Redirecting Existing Demand for Alternative Information Sources and Counternarratives towards Vaccine Confident Interpretations and Content to Improve COVID Vaccine Uptake

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finalmile. upstream

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Executive Summary

Our study aimed at exploring the nature of demand for misinformation, which is defined as the need to seek counter narratives, in order to address declining vaccine confidence. In many ways, staying unvaccinated is unexpected and inconsistent with rational decision theories. In spite of historical precedent of vaccination and trust in healthcare practitioners, they are motivated uniquely within COVID-19 context and common desire for safety for self and family, to arrive at their own conclusion, rather than defer the decision to medical and public health experts. For many, vaccine hesitancy is a result of unmet needs in the demand for information to make a decision.

Our research revealed that there are 5 drivers of demand that currently drive their consumption for COVID-19 vaccine content. These are:

1. Balance and Diversity
2. Freedom to Choose
3. Trust
4. Transparency
5. Certainty about value of time being spent

The key design levers that can be used to nudge social media users towards more COVID vaccine positive content and away from pathways that lead to vaccine hesitancy and misinformation:

- Categorizing content ratings through the lens of "tribe" drives trust
- Algorithm awareness can improve diversity, transparency, and autonomy and thus drive trust in platform
- Highest order aggregate data summaries enhance value of time
- Decision- or domain-specific ratings drive trust

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Supply side interventions have limitations

Supply side interventions aim to arrest the misinformation menace at its root. The primary focus has been:

1. Bringing in legislations against fake news (e.g. Honest Ad Bill 2017)
2. Information verification and monitoring using fact-checkers
3. Product development by social media platforms to remove economic incentives for spammers and create community support to identify misinformation
4. Media literacy programs
5. Journalistic certification systems (E.g. Reporters sans Frontiers)

Supply side interventions have had limited success. The core gaps include:

1. The difficulty in tracking and arresting misinformation in informal non-digital settings
2. Threat of biased censorship by the state to repress dissent
3. Absence of an uniform code to dictate fair moderation
4. Balancing censorship and free-speech

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The case for demand side interventions

Demand here refers to the need for seeking counternarratives to the mainstream narrative around the COVID vaccines, with an aim of making an informed decision.

The need for counternarratives is anchored to:

1. The perceived bias and the brewing distrust among population towards mainstream media/institutions/narratives
2. The inability to distill useful information due to information complexity, volume and lack of credibility markers in the information
3. Historical marginalization esp. among disadvantaged and minority groups

A desire to make a decision for themselves

A disproportionate unvaccinated population exists globally. In many ways, their behavior is unexpected and inconsistent. In spite of historical precedent of vaccination, where they fully trust their doctors and uptake other immunizations, they are motivated uniquely within COVID-19 context and common desire for safety for self and family, to arrive at their own conclusion, rather than defer the decision to medical and public health experts.

These individuals began their COVID vaccine consideration journey with a firm desire to make a decision for themselves. It comes from the lack of trust in the mainstream narrative.

Demand for information

Motivation for safety

Path to their decision

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Vaccine hesitant content serves this need better

In the current online information landscape, as compared to vaccine positive content, existing content that promotes "alternative narratives" cater to the need of formulating an individual conclusion - unfortunately, this content is often constructed to lead to a vaccine hesitant conclusion.

Once hesitant content is consumed, algorithms optimize for similar content. Breaking them free of this echo chamber is critical.

Demand for information in a environment marked by misinformation, uncertainty and distrust leads individuals to more vaccine hesitant conclusions than vaccine confident conclusions.

