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Thirdhand Smoke Educational Narratives on the Risks of Exposure to Children: Examining Facebook's Algorithmic Priorities and User Engagement

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Digital advertising platforms rely on algorithms to push paid advertisements to users. There remains a lack of clarity regarding algorithmic influences on reach, engagement, and recall for social media advertisements, particularly for public health campaigns. The purpose of this study was to further explore the ability of public health efforts to rely on social media algorithms to determine campaign reach and effectiveness. Four campaign messages designed to inform parents and caregivers about the harms of THS exposure for children were disseminated on Facebook for five months. Messages included images of children with a 4-part narrative that varied in scenario specificity. Following eight months of data collection, analyses found that the algorithm detected a strong user preference for more specific narrative scenarios with higher personalization. However, engagement data suggest that users might be more curious or have more opinions across messages than the algorithm could detect. Further, the algorithm did not sufficiently push advertisements to users who clicked on a past advertising link. Findings suggest that public health campaigns cannot rely on recruitment advertisements to signal prioritization of future advertisements to users and that traditional survey-based methods of assessing participant recall should be reconsidered to more accurately capture participant exposure.

Keywords: public health campaign, thirdhand smoke, tobacco prevention, Facebook, algorithms

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Thirdhand smoke (THS) is the toxic residue left behind from the smoke of cigarettes and cigars (Jacob III et al., 2017; Matt et al., 2011). It can persist in indoor environments for months to years after smoking stops (Matt et al., 2020, 2021). THS sticks to surfaces, accumulates in dust, and becomes embedded in everything from carpets and furniture to toys and pillows (Matt et al., 2004; Matt et al., 2008). The residue contains a mixture of toxic chemicals, including

several known to cause cancer and asthma (Jacob III et al., 2017). Humans are unintentionally exposed to these chemicals through skin absorption, breathing, and ingestion (Matt et al., 2011). Studies have found exposure to THS directly damages DNA, induces oxidative stress, and changes reproductive cell function (Hang et al., 2017; Martins-Green et al., 2014). Children are most at risk for negative health effects from THS exposure (Jacob III et al., 2017; Northrup et al., 2016), with research finding that parents need additional resources and information regarding THS risks and preventions (Record et al., 2024).

In 2019, researchers at California's Thirdhand Smoke Resource Center launched a state-wide social media campaign designed to educate adults about the risks of exposure to THS (Record et al., 2023). The THS awareness campaign recruited a panel of participants using Facebook's algorithm targeting California adults of low to middle socioeconomic status interested in children, travel, pets, cars, apartments, or real estate. After consulting with a member of Facebook's community research team, the working assumption was that the Facebook algorithm would prioritize pushing advertisements to users who clicked on an advertisement in the past from the same account. (This premise is consistent with the experience of searching online for a specific brand and then seeing an advertisement from that brand on social media platforms upon the next login.) In this case, that means that users who clicked on an advertisement from the Thirdhand Smoke Resource Center's Facebook page would be prioritized to receive future advertisements from the same account. Given this logic, the team recruited over 1,000 panel participants using Facebook's advertising system. Since all participants joined the study through the advertising system, it was assumed that they would be prioritized to receive future messages from the same Facebook account. Following the seven-month public health campaign, the investigators concluded that exposure to their seven campaign messages improved audience knowledge, attitudes, and perceived self-efficacy related to THS. However, the investigators also noted challenges in evaluating the reach and effectiveness of campaign messages. Specifically, the low levels of message recall contradicted the high reach and engagement data reported on the platform. Such unclear influence of Facebook's advertising algorithm is not unheard of in the academic literature and presents an opportunity for additional research.

LITERATURE REVIEW

Facebook's advertising platform has been at the forefront of reshaping modern advertising practices (Crain, 2019). The ease and simplicity of the platform are believed to be a key reason for the draw from organizations seeking to reach large, diverse audiences at low costs (Crain, 2019). But unlike more traditional forms of advertising that rely heavily on humans for decision making, digital advertising platforms, including Facebook, rely on their algorithms to make advertising decisions regarding which users seek which ads when and how often (Dempster & Lee, 2015). The challenge with such reliance is the lack of clarity regarding algorithmic influences on social media advertising outcomes. For example, although it often seems that social media advertising algorithms capture search history to determine which advertisements users see at an alarming rate, the low recall findings from the first THS education campaign demonstrate inconsistency with that expectation. The inability to count on consistent algorithmic decision-making is especially challenging in the public health sector. This is because the sector typically has limited resources, precise outcome goals following exposure that need to be documented (e.g., through survey responses), and longer evidence-based rationales in their advertisements, which require more reading that can substantially prolong the time a user spends with an advertisement, triggering algorithmic decision making more aligned with timed-out inactivity.

