Rootcause

EcoTok: Analysing the climate conversation on Tik Tok

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Contents

Reference Guide for External Links

Preliminary analysis of our original sample of videos	Read ↗
Full 3 level topic classification tree proposed by GPT-4	Read ↗
Top 20 Tik Toks by play, per category	Watch ↗
Top 100 users by plays, likes, comments and shares	Explore ↗
Summaries of 117 videos categorised under mental health	Read ↗

Analysing the breadth of climate related content across TikTok in the last five years

This project set out to analyse the breadth of climate related content across english language TikTok for the last five years in order to:

Create a narrative ‘map’ of the climate change conversation

Identify the most influential users publishing climate content

Quantify which types of climate content receive the highest levels of engagement

Explore the potential of artificial intelligence (specifically GPT-4) to analyse large amounts of social media data

62,000 videos

Our investigation analysed more than 62,000 videos

6.5 B plays

These videos had a total of over 6.5 billion plays

1B calls to action

Videos we tagged as ‘calls to action’ on climate change had over 1 billion plays on TikTok

14 million contests

We conducted 14 million contests between 5300 TikTok users to identify ‘Climate Superusers’

1/6

Videos tagged in our ‘climate change skepticism’ category are, on average, the most shared (175 times per video)

2/6

The category with the second-most plays on average are videos categorised as containing ‘misleading climate information’ (these videos could be from either side of the climate debate).

3/6

Conversely, content tagged in our climate change activist categories (e.g. criticising corporations, advocating petitions) receive, on average, very low levels of views despite having highest engagement statistics.

4/6

We found that a small number of top users have an outsized impact on climate content across the platform.

5/6

We found that amongst these users, videos promoting eco-friendly products are overrepresented.

6/6

Our work finds unusual patterns of engagement around some content. There is a suggestion of bias or manipulation. This is not confirmed and would require further investigation.

Lessons for Climate Communicators

Political content underperforms	The relative underperformance of political content, despite high engagement rates, suggests a different approach is needed to reach a wider audience
Identifying Influence	Total plays in not an especially helpful way of identifying users with the potential to influence
Finding Partners	This report identifies a number of TikTok users who produce content with impressive rates of engagement and could be useful influencing partners for campaigns
If in doubt, go cute	If you want to create viral TikTok content, use footage of cute animals to make your point
Hold your fire	Content criticising people, including politicians, underperforms

Our original sample of over 62,000 Tik Tok videos was built by snowballing hashtags. We start with #climatechange and capture the most frequent co-occurring hashtags until we have a sample built from 41 climate related hashtags.

You can find further details in our preliminary analysis of this sample here ↗

TikTok limitations

Everytime we search for a new hashtag we find new videos with previously added hashtags. This reveals the limits of Tik Tok's search function and the value of our snowballing approach.

We are confident that the 62,000 video sample represents a near-exhaustive all-time library of content on Tik Tok which refers to climate change by containing English language words.

Refinement

Our GPT-4 classification system is tested against a sample of 100 videos. We remove videos with less than two climate-change related hashtags as our tests find a substantial number of videos re 'piggybacking' on climate hashtags.

We also trim the sample to English language videos. Tests on a subsample of the new trimmed sample of c25K find it to be correct or near-correct 85% of the time.

We then generate a final working sample of 10K videos which is weighted by views to replicate the viewing-experience of average platform users.

Classification

We use a hybrid human-AI method to co-create a three-tiered classification system with GPT-4. We start with an initial level-1 template, to which GPT-4 adds level-1 and level-2 categories, and fleshes-out the third level.

The three-tiered classification systems generated are too exhaustive to work with effectively. However they (see e.g) do reveal interesting insight into the breadth of the climate conversation on TikTok.

We prune the three-tiered classification system to generate the final working two-level classification system.

Classification System (co-created with GPT-4)

Level One	Level Two
Call to Action	Urgent Appeals
	Highlighting the Need for Systemic Change
	Petitions
Negative Consequences	Environmental Disasters
	Effects on Wildlife
	Climate Crisis Implications
Ways We Can All Help	Promotion of Personal Contributions
	Promotion of Eco-Friendly Products
Discussions of Evidence Around Climate Change	Awareness and Education
	Climate Change Skepticism
	Misleading Climate Claims
Evoking Emotion	Cute Animals
	Personal Testimonies
	Gripping Imagery
Calling Out People	Corporate Responsibility
	Criticising Individuals
Entertainment around Climate Change	Gaming Related Content
	Humorous Approaches to Climate Awareness
	Music with Climate Message
Unique Perspectives	Cultural Connections
Mental Health	Discussion and Tips

An exploration of the emerging narratives around Climate Change on TikTok

We instruct GPT-4 to summarise and classify all 10K videos. This is the % of the videos it files under each broad category (n.b. videos could be placed in a maximum of 3 categories).