Demand for information → Vaccine hesitant pathways

Motivation for safety

Path to their decision
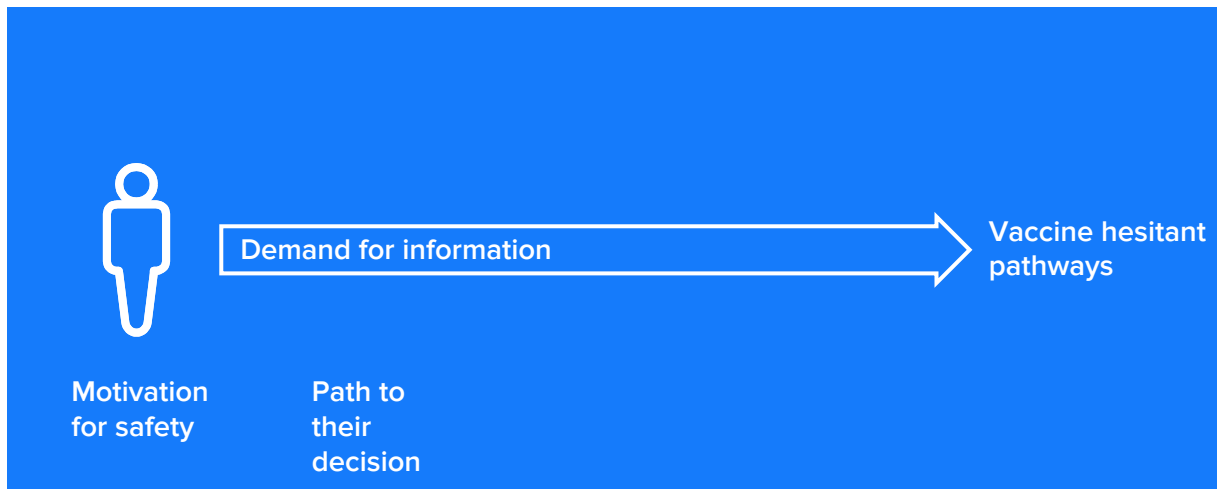
Rechanneling demand towards vaccine confidence

The demand can be channeled away from misinformation and vaccine hesitant content, and towards vaccine confident content, by intervening in the processes of search, judging and sharing of content on social media platforms.

In this study, we focused on search for and judging of content on YouTube. The key underlying hypotheses is that the goal of rechanneling demand can be achieved by understanding and addressing the needs that drive the demand.

How could vaccine positive pathways be more successful at meeting this demand?
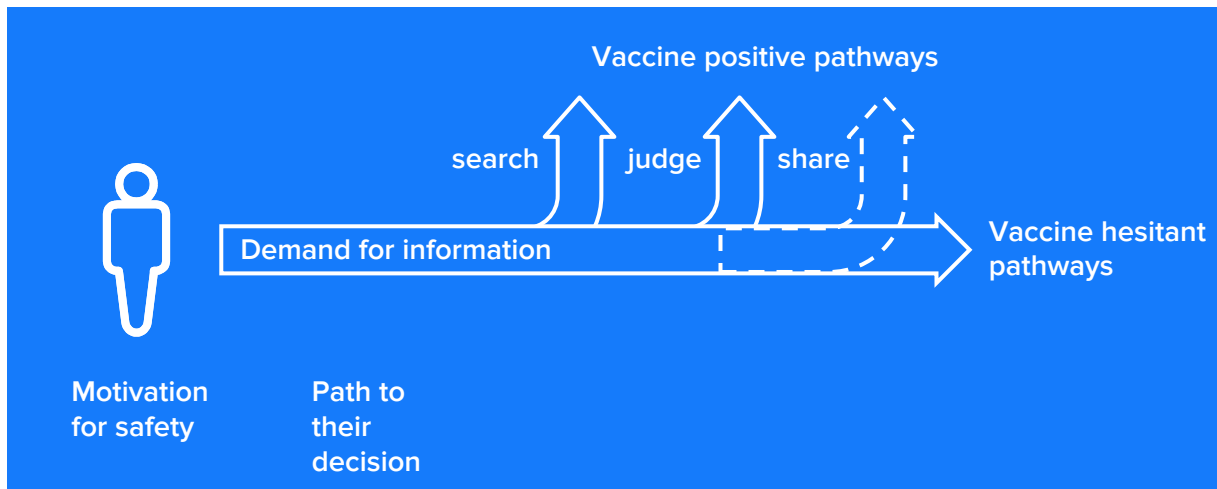
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Methodology

Research goals

This study aimed to identify behavioral levers that demonstrate the ability to nudge social media users off of vaccine hesitant pathways.

Specifically, it seeks nudge mechanisms agnostic of any specific platform intervention, thus enabling all platforms to leverage mechanisms in intervention design and evaluation.

This study intended to answer 3 key questions:

What needs do social media users satisfy by consuming vaccine hesitant content?

What are potential levers that could address these needs within content search and judgement situations?

Which levers and associated variables should social media platforms leverage in interventions?

