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ABSTRACT

Background: Distrust and partisan identity are theorized to undermine health communications. We examined the role of these factors on the efficacy of discussion groups intended to promote vaccine uptake.

Method: We analyzed survey data from unvaccinated Facebook users (N = 371) living in the US between January and April 2022. Participants were randomly assigned to Facebook discussion groups (intervention) or referred to Facebook's COVID-19 Information Center (control). We used Analysis of Covariance to test if the intervention was more effective at changing vaccination intentions and beliefs compared to the control in subgroups based on participants' partisan identity, political views, and information trust views.

Results: We found a significant interaction between the intervention and trust in public health institutions (PHIs) for improving intentions to vaccinate ($P = .04$), intentions to encourage others to vaccinate ($P = .03$), and vaccine confidence beliefs ($P = .01$). Among participants who trusted PHIs, those in the intervention had higher posttest intentions to vaccinate ($P = .008$) and intentions to encourage others to vaccinate ($P = .002$) compared to the control. Among non-conservatives, participants in the intervention had higher posttest intentions to vaccinate ($P = .048$). The intervention was more effective at improving intentions to encourage others to vaccinate within the subgroups of Republicans ($P = .03$), conservatives ($P = .02$), and participants who distrusted government ($P = .02$).

Conclusions: Facebook discussion groups were more effective for people who trusted PHIs and non-conservatives. Health communicators may need to segment health messaging and develop strategies around trust views.

Background

Vaccine hesitancy, often driven by viral misinformation, is recognized as a global threat [1]. Studies have shown that COVID-19 misinformation reduces vaccination intentions [2], encourages the avoidance of health-protective behaviors [3, 4], and casts doubt on the recommendations of medical experts. Scalable approaches to combating misinformation, such as fact-checking (including debunking and prebunking [5, 6]), 'nudges' [7], and literacy interventions [8], have demonstrated some success; however, some argue that debunking may not be enough to change minds [9]. In parallel, major social media platforms have begun to remove misinformative claims – an untested strategy that may cause harm [10].

Critics of these strategies point out that they do not place enough emphasis on socio-affective factors that drive misinformation acceptance, such as source cues, emotion, and worldview [11]. Others hypothesize a role for motivated reasoning and political partisanship in driving COVID-19 vaccine refusal, noting that vaccination has become politicized worldwide. There is reason to believe that political orientation could have a moderating role. In the United States, Republicans make up an increasingly disproportionate share of those who remain unvaccinated and or only partially vaccinated [12] and political orientation has been a strong national predictor of willingness to vaccinate throughout the COVID-19 pandemic [13–17]. Past studies have shown that people may engage in motivated reasoning, interpreting information in a way that aligns with their interests or strengthens their beliefs, particularly when those beliefs signal loyalty to their political party [18]. Thus, motivated reasoning is one possible explanation for the lower vaccination rate observed among Republicans.

A related, yet alternative, hypothesis suggests that trust in COVID-19 information sources may drive vaccine hesitancy. For example, [19] found that trust in public health institutions (PHIs) was a stronger predictor of COVID-19 vaccine hesitancy and uptake than partisanship or trust in Donald Trump. [20] found that trust in COVID-19 information sources predicts COVID-

19 vaccination beliefs, but the role of trust may be different for racial subgroups. [21] found that trust in institutions moderates the relationship between COVID-19 misinformation acceptance and preventative behaviors. In general, several scholars have observed that we are in the midst of a global trust crisis that is fueling a vaccine hesitancy epidemic and undermining health communication [1, 22]. Well before the COVID-19 pandemic, vaccine scholars warned of declining trust in institutions [23, 24] and vaccine information [25]. Distrust in government and public health institutions is known to be associated with lower intentions to accept vaccines [26–28] and the COVID-19 vaccine [19–21, 29–33]. Furthermore, organized anti-vaccine groups routinely promote a narrative that vaccine advocates can't be trusted [34], and past studies have found that perceived contradictory messages, sensationalized messaging, and information overload can contribute to distrusting views of the media and government [35].

In this paper, we examine how measures of political identity, partisanship, trust in government, and trust in public health institutions were associated with changes in COVID-19 vaccination intentions and beliefs after exposure to messages designed to promote vaccine uptake during the Omicron wave of the COVID-19 pandemic from January to April 2022. Subjects were exposed to these messages in the context of a study conducted in private Facebook groups, where we demonstrated that discussing vaccines can increase COVID-19 vaccination intentions and beliefs, even among the most vaccine hesitant [36]. Program effectiveness was measured by differences in program outcomes between participants assigned to the intervention compared to the control group.