FIGURE 3
Percentage of videos assigned to each category

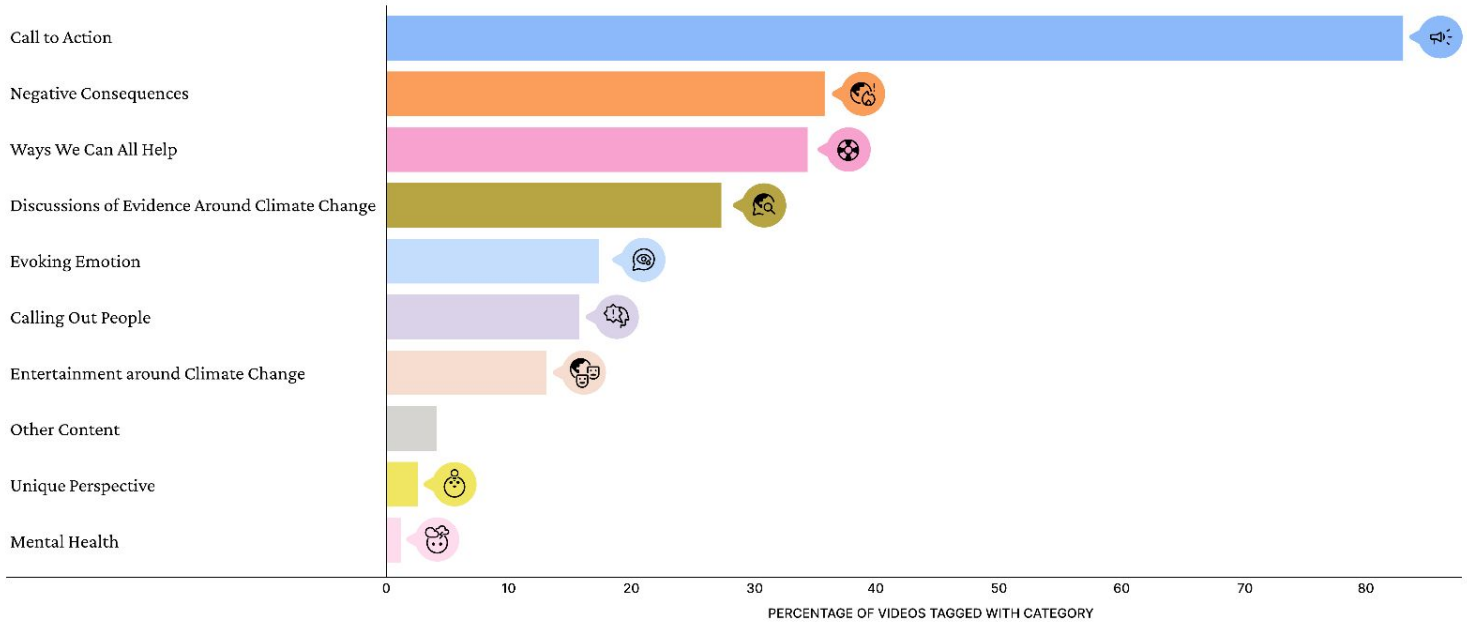
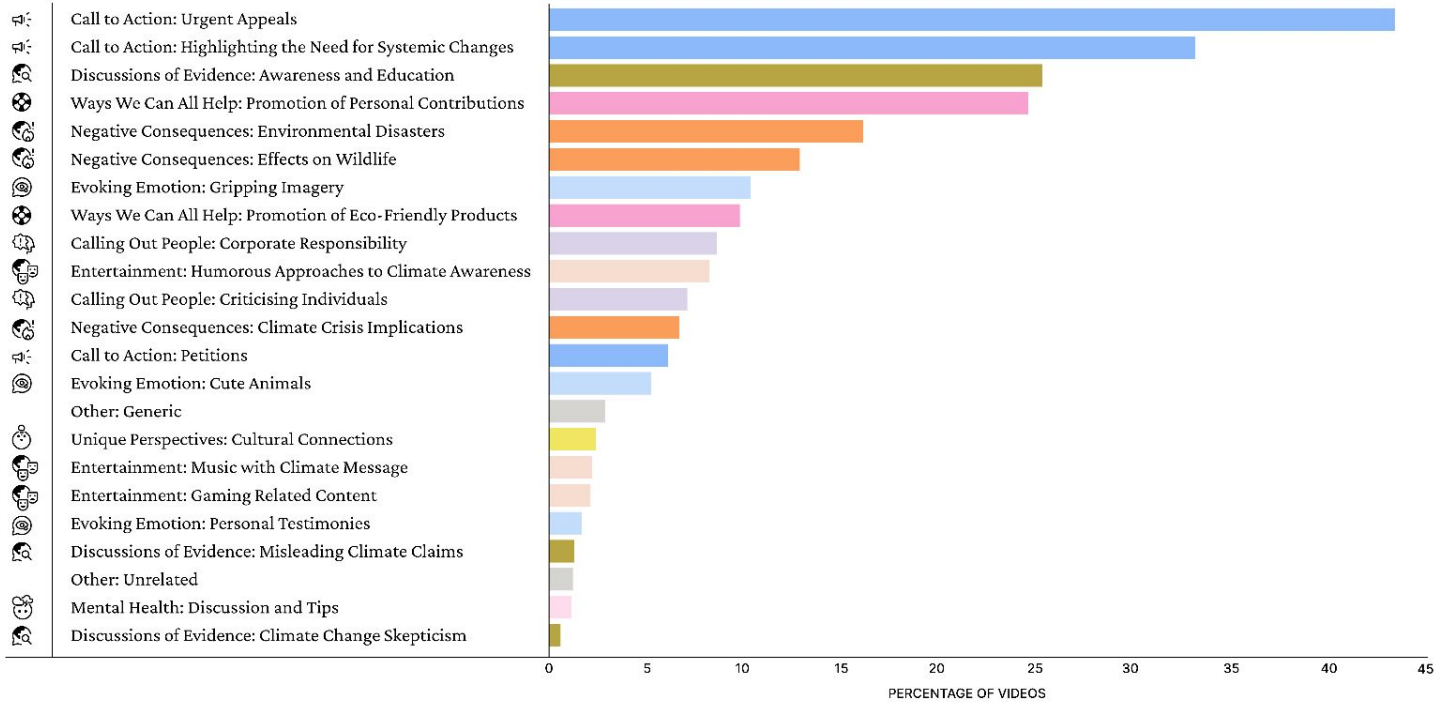


FIGURE 4

Percentage of videos assigned to each ‘level two’ category



We identify the Top 20 TikToks per topic category

CALL TO ACTION
Urgent Appeals ↗

CALL TO ACTION
Highlighting the Need for Systemic Change ↗

CALL TO ACTION
Petitions ↗

NEGATIVE CONSEQUENCES
Environmental Disasters ↗

NEGATIVE CONSEQUENCES
Effects on Wildlife ↗

NEGATIVE CONSEQUENCES
Climate Implications ↗

WAYS WE CAN ALL HELP
Promotion of Personal Contributions ↗

WAYS WE CAN ALL HELP
Promotion of Eco-Friendly Products ↗

DISCUSSION OF EVIDENCE
Awareness and Education ↗

DISCUSSION OF EVIDENCE
Climate Change Skepticism ↗

DISCUSSION OF EVIDENCE
Misleading Climate Claims ↗

EVOKING EMOTION
Cute Animals ↗

EVOKING EMOTION
Personal Testimonies ↗

EVOKING EMOTION
Gripping Imagery ↗

CALLING OUT PEOPLE
Corporate Responsibility ↗

CALLING OUT PEOPLE
Criticising Individuals ↗

ENTERTAINMENT
Gaming Related Content ↗

ENTERTAINMENT
Humorous Approaches to Climate Awareness ↗

ENTERTAINMENT
Music with Climate Message ↗

UNIQUE PERSPECTIVES
Cultural Connections ↗

MENTAL HEALTH
Discussion and Tips ↗

Beyond the ‘play’ metric: An analysis of the most influential climate users

Top 100 users

We identify the top 100 most-played users from our trimmed 10k sample, discovering that they are responsible for:

See the Top 100 Users here ↗

58%

of plays in sample

46%

of likes in the sample

36%

of all comments on videos in the sample

48%

of favourites in the sample

50%

of downloads in the sample

37%

of shares in the sample

Climate Superusers

While the number of plays demonstrates the potential reach of a user, sometimes the viral effect can distort which users are influential over time. Other indicators can illustrate greater engagement or more frequent content creation.

To address the limitations of assessing by single metrics this we use a rank aggregation method to identify ‘Climate Superusers’ within our sample. This involves carrying out 14 million head to head contests between users based on a range of criteria.

The Top 30 Climate Superusers on TikTok

Rank	Username	Profile
1	boycottsforchange	https://tiktok.com/@boycottsforchange
2	dracly.edits	https://tiktok.com/@dracly.edits
3	showme_yourmask	https://tiktok.com/@showme_yourmask
4	caseyc0w	https://tiktok.com/@caseyc0w
5	planetrevolutionary	https://tiktok.com/@planetrevolutionary
6	save.our.wildlife20	https://tiktok.com/@save.our.wildlife20
7	ourhomeisonfire	https://tiktok.com/@ourhomeisonfire
8	.worldclimate	https://tiktok.com/@.worldclimate
9	heartsforarctic	https://tiktok.com/@heartsforarctic
10	alex.haraus	https://tiktok.com/@alex.haraus
11	nessa.may.8	https://tiktok.com/@nessa.may.8
12	keeptheearthfresh	https://tiktok.com/@keeptheearthfresh
13	time..for..change	https://tiktok.com/@time..for..change
14	fulanivegan	https://tiktok.com/@fulanivegan
15	spreadawarenessplls	https://tiktok.com/@spreadawarenessplls

Rank	Username	Profile
16	earthscall	https://tiktok.com/@earthscall
17	climateawareness1	https://tiktok.com/@climateawareness1
18	letttheearthbreathe	https://tiktok.com/@letttheearthbreathe
18	stopclimate.changee	https://tiktok.com/@stopclimate.changee
20	glblwrmng	https://tiktok.com/@glblwrmng
21	nrdc.org	https://tiktok.com/@nrdc.org
22	earths.helper	https://tiktok.com/@earths.helper
23	jesscraven101	https://tiktok.com/@jesscraven101
24	sustainabilityhq	https://tiktok.com/@sustainabilityhq
25	protect.the.planettt	https://tiktok.com/@protect.the.planettt
26	citizensclimate	https://tiktok.com/@citizensclimate
27	therenewablebox	https://tiktok.com/@therenewablebox
28	letourplanetlive	https://tiktok.com/@letourplanetlive
29	emmxiia	https://tiktok.com/@emmxiia
30	thewimvmjg6	https://tiktok.com/@thewimvmjg6