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Research approach

This study leveraged YouTube as a social media proxy for understanding and intervening in the consumption of vaccine hesitant content.

The approach was exploratory and limited to identifying needs that drive vaccine hesitant consumption behavior and identifying search & judgement levers that both address these needs and demonstrate nudge potential.

A sequential mixed-method approach was deployed. Qualitative, generative, and quantitative approaches provided a cascade of outputs leveraged as inputs for each subsequent method.

Qualitative

Identified the needs people satisfy by consuming vaccine hesitant content

Generative

Explored levers to satisfy needs and ways to package them in YouTube interventions

Quantitative

Evaluated levers and their variables, and compared lever outcomes

African American target population

This study aimed to understand content search and judgement needs, and potential levers to nudge search and judgment behaviors through the lens of a population cluster. Vaccine hesitant individuals tend to cluster around strong relationships that reinforce alternative narratives for safety. They are often constructed around language, ethnicity, proximity, culture, etc.

Research has demonstrated that in context of distrust, individuals gravitate towards highly trusted, strong ties in their social networks.

The study focuses on African Americans living in rural areas in the Southern United States. This healthcare isolated population is in disproportionate need of Vaccine benefit, but significant barriers exist.

Rural and remote communities in the central and southern US have among the lowest COVID vaccination rates in the country. Historically, these communities have had poorer health outcomes, lower household incomes and lower educational attainment compared to other parts of the country. This cluster demonstrates a strong desire for autonomy. They want to make their own decisions and not be told what to do. They also express a desire to feel safe from COVID and have taken other vaccines in the past. These communities also harbor a deep mistrust of the 'urban, industrialized, coastal elites', who, they believe, constitute the majority of the government, mainstream media and academic institutions. This mistrust, we believe, alienates these communities from the mainstream narratives formed in more urban and affluent parts of the country, and drives the demand for 'alternative narratives'. Channeling this demand in the right directions can improve vaccine confidence and uptake in these communities and the country at large.

Research Objectives & Goals

To understand and unpack current online , YouTube, "content search" and "content judgement" behaviors in context of COVID vaccines to identify key behavioral drivers that can assist to channel "search" and "judgment" choices in a vaccine uptake conducive manner.

Goals

- *To explore the need for vaccine content*
- *To explore the triggers behind a users need for vaccine content search on YouTube*
- *To explore how covid-19 vaccine content is explored on YouTube*
- *To explore how content is judged and decisions are made to consume a particular content*

Qualitative Sample

6 triad in-depth interviews were conducted with a total sample size of 18.

A structured survey was used as a screener to build the sample frame from the population.

Points of representation within qualitative sample were
- African American ethnicity
- Southern U.S. state
- Rural geography
- Prior vaccination behavior for themselves or their family
- Not COVID vaccinated
- Desire for safety from COVID-19

Motivations

Motivations for information search manifest into approach and avoidance action tendencies.

Approach: *Proactive emotional responses towards attaining safety for self and family*

- To resolve confusion to make the right decision
- To be on the right side of the mandate
- To know and adhere to social norms and incentives to get vaccinated
- To capture divergent perspectives around covid vaccine

Avoidance: *Reactionary emotional responses to avoid risks and stressors that impact safety for self and family*

- Due to fear of complications due to existing comorbidities such as Cancer, Diabetes, Obesity etc.
- Due to fear of side-effects like enlarged breasts, heart disorders etc.
- Due to being skeptical of the rapid development of vaccine
- Due to the need to deconstruct government intent and motive

Core Needs

Qualitative findings suggested that there are 5 drivers of demand, seen in the target group of the study, that currently drive content consumption for COVID-19 vaccine and could be leveraged to direct demand towards vaccine positive interpretations. These needs are likely to be observed n contexts where trust deficit in institutions and mainstream narratives is an issue.

Currently, vaccine promotive content is not attuned for harnessing these drivers, while vaccine hesitant content may satisfy some of these successfully.