We test the following hypotheses:

H1) The effectiveness of discussing COVID-19 vaccines in private Facebook groups at improving vaccination intentions and beliefs will be significantly lower among Republican participants compared to non-Republicans.

H2) The effectiveness of discussing COVID-19 vaccines in private Facebook groups at improving vaccination intentions and beliefs will be significantly lower among conservative participants compared to non-conservatives.

H3) The effectiveness of discussing COVID-19 vaccines in private Facebook groups at improving vaccination intentions and beliefs will be significantly lower among participants who distrust government compared to those who trust them.

H4) The effectiveness of discussing COVID-19 vaccines in private Facebook groups at improving vaccination intentions and beliefs will be significantly lower among participants who distrust public health institutions compared to those who trust them.

In general, social media discussion groups are a promising alternative to broadcasting health information because they promote discussion and allow public health communicators to interact directly with the vaccine [9, 37, 38]. Social media platforms provide opportunities for health communicators to listen to and understand the concerns of the vaccine hesitant and to express empathy and caring [39].

We posit that partisan identity and trust in COVID-19 information sources might moderate the effectiveness of discussing vaccines in Facebook groups. Our rationale is as follows: compared to non-Republican participants, Republican participants might have been less receptive to pro-vaccine messages because anti-vaccination positions were more socially acceptable among fellow Republicans. Combined with individual inclinations for motivated reasoning, vaccine hesitant Republicans may have dismissed pro-vaccine administrator (admin) content in favor of anti-vaccine member content because they were motivated to believe arguments that supported their partisan identity [40]. If true, we expect treatment effects would have been lower among Republicans than non-Republicans.

Similarly, participants who do not trust the government and/or PHIs may have been less receptive to pro-vaccine admin messages than trusting participants. Untrusting participants may have viewed the admin messages as government propaganda or based on inaccurate or incomplete information. In contrast, admin messages may have been more persuasive for participants who viewed the CDC or FDA as trustworthy, credible sources [41]. In summary, we expect program effectiveness would have been lower among participants who distrusted government than those who trusted them. Likewise, we expect program effectiveness would have been lower among participants who distrusted PHIs compared to those who trusted them.

Our study is novel because it explicitly explores factors that moderate the effectiveness of a public health intervention conducted entirely in a social media setting. To our knowledge, no one has conducted subgroup or moderation analyses to identify factors that influence the effectiveness of discussing vaccines in social media groups (although see [42] for a recent example outside of social media).

Method

The analysis presented here uses experimental survey data collected from unvaccinated adults living in the United States between January and April 2022. Participants were recruited using Amazon's Mechanical Turk service and randomly assigned to COVID-19 Facebook discussion groups

(intervention) or referred to Facebook's COVID-19 Information Center (control). The experiment was conducted in two overlapping waves, and participants were provided gift cards for completing surveys (see [36] for further information). To measure program effectiveness, we used Analysis of Covariance (ANCOVA) to test if the intervention was more effective at changing vaccination intentions and beliefs compared to the control. The aim of the present study is to test hypotheses that partisan identity (H1), political views (H2), trust in government (H3), or trust in PHIs (H4) might have moderated the effectiveness of discussing vaccines in private Facebook groups. Second, we explored program effectiveness within each subgroup to identify groups of people more likely to benefit from participation in these vaccine discussion groups on Facebook.

Interventions

Participants in the intervention group were exposed to two to three posts from group admins each day for four weeks. Project staff served as group admins and interacted with members through a single organizational account that used 'GW Health Communication Corps' as its profile name and an organizational logo for its profile photo. To demonstrate empathy, admins thanked participants for sharing their thoughts and feelings, encouraged participants to contribute to discussions, and replied to comments in a respectful and nonjudgemental manner. If the admins did not understand a person's concern, they asked participants to clarify what they meant before responding. Posts covered a variety of topics (e.g. COVID-19 risks, vaccination benefits, and vaccine safety) and were intended to accord with the recommendations of Fuzzy Trace Theory (FTT) – i.e. they attempted to emphasize the bottom-line meaning of COVID-19 information in context [43, 44]. Since past studies have shown that trust in physicians has remained high during the pandemic [45], admins tried to include videos from medical experts when possible. Figure 1a shows an example poll that was used to encourage members to share their concerns. Figure 1b shows an example admin post that attempts to express empathy by acknowledging people's concerns and explains why doctors claim that long-term vaccine side effects are unlikely to occur.