A deeper dive into the performance of the different content types

FIGURE 5

Categories with the most views

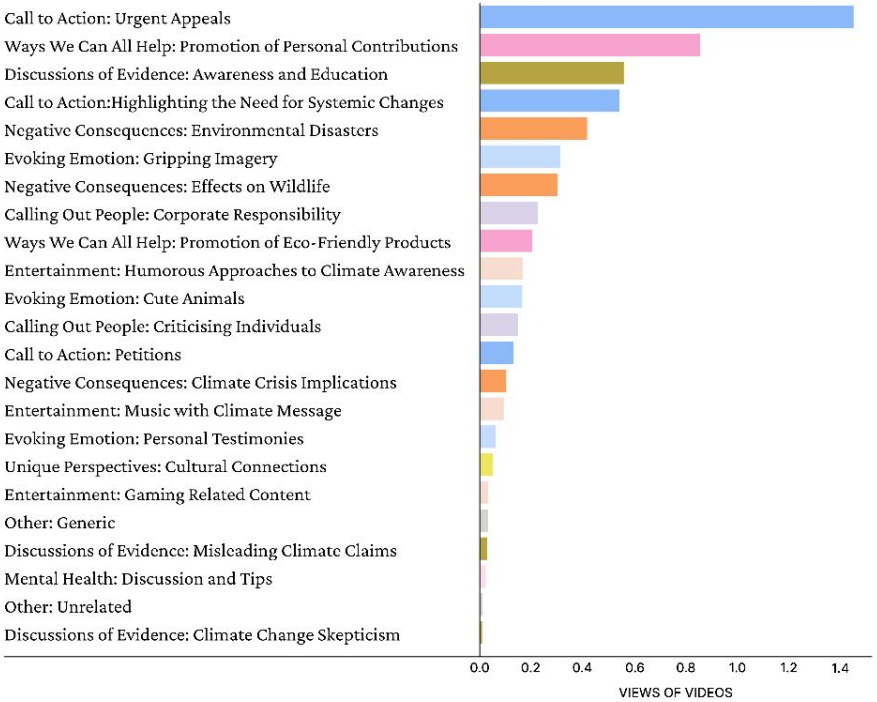
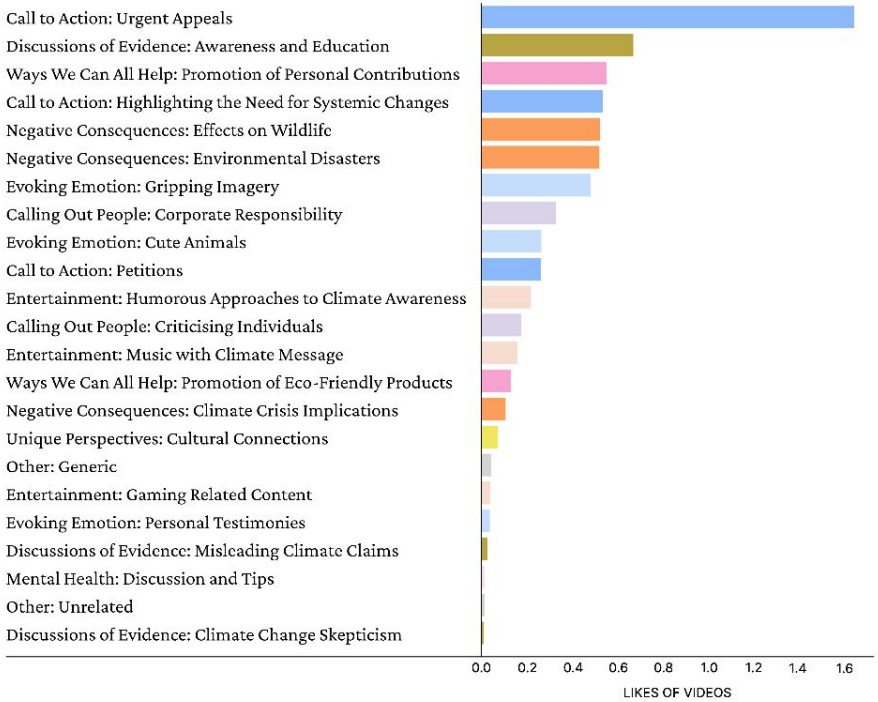


FIGURE 6

Categories with the most likes



Going deeper

To understand how different types of content perform we measure the median performance for each category by different metrics.

Statistical tests (using Fstats) show, with extremely high significance, that variation on the metrics is between categories rather than within them.