1. **Balance and diversity** - Individuals seek out counternarratives to the mainstream narrative to balance out the perceived mainstream bias

2. **Freedom to choose** (decision autonomy) - Individuals are strongly driven to make an informed decision for themselves, so they seek out content that informs rather than instruct

3. **Trust** - Individuals seek out experiences directly from first-hand sources as they distrust institutions

4. **Transparency** - Individuals glean available information (e.g. comments) to judge the incentives and inclinations of various sources

5. **Certainty about value of time spent** - Individuals avoid spending time on content that does not fulfill their needs

Heuristics Used

To search and scan

- The information theme or topics are sourced from a secondary source like TV news or yahoo news and then get channeled into YouTube

To judge content

- Content is judged in favor of predispositions, confirmation, cultivating diversity of views, real experiences, how others appraise information, and references.

To select content

- Content is selected based on certain video markers such as video length, video title, video date, familiarity with the channel, google search of the channel, number of subscribers and recent comments

To decide what to do next

- The decision to continue is based on how little dissonance is created with existing views and on the novelty & diversity of the video
- The decision to stop is based on the feeling of fatigue, irrelevance, confusion, and repetition

Concept Exploration

Theme Development & Ideation

The generative portion of this study focused on developing nudge concepts intended to fulfill needs identified in the prior qualitative study.

The effort started with multifunctional brainstorming sessions that included designers, researchers, and behavioral scientists which first developed solution themes and then ideas from themes.

After developing solution themes directly from needs uncovered in the qualitative study, 2 ideation sessions were conducted and focused on generating nudges intended to fulfill needs within search & judgement situations separately.

Ideation goals included addressing at least 2 needs per nudge idea. To help generate a diversity of ideas, ideation intentionally explored both internal and external motivations to fulfill needs and ideally nudge search and judgement behavior from current pathways.

Intrinsic motivations

Extrinsic motivations

Prioritized Ideas

Ideas were prioritized based on 4 heuristic measurements / judgements:

1. Breadth of needs addressed
2. Anticipated feasibility to execute on YouTube platform
3. Anticipated acceptability by YouTube users
4. Distinct focus on either content search or content judgement

Prioritization exercise led to 3 concepts. 2 search nudge ideas and 1 judgement nudge idea were prioritized for concept development.

|	**Point of Intervention**	**Potential Mechanism**
Prioritized Search Ideas	When a user searches for any COVID-19 related content, at the top of the search results there appears a bar showing a playlist containing a user sourced helpful videos and framed as "other people like to you" who have found these videos most useful in deciding about COVID-19 vaccines.	• Signal trust through different framing of 'others' as others "like you". "near you geographically" • Signal diversity using "this range of videos". • Signal certainty using "of the 50 million COVID-19 videos, these 12 have been deemed most helpful..."
	A prompt, containing an alternate set of videos determined by a diversity based algorithm, is presented at the top to the user on his/her profile feed as well as during their specific content viewing session, alerting the user that that he/she may be missing out on diversity aspect due to algorithm.	• Bring to the user's attention a lack of diversity in his/her viewing • Bring to the user's attention the potential algorithmic bias
Prioritized Judgement Ideas	While a user searches for COVID-19 content he/she is presented with an informational cue at the top of the comment section that presents an emotional sentiment analysis of the comment section.	• Assist users to gain awareness around the potential emotional nature of the content one can expect seeing this video and provide an avenue to the users to avoid sub-conscious emotional congruence with the video

Concept & Prototype Development

Starting from each prioritized concept, the multi-functional team of designers, researchers and behavioral scientists defined specific concept attributes such as language/phrasing, functionality, and placement within the YouTube mobile platform.

Designers then developed static prototypes of the interventions (highlighted in blue field) within the YouTube interface.
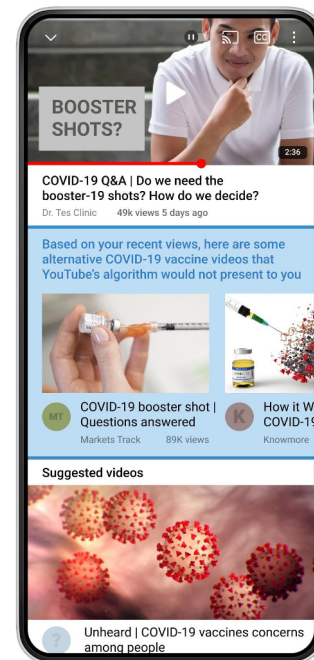

