

## **AMENDED Exhibit 1045**

# **PLAINTIFFS' OMNIBUS OPPOSITION TO DEFENDANTS' MOTIONS FOR SUMMARY JUDGMENT**

Case No.: 4:22-md-03047-YGR

MDL No. 3047

In Re: Social Media Adolescent Addiction/Personal Injury Products Liability Litigation

LAUREN GALLO WHITE, SBN 309075  
WILSON SONSINI GOODRICH & ROSATI  
Professional Corporation  
One Market Plaza, Spear Tower, Suite 3300  
San Francisco, CA 94105-1126  
Telephone: (415) 947-2000  
Facsimile: (415) 947-2099  
Email: lwhite@wsgr.com

Attorneys for Defendants  
YOUTUBE, LLC and GOOGLE, LLC

**UNITED STATES DISTRICT COURT**  
**FOR THE NORTHERN DISTRICT OF CALIFORNIA**  
**OAKLAND DIVISION**

IN RE: SOCIAL MEDIA ADOLESCENT  
ADDICTION/PERSONAL INJURY  
PRODUCTS LIABILITY LITIGATION

) MDL No. 3047  
) CASE NO.: 4:22-md-03047-YGR  
)

THIS DOCUMENT RELATES TO:  
ALL ACTIONS

) **GOOGLE LLC AND YOUTUBE,**  
) **LLC'S RESPONSES AND**  
) **OBJECTIONS TO MDL PERSONAL**  
) **INJURY PLAINTIFFS' THIRD SET**  
) **OF INTERROGATORIES (Nos. 6-8)<sup>1</sup>**  
)

) Honorable Yvonne Gonzalez Rogers  
) Honorable Peter H. Kang  
)

PROPOUNDING PARTY: MDL Personal Injury Plaintiffs

RESPONDING PARTY: Defendants Google LLC and YouTube, LLC

SET NO.: Three (3)

<sup>1</sup> Plaintiffs incorrectly numbered these Interrogatories as Nos. 5-7.

1 given its use of the undefined terms “developed, tested, or made available for use,” and “all features  
2 or surfaces accessible to some or all users of the platform.”

3 13. Defendants object to Plaintiffs’ definition of the term “Youth” as overbroad, unduly  
4 burdensome, seeking information that is not relevant to the claim or defense of any party, and not  
5 proportional to the needs of the case to the extent the definition includes users who are 18 years old  
6 or older. For purposes of Defendants’ responses to the Interrogatories and unless stated otherwise,  
7 “Youth” means users who are under the age of 18.

8 14. Defendants object to the relevant time period instruction as overly broad, not relevant  
9 to any party’s claim or defense, and as exceeding the permissible scope of discovery set forth in  
10 Magistrate Judge Kang’s June 20, 2024 Order (ECF No. 953). Defendants further object to this  
11 instruction as vague, ambiguous, unduly burdensome and not proportional to the needs of the case  
12 to the extent it seeks responses for Interrogatories for a time period running “until the present.” For  
13 purposes of responding to these Interrogatories, Defendants will respond as to the time period from  
14 January 1, 2015, through January 24, 2025 (the date of service of the Interrogatories) for  
15 Interrogatories pertaining to YouTube Main and YouTube Kids. Defendants will respond as to the  
16 time period from January 1, 2021, through January 24, 2025 (the date of service of the  
17 Interrogatories) for Interrogatories pertaining to users using YouTube Main in a supervised state.

18 **OBJECTIONS AND RESPONSES TO INTERROGATORIES**

19 **INTERROGATORY NO. 6:**

20 Identify and describe the Recommendation System used by You on the YouTube Platform,  
21 including explaining the below. Insofar as there is a different Recommendation System for  
YouTube Main, YouTube Kids, or any feature on either, please identify those differences:

- 22 a. How was the Recommendation System designed?  
23 b. How does the Recommendation System work?  
24 c. How does the Recommendation System make content recommendations to  
users?  
25 d. When was the Recommendation System implemented and is still in use as of  
the present date?  
26 e. How has the Recommendation System changed over time, from the date of its  
implementation up to the present date?  
27  
28