Participants in the control group were shown a single post that referred them to Facebook's COVID-19 Information Center. This resource was chosen to simulate usual interactions with COVID-19 content on Facebook, where the COVID-19 Information Center is the resource for anyone inquiring about COVID-19 or posting about COVID-19. Since the control group was
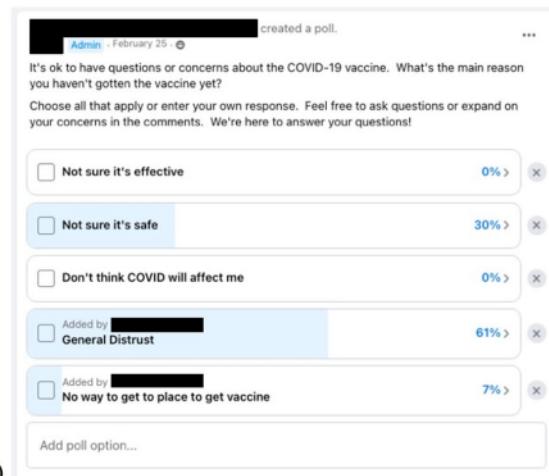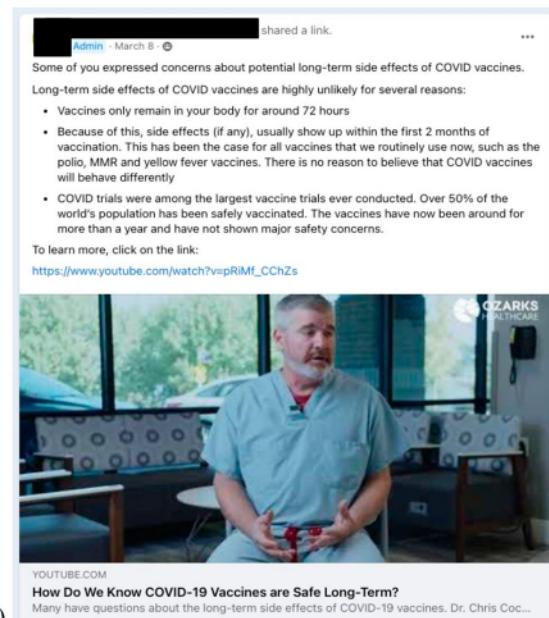
Figure 1. Example a) poll designed to encourage members to share their vaccine concerns and b) admin post that acknowledges group members' concerns and explains why doctors claim that long-term vaccine side effects are unlikely.

not moderated, posting and commenting features were disabled.

Measures

Trust in COVID-19 information sources was measured only in a baseline survey administered upon enrollment. This baseline survey measured demographic variables including age, race/ethnicity (White, African American/black, Asian American, Hispanic, other), gender (male, female, other), relationship status (married/living with partner, other), employment status (employment, other), educational attainment (less than high school, college degree/or other post high school education, advanced degree), income (U.S. dollars), political party affiliation (Republican, Independent, Democrat, other), and political views (conservative, moderate, liberal, no answer). Even

though political affiliation and ideology are related constructs, we chose to examine both measures separately since people within the same political party may hold varying ideological positions on COVID-19 related topics. We also measured vaccination intentions and vaccine beliefs in surveys conducted upon enrollment, and at 2, 4, and 6 weeks.

Vaccination intentions

The primary endpoints with respect to program effectiveness were group differences in expected 6-week intentions to vaccinate and intentions to encourage others to vaccinate. Intentions were measured with single items on a 7-point Likert scale (1 = *not at all likely*, 7 = *extremely likely*). Participants were asked the following questions: 1) '*How likely are you to get a COVID-19 vaccine in the next month?*' and 2) '*How likely are you to encourage a friend, co-worker, or family member to get the COVID-19 vaccine within the next month?*'. The intention to vaccinate scores for subjects who actually vaccinated during the study were imputed as an 8 on the original 7-point scale.

Vaccination beliefs

The secondary endpoints with respect to program effectiveness were group differences in expected 6-week COVID-19 vaccine confidence and complacency beliefs. Items used to measure COVID-19 vaccine beliefs were adapted from a multi-item vaccine hesitancy scale developed by [46]. Vaccine confidence beliefs were operationalized as the mean of the following two items: '*Thinking specifically about the COVID-19 vaccine, do you think the COVID-19 vaccine is 1) safe and 2) effective*'. Likewise, vaccine complacency beliefs were operationalized as the mean of the following two items: '*Thinking specifically about the COVID-19 vaccine, do you think the COVID-19 vaccine is 1) important and 2) necessary*'. Participants rated their beliefs on a 5-point scale (1 = *not at all*, 5 = *completely*). Responses within this scale were consistent in the pre-test (Cronbach's $\alpha = 0.91$) and post-test (Cronbach's $\alpha = 0.93$), and they loaded on two distinct factors in factor analysis (see Appendix A for further information).