Goal: Nudge users towards credible trust and quality anchors
Characteristics: finite content, decision framing, cultural norms, user neutrality
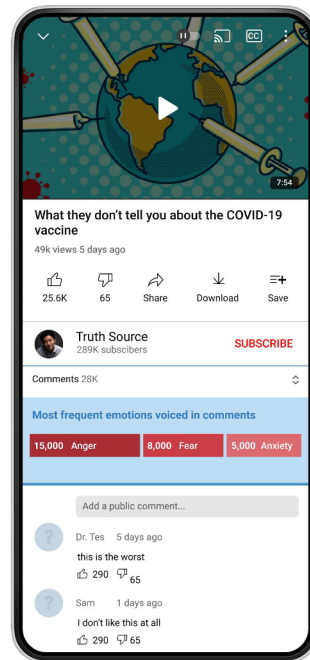
Goal: Nudge users away from watching vaccine hesitant content
Characteristics: emotional/sentiment salience data format, user neutrality

Goal: Nudge users out of their current algorithmic bubbles
Characteristics: self awareness, attribution,

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Quantitative Insights

Quantitative Objectives

To test the 3 behaviorally informed design concept's key levers.

Goals
- *To test the effectiveness of the primary behavior change mechanism in each concept*
- *To test the helpfulness of each concept in navigating information and making decisions*
- *To test the core needs that are being fulfilled by the concept*
- *To test alternative framings and configurations of the concept*

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Quantitative Sample

The sample size for quantitative research was 500.

The recruitment of the sample was done over telephone and email using a survey screener. The points of representation for the sample were:

- Age 30-55
- African American
- Southern U.S. state
- Rural and Semi urban geographic areas
- Prior non COVID-19 vaccination behavior
- Unvaccinated for COVID-19
- Uses social media to search for COVID-19 information
- Active YouTube user
- Harbors at least some degree of COVID-19 vaccine concern

Quantitative Survey Structure

A structured online survey questionnaire was used as the research instrument for data collection.

The survey was structured to test the 3 solution concepts individually as well as relatively.
- The survey was structured in a way that each of the objectives were captured by 1 question.
- Question 1 was meant to test the effectiveness of the lever. The spotlight was taken away from the user and questions were curated to seek their view is of the majoritarian preference.
- Question 2 involved understanding the degree of helpfulness on a Likert scale.
- Question 3 tested each solution concept on their relevance in meeting the core needs
- Question 4 and 5 were unique to each solution concept and involved testing the different frames of the solution concept.
- The final part of the questionnaire involved ranking each solution concept against each other on their inclusivity, upholding freedom to choose and need satisfaction.

# CONCEPT 1

Concept 1

Stimulus

Presenting users with a definite playlist of videos that indicates its helpfulness as sourced from 'others' and whose size is defined too

Needs being addressed

- Balance and Diversity
- Certainty of value for time
- Freedom to choose

Probes

- To explore what users understand from the word 'others' in the intervention
- To explore what is the most preferred approaches to helpfulness ratings by the users

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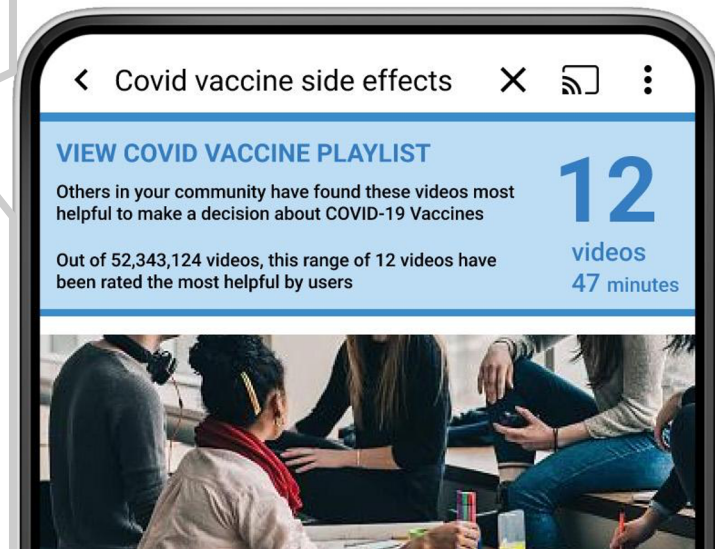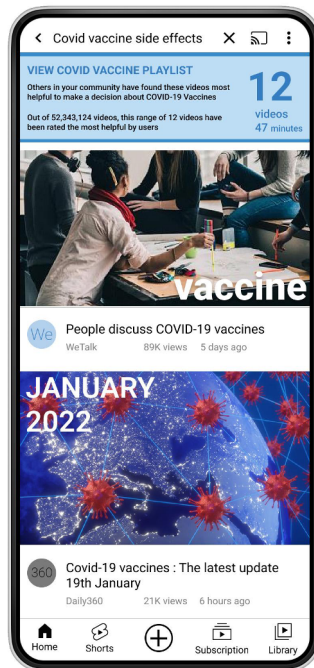
Insights

