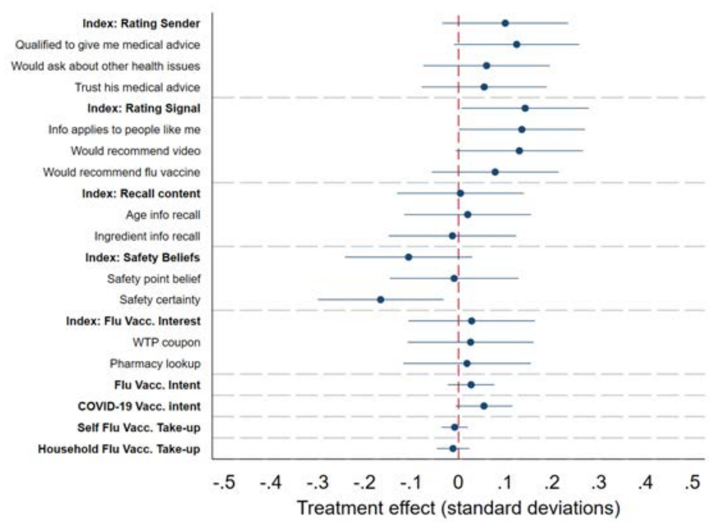
Appendix Figure A5: Relationship Between Flu Vaccine Intent and COVID-19 Vaccine Intent



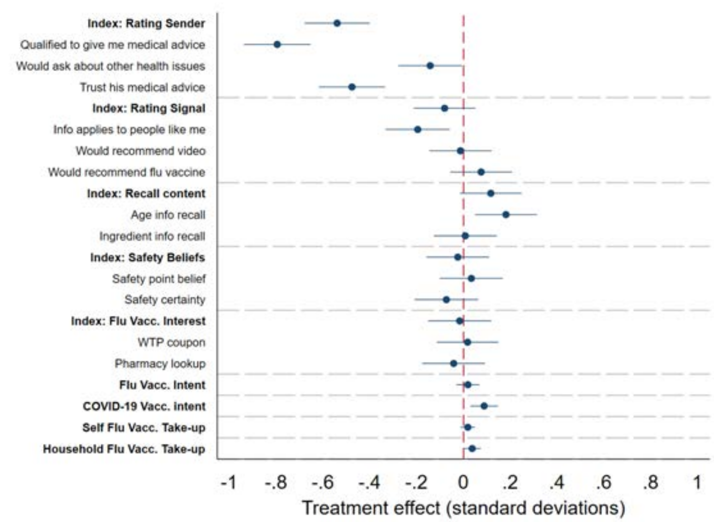
Panel (A): Concordance Treatment - Black Respondents



Panel (B): Concordance Treatment - White Respondents



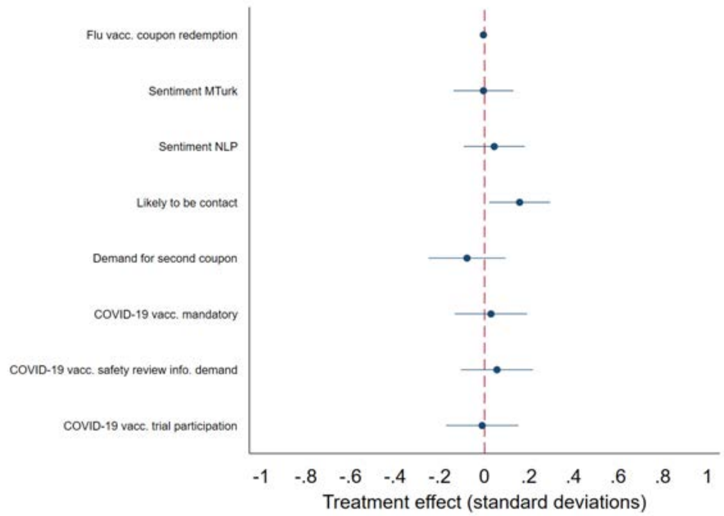
Panel (C): Acknowledgement Signal Treatment



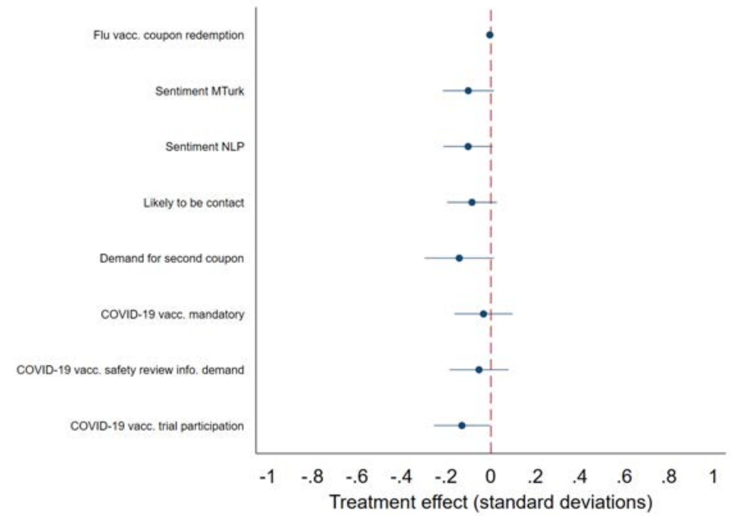
Panel (D): Layperson Treatment

Notes: Figure shows treatment effects of the concordant (vs. discordant) expert treatment with the standard signal among the sample of Black respondents (Panel (A)); the concordant (vs. discordant) expert treatment with the standard signal among the sample of White respondents (Panel (B)); the acknowledgement (vs. standard) signal treatment with a discordant, expert sender among the sample of Black respondents (Panel (C)); and the concordant non-expert (vs. expert) treatment with the standard signal among the sample of Black respondents (Panel (D)). Outcomes are described in Section II and in Appendix Section F. Outcomes are standardized except take-up and intent which are presented as in the main text. Dots represent coefficient estimates obtained from OLS regressions of each outcome of interest on the treatment indicator variable. Stratifying variables (platform and season) are included but not reported; an additional stratifying variable (an indicator (=1) if the respondent is married) is included in the regressions of the take-up outcomes. 95% confidence intervals using robust standard errors are shown.

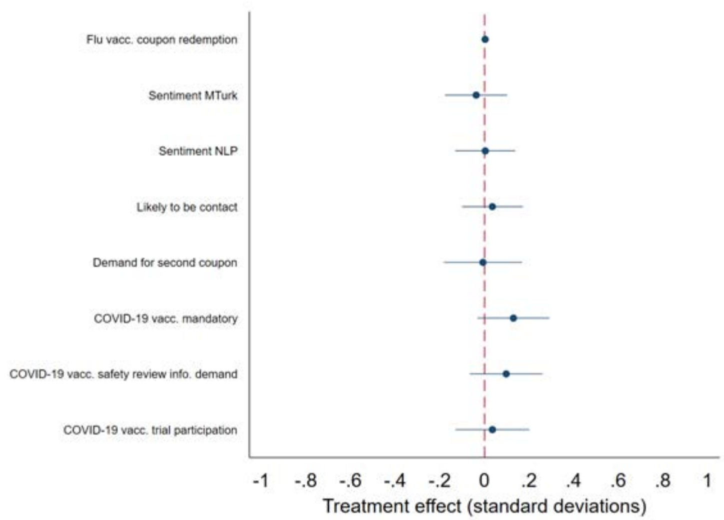
Appendix Figure A6: Treatment Effects For Individual Primary Outcomes



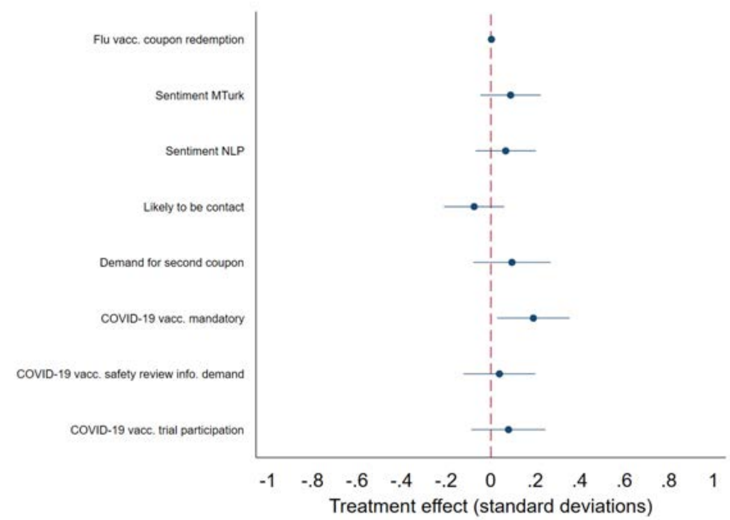
Panel (A): Concordance Treatment - Black Respondents



Panel (B): Concordance Treatment - White Respondents



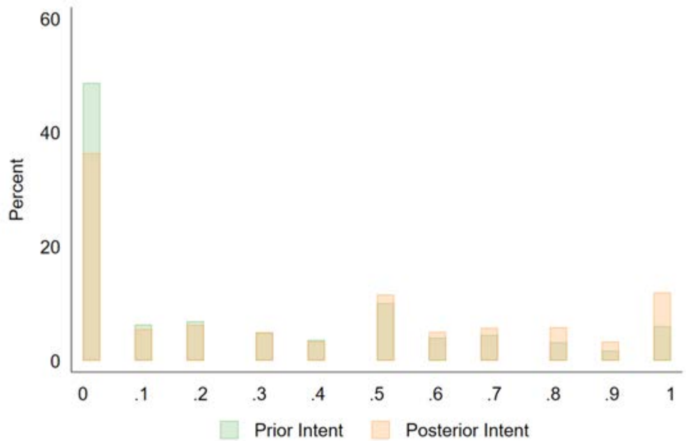
Panel (C): Acknowledgement Signal Treatment