**RESPONSE TO INTERROGATORY NO. 6:**

Defendants object to this Interrogatory as overly broad, unduly burdensome, and unreasonable because it seeks sweeping information about the Recommendation System for any feature on YouTube Main or YouTube Kids that is neither relevant nor proportional to any party's claim or defense, including because it is not limited to users under age 18. Defendants further object to the extent that this Interrogatory calls for proprietary, confidential, or trade secret information that is subject to the entry of a Protective Order and has little or no connection to the parties' claims and defenses in this action, imposing a further burden on Defendants that is disproportionate to the needs of this case. Defendants also object to the Interrogatory to the extent the information sought is already in the possession of Plaintiffs, or is otherwise equally accessible and available to them from other sources (including produced documents and testimony, the public record, and non-parties). Defendants object to this Interrogatory as unduly burdensome and not proportional to the needs of the case because the Interrogatory is not reasonably limited as to time. Defendants further object to the Interrogatory as impermissibly compound insofar as the Interrogatory seeks five separate categories of historical information about any feature on two different services (YouTube Kids and YouTube Main), in addition to requesting identification and description of the Recommendation System generally. To date, Plaintiffs have served 15 total Interrogatories: five in Set 1, ten in Set 2. Interrogatory No. 1 sought five categories of information about 58 custodians for a total of 5. Interrogatory No. 2 sought annual aggregate user data by reported age, unknown age, signed-in, and signed-out status for a total of 4; Interrogatory No. 3 sought watch time by reported age, unknown age, signed-in, and signed-out status for a total of 4; Interrogatory No. 4 sought average revenue per user, 1; Interrogatory No. 5 sought annual financial data, 1. Under the Court's guidance, Dec. 11, 2025 Hearing Tr. 20:13-20, 25:7-17, Interrogatory No. 6 counts as 6 separate Interrogatories, bringing Plaintiffs' total Interrogatories to 21. Plaintiffs are limited to 45 Interrogatories for YouTube. *See* Order Governing Discovery Limitations (entered March 7, 2024, modified March 21, 2024), Dkt. No. 702, Ex. A at 42. Plaintiffs cannot

1 circumvent this limitation by combining numerous discrete requests for information with multiple  
2 discrete sub-parts into a single Interrogatory.

3 Subject to and without waiving any of the foregoing objections, Defendants respond as  
4 follows:

5 YouTube's Recommendation System is a system for identifying videos that YouTube  
6 believes its users will find interesting, valuable, or enjoyable. The system uses various Signals—  
7 relating both to the videos that may be recommended and to viewers—to identify a particular  
8 subset of videos, from the vast corpus of videos posted on YouTube's platform, that may be of  
9 interest to different users, consistent with YouTube's content-moderation policies and other user-  
10 protection features.

11 a. YouTube's Recommendation System was designed to help YouTube users find  
12 videos they may want to watch and that are most likely to give them satisfaction and value.  
13 YouTube hosts billions of videos, with over 500 hours of new video content uploaded every  
14 minute, videos in nearly every language, posted by people around the globe, on virtually every  
15 subject imaginable. Without some system for helping users to find or discover the particular videos  
16 within this vast corpus that actually may be of interest to them, both users and creators would be  
17 worse off. YouTube's Recommendation System is a key part of YouTube's solution to this  
18 problem, by trying to accurately identify the videos that may interest a given user. In this way,  
19 YouTube's recommendation system connects billions of people around the world to content that  
20 inspires, informs, and entertains.

21 b. YouTube's Recommendation System works by suggesting videos that may be of  
22 interest or value to a given user, which may be related to the video a user is currently watching or  
23 videos the user has previously watched, other information about the user, as well as the content or  
24 information about the recommended videos, as further informed by YouTube's content moderation  
25 policies and judgments about what is appropriate content. Videos selected by the  
26 Recommendation System may be displayed to users on, for example, YouTube's home page,  
27  
28

1 watch page, or Shorts feed. Additional information regarding how the Recommendation System  
2 works can be found in Defendants' response to Interrogatory No. 7, below, the document  
3 previously produced as Bates No. GOOG-3047MDL-00406689 to GOOG-3047MDL-00406695  
4 ("Life of a Video Recommendation"), the document previously produced as Bates No. GOOG-  
5 3047MDL-02946657 to GOOG-3047MDL-02946813 ("How YouTube Responsibly  
6 Recommends Content and Protects Users"), and the document previously produced in native  
7 format as Bates No. GOOG-3047MDL-00157390 ("How YouTube Recommends Made for Kids  
8 Videos").