Key Learnings

- Videos rated helpful (43%) by other users are 'most likely' to motivate user to click the playlist as compared to views (25%) and likes (32%) which are not key signals for audience to evaluate and click

- User prefer others when they are defined as 'others similar to you (49%)' than 'other YouTube users (19%)' signaling preference for wisdom of the tribe than wisdom of the crowd

69% rated the effectiveness of mechanism 6 or more, with a mean score of 6.57

82% rated the concept moderate to extremely helpful

75% rated the concept moderate to most likely to satisfy needs

76% rated the concept moderate to most inclusive and neutral

78% rated the concept moderate to most supportive of autonomy

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What we think

Facilitating search and judgement of content over prescription of content

- The concept appeared to satisfy the core need of the users by facilitating the search and judgement when the collection of content is positioned as one that may be found as 'helpful' and not prescribing any solution thus reserving the right of judgement with the user itself.

Sourcing trust from closer ties preferred over weaker/broader ties

- The user response suggests that a broader affiliation ('YouTube community') while sourcing credibility for the information interventions is less efficient than a narrower affiliation, one which is closer to a similar group ('people like you'). This is consistent with other vaccine hesitant behaviour that historically avoids the reliance on a large institutional voices in contrast to individual human experiences.

Making the search more certain and valuable

- The concept provides a heuristic to the users to judge the expected certainty and value of time they invest by providing them with a small but finite playlist and at the same time providing another point of reference through total number of videos available that a user might have to skim through to achieve his/her search objectives.

# CONCEPT 2

Concept 2

Stimulus

Presenting users with an information prompt that informs them about the sentiments contained in the comments

Needs being addressed

- Balance and Diversity
- Transparency

Probes

- To explore what kind of sentiment analysis users favour
- To explore what type of information framing – absolute vs percentage, do users prefer

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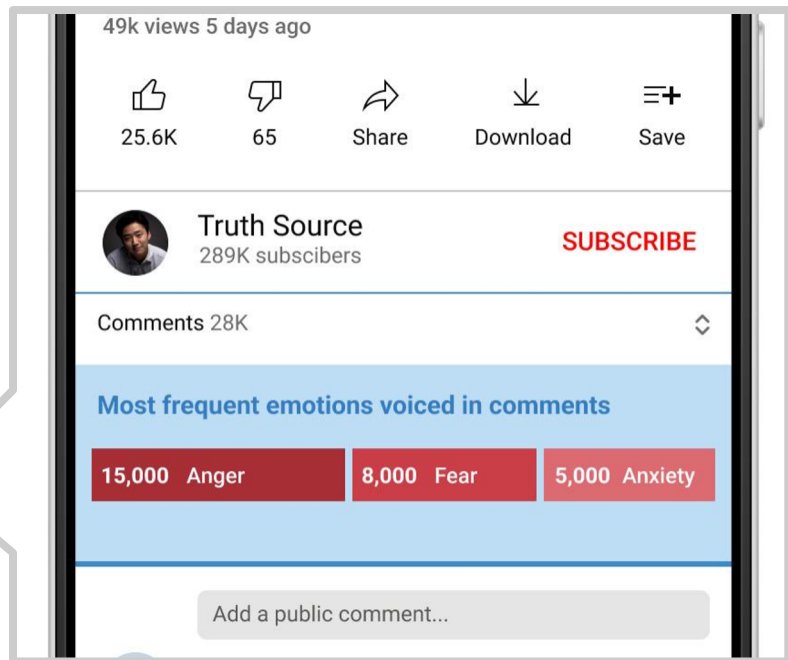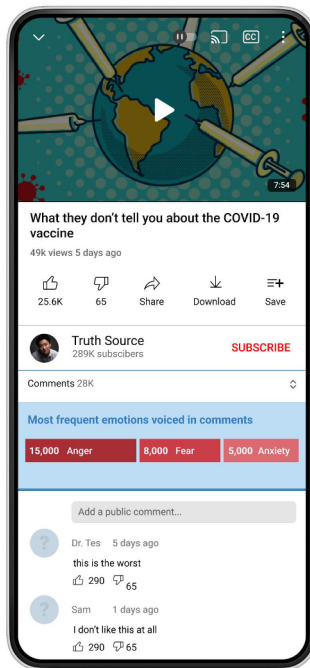
Insights