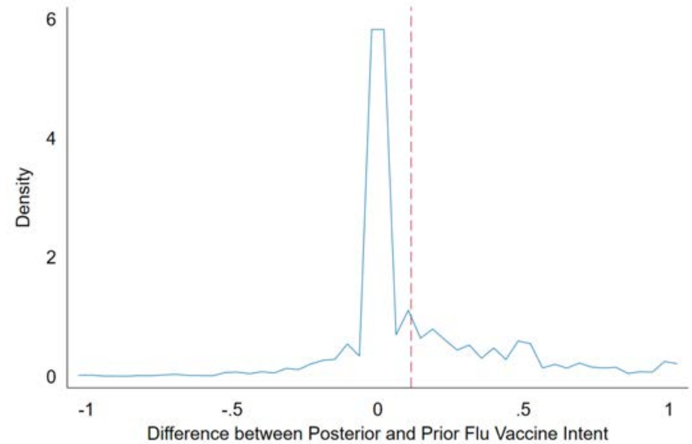
Panel (D): Layperson Treatment

Notes: Figure shows treatment effects of the concordant (vs. discordant) expert treatment with the standard signal among the sample of Black respondents (Panel (A)); the concordant (vs. discordant) expert treatment with the standard signal among the sample of White respondents (Panel (B)); the acknowledgement (vs. standard) signal treatment with a discordant expert sender among the sample of Black respondents (Panel (C)); and the concordant non-expert (vs. expert) treatment with the standard signal among the sample of Black respondents (Panel (D)). Outcomes are standardized except the flu vaccine coupon redemption outcome. Dots represent coefficient estimates obtained from OLS regressions of each outcome of interest on the treatment indicator variable. Stratifying variables (platform and season) are included but not reported; an additional stratifying variable (an indicator (=1) if the respondent is married) is included in the regressions of the redemption outcome.

Appendix Figure A7: Treatment Effects For Secondary Outcomes



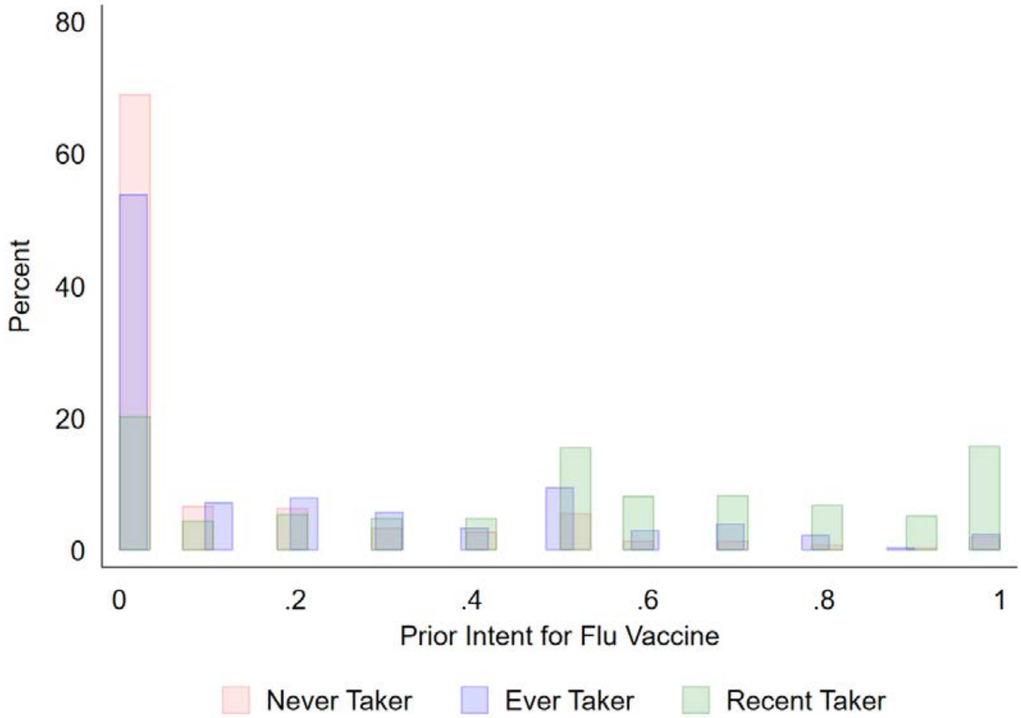
Panel (A): Histogram



Panel (B): Distribution of Difference

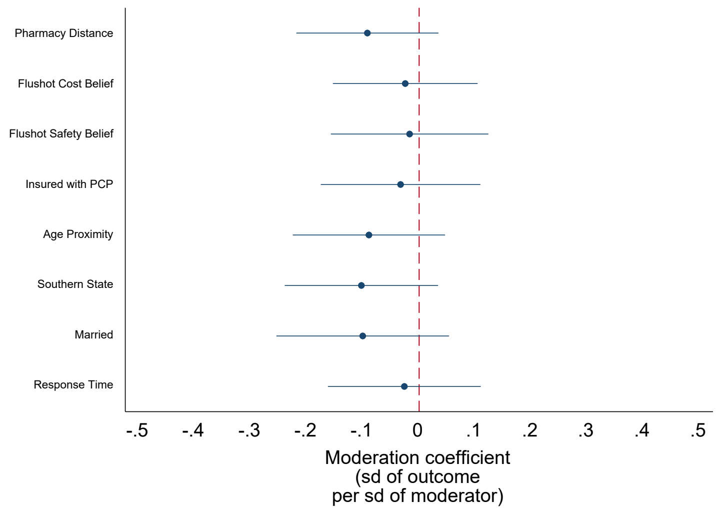
Notes: Panel (A) plots the prior and posterior flu shot intent. Panel (B) plots the histogram of the difference. See Appendix Section F for definitions.

Appendix Figure A8: Prior and Posterior Flu Vaccine Intent

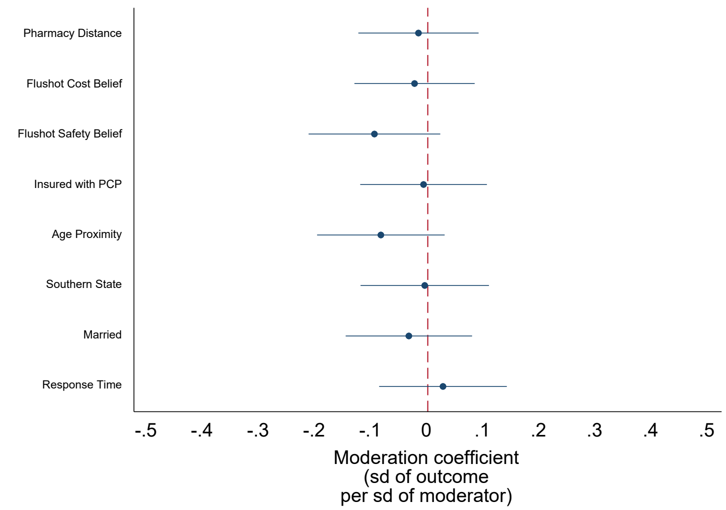


Notes: Figure shows the distribution of the variable *Prior Intent for Flu Vaccine* among never-takers, ever-takers and recent-takers of the flu vaccine. Never-takers of the flu vaccine are defined as respondents who reported having never received the flu vaccine. The ever-taker category encompasses respondents who reported having received their last flu vaccination over two years ago. Recent-takers include respondents who reported having received their last flu vaccination within the past two years but not in the current influenza season.

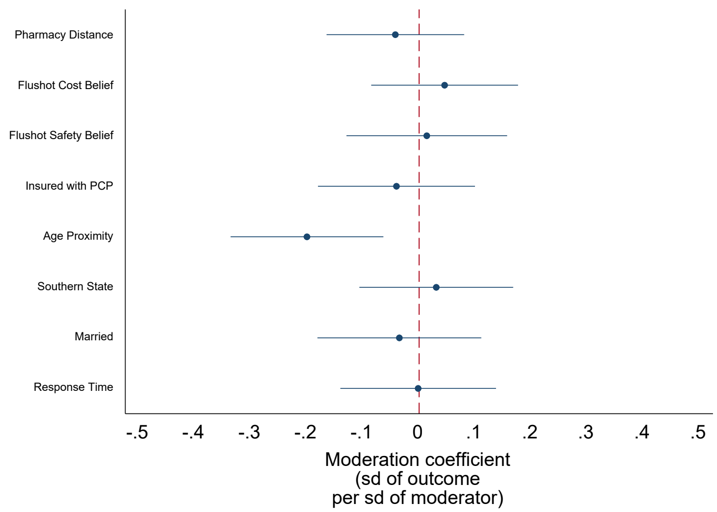
Appendix Figure A9: Histogram of Prior Flu Vaccine Intent by Vaccination Experience