Trust in COVID-19 information sources

Items measuring trust in COVID-19 information sources were adapted, in part, from the Pew Research Center's American News Pathways survey instrument. Participants were asked: '*How much do you trust each of these sources to provide correct information about COVID-19?*' and rated their trust using a 3-point scale (1 = *not at all*, 2 = *a little*, 3 = *a great deal*). Participants could also respond to the trust view questions with '*don't know*' or '*not applicable*'. Participants who answered '*not at all*' for both government trust questions were categorized as 'distrusting'. All other participants were categorized as 'trusting'. Likewise, PHI distrusting participants answered '*not at all*' for both health institution trust questions, and the remaining subjects were categorized as *PHI trusting*. Responses to these items were consistent (Cronbach's $\alpha = 0.88$) and loaded on two factors in factor analysis (see Appendix A, for further information).

Analyses

In this study, effectiveness was measured by differences in program outcomes between participants assigned to the intervention compared to the control group. We first examined whether the intervention was less effective for Republicans vs. non-Republicans (H1), conservatives vs. non-conservatives (H2), participants who distrusted vs. trusted government (H3), and participants who distrusted vs. trusted PHIs (H4). Because subgroups overlapped, to avoid low statistical power, we tested interactions between experimental conditions and moderating variables (partisan identity, political views, trust in government, and trust in PHIs) in separate models. We conducted two-way ANCOVAs with the experimental condition and moderating variable as the between-subjects factors, and program outcomes (intentions to vaccinate, intentions to encourage others to vaccinate, vaccine confidence beliefs, and vaccine complacency beliefs) as the dependent variables. ANCOVAs included baseline outcome scores and experimental wave as covariates. Because the distributions of pre- and post-test outcome residuals were observed to be non-normal, outcome variables were transformed using a Box–Cox transformation. Treatment effects were back-transformed to the original scale to facilitate interpretation.

We then examined program effectiveness within each subgroup (Republicans, non-Republicans, conservatives, non-conservatives, participants who distrusted government, participants who trusted government, participants who distrusted PHIs, and participants who trusted PHIs). For each subgroup, we tested differences in the expected 6-week outcomes between participants assigned to the intervention and control groups.

Results

Sample characteristics

371 (73%) of the 507 enrolled participants were eligible for analysis. We excluded 76 (15%) participants for failing to follow up at 6 weeks, 6 (1.2%) for responding incorrectly to attention check questions, 21 (4.1%) for explicitly stating in follow-up surveys that they were vaccinated before the study, and 7 (1.4%) for reporting infeasible dose counts on vaccination status questions

(e.g. participants reporting they had received 3 doses of a COVID-19 vaccine at the 2-week follow up). Last, since this analysis is focused on examining the moderating role of trust in COVID-19 information sources, we excluded 26 (5.1%) participants who provided ambiguous responses regarding their trust views of government and public health institutions (i.e. participants who responded to trust view questions with 'don't know' or 'not applicable'). A balance test verified that experimental groups did not differ significantly in terms of demographic variables, baseline trust views, or baseline outcomes (for further details, see Appendix B).

Table 1 provides a summary of sample characteristics stratified by experimental group. Participants were aged between 18 and 74 (M = 37; SD = 9.5) and mostly female (72.2%) and white (82.5%). Participants self-identified as Republicans most commonly (147,

Table 1. Sample characteristics stratified by experimental group.