- Framing of information in '%" was preferred more than framing of information in absolute numbers to evaluate sentiments of the comments (59% vs 41%)

- Information that provides users with overall sentiment contained in the comments was preferred over information that provided specific emotions contained in the comments (63% vs 37%)

71% rated the mechanism 6 or more, mean 6.52

85% rated the concept moderate to extremely helpful

67% rated the concept moderate to most likely to satisfy needs

64% rated the concept moderate to most inclusive and neutral

61% rated the concept moderate to most supportive of autonomy

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What we think

Making expected emotional nature of video visible
- This concept appears to aid the need for users to avoid highly emotionally charged content while they search for information and use the information on emotions for judgement of content.

Sourcing the information from other users is perceived to be more transparent
- This concept also seems to provide users with an element of transparency in that the feature offered them an objective assessment through sentiment analysis of the comments by sourcing sentiments from the comments section than a subjective evaluation of the content by the platform.

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CONCEPT 3

Concept 3

Presenting users with a suggestive content, while they view a covid-19 vaccine related content, that provides them with a set of videos that they generally miss out on because of YouTube's algorithm

Needs being addressed

- Balance and Diversity
- Certainty of value of Time
- Freedom to choose
- Trust

Probes

- To explore different framing to present the idea that a user might be missing out on certain videos

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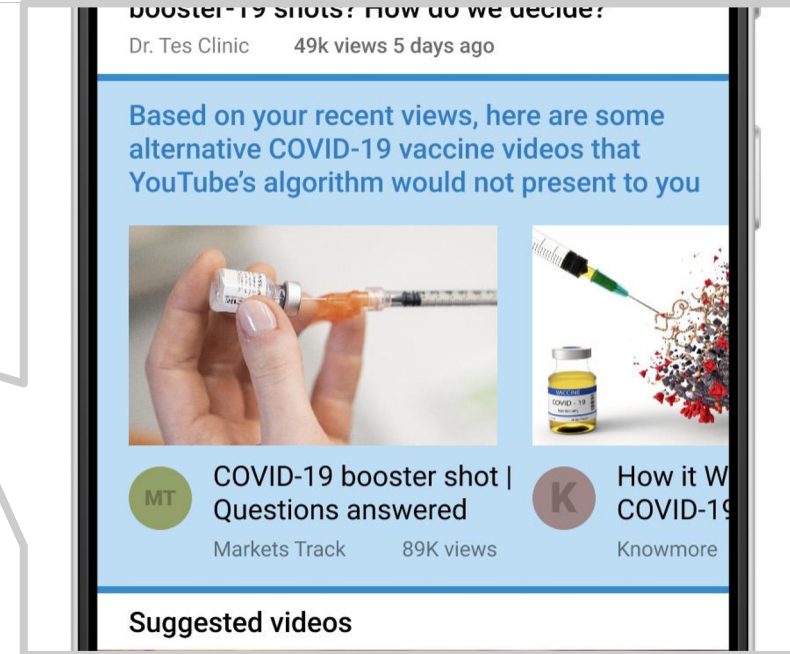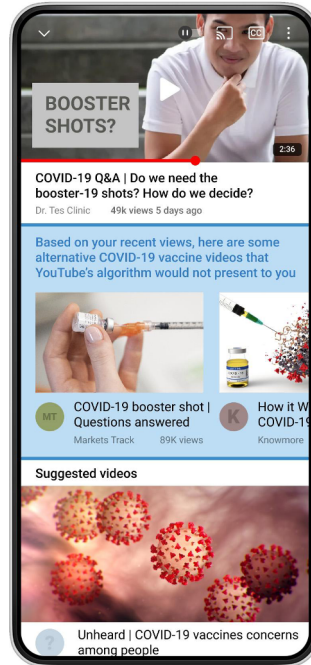
Insights

- Flagging playlist as something that has been overlooked due to YouTube algorithm than individual judgement preferred

- Fear of missing out was not seen to be playing a role indicating that people exercise agency in search and choice and avoid feeling a sense of loss of time invested in past consumption behavior.

