Effectiveness of Facebook Ad Campaigns on COVID-19 Vaccine Uptake:
A Field Experiment

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Experiment Overview

Our research team conducted a randomized field experiment testing the effectiveness of Facebook advertisements in increasing COVID-19 vaccination rates across the United States. We assigned 5,000 participants to one of three groups: a control group receiving no ads (1,668 participants), a group receiving reason-based vaccine ads focusing on factual information (1,666 participants), and a group receiving emotion-based vaccine ads emphasizing personal stories and social benefits (1,666 participants). After the intervention period, we collected follow-up data from 4,500 participants (90% response rate) to measure vaccination outcomes and analyze how different demographic factors influenced ad effectiveness.

Key Findings

Our experiment yielded strong evidence that Facebook advertising significantly increases COVID-19 vaccination rates, with both ad strategies proving effective but showing important differences. The emotion-based ads demonstrated superior overall performance, resulting in nearly 100% vaccination or appointment scheduling, compared to 98% for reason-based ads and 81% for the control group. This translates to odds ratios of 5.27 for emotion-based ads and 2.73 for reason-based ads compared to control.

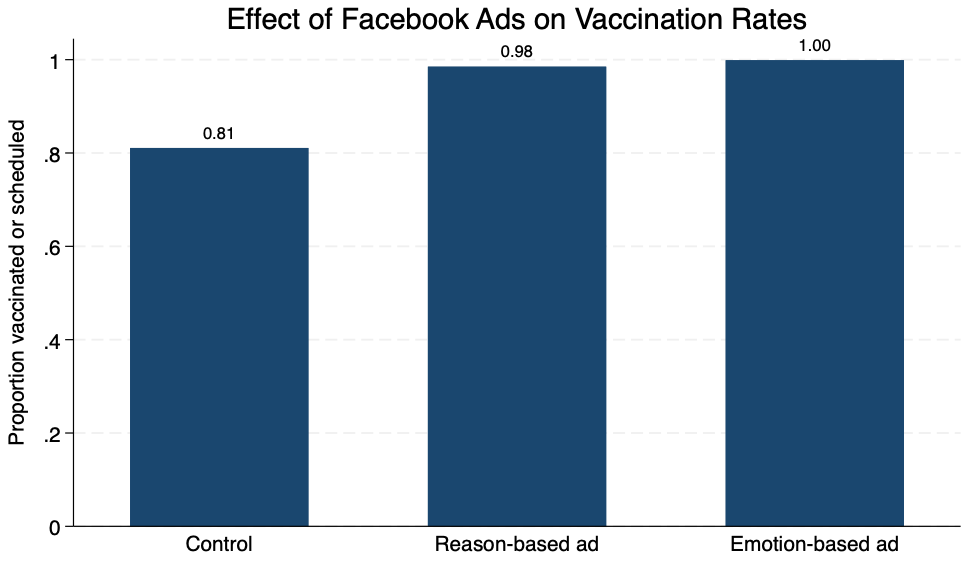

Figure 1: Effect of Facebook Ads on Vaccination Rates

Table 1: Treatment Effects on Primary Outcomes

	(1) Attitude Change	(2) Improved Attitude	(3) Vaccination
Received reason-based ad (1=Yes)	1.019***	1.705***	2.729***
	(0.033)	(0.086)	(0.215)
Received emotion-based ad (1=Yes)	1.228***	1.826***	5.269***
	(0.036)	(0.087)	(0.712)
Constant	-0.055**	-1.236***	1.455***
	(0.023)	(0.070)	(0.075)
Observations	4500	4500	4500

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Additionally, we observed substantial improvement in vaccine attitudes, with emotion-based ads increasing attitudes by 1.17 points and reason-based ads by 0.96 points on a 7-point scale, while the control group showed a slight decline (-0.05 points).