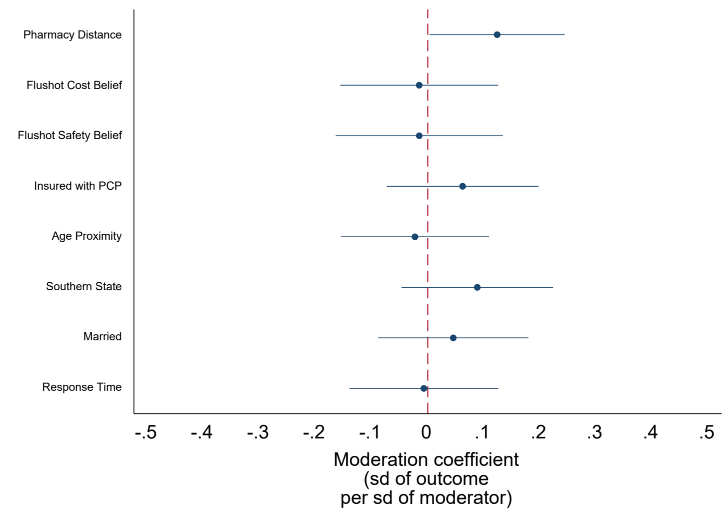
Panel (A): Concordance Treatment Heterogeneity - Black Respondents



Panel (B): Concordance Treatment Heterogeneity - White Respondents



Panel (C): Acknowledgement Treatment Heterogeneity



Panel (D): Layperson Treatment Heterogeneity

Notes: Figure reports heterogeneity in treatment effects by moderator of the concordant (vs. discordant) expert treatment with the standard signal among the sample of Black respondents (Panel (A)), the concordant (vs. discordant) expert treatment with the standard signal among the sample of White respondents (Panel (B)), the acknowledgement (vs. standard) signal treatment with a discordant expert sender among the sample of Black respondents (Panel (C)), and the concordant non-expert (vs. expert) treatment with the standard signal among the sample of Black respondents (Panel (D)). Estimates are obtained from a regression of the variable *Flu Vaccination Intent* on the treatment indicator, moderator, and their interaction. Both the outcome and the moderator are standardized to a mean of 0 and standard deviation of 1. Dots represent coefficient estimates on the interaction coefficient. Stratifying variables (platform and season) are included but not reported. Moderators (before standardization) are defined as: Pharmacy Distance = distance to nearest pharmacy in miles; Flushot Cost Belief = belief about own out-of-pocket cost for the flu shot in USD; Flushot Safety Belief = prior belief of fraction of individuals who get the flu from the flu shot; Insured with PCP = dummy for having a primary care provider and health insurance; Age Proximity = dummy equal to one if sender and receiver age difference is no more than ten years; Southern State = dummy for residence in the U.S. South; Married = dummy for being married; and Response Time = log of time in seconds that the respondent spent on the survey up to (but excluding) the video treatment screen.

Appendix Figure A10: Treatment Effect Heterogeneity

B Appendix Tables

Appendix Table B1: Sender Ratings by Study Arm

	Concordant vs. Discordant - Black Rs			Concordant vs. Discordant - White Rs			Layperson vs. Expert - Black Rs		
	(1) Age	(2) Education	(3) Attractiveness	(4) Age	(5) Education	(6) Attractiveness	(7) Age	(8) Education	(9) Attractiveness
Black Sender	0.019	-0.153	0.349	-0.527	-2.841	-0.339			
	(0.189)	(0.233)	(0.162)	(0.202)	(1.045)	(0.218)			
	[0.918]	[0.512]	[0.034]	[0.010]	[0.008]	[0.124]			
Layperson Role							-0.378	-1.713	-0.583
							(0.195)	(0.191)	(0.215)
							[0.055]	[0.000]	[0.008]
Mean	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Observations	103	103	103	89	89	89	102	102	102

Notes: Table reports OLS estimates based on the MTurker sample. Dependent variables are perceptions of age, education and attractiveness. The outcomes are described in Appendix Section E and standardized to a mean of 0 and a standard deviation of 1. Columns (1) to (3) compare Black vs. White experts among the Black respondent MTurk sample. Columns (4) to (6) compare Black vs. White experts among the White respondent MTurk sample. Columns (7) to (9) compare the same sender, assuming a different identity (lay vs. expert) among the Black respondent MTurk sample. The mean of each dependent variable for the omitted group is shown. Robust standard errors are in parentheses, and *p*-values are in brackets.

Appendix Table B2: Attrition from Baseline Survey

	(1) Black Respondents	(2) White Respondents
Expert Discordant	-0.006	0.023
	(0.022)	(0.014)
	[0.765]	[0.088]
Layperson Concordant	-0.000	
	(0.022)	
	[0.990]	
Acknowledgement Signal Discordant	0.021	
	(0.022)	
	[0.341]	
p-value	0.627	n.a.
Mean	0.13	0.05
Observations	1938	1307

Notes: Table reports OLS estimates on the baseline sample. The dependent variable is attrition from the baseline survey, which is an indicator variable equal to 1 if the respondent was randomized but did not complete the baseline survey and 0 otherwise. Column (1) corresponds to the sample of Black respondents. Column (2) corresponds to the sample of White respondents. The reported p-value at the bottom of the table tests the null hypothesis that the effect of all four treatments on attrition, among Black respondents, is the same. Stratifying variables (platform and season) are included but not reported. Robust standard errors are in parentheses. *p*-values are in brackets.

Appendix Table B3: Summary Statistics

	Scale	All			Black			White		
	(1)	(2) Mean	(3) SD	(4) N	(5) Mean	(6) SD	(7) N	(8) Mean	(9) SD	(10) N
Panel A: Demographic Characteristics										
Age	(C)	36.83	6.74	2893	35.87	6.56	1672	38.14	6.76	1221
Low Household Income	(B)	0.53	0.50	2893	0.60	0.49	1672	0.42	0.49	1221
Completed High School	(B)	0.88	0.32	2893	0.88	0.33	1672	0.89	0.31	1221
Married	(B)	0.25	0.43	2893	0.19	0.39	1672	0.32	0.47	1221
South	(B)	0.52	0.50	2879	0.58	0.49	1667	0.44	0.50	1212
Panel B: Health Characteristics										
Insured	(B)	0.63	0.48	2809	0.60	0.49	1602	0.66	0.47	1207
Subjective Health Status	[1,5]	3.47	1.03	2893	3.64	1.02	1672	3.23	0.99	1221
Subjective Flu Shot Cost	(C)	33.56	70.94	2893	39.71	82.60	1672	25.15	49.62	1221
Has Primary Care Provider	(B)	0.47	0.50	2893	0.44	0.50	1672	0.53	0.50	1221
Never Taker	(B)	0.27	0.45	2893	0.27	0.45	1672	0.28	0.45	1221
Ever Taker	(B)	0.45	0.50	2893	0.45	0.50	1672	0.45	0.50	1221
Recent Taker	(B)	0.28	0.45	2893	0.28	0.45	1672	0.28	0.45	1221
Panel C: Prior Elicitation										
Flu Vaccine Intent	[0,10]	2.57	3.23	2893	2.57	3.26	1672	2.56	3.19	1221
Likelihood of Contracting Flu	[0,10]	2.48	2.77	2893	2.21	2.83	1672	2.84	2.65	1221
Belief about Safety of Flu Vaccine	[0,100]	57.22	28.09	2893	54.45	27.86	1672	61.02	27.98	1221

Notes: Columns (2)-(4) show the mean, standard deviation, and sample size for all respondents. Columns (5)-(7) restrict the sample to Black respondents, and columns (8)-(10) restrict the sample to White respondents. *Low Income* is a binary variable equal to 1 if the respondent's self-reported household income is less than or equal to the median income of Black respondents in the sample (=$30k). *Subjective Health Status* is measured on a 5-point Likert scale (where 1 is poor and 5 is excellent). *Subjective Flu Shot Cost* is in US$; the values above the 99th percentile are set to the 99th percentile value. *Never Taker* is a binary variable equal to 1 if the respondent has never received the flu shot. *Ever Taker* is a binary variable equal to 1 if the respondent has received the flu shot more than 2 years ago. *Recent Taker* is a binary variable equal to 1 if the respondent has received the flu shot within the past 2 years. *Belief about Safety of Flu Vaccine* is belief over how many individuals out of 100 will *not* contract the flu from the flu shot. (C) indicates that the variable is continuous; (B) indicates that the variable is binary. In cases when the variable is not binary or continuous, the scale of the raw variable is provided.