70% rated the mechanism 6 or more, mean 6.67

80% rated the concept moderate to extremely helpful

59% rated the concept moderate to most likely to satisfy needs

59% rated the concept moderate to most inclusive and neutral

62% rated the concept moderate to most supportive of autonomy

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What We Think

A means to signal balance and diversity
- The key success indicated by this concept is a nudge that could inject new content into an existing search pathway which is likely vaccine hesitant. The direct appeal of content counter to the one suggested through algorithm is strong representing a potential new means to deliver balance and diversity.

Preserving control over content choice and judgement
- Users appear to have related directly to the positioning of the counter content as suggestions to the YouTube algorithm. This may indicate that they have a high awareness that they are subject to the algorithm yet also an inability to escape it. Acknowledging this and also giving the user the choice to access the counter-algorithm content preserves a sense of agency and choice.

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Comparative results

	Concept 1 (%)	Concept 2 (%)	Concept 3 (%)
most likely to satisfy your needs for navigating COVID-19 vaccine content online	51	28	21
most neutral and inclusive to least neutral and inclusive	50	26	25
most supportive of freedom to choose what to watch to least supportive	47	25	28

Note: Numbers rounded off

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Interpretation:

- Concept 1 was the preferred solution concept as compared to Concept 2 and Concept 3.

- Concept 1 with its idea of a definite playlist, assured quality content, sourcing trust from close ties appears to satisfy user needs during COVID-19 vaccine content search, provide neutral and inclusive content and at the same time preserving an individual's agency and control through freedom of choice.

Conclusion/Recommendation

Applying/scaling this structure

NEEDS	LEVERS	EXPERIENCE POINT	BEHAVIOR (nudge)
Balance & Diversity	Time Certainty	Initial search page	Use trust anchors
Autonomy	Reference Social Group	Selected video pre-watch	Avoid contentious content
Trust	Social Signal	Suggestions post-watch	Diversify consumption
Transparency	Informational Framing	Others outside study	Others outside study
Certainty of effort	Sentiment Framing		
	Bias Attribution/Anchor		
	Content Curation		

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Designing effective nudges

How could vaccine positive pathways be more successful at meeting the demand for information?

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Vaccine positive pathways

SEARCH levers

| Time Certainty |
| Informational Framing |
| Content Curation |

JUDGE levers

| Sentiment Framing |
| Reference Social Group |
| Social Signal |
| Bias Attribution/Anchor |

Path to their vaccine decision

Demand for information

Vaccine hesitant pathways

Motivation for safety from COVID

NEEDS that drive pathway

Balance & Diversity	Transparency
Autonomy	Certainty of effort
Trust	

Final Mile Consulting & Upstream Thinking

Recommendations for SM Platforms

- Categorizing content ratings through the lens of "tribe" drives TRUST.
  Categorize content reactions and ratings by user specific attributes such as proximity, age, gender, race, etc.

- Algorithm awareness can improve DIVERSITY, TRANSPARENCY, & AUTONOMY and thus drive TRUST in platform
  Users know know their content choices are skewed by algorithms when brought to their attention. Leverage this awareness to drive people to alternative content pathways.

- Highest order aggregate data summaries enhance VALUE OF TIME
  Instead of raw numbers or specific language, use summaries that put the least cognitive burden on users. Establishing content limits (ie specific number of videos) prevents confusion & frustration.

- Decision- or domain-specific ratings drive TRUST
  Frame content reactions and ratings to specific user decisions or goals (ie. most helpful for making a decision, provided most certainty)

Applicability

- The findings are valid and reliable for the cohort involved in the study, i.e., African American middle-aged population residing in US South.

- Beyond this cohort, we believe the solution concepts and the underlying behavioral mechanisms are fundamental to online search and judgement behaviors in context of trust deficit in institutions and mainstream narratives. Further testing and expansion of the sample can help make this framework more generalizable and improve its robustness.

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For further information
Saransh.Sharma@thefinalmile.com