9 c. Defendants refer Plaintiffs to Defendants' response in subsections (a) and (b),  
10 above, Defendants' response to Interrogatory No. 7, below, the document previously produced as  
11 Bates No. GOOG-3047MDL-00406689 to GOOG-3047MDL-00406695 ("Life of a Video  
12 Recommendation"), the document previously produced as Bates No. GOOG-3047MDL-02946657  
13 to GOOG-3047MDL-02946813 ("How YouTube Responsibly Recommends Content and Protects  
14 Users"), and the document previously produced in native format as Bates No. GOOG-3047MDL-  
15 00157390 ("How YouTube Recommends Made for Kids Videos").

16 d. The Recommendation System was originally implemented in 2008, and is still in  
17 place today.

18 e. While the Recommendation System is never static, significant changes that have  
19 been made over time include:

- 20 i. When the Recommendation System was first launched in 2008, the system made  
21 recommendations based solely on how many views a video received.
- 22 ii. In 2011, YouTube built classifiers to identify videos that were racy or violent and  
23 prevented them from being recommended.
- 24 iii. In 2012, YouTube added video-specific watchtime as a metric for the  
25 Recommendation System.
- 26 iv. In 2015, YouTube took steps to demote certain sensationalistic tabloid content from  
27 appearing on homepages.
- 28 v. In 2016, YouTube began removing videos of minors in risky situations from  
recommendations.
- vi. In 2017, YouTube updated its Recommendation System on YouTube Kids to bar  
recommendations on Home and Watch Next from a channel when the user has  
blocked 2+ videos from that channel.

- vii. In 2017, to ensure that YouTube's recommendation system was fair to marginalized communities, YouTube began evaluating the machine learning that powers its system for fairness across protected groups—such as the LGBTQ+ community.
- viii. In 2018, YouTube expanded parental controls on YouTube Kids to enable parents to choose what content level of videos are available to their children, including the option to limit the content to only specific parent-approved content.
- ix. In 2019, YouTube updated its Recommendation System to reduce recommendations of borderline content and content that could misinform users in harmful ways.
- x. In 2020, YouTube restricted recommendations of videos Made for Kids to only videos human-confirmed as Made for Kids.
- xi. In 2023, YouTube began limiting repeated recommendations of videos that idealize unhealthy standards or behaviors to teens in the United States.

**INTERROGATORY NO. 7:**

Identify and describe all Signals used in the Recommendation System on the YouTube Platform, including identifying and explaining the below. Insofar as different Signals are used in the Recommendation System for YouTube Main, YouTube Kids, or any other feature on either, please identify those differences:

- a. Who determines what Signals should be used in the Recommendation System;
- b. For each Signal, when did YouTube begin using that Signal in the Recommendation System;
- c. For each Signal, what weight is given to the Signal in relation to other Signals in the Recommendation System; and,
- d. Who determines what weight or ranking is given to a Signal in the Recommendation System and has that changed over time.

**RESPONSE TO INTERROGATORY NO. 7:**

Defendants object to this Interrogatory as overly broad, unduly burdensome, and unreasonable because it seeks sweeping information about the Recommendation System for any feature on YouTube Main or YouTube Kids that is neither relevant nor proportional to any party's claim or defense, including because it is not limited to users under age 18. Defendants further object to the extent that this Interrogatory calls for proprietary, confidential, or trade secret information that is subject to the entry of a Protective Order and has little or no connection to the parties' claims and defenses in this action, imposing a further burden on Defendants that is disproportionate to the needs of this case. Defendants also object to the Interrogatory to the extent the information sought is already in the possession of Plaintiffs, or is otherwise equally accessible and available to them from other sources (including produced documents and testimony, the public record, and non-

1 parties). Defendants object to this Interrogatory as unduly burdensome and not proportional to the  
2 needs of the case because the Interrogatory is not reasonably limited as to time. Defendants also  
3 object to this Interrogatory as overly broad and not proportional to the needs of these cases because  
4 it seeks information regarding the weight given to each Signal, of which there are hundreds based  
5 on Plaintiffs' definition, with no time limitation. Defendants further object to the Interrogatory as  
6 impermissibly compound insofar as the Interrogatory seeks four categories of information beyond  
7 identification and description of all Signals about Recommendation Systems for two different  
8 products, YouTube Kids and YouTube Main, since their implementation. Under the Court's  
9 guidance, Dec. 11, 2025 Hearing Tr. 20:13-20, 25:7-17, Interrogatory No. 7 counts as 5 separate  
10 Interrogatories, bringing Plaintiffs' total Interrogatories to 26. Plaintiffs are limited to 45  
11 Interrogatories for YouTube. *See* Order Governing Discovery Limitations (entered March 7, 2024,  
12 modified March 21, 2024), Dkt. No. 702, Ex. A at 42. Plaintiffs cannot circumvent this limitation  
13 by combining numerous discrete requests for information with multiple discrete sub-parts into a  
14 single Interrogatory.