Given that meta-analyses find social media presence has enhanced behavior change outcomes across a variety of public health communication campaign topics (An et al., 2017; Laranjo et al., 2015), public health campaigns, in particular tobacco prevention campaigns, have been a prominent area utilizing the audience targeting and reach benefits of digital platforms. Despite the high degree of use, many questions remain regarding the extent to which the algorithms influence public health campaign reach, engagement, and recall. Research in this area is starting to mount, with a variety of studies examining the role of algorithms within the context of public health marketing. For instance, studies have explored the role of algorithms for audience tailoring (Kim et al., 2019), cessation recruitment (Ramo et al., 2014), enhancing educational curriculum (Kousoulis et al., 2014), exposure recall (Romberg et al., 2020) and organically reaching

users (Pócs et al., 2021). As public health and communication scholars continue to utilize novel and technologically savvy dissemination channels, some questions still remain.

The purpose of this study was to further explore the ability of public health campaigns and interventions to rely on social media algorithms to determine campaign reach and effectiveness. To do this, the Thirdhand Smoke Resource Center launched a second campaign with similar educational goals. Given that children are most at risk for negative health effects (Jacob III et al., 2017; Northrup et al., 2016) and parents are in need of additional educational information (Record et al., 2024), this campaign centered the goal of informing parents and childcare providers about the harms of THS exposure for children. The following research question guided this area of inquiry.

RQ1: What message characteristics are prioritized by the Facebook algorithm?

RQ2: How does engagement data vary across messaging and reflect algorithmic priorities?

RQ3: To what extent do Facebook algorithms prioritize advertisements to users who clicked on an advertisement from the same account in the past?

METHODS

Message Development

Building on the findings from the first campaign (Record et al., 2023), the goal of the present campaign was to increase awareness among parents and adults who care for children (e.g., grandparents, teachers) regarding the negative effects of THS exposure for children. Message development followed best practice guidelines (Atkin & Freimuth, 2013) and began with a thorough review of existing campaign images designed to educate adults about children's health. Six potential images were modeled from these campaigns. These images were iteratively reviewed by content and persuasion experts before being finalized for pilot testing with focus groups.

In addition to the image, the companion text to be used as the Facebook caption was informed by the substantial body of research demonstrating the persuasive impact of narrative messages. A recent meta-analysis confirmed that narrative messages have a stronger and more sustainable persuasive impact on attitudes, intentions, and behaviors compared to non-narrative messages (Oschatz & Marker, 2020). Further, another meta-

analysis found narratives told from the first-person point-of-view have a stronger persuasive impact on perceptions than third-person narratives and that the effects were significantly stronger for stories written in the past tense and that depicted the protagonist as being similar to message recipients (Chen & Bell, 2022). Given these findings, the present campaign paired the visual images with first-person narratives from the perspective of a parent. Although each narrative presented a unique scenario of THS exposure risks for children, all narratives followed the same 4-part structure: (1) presentation of the situation, (2) learning about and explaining what THS is, (3) application of knowledge to the situation, and (4) action taken to protect their child from THS exposure, including reaching out to the Thirdhand Smoke Resource Center for additional information. To explore how the Facebook algorithm would respond to narrative types, half of the narratives were written as broad experiences with low personalization, and half were written with more specific experiences with higher personalization. Six narratives, each paired with one of the draft images, were also iteratively reviewed by content and persuasion experts before being finalized for pilot testing with focus groups.

The six campaign images with their paired narratives were focus group tested with members of the target audience in the Los Angeles area; participants received a $50 gift card in exchange for their time. Based on focus group feedback, four final images and narratives were selected for the campaign, which can be seen in Table 1. These messages were formatted to fit the look and advertising requirements of Facebook.

Participants

Five weeks before the campaign launched (November 24, 2020), participants were recruited via a Facebook advertisement targeting eligible adults. Using Facebook algorithms for advertisement targeting, the audience characteristics were defined using the following predetermined categories in the Facebook advertising system: (1) living in the United States, (2) age 18 and older, (3) having interests in grandparenting, parenting, smart parenting, early childhood, grandparent, parent, child, kids, child development, parent-teacher association, child development stages or working parent, or (4) employment as a grandparent. With these targeting characteristics, the estimated sampling frame was 130 million people.