Characteristic	Total (N = 371)	Intervention (N = 206)	Control (N = 165)	Chi-squared P-value
Age (Mean (SD))	37.0 (9.5)	36.9 (9.9)	37.1 (9.0)	.844
Race/ethnicity (%)				.262
White	306 (82.5)	166 (80.6)	140 (84.8)	
Black or African American	41 (11.1)	22 (10.7)	19 (11.5)	
Asian American	7 (1.9)	5 (2.4)	2 (1.2)	
Other	17 (4.6)	13 (6.3)	4 (2.4)	
Female (%)	268 (72.2)	148 (71.8)	120 (72.7)	.943
Married (%)	153 (41.2)	85 (41.3)	68 (41.2)	1.000
Working (%)	266 (71.7)	149 (72.3)	117 (70.9)	.852
Some College (%)	294 (79.2)	158 (76.7)	136 (82.4)	.222
Income (%)				.782
Less than $34,999	144 (30.7)	76 (37.6)	68 (41.2)	
$35,000–$74,999	152 (41.4)	86 (42.6)	66 (40.0)	
$75,000–$99,999	71 (19.3)	40 (19.8)	31 (18.8)	
Political View (%)				.656
Conservative	168 (45.3)	93 (45.1)	75 (45.5)	
Moderate	114 (30.7)	64 (31.1)	50 (30.3)	
Liberal	78 (21.0)	41 (19.9)	37 (22.4)	
No answer	11 (3.0)	8 (3.9)	3 (1.8)	
Political Affiliation (%)				.881
Republican	147 (39.6)	81 (39.3)	66 (40.0)	
Independent	133 (35.8)	77 (37.4)	56 (33.9)	
Democrat	73 (19.7)	39 (18.9)	34 (20.6)	
Other	18 (4.9)	8 (3.9)	9 (5.5)	
Distrusted Federal Government (%)	204 (55.0)	115 (55.8)	89 (53.9)	.797
Distrusted Local Government (%)	185 (49.9)	106 (51.5)	79 (47.9)	.562
Distrusted FDA (%)	148 (39.9)	81 (39.3)	67 (40.6)	.885
Distrusted CDC (%)	134 (36.1)	71 (39.3)	64 (38.2)	.528

39.6%), followed by Independents (133, 35.8%), Democrats (73, 19.7%), and no party affiliation (18, 4.9%). Most participants described their political views as conservative (168, 45.3%), followed by moderate (114, 30.7%), liberal (78, 21.0%), or other (11, 3.0%). More than half (204, 55.0%) of the sample distrusted the federal government, 185 (49.9%) distrusted their local government, 148 (39.9%) distrusted the Food and Drug Administration (FDA), and 134 (36.1%) distrusted the Centers for Disease Control and prevention (CDC). Chi-square tests of independence were performed to examine the relationships between moderating variables. The results showed a significant association between all moderating variables. For example, Republicans were more likely to have conservative political views (χ^2(1, N = 371) = 203, ($p < .001$)), distrust government (χ^2(1, N = 371) = 6.91, ($P = .008$)), and distrust PHIs (χ^2(1, N = 371) = 12.18, ($p < .001$)). Detailed results for all chi-square tests of independence are available in the Appendix C.

Hypothesis: differential effects of discussing vaccines

In line with H4, the analysis showed significant interactions between the intervention and public health institution (PHI) trust views on 3 of the 4 program outcomes. Compared to participants who did not trust PHIs, the intervention was more effective for participants who trusted PHIs on the intentions to vaccinate (B = 0.11; 95% CI = 0.004, 0.22; P = .04) (Figure 2a), intentions to encourage others to vaccinate (B = 0.16; 95% CI = 0.02, 0.31; P = .03) (Figure 2b), and vaccine confidence beliefs outcomes (B = 0.21; 95% CI = 0.05, 0.38; P = .01) (Figure 2c). No other interactions were statistically significant at the $p < .05$ level (see Appendix D for all results).