FIGURE 7

Median number of comments per category

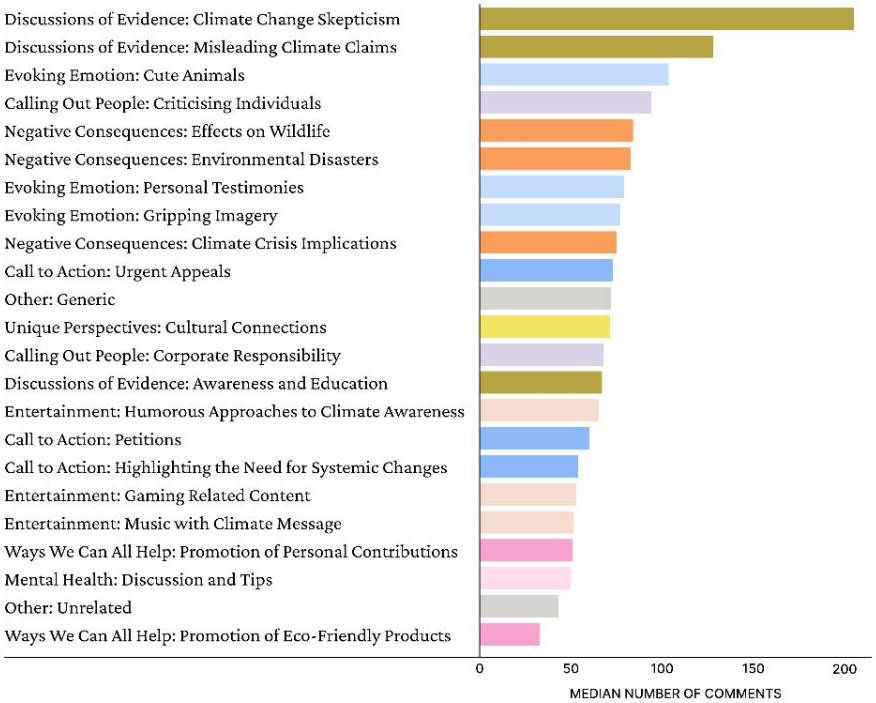


FIGURE 8

Median number of downloads per category

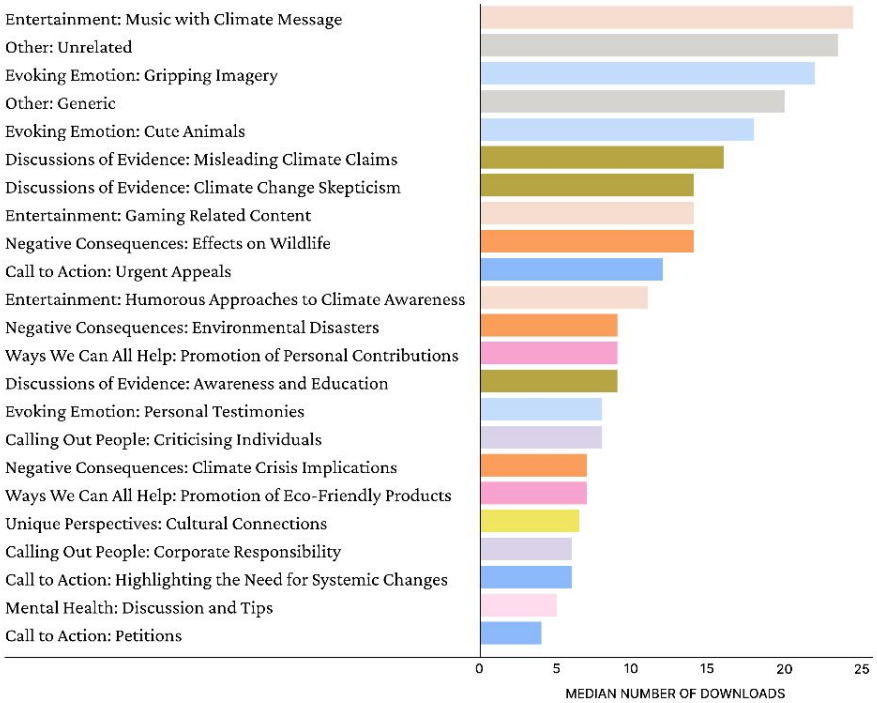


FIGURE 9

Median number of favourites per category

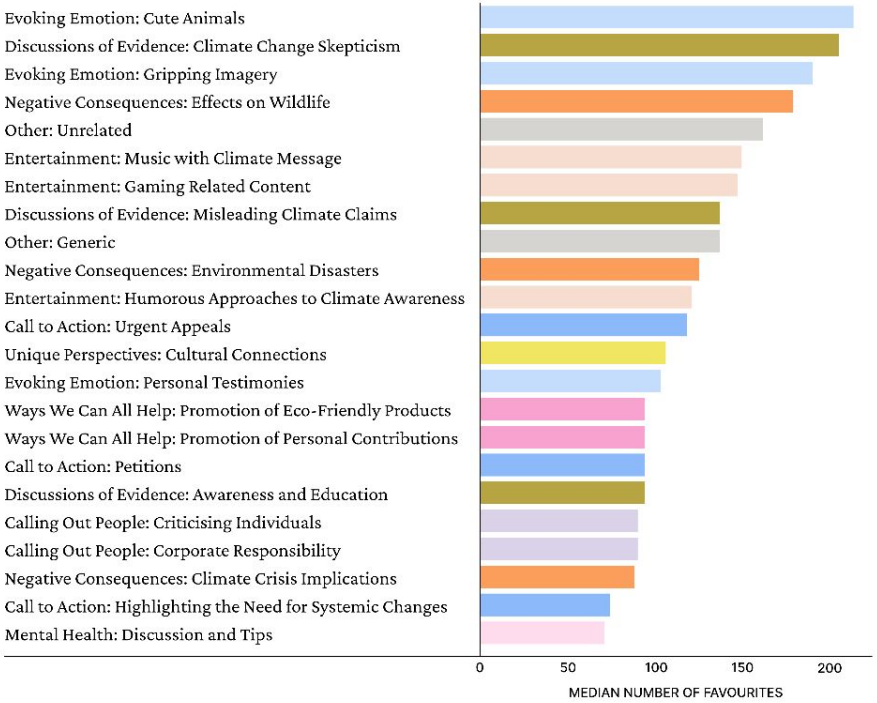


FIGURE 10

Median number of likes per category

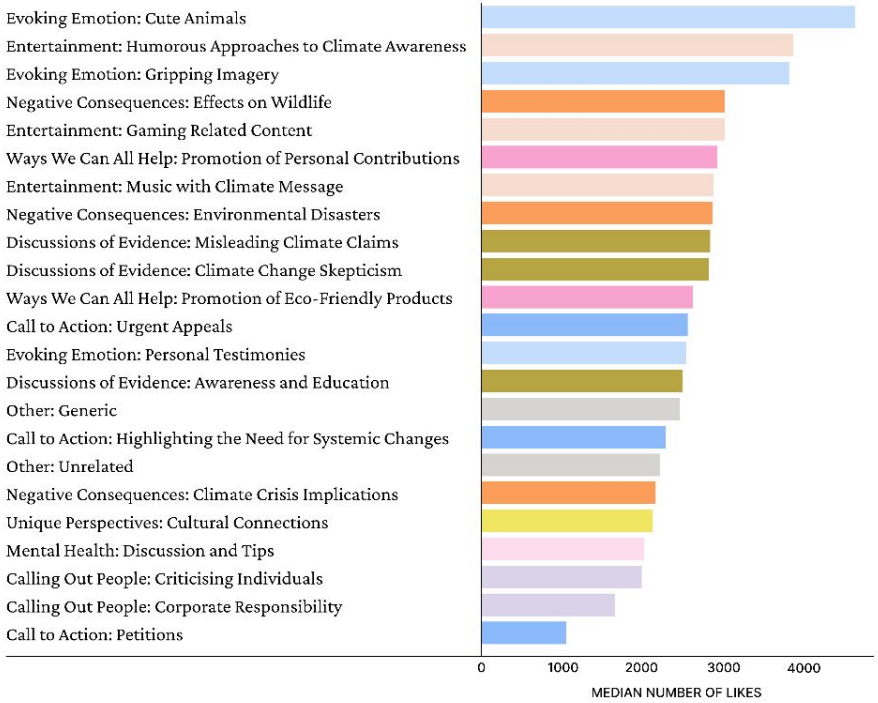


FIGURE 11

Median number of plays per category

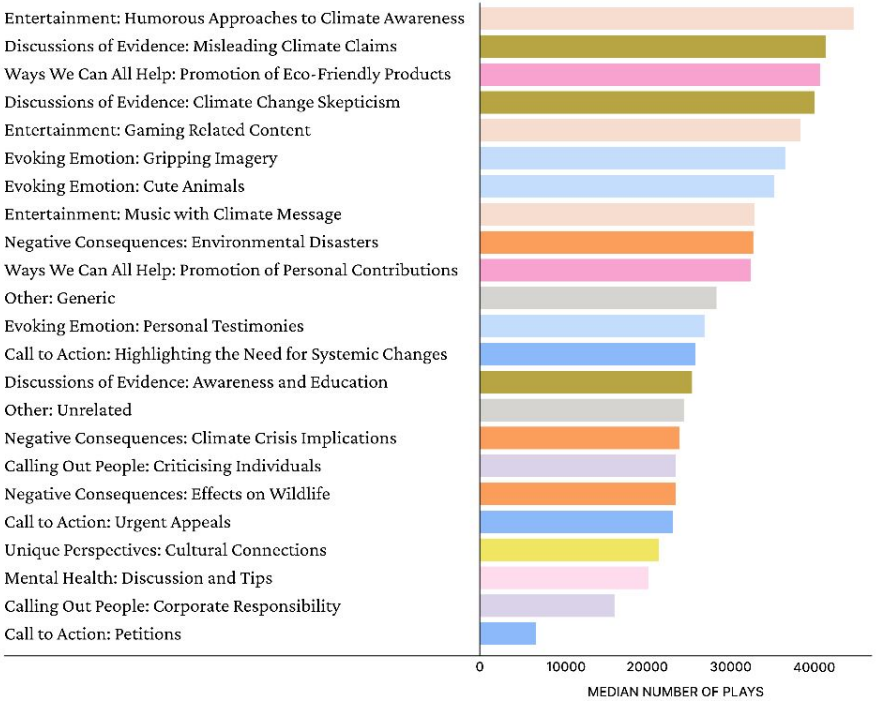
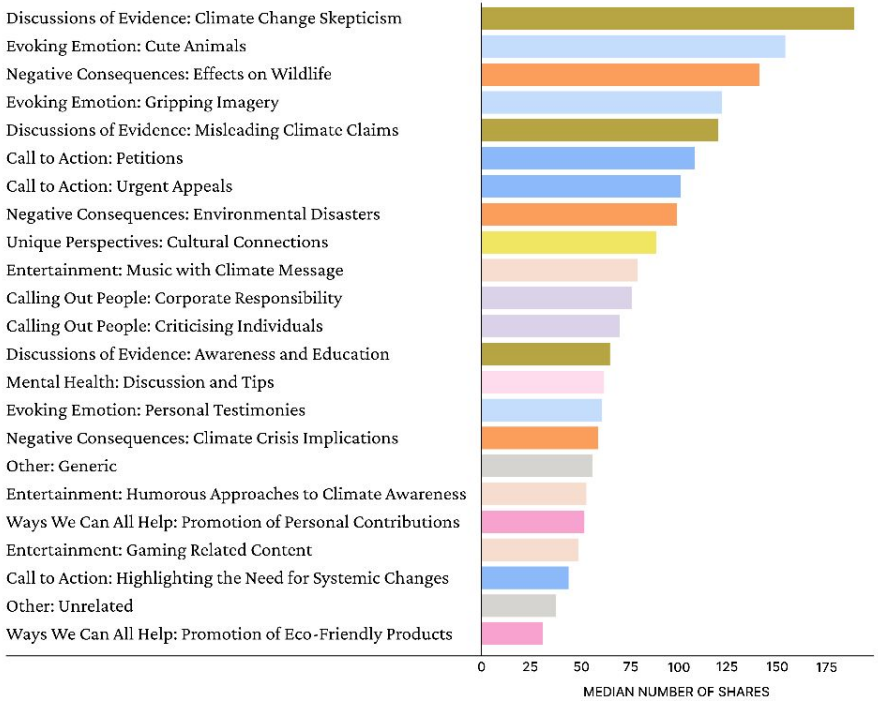