Table 1

Final Campaign Messages: Images with Full Narratives

	Campaign Messages			
Theme	Playing through Touch	Crawling on Floors	Recently Quit Smoking	Holding an Infant
Image				
Specificity	Broad	Broad	Specific	Specific
Narrative Part 1: Presentation of the situation	I thought the risks of tobacco exposure ended with secondhand smoke. But then a friend told me about toxic tobacco smoke residue, known as thirdhand smoke.	When my daughter was learning to crawl, I worried how to keep the dirt out of my carpet. Then I searched online and found out there is something worse than just dirt--thirdhand smoke.	I stopped smoking a few years before we had our son. I was horrified to learn that toxic tobacco residue, called thirdhand smoke, was probably still in our home.	I learned a lot about the harms of tobacco use while I was pregnant. What surprised me most was learning that smoking can leave behind a residue, known as thirdhand smoke.
Narrative Part 2: Learning about what THS is	Thirdhand smoke residue can stick everywhere my daughter crawls and on anything she puts in her mouth. What is worse, the residue can remain in carpets and on surfaces for years after someone stops smoking.	Thirdhand smoke is the toxic residue that can remain years after someone stops smoking. Carpets are like sponges for this residue, soaking up tobacco smoke chemicals and releasing them back into the air.	Thirdhand smoke is the toxic residue that can remain years after someone stops smoking. The residue can stick everywhere my son crawls and on anything he puts in his mouth.	Thirdhand smoke sticks to the clothes, skin, and hair of smokers unless they wash it off. Until then, the toxic residue can be passed on to other people, including my baby.
Narrative Part 3: Application of knowledge to the situation	What scared me most was discovering that thirdhand smoke can hurt her lungs and make it harder for her to build a healthy immune system.	I was alarmed to find out that even a little exposure to the chemicals in thirdhand smoke could hurt her lungs and weaken her immune system.	What scared me most is that studies found nicotine on the hands of children who live in homes of former smokers like me. Even a small amount of exposure to thirdhand smoke can hurt my son's lungs and make it harder for him to combat infections.	I didn't realize that even a small amount of exposure to the chemicals in thirdhand smoke can hurt her lungs and make it harder for her to fight infections.
Narrative Part 4: Action taken to protect their child from THS exposure	I knew I had to make sure that my daughter was not exposed to thirdhand smoke. I found practical information at thirdhandsmoke.org to help me protect her.	I wanted to keep my daughter healthy, so I visited thirdhandsmoke.org to learn how to keep thirdhand smoke out of our home.	I wanted to make sure my son was living in a home without thirdhand smoke, so I visited the resources page of thirdhandsmoke.org to learn what I could do to keep him safe.	Since my in-laws smoke, I knew I had to talk with them about the health risks of thirdhand smoke residue. So I went to thirdhandsmoke.org for tips on how to talk with them about washing their hands, washing their faces, and changing their clothes before holding my baby.

Individuals who clicked the recruitment advertisement were directed to the baseline survey. Facebook estimates the advertisement produced 735,233 impressions, with 376,509 unique individuals reached. Of those reached, Facebook recorded 6,058 advertisement clicks with an advertisement cost of $4,054.14 (i.e., $.067/click). Of those who clicked the advertisement, 1,118 attempted to participate in the Qualtrics baseline survey. After removing participants who did not provide e-mail addresses for follow-up and duplicates, 684 unique participants were included in the study. Participants agreed to a panel design study, receiving an invitation to complete one survey a month for the next eight months. Across the intervention, participants were incentivized as follows: ten participants were randomly selected to receive a $100 Amazon gift card at the first wave, five were randomly selected to receive a $50 Amazon gift card at the middle six waves, and five were randomly selected to receive a $100 Amazon gift card at the last wave (total incentive budget of $3,000).

Intervention Procedures

Following two months of baseline data collection, the four campaign messages were posted as Facebook advertisements daily for five months (December 12, 2020 through Jun 20, 2021) using the same targeting terms as the recruitment advertisement. The bid strategy was set in Facebook at "highest volume," meaning the algorithm was allowed to push messages based on the anticipated highest volume of link clicks. The budget for the campaign messages was $10,500. When clicked, the campaign messages directed users to the home page of the Thirdhand Smoke Resource Center website (thirdhandsmoke.org). Each month, the 684 participants received an e-mail invitation (and two reminders) to complete the next survey.