Exploratory analysis: significant effects within subgroups

Trust in PHIs was associated with a more effective intervention: Among participants who trusted PHIs, participants in the intervention group had higher expected 6-week intentions to vaccinate (B = 0.43; 95% CI = 0.11, 0.76; P = .008), intentions to encourage others to vaccinate (B = 0.56; 95% CI = 0.20, 0.91; P = .002), and marginally higher vaccine confidence beliefs (B = 0.22; 95% CI = 0.00, 0.43; P = 0.050) than participants in the control group. We also found that Republicans (B = 0.18; 95% CI = 0.01, 0.34; P = .03), conservatives (B = 0.22; 95% CI = 0.04, 0.40; P = .02), and participants who distrusted the government (B = 0.13; 95% CI = 0.02, 0.24; P = .02) had higher expected 6-week intentions to encourage others to vaccinate than corresponding participants in the control group. Non-republicans (B = 0.27; 95% CI = −0.10, 0.64; P
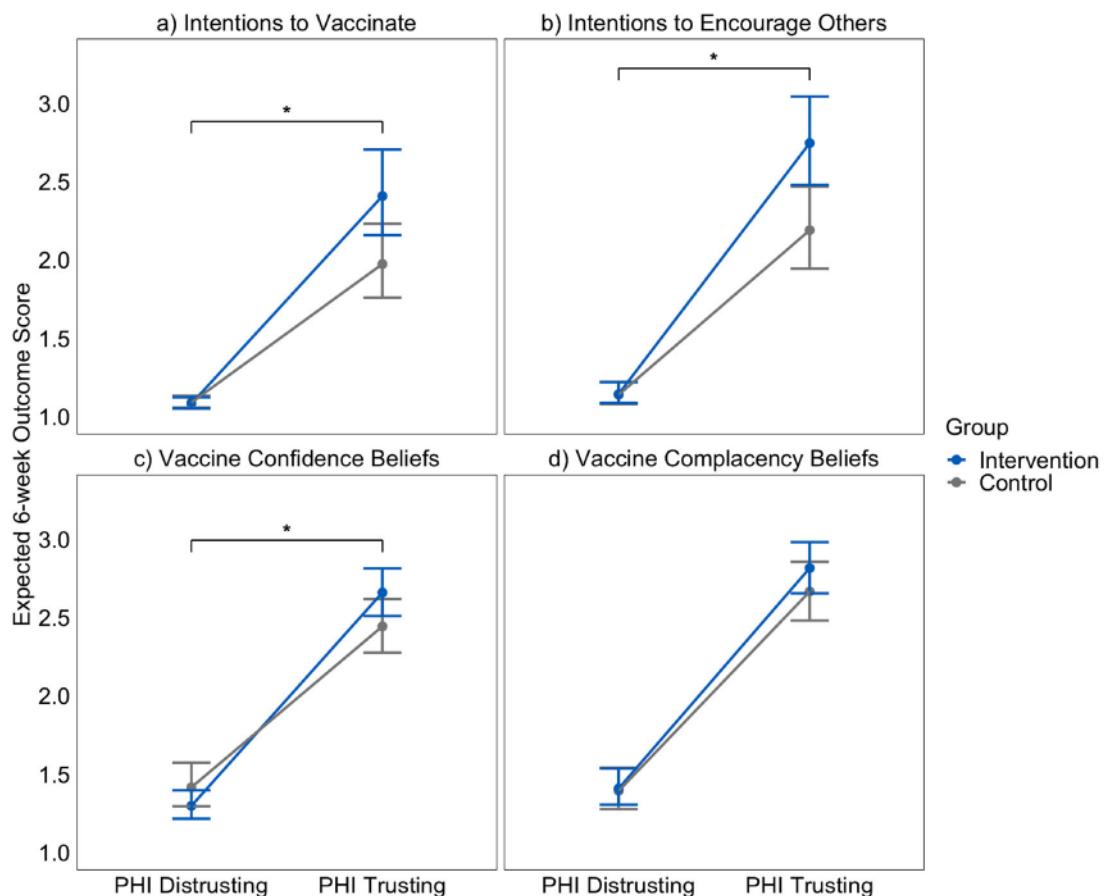
Figure 2. N = 371. Differences in expected 6-week outcomes across PHI trust categories (PHI distrusting, n = 119; PHI trusting, n = 252) were significantly more positive on 3 of the 4 program outcomes for participants in the intervention than the control condition. Error bars indicate the 95% confidence interval for expected 6-week a) intentions to vaccinate, b) intentions to encourage others to vaccinate, c) vaccine confidence beliefs, and d) vaccine complacency beliefs.

= .16), non-conservatives (B = 0.18; 95% CI = −0.22, 0.57, P = .39), and participants who trusted the government (B = 0.40; 95% CI = −0.07, 0.87; P = .10) also had higher expected 6-week intentions to encourage other to vaccinate than corresponding participants in the control group; however, these differences were not statistically significant. As shown in Appendix E, standard errors were higher for non-Republicans, non-conservatives, and the two 'trusting' groups, indicating lower statistical power for those subgroups. Non-conservatives (B = 0.35; 95% CI = 0.00, 0.69, P = .048) in the intervention group had higher expected 6-week intentions to vaccinate than non-conservatives in the control group. We did not observe any significant effect of our intervention on vaccine complacency beliefs. See Figure 3 for plots of the treatment effects for each subgroup. Detailed results for all treatment effect estimates are available in the Appendix E.

Discussion

Similar to past findings on the association between trust in COVID-19 information sources and vaccine uptake, intentions, and beliefs [17, 19, 20], this work shows that trust views appear to have moderated the effectiveness of using private Facebook discussion groups to promote COVID-19 vaccination and improve COVID-19 vaccine beliefs. The intervention was associated with significantly larger improvements in intentions to vaccinate, intentions to encourage others to vaccinate, and vaccine confidence beliefs for participants who trusted PHIs than those who did not. Thus, participants who trusted PHIs ended the program with higher intentions to vaccinate or encourage others to vaccinate if they discussed vaccines in Facebook groups compared to if they were referred to Facebook's COVID-19 Information Center. This provides support for the role of trust in public health institutions in moderating the efficacy of our intervention.