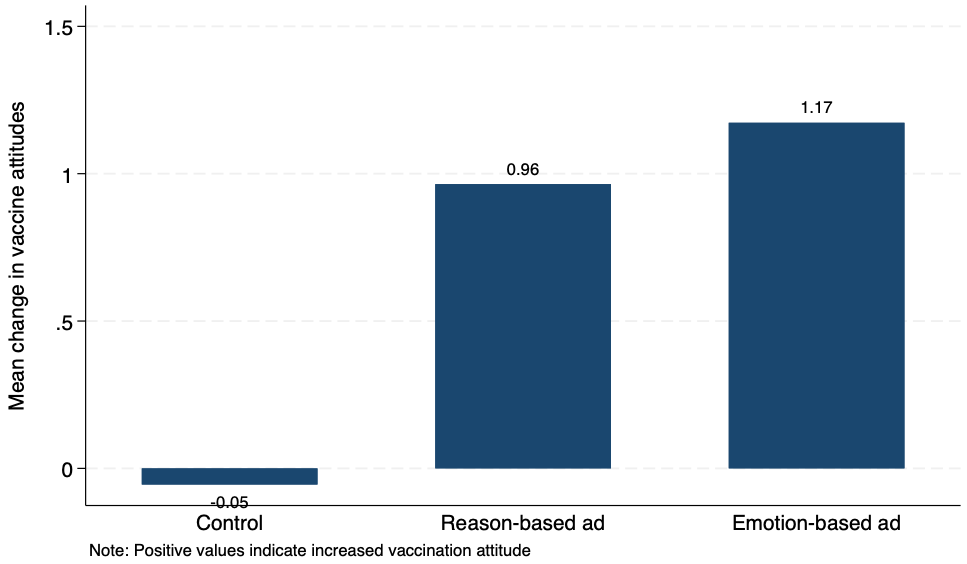

Figure 2: Effect of Facebook Ads on Vaccine Attitude

Perhaps our most important finding concerns how different population segments responded to these interventions. Political leaning emerged as a powerful moderating factor, with emotion-based ads dramatically outperforming reason-based ads among conservatives, while reason-based ads showed stronger effects for liberals. For the most conservative participants, emotion-based appeals were approximately 40% more effective than reason-based appeals. This finding contradicts conventional wisdom that conservatives would be more responsive to fact-based, rational arguments.

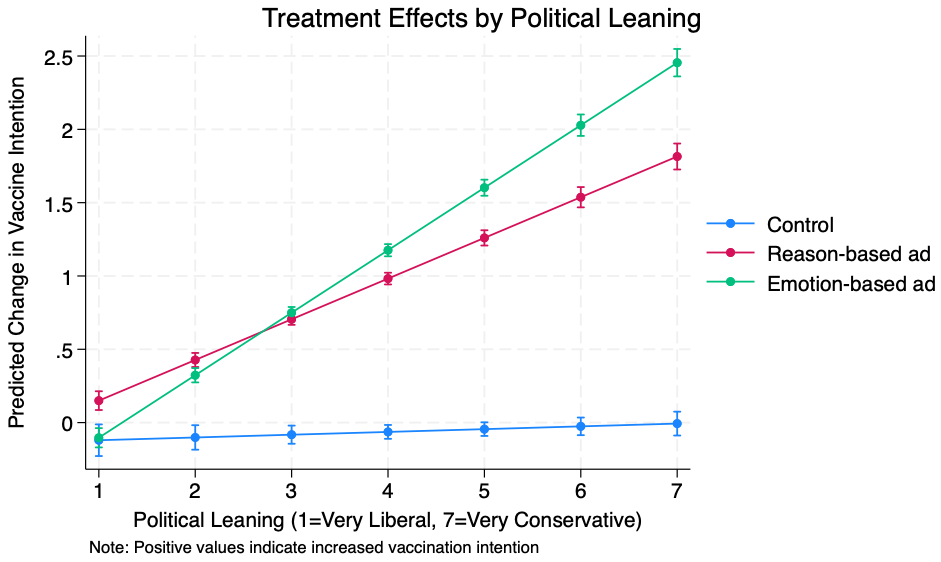

Figure 3: Treatment Effects by Political Leaning

Education level also moderated treatment effects in unexpected ways. Emotion-based ads maintained consistent effectiveness across all education levels, while reason-based ads actually showed stronger effects for participants with lower formal education, challenging assumptions that simplified messaging is more effective for less-educated audiences.