FIGURE 12

Median number of shares per category



Comparisons

For each of our metrics, we look at how average or ‘typical’ videos from each category perform in comparison to the other categories.

These charts give us a quick way to assess the how people engage with different types of content on Tiktok.

Ways We Can All Help

FIGURE 13

Multivariate ranking chart for Promotion of eco-friendly products

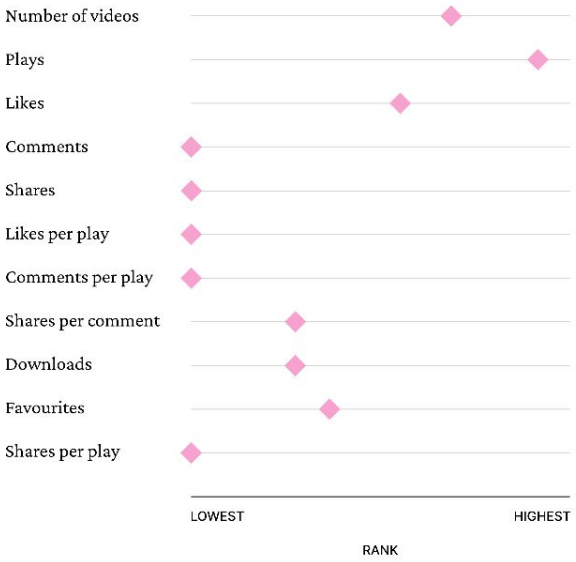
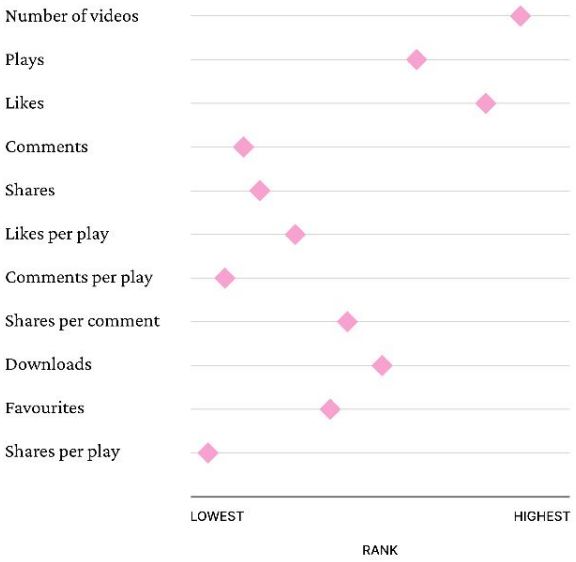


FIGURE 14

Multivariate ranking chart for Promotion of personal contributions



Call to Action

CATEGORY

FIGURE 15

Multivariate ranking chart for Highlighting the Need for Systemic Changes

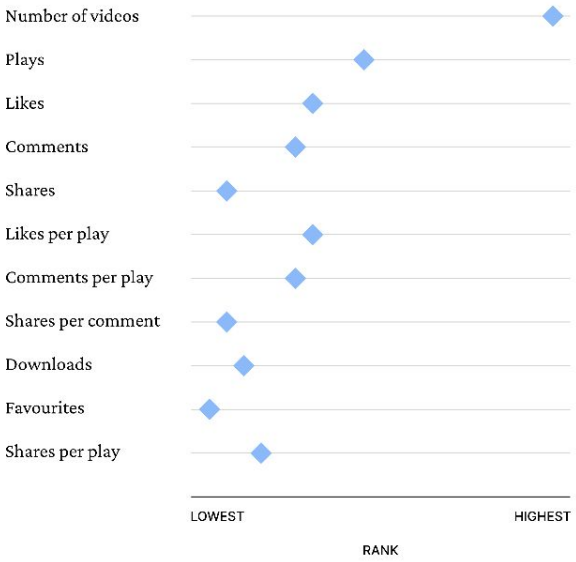


FIGURE 16

Multivariate ranking chart for Petitions

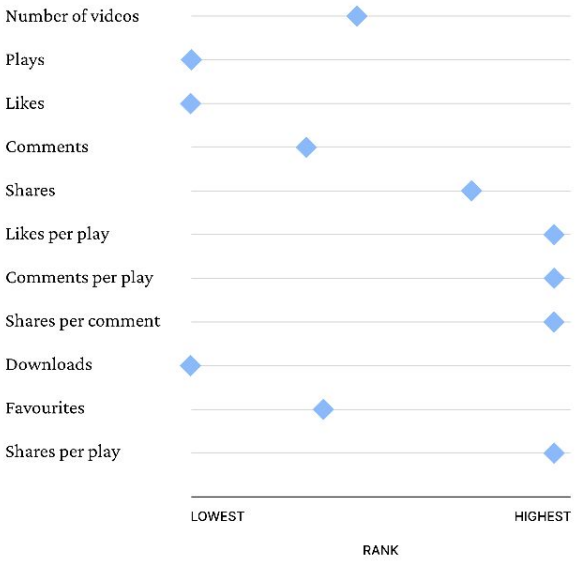
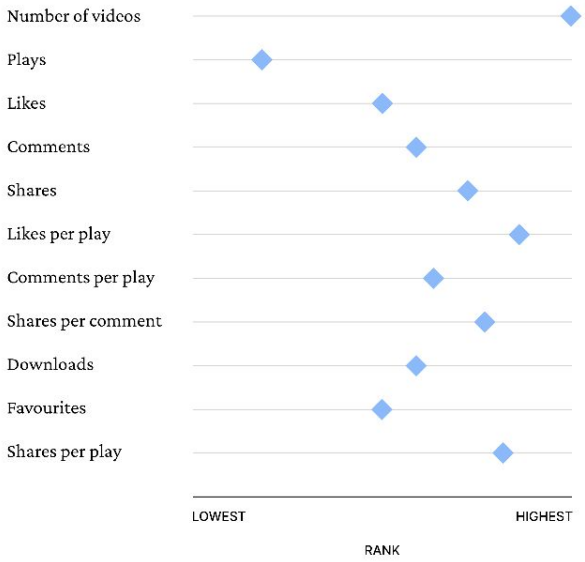