Measures

The survey instrument was the same one used in the first thirdhand smoke education campaign (Record et al., 2023). All eight surveys included items to assess social media use, behavioral outcomes, and THS-related exposures and perceptions. During the intervention period, surveys also included items to assess message recall. Demographic characteristics were collected at baseline.

The approach to assessing campaign recall follows past practices (Record et al., 2023; Record et al., 2017). Participants were shown all four campaign images and asked to

select which they recalled seeing over the last month and, for those they recalled seeing, how frequently they recalled having seen them from once or twice to every day (i.e., 1 = once or twice, 2 = every week, 3 = most days, 4 = every day). Participants who did not report that they recalled seeing the images were automatically coded as 'never' seeing the advertisement.

Data Analysis

Multivariable regression analyses were completed in Stata Version 18 (StataCorp, 2023); all other analyses were performed in IBM (2019) SPSS. Participants with six or more missing item responses across the measures of knowledge, attitude, efficacy, and behavioral intention were excluded from the within-wave analysis. For participants with fewer than six missing responses, hot-deck imputation (Andridge & Little, 2010) in Stata (2019) was used, replacing missing values via variable matching based on within-wave gender and smoking status (n = 16, 2.3%). The approach replaces the missing data with a randomly selected response from the matched options.

Preliminary analyses examined influences on participation by modeling attendance using logistic regression at two timepoints. First, between survey 1 and survey 2, age and education significantly accounted for the probability of participation, with younger and more educated adults more likely to participate. Second, between survey 1 and survey 8, education significantly accounted for the probability of participation, with more educated adults more likely to participate. Further, binomial regression modeling was used to explore influential factors on the number of completed surveys by a participant. Analyses again found age and education to significantly account for the number of completed surveys, with younger and more educated adults completing more surveys.

RESULTS

Among the 684 participants, 80 (12%) completed all eight waves of data collection. Preliminary analyses found that prior to the study, 55% of participants had not heard of the term THS. Select demographic data are presented in Table 2; perceptions of THS and personal exposure in the past 30 days are presented in Table 3.

Table 2

Demographic Characteristics of Participating U.S. Adults by Survey

Survey: Phase	N (*Att)	Smoker %[a]	Female %	Age *M* (SD)	White %	FB Activity[b] %	Employ[c] %	Educ[d] %	Adults[e] *m*(SD)	Children[f] *m*(SD)	Own Home[g] %	SF Home[h] %	Pets[i] %
1: Pre	701	18%	92%	43.24 (12.41)	49%	40%	54%	27%	2.78 (4.67)	2.03 (5.01)	37%	57%	63%
2: Pre	231 (33%)	14%	88%	40.92 (11.29)	54%	38%	57%	39%	2.47 (1.85)	1.71 (1.47)	44%	58%	64%
3: During	204 (29%)	15%	93%	42.45 (11.06)	56%	40%	56%	38%	2.51 (1.92)	1.64 (1.34)	46%	64%	65%
4: During	173 (25%)	10%	91%	41.45 (11.51)	55%	36%	60%	39%	2.55 (2.07)	1.53 (1.35)	47%	60%	64%
5: During	165 (24%)	12%	89%	41.52 (11.04)	54%	36%	60%	40%	2.54 (2.02)	1.56 (1.42)	45%	62%	71%
6: During	152 (22%)	13%	90%	41.26 (11.65)	55%	37%	61%	34%	2.66 (2.47)	1.57 (1.42)	42%	61%	70%
7: Post	134 (19%)	14%	91%	43.20 (12.01)	61%	37%	60%	35%	2.58 (2.18)	1.46 (1.38)	43%	65%	70%
8: Post	154 (22%)	11%	92%	43.08 (11.87)	55%	31%	64%	33%	2.81 (2.86)	1.50 (1.36)	44%	68%	71%

Notes: Data collected pre COVID-19 stay-at-home orders. *percent attrition from wave 1; [a]individuals report smoking some days or every day; [b]Belief that they are more or much more active than their peers on Facebook; [c]Full-time, part-time, or retired; [d]Bachelor's Degree or higher; [e]Adults 18 or older living in the home; [f]Children age 17 or younger living in the home; [g]Homeowner; [h]Living in a single-family home; [i]A pet lives in home at least 5 days a week

Table 3

Reactions to THS and Self-Reported Exposure to Tobacco Smoking and Vaping in Past 30 Days by Survey