Appendix Table B4: Balance Table for Baseline Survey Sample

	Black Rs: Concor. vs Discor.			White Rs: Concor. vs Discor.			Black Rs: Acknow. vs Standard			Black Rs: Lay vs Expert			
	Coeff.	Mean	N	Coeff.	Mean	N	Coeff.	Mean	N	Coeff.	Mean	N	F-stat.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Panel A: Demographic Characteristics													
Age	-0.258	36.125	832	-0.008	38.165	1221	-0.276	36.125	827	-0.381	35.920	845	0.766
	(0.452)			(0.353)			(0.458)			(0.438)			[0.513]
	[0.568]			[0.982]			[0.547]			[0.385]			
Low Household Income	0.046	0.580	832	-0.015	0.432	1221	0.021	0.580	827	-0.028	0.627	845	0.639
	(0.034)			(0.028)			(0.034)			(0.034)			[0.590]
	[0.179]			[0.597]			[0.543]			[0.411]			
Completed High School	-0.032	0.897	832	0.024	0.878	1221	-0.031	0.897	827	0.019	0.865	845	0.939
	(0.022)			(0.018)			(0.023)			(0.023)			[0.421]
	[0.157]			[0.176]			[0.167]			[0.416]			
Married	-0.043	0.213	832	0.023	0.306	1221	-0.026	0.213	827	0.029	0.171	845	0.911
	(0.027)			(0.027)			(0.028)			(0.027)			[0.435]
	[0.120]			[0.393]			[0.344]			[0.280]			
South	-0.049	0.570	828	-0.019	0.450	1212	0.031	0.570	824	0.099	0.522	843	3.166
	(0.035)			(0.028)			(0.034)			(0.034)			[0.024]
	[0.156]			[0.499]			[0.369]			[0.004]			
Panel B: Health Characteristics													
Insured	-0.020	0.611	797	0.010	0.653	1207	0.003	0.611	790	0.014	0.591	812	0.174
	(0.035)			(0.027)			(0.035)			(0.035)			[0.914]
	[0.566]			[0.719]			[0.939]			[0.695]			
Subjective Health Status	-0.117	3.643	832	-0.017	3.237	1221	0.012	3.643	827	0.225	3.523	845	3.637
	(0.070)			(0.057)			(0.072)			(0.069)			[0.012]
	[0.094]			[0.771]			[0.870]			[0.001]			
Subjective Flu Shot Cost	5.784	38.144	832	0.360	25.022	1221	-4.227	38.144	827	-1.133	43.916	845	1.355
	(5.936)			(2.836)			(5.309)			(6.093)			[0.255]
	[0.330]			[0.899]			[0.426]			[0.853]			
Has Primary Care Provider	-0.004	0.460	832	-0.009	0.532	1221	-0.043	0.460	827	-0.043	0.455	845	1.080
	(0.035)			(0.029)			(0.034)			(0.034)			[0.356]
	[0.904]			[0.762]			[0.215]			[0.212]			
Never Taker	-0.019	0.281	832	0.004	0.275	1221	0.033	0.281	827	-0.029	0.263	845	2.444
	(0.031)			(0.026)			(0.032)			(0.030)			[0.062]
	[0.528]			[0.867]			[0.305]			[0.322]			
Ever Taker	-0.024	0.468	832	-0.003	0.446	1221	-0.045	0.468	827	0.026	0.443	845	0.816
	(0.035)			(0.028)			(0.035)			(0.034)			[0.485]
	[0.486]			[0.902]			[0.196]			[0.455]			
Recent Taker	0.044	0.252	832	-0.001	0.278	1221	0.012	0.252	827	0.004	0.294	845	1.144
	(0.031)			(0.026)			(0.030)			(0.031)			[0.330]
	[0.156]			[0.976]			[0.690]			[0.899]			
Panel C: Prior Elicitation													
Flu Vaccine Intent	0.118	2.446	832	0.083	2.529	1221	0.049	2.446	827	0.213	2.554	845	0.859
	(0.225)			(0.181)			(0.223)			(0.224)			[0.462]
	[0.600]			[0.648]			[0.825]			[0.342]			
Likelihood of Contracting Flu	0.202	2.144	832	-0.146	2.913	1221	0.167	2.144	827	-0.279	2.342	845	0.949
	(0.196)			(0.151)			(0.197)			(0.194)			[0.416]
	[0.303]			[0.334]			[0.397]			[0.150]			
Belief about Safety of Flu Vaccine	-0.896	55.820	832	-1.882	61.979	1221	-2.228	55.820	827	-1.704	55.022	845	0.802
	(1.976)			(1.592)			(1.950)			(1.898)			[0.493]
	[0.650]			[0.237]			[0.254]			[0.370]			
Panel D: Follow-up Survey													
Completed Follow-up Survey	0.012	0.161	832	-0.016	0.318	1221	0.010	0.161	827	0.010	0.173	845	0.238
	(0.026)			(0.026)			(0.026)			(0.026)			[0.870]
	[0.630]			[0.536]			[0.701]			[0.714]			

Notes: Table reports estimates obtained from OLS regressions of each respondent characteristic (rows) on treatment variables by study arm. Columns (1) to (3) test the effects of the concordant (vs. discordant) expert treatment with the standard signal, among the sample of Black respondents. Columns (4) to (6) test the effects of concordant (vs. discordant) expert treatment with the standard signal, among the sample of White respondents. Columns (7) to (9) test the effects of the acknowledgement (vs. standard) signal treatment with discordant, expert senders, among the sample of Black respondents. Columns (10) to (12) test the effects of the concordant non-expert (vs. concordant expert) treatment with the standard signal, among the sample of Black respondents. *Subjective Health Status* is measured on a 5-point Likert scale (where 1 is poor and 5 is excellent). *Subjective Flu Shot Cost* is in US$; the values above the 99th percentile are set to the 99th percentile value. *Never Taker* is a binary variable equal to 1 if the respondent has never received the flu shot. *Ever Taker* is a binary variable equal to 1 if the respondent has received the flu shot more than 2 years ago. *Recent Taker* is a binary variable equal to 1 if the respondent has received the flu shot within the past 2 years. Total respondents completing the follow-up survey by experimental condition are as follows: 72 for concordant-Black respondents; 67 for discordant-Black respondents; 184 for concordant-White respondents; 193 for discordant-White respondents; 70 for acknowledgement signal treatment; 67 for standard signal treatment; 79 for non-expert treatment; and 72 for expert treatment. Stratifying variables (platform and season) are included but not reported. The reported *F*-statistics in Column (13) test the null hypothesis that the effects of all four treatments (i.e. concordant expert, discordant expert (standard signal), concordant non-expert, and discordant expert (acknowledgement signal) are the same, among the sample of Black respondents. Robust standard errors are in parentheses. *p*-values are shown in brackets.

Appendix Table B5: Balance Table for Follow-up Survey Sample

	Black Rs: Concor. vs Discor.			White Rs: Concor. vs Discor.			Black Rs: Acknow. vs Standard			Black Rs: Lay vs Expert			
	Coeff.	Mean	N	Coeff.	Mean	N	Coeff.	Mean	N	Coeff.	Mean	N	F-stat.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Panel A: Demographic Characteristics													
Age	-0.926	37.597	139	0.033	39.518	377	-1.460	37.597	137	-0.313	36.653	151	0.627
	(1.103)			(0.634)			(1.169)			(0.978)			[0.598]
	[0.403]			[0.959]			[0.214]			[0.749]			
Low Household Income	0.095	0.493	139	-0.003	0.472	377	0.020	0.493	137	0.000	0.583	151	0.625
	(0.085)			(0.052)			(0.086)			(0.082)			[0.599]
	[0.267]			[0.960]			[0.819]			[0.995]			
Completed High School	0.009	0.881	139	0.009	0.891	377	0.019	0.881	137	0.022	0.889	151	0.147
	(0.056)			(0.032)			(0.054)			(0.050)			[0.932]
	[0.869]			[0.772]			[0.720]			[0.653]			
Married	-0.172	0.313	139	0.079	0.269	377	-0.064	0.313	137	0.189	0.139	151	3.468
	(0.070)			(0.048)			(0.077)			(0.067)			[0.017]
	[0.015]			[0.100]			[0.404]			[0.006]			
South	0.136	0.463	138	-0.005	0.398	375	0.127	0.463	137	-0.088	0.606	150	1.186
	(0.085)			(0.051)			(0.085)			(0.082)			[0.315]
	[0.110]			[0.927]			[0.141]			[0.287]			
Panel B: Health Characteristics													
Insured	-0.100	0.723	137	-0.004	0.689	373	0.025	0.723	132	0.136	0.625	151	1.216
	(0.081)			(0.048)			(0.078)			(0.075)			[0.304]
	[0.221]			[0.927]			[0.746]			[0.073]			
Subjective Health Status	-0.003	3.582	139	0.002	3.119	377	-0.108	3.582	137	0.119	3.569	151	0.562
	(0.179)			(0.105)			(0.188)			(0.157)			[0.641]
	[0.985]			[0.982]			[0.567]			[0.449]			
Subjective Flu Shot Cost	6.812	35.179	139	0.582	21.870	377	-3.721	35.179	137	-15.222	41.903	151	0.553
	(13.295)			(5.226)			(12.213)			(12.250)			[0.647]
	[0.609]			[0.911]			[0.761]			[0.216]			
Has Primary Care Provider	-0.071	0.448	139	-0.065	0.575	377	0.123	0.448	137	0.260	0.375	151	4.356
	(0.084)			(0.051)			(0.083)			(0.079)			[0.005]
	[0.399]			[0.206]			[0.143]			[0.001]			
Never Taker	0.069	0.239	139	0.016	0.269	377	0.066	0.239	137	-0.079	0.306	151	0.666
	(0.075)			(0.046)			(0.077)			(0.073)			[0.574]
	[0.363]			[0.735]			[0.391]			[0.279]			
Ever Taker	-0.043	0.463	139	0.042	0.435	377	-0.144	0.463	137	-0.001	0.417	151	0.972
	(0.085)			(0.051)			(0.083)			(0.080)			[0.406]
	[0.615]			[0.416]			[0.087]			[0.986]			
Recent Taker	-0.026	0.299	139	-0.057	0.295	377	0.078	0.299	137	0.081	0.278	151	0.655
	(0.078)			(0.045)			(0.080)			(0.074)			[0.580]
	[0.737]			[0.207]			[0.335]			[0.280]			
Panel C: Prior Elicitation													
Flu Vaccine Intent	-0.407	3.269	139	0.128	2.912	377	0.420	3.269	137	1.109	2.861	151	1.487
	(0.612)			(0.347)			(0.597)			(0.560)			[0.218]
	[0.507]			[0.713]			[0.483]			[0.050]			
Likelihood of Contracting Flu	0.121	2.552	139	-0.426	3.249	377	0.001	2.552	137	0.698	2.667	151	1.178
	(0.495)			(0.271)			(0.476)			(0.513)			[0.318]
	[0.807]			[0.116]			[0.998]			[0.176]			
Belief about Safety of Flu Vaccine	-2.863	55.761	139	-3.503	65.995	377	1.570	55.761	137	-3.260	52.986	151	1.096
	(4.751)			(2.851)			(4.802)			(4.600)			[0.351]
	[0.548]			[0.220]			[0.744]			[0.480]			