15 Defendants also object to Plaintiffs' requests for information pertaining to "all Signals"  
16 and/or "each Signal" used in the Recommendation System as overly broad, unduly burdensome, and  
17 not proportional to the needs of the case. The Recommendation System is constantly evolving and  
18 learns every day from over 80 billion Signals.

19 Subject to and without waiving any of the foregoing objections, Defendants respond as  
20 follows:

21 The Recommendation System utilizes both user-specific Signals and video-specific Signals.  
22 User-specific Signals include:

- 23 1. **Watch History**: This includes information about the content that a user has  
24 watched and is used to provide appropriate content recommendations that are  
similar to that content.
- 25 2. **Search History**: A user's previous search queries may be used to provide video  
26 recommendations on the same topic.



- 1           3.       **Demographics by age and gender:** Signals related to the user’s age and gender  
2               are used to recommend appropriate content that is similar to content that other  
3               viewers in similar demographic categories view.
- 4           4.       **User activity level:** More active users are likely to see recommendations of more  
5               recently uploaded content.
- 6           5.       **Direct User Inputs:** YouTube also uses input data drawn from direct actions a  
7               user may take in relation to content. These include:
  - 8               •   **Channel Subscriptions:** Signed-in users can indicate which creator channels they  
9               are interested in following by subscribing to them. These “subscribed channels”  
10              are recorded against the signed-in user’s ID.
  - 11             •   **Video Likes:** Signed-in users can indicate they like a video by clicking a  
12              “thumbs up” icon. A user’s “liked videos” are recorded against the user’s ID,  
13              and provide a signal that content was relevant and enjoyable for the user. This  
14              user action is an input for future recommendations, including by suggesting  
15              appropriate content that is similar to the user’s “liked videos.”
  - 16             •   **Video Dislikes:** Signed-in users can indicate they dislike a video by clicking a  
17              “thumbs down” icon. This user action is recorded against the user’s ID, and is  
18              used to demote content similar to videos that the user has previously disliked.
  - 19             •   **Content Dismissals:** Signed-in users can explicitly indicate if they are not  
20              interested in a particular video or channel by selecting “Not interested” or “Don’t  
21              recommend channel” from a menu on the homepage. A dismissed video or  
22              channel is explicitly filtered from recommendations, and this user action can be  
23              used to demote content similar to videos or channels that the user has previously  
24              dismissed.
  - 25             •   **Satisfaction Surveys:** As an additional measure for whether users are satisfied  
26              with the content they are watching, YouTube measures “valued watchtime”—  
27              the time spent watching a video that users consider valuable. YouTube measures  
28              valued watchtime through user surveys that ask users to rate a video they were  
              recommended and/or watched from one to five smile icons. YouTube uses this  
              information to avoid recommending items that are off-putting (and not merely  
              irrelevant) to a viewer or that they regret watching. Only videos that users rate  
              highly with four or five icons are counted as valued watchtime. This user action  
              can be used to uprank or downrank content.
6.       **Content Impression Data:** If YouTube suggested a video, but the user scrolled past  
              without watching, this suggests the user might not be interested in this content and  
              YouTube might limit recommending similar content too frequently.

1           7.     **Coarse-Grained Device Location:** This information includes the user’s general  
2           area and the user’s country code.

3           8.     **Device OS:** This information helps ensure that recommendations are customized to  
4           the screen surface on which they will be viewed. For example, longer content may  
5           be recommended on television.