FIGURE 17

Multivariate ranking chart for Urgent Appeal



Calling People Out

FIGURE 18

Multivariate ranking chart for Corporate Responsibility

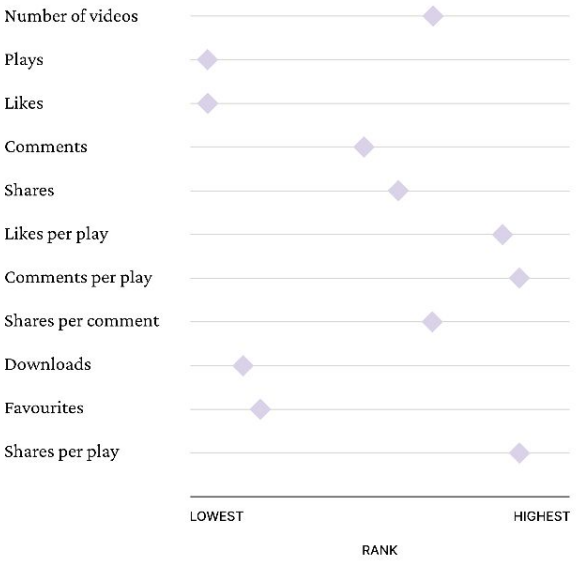
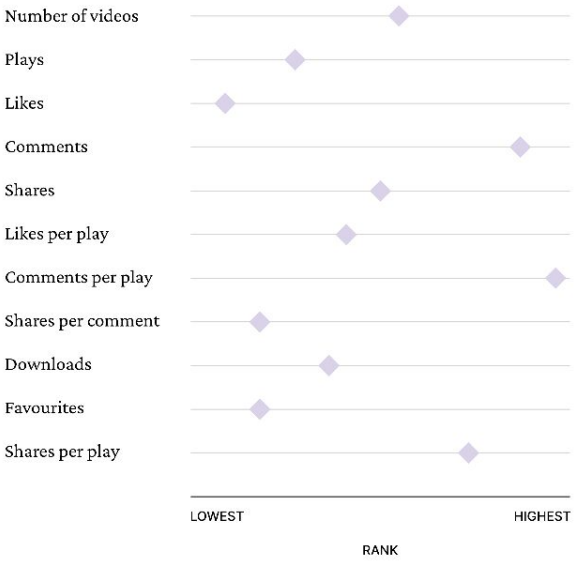


FIGURE 19

Multivariate ranking chart for Criticising individuals



Discussions of Evidence Around Climate Change

CATEGORY

FIGURE 20

Multivariate ranking chart for Climate change awareness and education

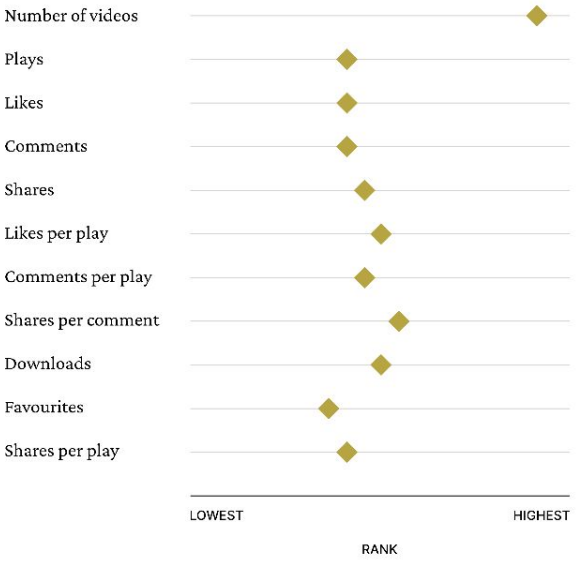


FIGURE 21

Multivariate ranking chart for Climate change skepticism

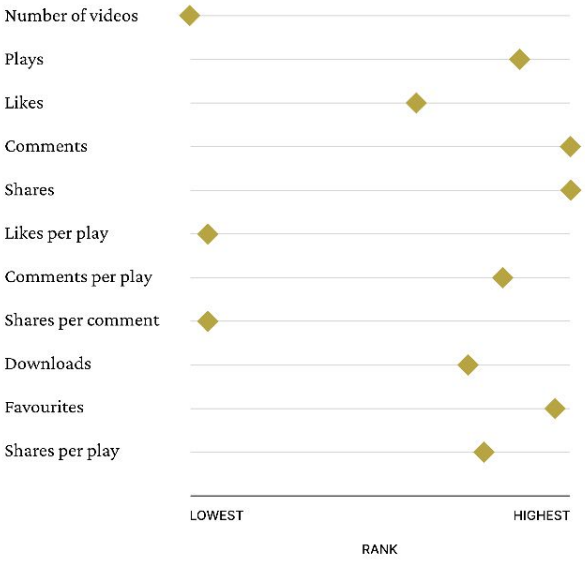
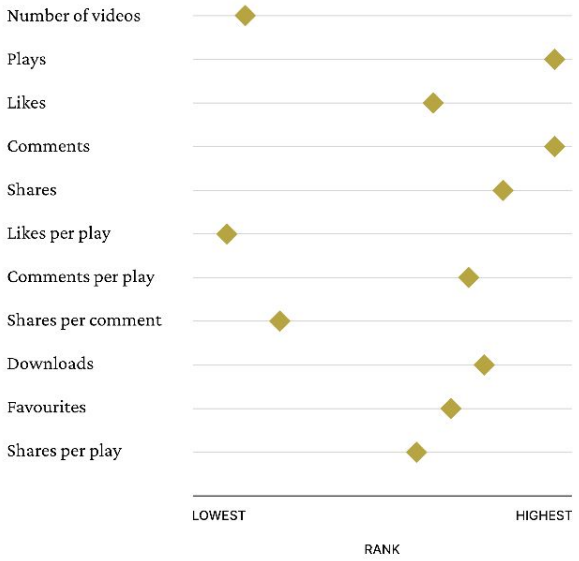