Notes: Table reports estimates obtained from OLS regressions of each respondent characteristic (rows) on treatment variables by hypothesis based on the follow-up survey sample. Columns (1) to (3) test the effects of the concordant (vs. discordant) expert treatment with the standard signal, among the sample of Black respondents. Columns (4) to (6) test the effects of concordant (vs. discordant) expert treatment with the standard signal, among the sample of White respondents. Columns (7) to (9) test the effects of the acknowledgement (vs. standard) signal treatment with discordant, expert senders, among the sample of Black respondents. Columns (10) to (12) test the effects of the concordant non-expert (vs. concordant expert) treatment with the standard signal, among the sample of Black respondents. *Subjective Health Status* is measured on a 5-point Likert scale (where 1 is poor and 5 is excellent). *Subjective Flu Shot Cost* is in US$; the values above the 99th percentile are set to the 99th percentile value. *Never Taker* is a binary variable equal to 1 if the respondent has never received the flu shot. *Ever Taker* is a binary variable equal to 1 if the respondent has received the flu shot more than 2 years ago. *Recent Taker* is a binary variable equal to 1 if the respondent has received the flu shot within the past 2 years. (*Prior*) *Flu Vaccine Intent* and likelihood of contracting flu are measured on a 11-point Likert scale (where 0 is not at all likely and 10 is extremely likely). Stratifying variables (platform and season) are included but not reported. The reported *F*-statistics in Column (13) test the null hypothesis that the effects of all four treatments (i.e. concordant expert, discordant expert (standard signal), concordant non-expert, and discordant expert (acknowledgement signal) are the same, among the sample of Black respondents. Robust standard errors are in parentheses. *p*-values are shown in brackets.

Appendix Table B6: Treatment Effects on Ratings, Knowledge and Intent with PDS LASSO-Selected Controls

	(1) Rating Sender	(2) Rating Signal	(3) Recall Content	(4) Safety Beliefs	(5) Coupon Interest	(6) Flu Vacc. Intent	(7) COVID-19 Vacc. Intent
PANEL A: Concordant vs. Discordant Expert Sender (with Standard Signal) - Black Respondents							
Concordance Treat	0.122	0.075	0.037	-0.092	-0.040	0.007	0.013
	(0.063)	(0.059)	(0.063)	(0.067)	(0.062)	(0.019)	(0.027)
	[0.051]	[0.206]	[0.560]	[0.167]	[0.520]	[0.696]	[0.630]
Mean in control	0.00	0.00	0.00	0.00	0.00	0.34	0.40
Observations	832	832	832	832	831	832	587
PANEL B: Concordant vs. Discordant Expert Sender (Standard Signal Condition) - White Respondents							
Concordance Treat	-0.102	-0.030	-0.008	-0.024	-0.121	-0.002	-0.003
	(0.052)	(0.046)	(0.053)	(0.058)	(0.052)	(0.015)	(0.022)
	[0.053]	[0.509]	[0.885]	[0.677]	[0.020]	[0.898]	[0.878]
Mean in control	0.00	0.00	0.00	0.00	0.00	0.37	0.45
Observations	1221	1221	1221	1221	1221	1221	866
p-value	0.007	0.155	0.590	0.446	0.317	0.699	0.637
PANEL C: Standard vs. Acknowledgement Signal (Discordant, Expert Condition) - Black Respondents							
Acknowledgement Signal Treat	0.093	0.134	0.028	-0.096	-0.016	0.021	0.055
	(0.065)	(0.059)	(0.066)	(0.068)	(0.064)	(0.018)	(0.027)
	[0.151]	[0.022]	[0.667]	[0.157]	[0.803]	[0.251]	[0.040]
Mean in control	0.00	0.00	0.00	0.00	0.00	0.34	0.40
Observations	827	827	827	827	825	827	581
PANEL D: Lay person vs. Expert (Concordant, Standard Signal Condition) - Black Respondents							
Layperson Treat	-0.543	-0.097	0.120	0.019	-0.026	0.011	0.097
	(0.065)	(0.056)	(0.062)	(0.068)	(0.064)	(0.019)	(0.027)
	[0.000]	[0.082]	[0.053]	[0.780]	[0.688]	[0.568]	[0.000]
Mean in control	0.00	0.00	0.00	0.00	0.00	0.37	0.43
Observations	845	845	845	845	845	845	592
p-value	0.000	0.004	0.311	0.230	0.913	0.686	0.266
PDS LASSO-Chosen Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Table reports OLS estimates including PDS LASSO selected controls. Each dependent variable in columns (1) to (5) is an inverse-covariance-weighted index as described in Anderson (2008) and standardized to the mean of 0 and standard deviation of 1. Dependent variables in columns (6) to (7) are measured on a scale of 0 to 1. COVID-19 Vacc. Intent was asked during the 2020-2021 flu season only. Outcome variables are described in Section II and in Appendix Section F. The *p*-value in Panel (B) tests the null hypothesis that concordance treatment effects are the same across Black and White respondents. The *p*-value in Panel (D) tests the null hypothesis that discordant expert (acknowledgement signal) treatment and concordant expert (standard signal) treatment effects are equal. Stratifying variables (platform and season) are forced to be included in the LASSO selection but not reported. Robust standard errors are in parentheses. *p*-values are in brackets.

Appendix Table B7: Treatment Effects on Flu Vaccine Take-up with PDS LASSO-Selected Controls

	Follow-up Sample		Full Sample		
	(1)	(2)	(3)	(4)	(5)
	Self Flu Vacc. Take-up	Household Flu Vacc. Take-up	Flu Vacc. Coupon Redemption	Self Flu Vacc. Take-up	Household Flu Vacc. Take-up
PANEL A: Concordant vs. Discordant Expert Sender (with Standard Signal) - Black Respondents					
Concordance Treat	-0.130	-0.044	-0.007	-0.003	-0.012
	(0.079)	(0.088)	(0.005)	(0.015)	(0.018)
	[0.103]	[0.613]	[0.143]	[0.833]	[0.495]
Mean in control	0.30	0.48	0.00	0.05	0.08
Observations	139	139	832	832	832
PANEL B: Concordant vs. Discordant Expert Sender (Standard Signal Condition) - White Respondents					
Concordance Treat	0.009	0.015	-0.007	-0.006	-0.006
	(0.042)	(0.049)	(0.006)	(0.015)	(0.019)
	[0.830]	[0.762]	[0.273]	[0.702]	[0.753]
Mean in control	0.23	0.38	0.01	0.08	0.13
Observations	377	377	1221	1221	1221
p-value	0.118	0.551	0.985	0.902	0.806
PANEL C: Standard vs. Acknowledgement Signal (Discordant, Expert Condition) - Black Respondents					
Acknowledgement Signal Treat	-0.129	-0.100	0.003	-0.006	-0.009
	(0.073)	(0.079)	(0.006)	(0.015)	(0.018)
	[0.080]	[0.202]	[0.584]	[0.684]	[0.602]
Mean in control	0.30	0.48	0.00	0.05	0.08
Observations	137	137	827	827	827
PANEL D: Lay person vs. Expert (Concordant, Standard Signal Condition) - Black Respondents					
Layperson Treat	-0.036	0.079	0.003	0.015	0.033
	(0.075)	(0.083)	(0.003)	(0.016)	(0.019)
	[0.633]	[0.339]	[0.302]	[0.345]	[0.079]
Mean in control	0.26	0.38	0.00	0.05	0.07
Observations	151	151	845	845	845
p-value	0.371	0.112	0.923	0.337	0.105
PDS LASSO-Chosen Controls	Yes	Yes	Yes	Yes	Yes

Notes: Table reports OLS estimates based on the follow-up survey sample (columns (1) to (2)) and full sample (columns (3) to (5)) including PDS LASSO-selected controls. All dependent variables are binary variables and described in Section II and Appendix Section F. The *p*-value in Panel (B) tests the null hypothesis that concordance treatment effects are the same across Black and White respondents. The *p*-value in Panel (D) tests the null hypothesis that discordant expert (acknowledgement signal) treatment and concordant expert (standard signal) treatment effects are equal. Stratifying variables (platform and season) and an indicator (=1) if the respondent is married are forced to be included in the LASSO-selection but not reported. Robust standard errors are in parentheses. *p*-values are in brackets.