In contrast, we did not observe a moderating effect of partisan identity or political views on the intervention. These results suggest that Facebook discussion groups may be more likely to be effective if people have some degree of trust in PHIs regardless of their political orientation. Conversely, if people distrust the CDC or FDA, then convincing people to vaccinate may require more time and effort or alternative strategies such as incorporating locally trusted voices [9, 47]. In summary, our results suggest that health interventions may be more effective at changing
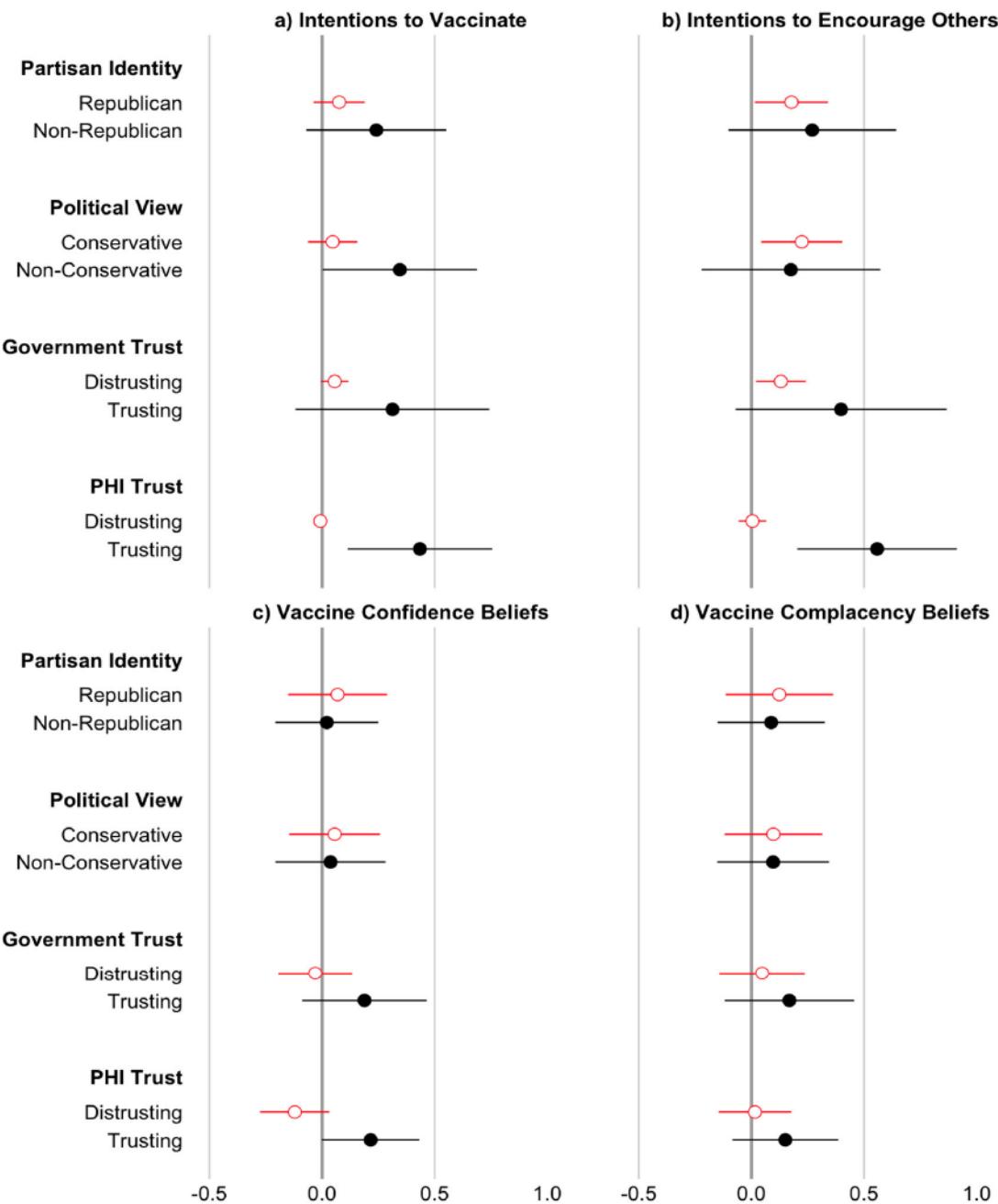
Figure 3. N = 371. Among participants who trusted PHIs (n = 252), the intervention was significantly more effective than the control at improving a) intentions to vaccinate and b) intentions to encourage others to vaccinate. The intervention was significantly more effective than the control at b) improving intentions to encourage others to vaccinate within the subgroups of Republicans (n = 224), conservatives (n = 203), and participants who distrusted government (n = 177). Error bars indicate the 95% confidence interval for differences in expected 6-week outcomes across experimental conditions.

vaccination intentions and beliefs if messages are tailored to individuals' trust views. For example, incorporating information sources that are viewed as trustworthy by the specific audience or focusing on addressing trust concerns, such as improving perceptions about the intentions and motives of public health institutions.