FIGURE 22

Multivariate ranking chart for Misleading climate claims



Entertainment Around Climate Change

CATEGORY

FIGURE 23
Multivariate ranking char for Gaming related content

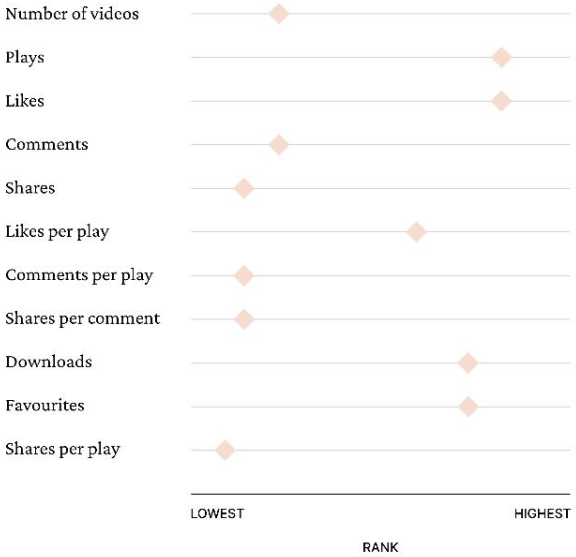


FIGURE 24
Multivariate ranking chart for Humorous approaches to climate change

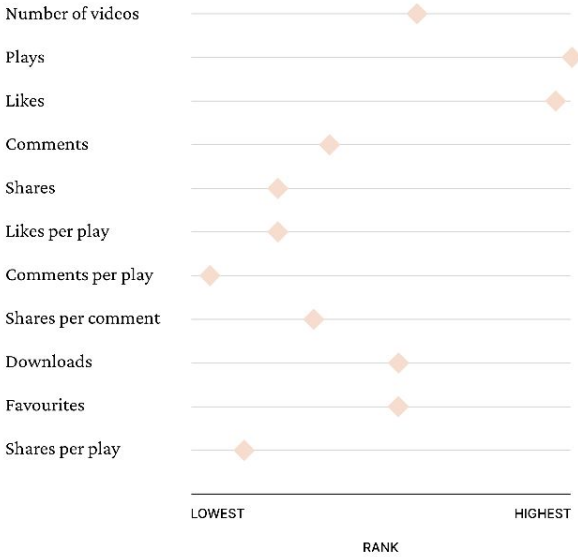
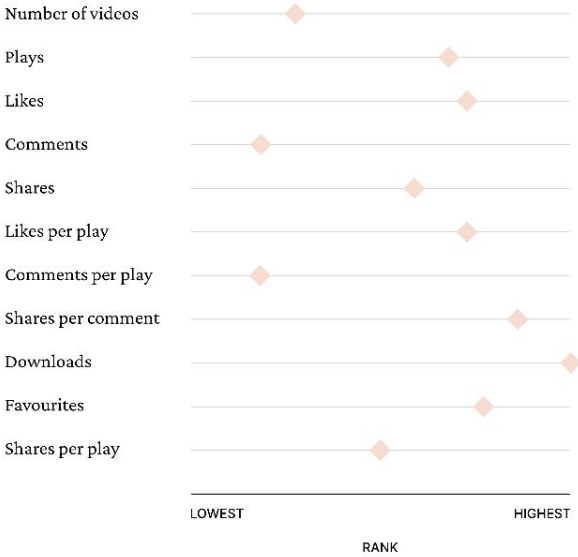


FIGURE 25
Multivariate ranking chart for Music with climate messages



Evoking Emotion

FIGURE 26

Multivariate ranking chart for Cute Animals

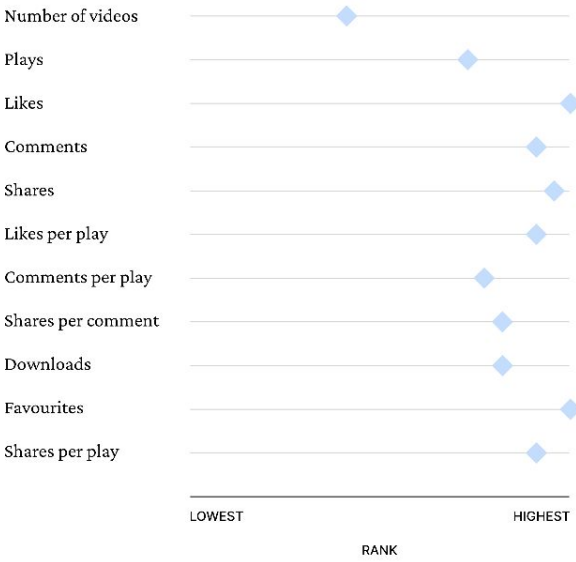


FIGURE 27

Multivariate ranking chart for Gripping Imagery

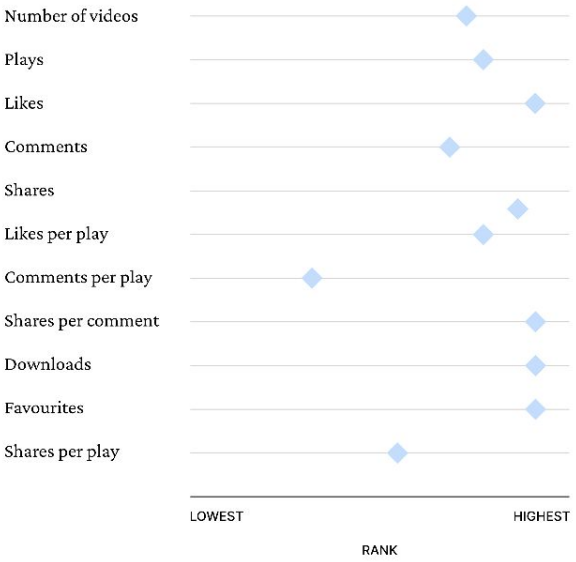
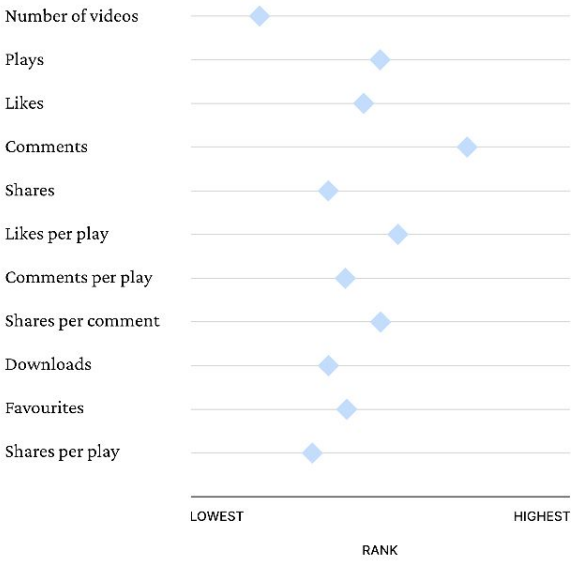


FIGURE 28

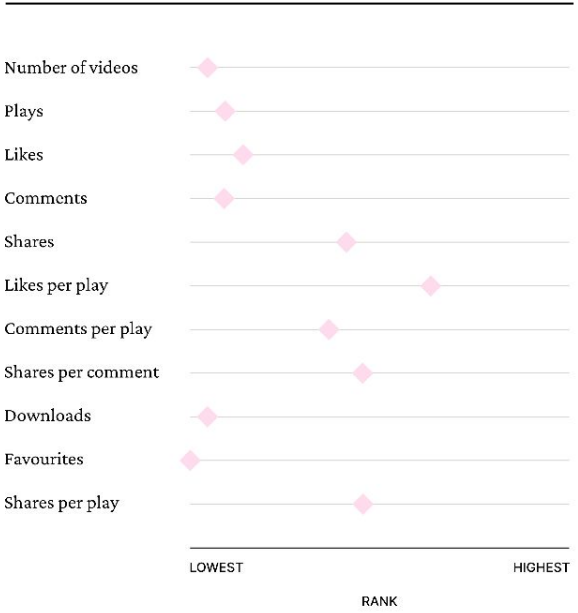
Multivariate ranking chart for Personal Testimonies