Appendix Table B8: Heterogeneity by Vaccination Experience on Ratings, Knowledge and Intent with PDS LASSO-Selected Controls

	(1) Rating Sender	(2) Rating Signal	(3) Recall Content	(4) Safety Beliefs	(5) Coupon Interest	(6) Flu Vacc. Intent	(7) COVID-19 Vacc. Intent
PANEL A: Concordant vs. Discordant Expert Sender (with Standard Signal) - Black Respondents							
Concordance Treat × Never Taker	0.216	-0.226	0.242	-0.138	-0.011	-0.062	-0.012
	(0.116)	(0.118)	(0.121)	(0.128)	(0.125)	(0.036)	(0.055)
	[0.062]	[0.056]	[0.045]	[0.280]	[0.933]	[0.085]	[0.823]
Concordance Treat × Ever Taker	0.123	0.144	-0.154	-0.059	-0.078	0.014	0.007
	(0.088)	(0.086)	(0.088)	(0.096)	(0.101)	(0.028)	(0.039)
	[0.164]	[0.095]	[0.080]	[0.540]	[0.437]	[0.616]	[0.859]
Concordance Treat × Recent Taker	0.037	0.279	0.161	-0.100	-0.015	0.074	0.051
	(0.119)	(0.108)	(0.120)	(0.140)	(0.140)	(0.035)	(0.048)
	[0.753]	[0.010]	[0.181]	[0.475]	[0.913]	[0.037]	[0.288]
p-value: Never Taker=Recent Taker	0.277	0.002	0.632	0.843	0.980	0.008	0.392
Mean in control	0.00	0.00	0.00	0.00	0.00	0.23	0.29
Observations	832	832	832	832	831	832	587
PANEL B: Concordant vs. Discordant Expert Sender (Standard Signal Condition) - White Respondents							
Concordance Treat × Never Taker	0.050	0.199	-0.049	-0.016	-0.107	-0.003	-0.009
	(0.098)	(0.093)	(0.103)	(0.106)	(0.100)	(0.026)	(0.041)
	[0.609]	[0.032]	[0.636]	[0.877]	[0.286]	[0.895]	[0.828]
Concordance Treat × Ever Taker	-0.248	-0.183	0.004	-0.074	-0.070	-0.033	-0.006
	(0.083)	(0.075)	(0.077)	(0.089)	(0.087)	(0.024)	(0.033)
	[0.003]	[0.014]	[0.962]	[0.410]	[0.420]	[0.164]	[0.851]
Concordance Treat × Recent Taker	-0.039	-0.034	-0.003	0.040	-0.336	0.043	0.007
	(0.098)	(0.081)	(0.103)	(0.109)	(0.124)	(0.027)	(0.041)
	[0.694]	[0.677]	[0.980]	[0.717]	[0.007]	[0.101]	[0.865]
p-value: Never Taker=Recent Taker	0.520	0.057	0.745	0.710	0.147	0.206	0.787
Mean in control	0.00	0.00	0.00	0.00	0.00	0.22	0.36
Observations	1221	1221	1221	1221	1221	1221	866
PANEL C: Standard vs. Acknowledgement Signal (Discordant, Expert Condition) - Black Respondents							
Acknowledgement Signal Treat × Never Taker	0.156	-0.021	0.045	-0.083	0.008	-0.021	0.008
	(0.118)	(0.110)	(0.122)	(0.129)	(0.130)	(0.035)	(0.050)
	[0.187]	[0.846]	[0.709]	[0.518]	[0.950]	[0.540]	[0.866]
Acknowledgement Signal Treat × Ever Taker	0.012	0.237	-0.042	-0.082	-0.105	0.006	0.068
	(0.094)	(0.089)	(0.090)	(0.102)	(0.104)	(0.029)	(0.041)
	[0.898]	[0.008]	[0.641]	[0.418]	[0.315]	[0.824]	[0.099]
Acknowledgement Signal Treat × Recent Taker	0.160	0.147	0.179	-0.119	0.131	0.102	0.099
	(0.122)	(0.114)	(0.123)	(0.125)	(0.143)	(0.038)	(0.054)
	[0.187]	[0.198]	[0.146]	[0.342]	[0.362]	[0.007]	[0.067]
p-value: Never Taker=Recent Taker	0.981	0.288	0.437	0.848	0.526	0.017	0.218
Mean in control	0.00	0.00	0.00	0.00	0.00	0.23	0.29
Observations	827	827	827	827	825	827	581
PANEL D: Lay person vs. Expert (Concordant, Standard Signal Condition) - Black Respondents							
Layperson Treat × Never Taker	-0.586	0.213	0.076	-0.025	-0.089	0.056	0.174
	(0.132)	(0.131)	(0.125)	(0.139)	(0.126)	(0.031)	(0.053)
	[0.000]	[0.102]	[0.546]	[0.860]	[0.477]	[0.074]	[0.001]
Layperson Treat × Ever Taker	-0.661	-0.220	0.068	0.040	-0.076	0.010	0.064
	(0.098)	(0.095)	(0.087)	(0.112)	(0.103)	(0.029)	(0.040)
	[0.000]	[0.020]	[0.435]	[0.719]	[0.460]	[0.718]	[0.107]
Layperson Treat × Recent Taker	-0.399	-0.226	0.230	0.022	0.070	-0.040	0.081
	(0.116)	(0.103)	(0.109)	(0.130)	(0.138)	(0.036)	(0.046)
	[0.001]	[0.028]	[0.035]	[0.867]	[0.612]	[0.267]	[0.078]
p-value: Never Taker=Recent Taker	0.284	0.007	0.344	0.805	0.388	0.043	0.184
Mean in control	0.00	0.00	0.00	0.00	0.00	0.17	0.30
Observations	845	845	845	845	845	845	592
PDS LASSO-Chosen Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Table reports OLS estimates including PDS LASSO-selected controls. Each dependent variable in columns (1) to (5) is an inverse-covariance-weighted index as described in Anderson (2008) and standardized to the mean of 0 and standard deviation of 1. Dependent variables in columns (6) to (7) are are on a scale of 0 to 1. COVID-19 Vacc. Intent was asked during the 2020-2021 flu season only. Outcome variables are described in Section II and in Appendix Section F. *Never Taker* is a binary variable equal to 1 if the respondent has never received the flu shot. *Ever Taker* is a binary variable equal to 1 if the respondent received their last flu shot more than 2 years ago. *Recent Taker* is a binary variable equal to 1 if the respondent received their last flu shot within the past 2 years, but not in the current season. The reported *p-value: Never Taker=Recent Taker* tests the null hypothesis that [*treatment*] × *Never Taker* and [*treatment*] × *Recent Taker* is the same. Stratifying variables (platform and season) are included in the LASSO-selection but not reported. Robust standard errors are in parentheses. *p*-values are in brackets.

Appendix Table B9: Test for Differential Sender Effects - Black Respondents

	(1) Rating Sender	(2) Rating Signal	(3) Recall Content	(4) Safety Beliefs	(5) Coupon Interest	(6) Flu Vacc. Intent	(7) COVID-19 Vacc. Intent
Sender 2 (B)	0.272	0.126	-0.010	0.057	0.025	0.006	-0.000
	(0.161)	(0.163)	(0.157)	(0.145)	(0.143)	(0.055)	(0.065)
	[0.091]	[0.437]	[0.951]	[0.692]	[0.859]	[0.915]	[0.996]
Sender 3 (W)	-0.071	-0.138	0.116	0.333	-0.028	0.014	-0.097
	(0.160)	(0.153)	(0.138)	(0.150)	(0.149)	(0.055)	(0.067)
	[0.656]	[0.367]	[0.402]	[0.027]	[0.849]	[0.803]	[0.150]
Sender 4 (W)	-0.263	-0.197	0.159	0.275	-0.085	-0.061	-0.067
	(0.155)	(0.156)	(0.150)	(0.164)	(0.152)	(0.055)	(0.068)
	[0.091]	[0.206]	[0.290]	[0.093]	[0.577]	[0.271]	[0.327]
Sender 5 (B)	0.238	0.202	0.041	-0.046	-0.034	0.004	0.047
	(0.157)	(0.164)	(0.157)	(0.145)	(0.151)	(0.057)	(0.072)
	[0.132]	[0.217]	[0.795]	[0.748]	[0.821]	[0.950]	[0.513]
Sender 6 (W)	0.418	0.196	0.131	0.133	-0.075	0.030	0.008
	(0.161)	(0.159)	(0.152)	(0.153)	(0.147)	(0.054)	(0.071)
	[0.010]	[0.218]	[0.387]	[0.385]	[0.612]	[0.585]	[0.912]
Sender 7 (W)	0.184	0.075	0.230	0.223	-0.070	-0.045	-0.061
	(0.160)	(0.159)	(0.149)	(0.154)	(0.149)	(0.056)	(0.067)
	[0.250]	[0.638]	[0.123]	[0.147]	[0.637]	[0.420]	[0.367]
Sender 8 (B)	0.205	0.034	0.035	-0.008	0.003	0.009	-0.012
	(0.155)	(0.155)	(0.144)	(0.153)	(0.147)	(0.054)	(0.068)
	[0.187]	[0.828]	[0.806]	[0.956]	[0.984]	[0.874]	[0.864]
Sender 9 (B)	0.302	0.156	0.226	0.185	-0.035	0.054	0.066
	(0.149)	(0.155)	(0.143)	(0.161)	(0.154)	(0.058)	(0.070)
	[0.043]	[0.315]	[0.115]	[0.252]	[0.819]	[0.350]	[0.347]
Sender 10 (B)	0.201	0.125	0.281	0.251	-0.230	-0.001	-0.121
	(0.147)	(0.157)	(0.140)	(0.161)	(0.142)	(0.056)	(0.063)
	[0.172]	[0.425]	[0.045]	[0.119]	[0.106]	[0.987]	[0.057]
p-value: White Senders	0.001	0.108	0.641	0.213	0.977	0.432	0.489
p-value: Black Senders	0.955	0.891	0.160	0.277	0.407	0.893	0.035
Mean	0.00	0.00	0.00	0.00	0.00	0.36	0.44
Observations	832	832	832	832	831	832	587

Notes: Table reports OLS estimates among the sample of Black respondents. Each dependent variable in columns (1) to (5) is an inverse-covariance-weighted index as described in Anderson (2008) and standardized to the mean of 0 and standard deviation of 1. Dependent variables in columns (6) to (7) are on a scale of 0 to 1. COVID-19 Vacc. Intent was asked during the 2020-2021 flu season only. Outcome variables are described in Section II and in Appendix Section F. "(B)" indicates Black senders, while "(W)" indicates White senders. The *p*-value labeled "White Senders" tests the null hypothesis that the effect of all White senders is the same. The *p*-value labeled "Black Senders" tests the null hypothesis that the effect of all Black senders is the same. Stratifying variables (platform and season) are included but not reported. Robust standard errors are in parentheses. *p*-values are shown in brackets.