Beyond the motivated reasoning hypothesis, individuals identifying as Republican, conservative, or who professed distrust of government showed a significant intervention effect resulting in higher intentions to encourage others to vaccinate in the intervention group. We speculate that respectful and nonjudgemental interactions between admins and group members may have motivated vaccine refusers to sympathize, understand, and respect the positions of vaccine advocates. Thus, vaccine refusers may have ended the program more supportive of others considering vaccination but remained unconvinced about vaccinating themselves. Alternatively, we speculate that the survey question about intentions to encourage others to vaccinate may be functioning similarly to a nominative survey technique – i.e. they may be indexing support for a behavior (vaccination)

that these individuals believe to be socially undesirable [48]. It may be that, if COVID-19 vaccination is viewed as socially undesirable to certain groups, reports of intent to encourage others to vaccinate may be a more accurate reflection of their real intentions to get vaccinated themselves[1].

Limitations and future work

Due to concerns about statistical power, we analyzed the moderating variables in separate models. However, there was correlation among these variables, e.g. non-conservatives were more trusting of government than conservatives. Therefore, it is possible that in a study with a larger sample size, multivariable models containing simultaneously all four moderating interaction terms could be tested, allowing the independent moderating effects of each variable to be identified. Second, since participants were recruited and reimbursed for participation, our study population likely included people who otherwise would not seek out vaccine information. Thus, different factors might moderate effectiveness in groups of people actively seeking information. Third, since participants were predominantly female and white, our results may not generalize to the broader Facebook population. However, the limited diversity of our sample cannot explain the observed differences in 6-week outcomes across experimental groups.

Last, because we used single items to measure trust in COVID-19 information sources and measured trust views only in the baseline surveys, we did not distinguish between various dimensions of trust such as perceived motives and competence of information sources. Additionally, we could not account for changes in trust views that might have occurred during the study. To address these limitations, future work may explore using more comprehensive measures of trust, while examining the relationship between intentions to encourage others to vaccinate and actual vaccination behaviors. For example, researchers could investigate trust views of additional sources of information such as the National Institutes for Health (NIH) or the pharmaceutical companies that develop and manufacture vaccines. They could, include questions about the motives and competence of each information source or focus on vaccination-specific information instead of general COVID-19 information. They could also measure trust views at multiple time points throughout a study.

Conclusion

Declining trust in institutions remains a key obstacle for reducing vaccine hesitancy. Consistent with past findings about the deleterious effect of distrust on vaccination uptake, we found that trust in PHIs moderated the effectiveness of discussions that were intended to promote vaccine uptake in Facebook groups. Our intervention was significantly more effective for people who trusted PHIs compared to people who did not. Beyond the effects of trust in PHIs, we found that discussing vaccines in Facebook groups was associated with increased intentions to encourage others to vaccinate among Republicans and conservatives. Taken together, these results suggest that online discussion groups may be an effective way for public health communicators to promote vaccine uptake to large numbers of people; however, their messages must be tailored to account for differences in PHI trust in these groups. We suspect that healthcare providers may also find greater success in promoting vaccines by tailoring face-to-face discussions to their patients' trust views. This is encouraging because, unlike political affiliation and ideology, which are hard to change, health communicators focused on trust concerns about PHIs may be able to improve trust views. Now that the COVID-19 pandemic is over, our results emphasize the critical need to repair lost trust in PHIs before the next viral outbreak occurs.

Funding

Notes

1. An earlier version of this manuscript was published in the GWU Proquest dissertation library prior to beingpeer reviewed [49].

Ethics approvals

Institutional Review Board approvals were obtained from George Washington University (January 24, 2022, Ref. n. FWA00005945).

Conflicts of interest

LA receives royalties for the sale of Text2Quit. DAB has received consulting fees from Merck & Co. for participating in the 2021 Merck Global Vaccine Confidence Expert Input Forum, and has received a speaking honorarium from the United Nations Shot@Life Foundation.

Authors contribution

DAB and LA designed the study, obtained grant funding and oversaw project administration. DK, MN, SS contributed to study design and methodology.

DK, DAB, and LA analyzed the data and wrote the draft manuscript. All authors reviewed the manuscript and confirm the approval of the submitted manuscript.

Data availability

Data are available upon reasonable request.

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