Mental Health

FIGURE 29

Multivariate ranking chart for Mental Health



Negative Consequences

CATEGORY

FIGURE 30

Multivariate ranking chart for Climate Crisis Implications

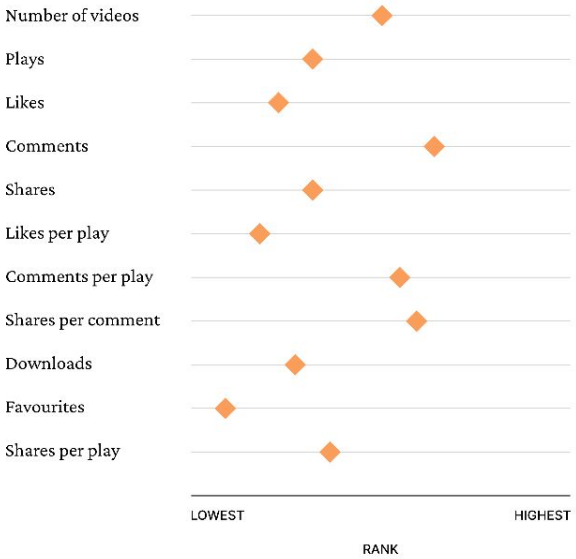


FIGURE 31

Multivariate ranking chart for Effects of Wildlife

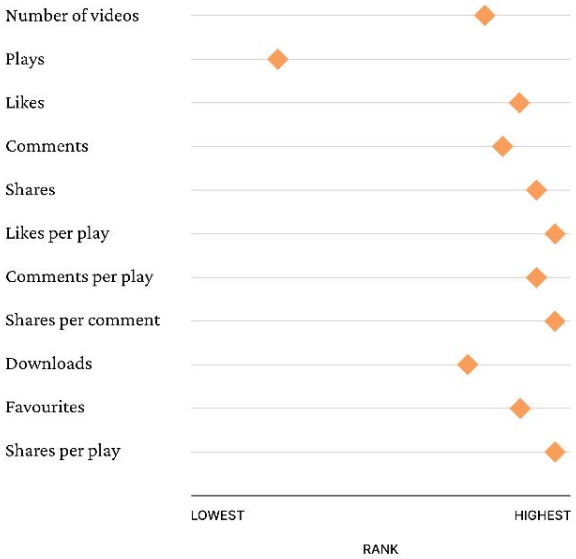
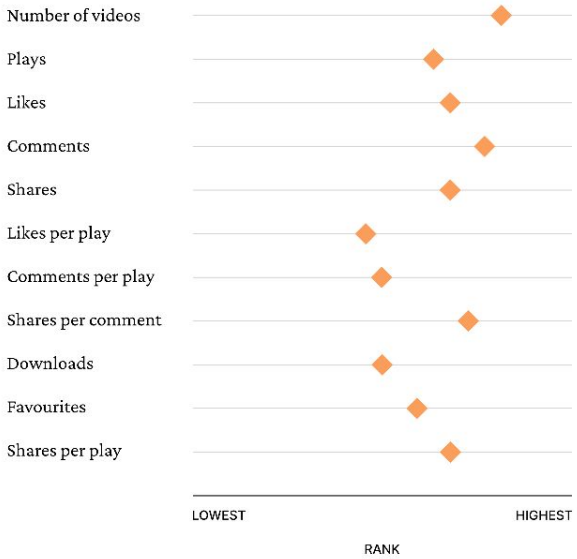


FIGURE 32

Multivariate ranking chart for Environmental Disasters



Observations

Misleading information

Misleading information about climate change and climate change skepticism both score very highly for plays and engagement

Eco-friendly products

Videos promoting eco-friendly products have lots of plays but low engagement. Advertising/Promoted content may be a factor here.

Petitions

Engagement rates with petitions and corporate criticism are high but overall plays and likes are low. This could reflect follower networks or algorithmic bias.

Animals

Content with cute animals performs exceptionally well.

A summary of the themes emerging around mental health and climate change

There are 117 videos from our sample of 10,000 categorised as relevant to mental health. We ask GPT-4 to generate summaries of each of the videos.

We find that climate anxiety is the biggest theme in these videos with many of them also containing wider critique of capitalism.

Read the summaries of the videos here↗

Something a bit odd...

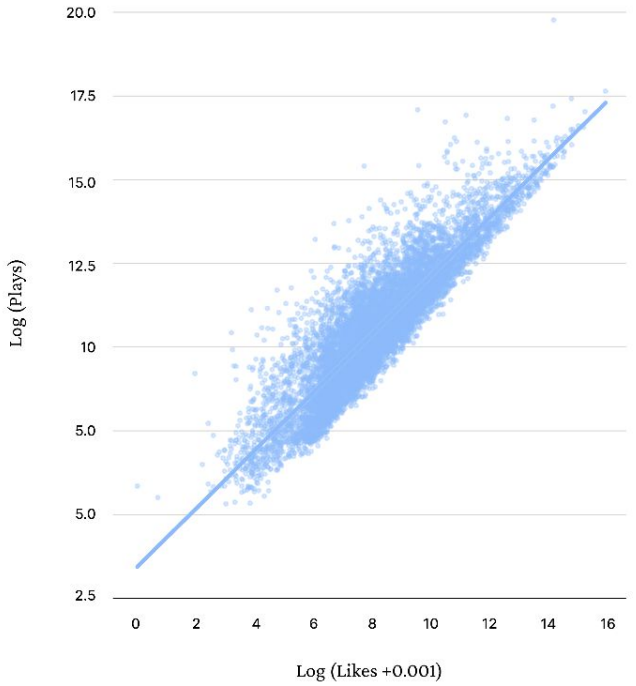
Something funny going on here...!?

This would be a headline grabbing claim and further investigation is essential.

We run tests on our key metrics to see how they perform in relation to each other. In particular we want to understand how overall plays related to likes, comments and shares per play.

This graph shows that likes per play go up in correlation with plays. This is normal and shows that there is no discernible effect on total likes from users playing the same video multiple times.

FIGURE 1
Plotting the relationship between likes and plays

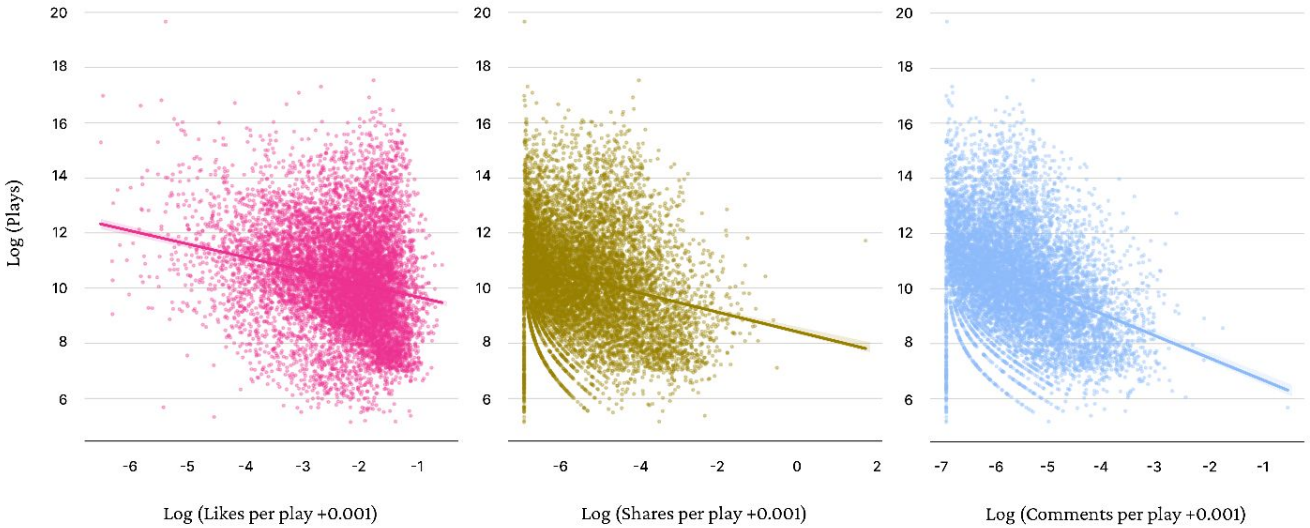


BUT,

When we look at engagement indicators per play we expect that videos with more engagement get more plays, however these graphs show the opposite effect.

We notice this effect elsewhere in this report, finding the strongest pattern of high engagement, but low views, on videos containing petitions and criticism of corporations, and an opposite pattern of low-engagement and high views on climate-skeptic posts. It is entirely possible there is a user behaviour based explanation for this but we would need to do further research to understand this phenomenon better.

FIGURE 2
Examining the relationship between plays and engagement



Lessons from our research and recommendations for a path forward

Artificial Intelligence learnings

1/3

This work shows the potential GPT-4 to classify vast amounts of data quickly and with enough accuracy to perform secondary analyses

2/3

GPT-4 has required significant supervision and does not perform categorisation consistently between runs

3/3

AI analysis of social media data can help identify users and networks of influence in way that can inform strategic communications campaigns

Possible Next Steps

1/7

Investigate evidence of systematic algorithmic bias against high engagement/low play climate change content

2/7

Evaluate top users within specific categories

3/7

Create an interactive data visualisation of categories, users and top TikToks

4/7

Build on preliminary network analysis of communities of users

5/7

Enhanced statistical analysis of categories

6/7

Spend more time developing a third tier of categorisation, perhaps including testing AI audio to text or video to text tools

7/7

Use this analytical approach as the basis to look at other platforms or topics

Rootcause

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