Appendix Table B10: Heterogeneity by Income on Ratings, Knowledge and Intent

	(1) Rating Sender	(2) Rating Signal	(3) Recall Content	(4) Safety Beliefs	(5) Coupon Interest	(6) Flu Vacc. Intent	(7) COVID-19 Vacc. Intent
PANEL A: Concordant vs. Discordant Expert Sender (with Standard Signal) - Black Respondents							
Concordance Treat × Low Income	0.280	0.381	0.072	-0.017	0.114	0.081	-0.023
	(0.139)	(0.140)	(0.145)	(0.134)	(0.131)	(0.053)	(0.062)
	[0.045]	[0.007]	[0.619]	[0.897]	[0.384]	[0.122]	[0.709]
Low Income	-0.102	-0.203	-0.117	-0.079	-0.109	-0.056	0.001
	(0.101)	(0.097)	(0.101)	(0.095)	(0.092)	(0.037)	(0.044)
	[0.313]	[0.037]	[0.248]	[0.405]	[0.241]	[0.128]	[0.985]
Concordance Treat	0.013	-0.095	-0.046	-0.077	-0.074	-0.022	0.049
	(0.108)	(0.111)	(0.110)	(0.107)	(0.103)	(0.042)	(0.048)
	[0.901]	[0.389]	[0.674]	[0.472]	[0.475]	[0.599]	[0.304]
Mean in control	0.00	0.00	0.00	0.00	0.00	0.38	0.40
Observations	832	832	832	832	831	832	587
PANEL B: Concordant vs. Discordant Expert Sender (Standard Signal Condition) - White Respondents							
Concordance Treat × Low Income	0.029	-0.014	0.163	-0.114	-0.133	0.016	0.023
	(0.115)	(0.119)	(0.124)	(0.118)	(0.113)	(0.042)	(0.051)
	[0.798]	[0.906]	[0.189]	[0.337]	[0.239]	[0.713]	[0.651]
Low Income	0.041	-0.046	-0.264	0.000	0.062	-0.010	-0.039
	(0.081)	(0.085)	(0.087)	(0.083)	(0.082)	(0.030)	(0.037)
	[0.610]	[0.587]	[0.003]	[0.998]	[0.448]	[0.739]	[0.295]
Concordance Treat	-0.086	-0.004	-0.051	0.019	-0.027	-0.003	-0.001
	(0.075)	(0.077)	(0.076)	(0.077)	(0.074)	(0.028)	(0.033)
	[0.251]	[0.959]	[0.503]	[0.803]	[0.720]	[0.910]	[0.985]
Mean in control	0.00	0.00	0.00	0.00	0.00	0.38	0.47
Observations	1221	1221	1221	1221	1221	1221	866
p-value	0.165	0.036	0.639	0.610	0.165	0.328	0.563
PANEL C: Standard vs. Acknowledgement Signal (Discordant, Expert Condition) - Black Respondents							
Acknowledgement Signal Treat × Low Income	-0.153	-0.110	0.022	-0.088	-0.146	-0.036	-0.068
	(0.138)	(0.134)	(0.145)	(0.133)	(0.135)	(0.052)	(0.063)
	[0.269]	[0.413]	[0.880]	[0.507]	[0.279]	[0.484]	[0.282]
Low Income	-0.104	-0.203	-0.126	-0.080	-0.105	-0.056	-0.000
	(0.101)	(0.097)	(0.101)	(0.095)	(0.092)	(0.037)	(0.044)
	[0.301]	[0.037]	[0.214]	[0.400]	[0.254]	[0.126]	[0.997]
Acknowledgement Signal Treat	0.195	0.207	-0.006	-0.045	0.117	0.050	0.097
	(0.103)	(0.101)	(0.109)	(0.105)	(0.106)	(0.041)	(0.049)
	[0.060]	[0.041]	[0.955]	[0.667]	[0.270]	[0.225]	[0.049]
Mean in control	0.00	0.00	0.00	0.00	0.00	0.38	0.40
Observations	827	827	827	827	825	827	581
PANEL D: Lay person vs. Expert (Concordant, Standard Signal Condition) - Black Respondents							
Layperson Treat × Low Income	-0.115	-0.156	0.077	0.026	-0.074	-0.027	0.045
	(0.145)	(0.137)	(0.143)	(0.139)	(0.142)	(0.051)	(0.061)
	[0.430]	[0.257]	[0.593]	[0.853]	[0.602]	[0.602]	[0.457]
Low Income	0.188	0.182	-0.056	-0.105	0.007	0.029	-0.022
	(0.101)	(0.100)	(0.104)	(0.101)	(0.100)	(0.038)	(0.044)
	[0.062]	[0.070]	[0.588]	[0.299]	[0.947]	[0.449]	[0.614]
Layperson Treat	-0.460	0.018	0.074	-0.042	0.028	0.036	0.061
	(0.116)	(0.107)	(0.111)	(0.110)	(0.111)	(0.040)	(0.047)
	[0.000]	[0.864]	[0.503]	[0.700]	[0.801]	[0.372]	[0.198]
Mean in control	0.00	0.00	0.00	0.00	0.00	0.36	0.45
Observations	845	845	845	845	845	845	592

Notes: Table reports OLS estimates. Each dependent variable in columns (1) to (5) is an inverse-covariance-weighted index as described in Anderson (2008) and standardized to the mean of 0 and standard deviation of 1. Dependent variables in columns (6) to (7) are on a scale of 0 to 1. COVID-19 Vacc. Intent was asked during the 2020-2021 flu season only. Outcome variables are described in Section II and in Appendix Section F. *Low Income* is a binary variable, which is equal to 1 if the respondent's self-reported household income is less than or equal to the median income among Black respondents in the sample (=$30k). The *p*-value in Panel (B) tests the null hypothesis that concordance treatment effects are the same across Black and White respondents. Stratifying variables (platform and season) are included but not reported. Robust standard errors are in parentheses. *p*-values are in brackets.

C Baseline Survey Questionnaire

The baseline survey questionnaire is available from this link.

D Example Videos and Scripts

Appendix Table D11: Example Videos

Treatment Condition	Video Link
Lay person, standard signal	https://youtu.be/bASxTEbfNMA
Doctor, standard signal	https://www.youtube.com/watch?v=esU_77AjaX8

E Secondary Outcomes

We gathered several secondary outcomes. The first one involves open text responses to a question asking "*What are your thoughts on the recommendation you just received in the video?*"[23] Open responses are coded in two ways: by Mturkers on a scale from -1 (most negative) to +1 (most positive) (*Sentiment Mturk*), [24] and through automated Natural Language Processing sentiment analysis on a scale from -1 (most negative) to +1 (most positive) (*Sentiment NLP*). The latter method employs Python's Sentiment Intensity Analyzer Polarity Score function from the NLTK package.

Likely to be Contact is captured by a respondent's answer to the question of whether a person like the one in the video would be likely to be a contact in the respondent's phone or a friend on social media (yes/no).

Demand for Second Coupon measures demand for a second flu shot coupon, to be given to a friend or family member. It is a simple yes or no question, and thus a coarser, but more intuitive/comprehensive (for the respondent) measure of coupon demand than the WTP measure. A few respondents (approximately 5%) were asked this question during the follow-up survey, while the majority of respondents were asked during the baseline survey.

We also elicit three additional measures of attitudes towards the COVID-19 vaccine (elicited in the second flu season only). They are *Vaccination Mandatory*, *Safety Review Information Demand*, and *Trial Participation*. The first captures a respondent's view on whether COVID-19 vaccination should be mandatory (11-point Likert scale). The second captures demand for information gathered in an independent review of COVID-19 vaccine safety that would be sent by email to the participant (yes/no). The third captures interest in participating in a COVID-19 vaccine trial, measured by whether the respondent demands a link to a National Institutes of Health (NIH) website with sign-up information for trials (yes/no).

[23]The question is asked right after the video.

[24]2,847 out of 2,893 responses were rated and coded; 46 responses were coded as missing because the responses did not include any information. Each response was rated by three different MTurkers.