	Pre		Intervention				Post	
	Survey 1	Survey 2	Survey 3	Survey 4	Survey 5	Survey 6	Survey 7	Survey 8
*Select your level of agreement, m(SD)								
I find the smell of stale tobacco smoke unpleasant.	4.40 (1.12)	4.53 (0.94)	4.48 (1.00)	4.53 (0.86)	4.60 (0.72)	4.60 (0.78)	4.56 (0.89)	4.47 (1.01)
Stale cigarette smoke makes me feel ill.	3.99 (1.23)	4.10 (1.12)	4.05 (1.13)	4.16 (1.03)	4.16 (1.04)	4.18 (1.08)	4.14 (1.06)	4.23 (1.05)
In the last month…(%)								
No one smoked inside my home.	71%	75%	77%	77%	79%	81%	78%	81%
No one vaped inside my home.	76%	78%	80%	75%	82%	80%	80%	82%
I was in a place that smelled of stale tobacco smoke.	65%	56%	52%	52%	52%	46%	44%	52%
I have not spent time with a family member, friend, or co-worker who smokes cigarettes.	42%	52%	51%	59%	59%	59%	54%	52%
I have not spent time with a family member, friend, or co-worker who vapes.	71%	71%	78%	73%	77%	76%	73%	79%

Notes: Wave sample sizes are provided in Table 1. Questions asked each wave; *Response options on a 5-point scale from strongly disagree to strongly agree

Algorithmic Message Characteristic Priorities

The first research question considered what message characteristics are prioritized by the Facebook algorithm as demonstrated through engagement data. The four message

themes varied in their scenario specificity (see Table 1). Based on the Facebook impressions (i.e., number of news feeds on which the advertisement appeared), reach (i.e., the advertisement fully loaded), and click (i.e., the individual clicked on the advertisement) data presented in Table 4, it appears that the algorithm, for reasons unknown, detected a strong user preference for more specific narrative scenarios with higher personalization. This is evidenced by both of the narratives with specific scenarios having (1) at least four times higher impressions, (2) at least two times higher reach, and (3) at least 1.6 times more clicks than a broad message with lower specificity.

Table 4
Facebook impression, reach, and click data by message

	Campaign Messages*+			
	Playing through Touch	Crawling on Floors	Recently Quit Smoking	Holding an Infant
Scenario Specificity	Broad	Broad	Specific	Specific
Impressions	23,906	234,257	1,010,775	1,039,885
Reach	19,687	143,462	345,958	561,767
Impressions to reach conversion rate	*82.4%*	*61.2%*	*34.2%*	*54.0%*
Clicks ($/click)	168 ($0.62)	2,963 ($0.44)	4,896 ($0.45)	17,320 ($0.40)
Reach to click conversion rate	*0.9%*	*2.1%*	*1.4%*	*3.1%*
Reactions	9	181	138	957
Comments	2	89	67	>1,100
Shares	1	58	66	457

Notes. *See Table 1 for message descriptions; +Differences reflect the selected bid strategy of "highest volume," which prioritizes amount of clicks

Algorithmic Engagement Priorities

The second research question examined how engagement data varies across messaging and how that variation reflects algorithmic priorities. Based on the Facebook reaction, comment, and share data presented in Table 4, user engagement generally followed algorithmic priorities with higher user engagement on the more specific narrative scenarios with greater personalization. However, this was not as clear as the algorithm

distinctions, with one of the more specific narrative scenarios (i.e., recently quit smoking) receiving similar engagement shares but less engagement reactions and comments than one of the less specific narrative scenarios with lower personalization (i.e., crawling on floors). Although the algorithm clearly identified a user preference between narrative types, engagement data suggests that users might be more curious or have more opinions across messages than the algorithm could detect.

Algorithmic Engagement for Past Clicks

The third research question sought to explore the extent to which the algorithm pushes advertisements to users who clicked on an advertisement in the past. To begin, the Facebook advertising system records multiple types of message exposure, including impressions, unique individuals reached, and clicks. After five months, collectively, the messages recorded over 2.30 million impressions, reached 914,557 users, and had 25,347 link clicks (cost of $0.41/click). Within each of the five intervention periods, the majority of participants did not recall any of the campaign messages (range of zero recall: 68.9% [survey 7] – 82.5% [survey 3]). Recollection of one message ranged from 9.5% (survey 3) to 17.8% (survey 7); two messages ranged from 7.1% (survey 6) to 10.4% (survey 7); three messages ranged from 0.7% (survey 7) to 3.0% (survey 5); all messages ranged from 0.6% (survey 4) to 2.2% (survey 7). Given the low recall from the recruited participants, these data suggest the algorithm is not sufficiently pushing advertisements to users who clicked on a past advertising link.