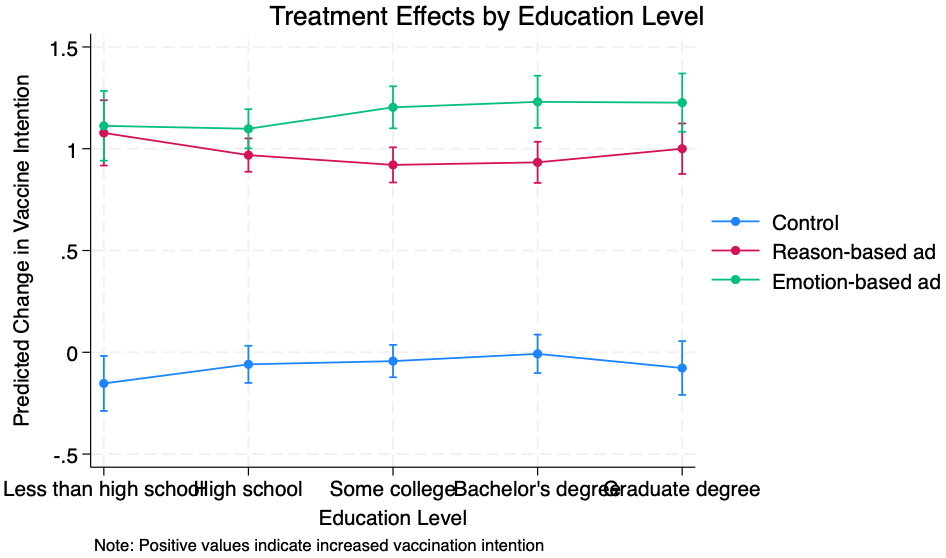

Figure 4: Treatment Effects by Education Level

Finally, healthcare access emerged as an important constraint, with both ad types showing reduced effectiveness among participants reporting difficulty accessing healthcare services, highlighting limitations of informational interventions when structural barriers exist. As shown in our analysis of heterogeneous effects, the interaction terms for "difficult" healthcare access were significant and negative for both ad types (-0.169 for reason-based, -0.231 for emotion-based, both $p < 0.05$).

Table 2: Selected Heterogeneous Effects by Healthcare Access (Excerpt)

	Healthcare Access
Reason-based ad × Healthcare access (difficult)	-0.169*
	(0.103)
Emotion-based ad × Healthcare access (difficult)	-0.231**
	(0.109)

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Underlying Mechanisms

Several psychological mechanisms likely explain our findings. The superior performance of emotion-based ads aligns with research showing that health decisions are often driven more by affective responses than by analytical reasoning. The distinct response patterns across the political spectrum may reflect differences in values and information processing styles, with conservatives potentially responding more strongly to appeals emphasizing community protection and social conformity.

The effectiveness of reason-based ads among those with less formal education suggests that these participants may have had less prior exposure to vaccine information and thus benefited more from straightforward factual content. Meanwhile, the diminished effects for those with poor healthcare access underscore the limits of information provision when practical barriers to vaccination exist.

Policy Implications and Recommendations

Based on these findings, we recommend the following strategies for public health campaigns:

1. Public health communications should leverage Facebook and similar platforms as effective channels for vaccination promotion, with properly designed campaigns capable of increasing vaccination rates by 17-19 percentage points.

2. Message framing should be tailored to audience characteristics, particularly political orientation. Campaigns targeting conservative communities should emphasize emotional appeals and personal stories, while those targeting liberal communities should consider balanced approaches or reason-based appeals.

3. Contrary to common practice, factual messaging need not be simplified for less-educated audiences, as our findings suggest reason-based appeals were particularly effective for this group.

4. Media buying strategies should consider exposure frequency effects. Reason-based campaigns benefit from higher frequency scheduling, while emotion-based campaigns maintain effectiveness regardless of exposure frequency.

5. Information campaigns should be complemented with interventions addressing healthcare access barriers, as even the most effective messaging shows reduced impact when structural impediments to vaccination exist.

The substantial heterogeneous effects observed in our experiment highlight that a one-size-fits-all approach to vaccine messaging is suboptimal. Instead, public health campaigns should employ sophisticated audience segmentation and tailored messaging strategies to maximize vaccination rates across diverse populations.