F Outcome Measures: Question Wording

Family Name	Variable Name	Question Text	Response Options
Main Outcomes			
z-score: Rating Sender	Trust I	• If a person like the one in the video was located near you, would you want to ask him about other health issues?	[1: Yes, 0: No]
	Trust II	• How much do you agree or disagree with the following statements? I trust the person in the video to give me medical advice.	[1: Disagree strongly, 2: Disagree, 3: Neither agree nor disagree, 4: Agree, 5: Agree strongly]
	Qualification	• How much do you agree or disagree with the following statements? The person in the video is qualified to give me medical advice.	[1: Disagree strongly, 2: Disagree, 3: Neither agree nor disagree, 4: Agree, 5: Agree strongly]
z-score: Rating Signal	Endorsement I	• How likely are you to recommend this video to your friends or family?	[On a scale of 0 (Not at all likely) to 10 (Extremely likely)]
	Endorsement II	• How likely are you to recommend the flu shot to a family member or friend?	[On a scale of 0 (Not at all likely) to 10 (Extremely likely)]
	Relevance	• How much do you agree or disagree with the following statements? The information provided in the video applies to people like me.	[1: Disagree strongly, 2: Disagree, 3: Neither agree nor disagree, 4: Agree, 5: Agree strongly]
z-score: Recall Content	Recall Ingredient	• What did the person in the video say about what the flu shot contains?	[1: the respondent chose the option, "Contains no active flu virus", 0: the respondent chose either "Contains active flu virus" or "Don't know"]
z-score: Safety Beliefs	Safety Point Belief	• Safety Point Belief $= \frac{(100-\text{Posterior Belief})-(100-\text{Prior Belief})}{100}$ – Prior and posterior of a respondent's estimate of the question: Take 100 adult men from your community, selected at random. Let's say all of the 100 adult men selected at random from your community receive a flu shot at the start of the flu season. How many of them, do you believe, get the flu from the flu shot?	[On a scale of -1 to 1]
	Safety Certainty	• Safety Certainty $= \frac{\text{Posterior Number of Balls}-\text{Posterior Number of Balls}}{10}$ – Prior and posterior of the number of balls placed in the "0-9" bin as a response to the question: Consider the group of 100 adult men selected at random from your community, and suppose all of them get the flu shot. You have 10 balls that you can put in 10 different bins, reflecting what you believe are the chances out of 10 that the number of men who get the flu from the flu shot falls in each bin. The more likely you think it is that the number of men who get the flu from the flu shot falls in a given bin, the more balls you should place in that bin. For example, if you put all the balls in one bin, it means you are certain the number of men that will get the flu from the flu shot is somewhere in that range.	[On a scale of -1 to 1]
z-score: Coupon Interest	Willingness to pay (WTP)	• After completion of this survey, you will receive an email with a flu shot coupon that you can use at major pharmacies near you (including Walgreens, Rite-Aid, CVS, Walmart, Kroger, Costco and Albertsons). The coupon covers the full cost of the flu shot. In order to redeem the coupon, you just need to present it at the pharmacy, for example on your smart phone or printed out. You may be offered to trade in your flu shot coupon for an electronic cash gift card redeemable at Amazon.com and other online retailers. The gift card would be sent to you by email, within 5 business days of completing the survey. For each of the amounts listed below, please select whether, if you are offered that amount, you would prefer to keep your flu shot coupon, or receive the electronic cash reward instead. The computer will then randomly select a participant, and will randomly draw one price offer for the selected participant. If you are the randomly selected participant, we will implement the choice you made at the randomly selected price.	
		If the computer randomly selects me, and randomly selects a gift card in the amount of $1: I prefer to ...	[... keep the flu shot coupon and receive no cash gift card., ... give up the flu shot coupon and receive an electronic cash gift card in the amount of $1.]
		If the computer randomly selects me, and randomly selects a gift card in the amount of $2: I prefer to ...	[... keep the flu shot coupon and receive no cash gift card., ... give up the flu shot coupon and receive an electronic cash gift card in the amount of $2.]
		If the computer randomly selects me, and randomly selects a gift card in the amount of $5: I prefer to ...	[... keep the flu shot coupon and receive no cash gift card., ... give up the flu shot coupon and receive an electronic cash gift card in the amount of $5.]
		If the computer randomly selects me, and randomly selects a gift card in the amount of $10: I prefer to ...	[... keep the flu shot coupon and receive no cash gift card., ... give up the flu shot coupon and receive an electronic cash gift card in the amount of $10.]
	Pharmacy Lookup	• Would you like to receive information about where you can redeem your flu shot coupon? We can provide you with a link to look up participating pharmacies that accept the flu shot coupon and that are closest to you. The link would pop up on the final screen of the survey.	[1: Yes, 0: No]

Family Name	Variable Name	Question Text	Response Options
n.a.	Flu Vaccination Intent	• How likely are you to get a flu shot between now and February 2020? (*2019-20 wave*) • How likely are you to get a flu shot between now and February 2021? (*2020-21 wave*)	[On a scale of 0 (Not at all likely) to 10 (Extremely likely)]
n.a.	COVID-19 Vaccination Intent	• Suppose a vaccine against COVID-19 becomes available to everyone, at no cost. Would you or would you not get vaccinated against COVID-19?	[On a scale of 0 (Definitely not get vaccinated) to 10 (Definitely get vaccinated)]
n.a.	Self Flu Vaccine Take-up	• A binary variable equal to 1 if the respondent redeemed a flu vaccine coupon or answered "yes" to the question in the follow-up survey: "Did you get the flu shot since you completed our first survey?"	[1: Yes, 0: No]
n.a.	Household Flu Vaccine Take-up	• A binary variable equal to 1 if the respondent redeemed a flu vaccine coupon or the respondent answered "yes" to one of the questions in the follow-up survey: (1) "Did you get the flu shot since you completed our first survey?"; (2) "Did your spouse or partner get a flu shot this season?"; or (3) "Did your children get a flu shot this season?"	[1: Yes, 0: No]
		Secondary Outcomes	
n.a.	Flu Vaccine Coupon Redemption	• A binary variable equal to 1 if the respondent redeemed a flu vaccine coupon, and 0 otherwise.	[1: Yes, 0: No]
n.a.	Sentiment MTurk	• What are your thoughts on the recommendation you just received in the video?	[Open-text response; then coded as -1: Negative, 0: Neutral, or 1: Positive]
n.a.	Sentiment NLP	• Each open text response rated through automated Natural Language Processing sentiment analysis.	[-1: Negative, 0: Neutral, 1: Positive]
n.a.	Likely to be Contact	• Would a person like the one in the video be a contact in your phone or a friend on social media?	[1: Yes, 0: No]
n.a.	Demand for Second Coupon	• Would you like to receive a second coupon for a free flu shot, to give to a friend or family member? It would be sent to you by email, just like your own coupon.	[1: Yes, 0: No]
n.a.	COVID-19 Vaccine Mandatory	• In your opinion, should vaccinations against COVID-19 be voluntary, or should they be mandatory (in other words, everyone would be required to receive the vaccine)?	[0: Should definitely be voluntary, 10: Should definitely be mandatory]
n.a.	COVID-19 Vaccine Safety Review Information Demand	• [If assigned into the FDA treatment] The Food and Drug Administration (FDA) has formed an advisory committee of experts, who will perform an independent review of the safety and efficacy of any COVID-19 vaccine approved by the FDA. Once a vaccine has been developed and the advisory committee has completed its review, would you like to receive an email notification with the results of the review? • [If assigned into the NMA treatment] The National Medical Association (NMA), which represents Black physicians and health professionals in the US, will perform an independent review of the safety and efficacy of any COVID-19 vaccine approved by the FDA. Once a vaccine has been developed and the NMA has completed its review, would you like to receive an email notification with the results of the review?	[1: Yes, 0: No] [1: Yes, 0: No]
n.a.	COVID-19 Vaccine Trial Participation	• The National Institutes of Health (NIH) is recruiting participants for COVID-19 vaccine trials. Are you interested in finding out more and potentially participating?	[1: Yes, 0: No]
n.a.	Ratings on Age	• This outcome is measured based on the MTurk survey sample. Each respondent was randomly shown one of ten portraits of senders and was asked to respond to the question: "How old do you think this person is?"	[Open-text response; then coded as 1: $18 \leq$ rated age ≤ 24, 2: $25 \leq$ rated age ≤ 34, 3: $35 \leq$ rated age ≤ 44, 4: $45 \leq$ rated age ≤ 54, 5: $55 \leq$ rated age ≤ 64, 6: $65 \leq$ rated age]
n.a.	Ratings on Education	• This outcome is measured based on the MTurk survey sample. Each respondent was randomly shown one of ten portraits of senders and was asked to respond to the question: "What is the highest degree or level of schooling that you think the person completed?"	[1: Less than a high school diploma, 2: High school diploma or equivalent (for example: GED), 3: Some college but no degree, 4: Associate's degree, 5: Bachelor's degree, 6: Graduate degree (for example: MA, MBA, JD, PhD)]
n.a.	Ratings on Attractiveness	• This outcome is measured based on the MTurk survey sample. Each respondent was randomly shown one of ten portraits of senders and was asked to respond to the question: "How attractive is this person?"	[1: Not at all attractive, 2: Somewhat unattractive, 3: Neither attractive nor unattractive, 4: Somewhat attractive, 5: Extremely attractive]