DISCUSSION

Through implementing a campaign designed to inform adults about the harms of THS exposure for children, the purpose of this study was to explore the role of algorithms during a public health campaign. Overall, findings show that engagement was generally high, with some variation across message types. However, message recall was substantially low. Based on meta-analytic findings that the average campaign will reach over 40% of its target audience (measured via campaign recall; Snyder & Hamilton, 2002), the fact that the present campaign never reached over 32% of its target audience within a surveyed time period suggests that the algorithm was not reliable for prioritizing participants who had clicked on an advertisement from the same account in the past.

Although participant recall is known to underestimate exposure, the span of this discrepancy suggests challenges beyond the limitations of self-reported recall.

As requested by the advertising system, the cost per click was reasonably consistent across the four messages (as opposed to forcing the platform to push the four messages at equal rates). This setting allowed the research team to consider more nuanced preferences among users that might be missed otherwise. For instance, the observed variations in narrative type preference among both the algorithm and users are consistent with past research (Kim et al., 2019). Results showed the Facebook algorithm detected a clear distinction in user response to scenario specificity, with an expectation that users were most likely to click on more specific narrative scenarios with higher personalization; this is consistent with past research on narrative messaging (Chen & Bell, 2022; Oschatz & Marker, 2020) and on consumer engagement behaviors (Lee et al., 2018). Interestingly, engagement data found that to be mostly true, with two opposing narrative scenarios producing similar engagement results. Conflicts between engagement data and algorithmic preferences are not unusual, with some research suggesting the algorithm might be uniquely influenced based on the type of engagement data, such as shares, guiding algorithmic decision-making more than reaction types (Pócs et al., 2021).

Understanding algorithmic influences on tobacco prevention advertisements contributes to our scholarly understanding of how public communication environments, such as social media platforms, create spaces of behavioral influence (Hornik et al., 2022; Liu et al., 2019). As Hornik and colleagues argue, "media effects naturally occur in the context of such a complex [public communication environment], where people are immersed in messages from multiple sources, and make behavioral choices reflecting their engagement with that environment" (Hornik et al., 2022, p. 188). Algorithms play a key role in determining user exposure to sources and messages. As public health advocates work to promote anti-tobacco messaging, digital advertising algorithms will continue to be a necessary entity to understand and leverage. Findings here suggest that message exposure needs to be more critically considered for health interventions relying on social media platforms; existing advertisement algorithms should not be exclusively relied upon for reaching target audiences. Present standards for assessing message exposure and

reach are of limited value, with more sensitive and valid exposure and recall strategies needed.

A few limitations need to be acknowledged. First, this study experienced recruitment challenges inconsistent with the past campaign (Record et al., 2023), possibly due to social technology shifts at the beginning of the COVID-19 pandemic. This resulted in a smaller sample size than initially planned. Now that we are in a distinct post-pandemic area, future campaign recruitment might return closer to pre-pandemic expectations. Second, engagement data only considered quantitative assessments, and qualitative analyses of comments were not considered in the present study. This limits the interpretive ability to consider the tone and sentiment of participant engagement. Future research would benefit from the insights provided in a content analysis of the message comments. Third, the vast majority of participants identified as female. Thus, the reported data could reflect a gender bias. Finally, the decision to set Facebook's advertising algorithm to vary as needed was made to establish patterns in algorithm preferences. Now that those patterns have been established, future research can further explore the relationship between algorithmic priorities and user engagement data by forcing the algorithm to push messages equally and then observe engagement differences.

Conclusion

Facebook's advertising platform and other digital platforms with advertising features are likely to continue setting the standards for modern advertising practices. For public health advocates, it is essential to understand the role of digital algorithms in prioritizing messages and the challenge of reconciling recall data with platform-reported reach. The more that is known about how digital advertising algorithms respond to public health campaign advertisements, the more precise the health prevention efforts can be. The findings here suggest that public health campaigns cannot rely on recruitment advertisements to signal prioritization of future advertisements to users. In addition, traditional survey-based methods of assessing participant recall should be reconsidered to more accurately capture participant exposure.

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Online Connections

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