6           Video-specific Signals, by contrast, include the video’s view count, the number of users  
7           that subscribe to the channel to which the video belongs, users’ ratings of the video, and average  
8           watch time. Video-specific Signals also include “quality-based classifiers”—i.e., aggregate  
9           assessments of the quality or category of a video as determined by machine-learning classifiers  
10          and human evaluators. The Recommendation System uses these categorizations to determine how  
11          to rank content surfaced to a user. Broadly, there are two types of quality-based classifiers:

- 12           •     **Reduce:** If the quality of the content suggests that it may not be appropriate to  
13           recommend widely (e.g., because it is low-quality or clickbait), “Reduce” classifiers  
14           may lead YouTube’s Recommendation System not to widely recommend the  
15           content, reduce the content in recommendations, or disperse the content to prevent  
16           concentration of a certain type of content in recommendations.
- 17           •     **Raise:** “Raise” classifier technology categorizes sources that are authoritative on  
18           important sensitive topics, including health, finance and elections. The  
19           Recommendation System uses this categorization to raise authoritative sources in  
20           Breaking News and Top News displays, in recommendations via the Watch Next  
21           panel and the homepage, and in information panels that appear on certain videos,  
22           pointing users to third-party sources for additional context and resources.

23          In addition, specifically in connection with child-directed content, YouTube has developed  
24          a set of quality principles, which set out certain factors to indicate what is considered low or high  
25          quality content in order to elevate high quality child-directed content within recommendations.  
26          Machine-learning classifiers have been trained to identify child-directed content that is high quality  
27          (which should be promoted, i.e. subject to a “Raise” action), and low quality but not policy violating  
28          content (which should be minimized in recommendations, i.e. subject to a “Reduce” action). Videos  
29          raised in recommendations as “high quality” under these principles include videos that demonstrate  
30          healthy habits, promote critical thinking, and include life lessons and strong characters. By contrast,

1 videos minimized in recommendations as “low quality” include heavily commercial or promotional  
2 content, content that encourages dangerous activities, and content that is sensational or misleading.

3 For more information about Signals used in the Recommendation System, Defendants refer  
4 Plaintiffs to the documents previously produced as Bates No. GOOG-3047MDL-00406689 to  
5 GOOG-3047MDL-00406695 (“Life of a Video Recommendation”), the document previously  
6 produced as Bates No. GOOG-3047MDL-02946657 to GOOG-3047MDL-02946813 (“How  
7 YouTube Responsibly Recommends Content and Protects Users”), and the document previously  
8 produced in native format as Bates No. GOOG-3047MDL-00157390 (“How YouTube  
9 Recommends Made for Kids Videos”).

10 a. The Signals used by the Recommendation System are determined by YouTube’s  
11 engineers and other personnel working in YouTube’s search and discovery teams under the  
12 direction of YouTube’s management.

13 b. Defendants refer Plaintiffs to Defendants’ response to Interrogatory No. 6(e).

14 c. There is no set weight assigned to one Signal over another; the weighting changes  
15 constantly, and varies depending on predictions of how to deliver satisfying, high quality and safe  
16 content for a particular user at a particular moment. Different YouTube features rely on certain  
17 recommendation signals more than others, however. For video recommendations provided in a  
18 user’s “Up Next” feed, a key signal is the video that the user is currently watching. For  
19 recommendations on a user’s YouTube homepage, watch history is a key signal. In both scenarios,  
20 recommendations are also limited and informed by YouTube’s Community Guidelines and other  
21 content-moderation policies, as described above.

22 d. The precise weight or ranking given to a Signal is determined by the  
23 Recommendation System, operating in accordance with policies set by personnel working in  
24 YouTube’s search and discovery teams under the direction of YouTube’s management.

25 **INTERROGATORY NO. 8:**

26 Identify and describe all user controls that You claim allow users to modify the Recommendation  
27 System on the YouTube Platform, and how have those controls changed over time from the date of  
28

1 Subject to and without waiving any of the foregoing objections, Defendants respond as  
2 follows:

3 YouTube offers user controls that allow users to modify the Recommendation System.  
4 These include removing specific videos from a user's watch history, removing individual searches  
5 from a user's search history, as well as turning off or deleting a user's watch or search history  
6 entirely, all of which will modify the recommendations that a given user sees via YouTube's  
7 Recommendation System. In addition, users can dismiss a recommended video by selecting "not  
8 interested" on the video, and can also ensure that videos from a particular channel do not show up  
9 in recommendations by selecting "don't recommend channel." For additional information about  
10 these user controls, Defendants refer Plaintiffs to the YouTube Help article titled "Manage Your  
11 Recommendations & Search Results."<sup>2</sup>

12 YouTube began allowing users to pause watch or search history in 2011, began allowing  
13 users to dismiss recommended videos and select "don't recommend channel" in 2014, and began  
14 allowing users to set an auto-delete option for their watch and search history in 2019.

15  
16 Respectfully submitted,

17 Dated: February 24, 2025

**WILSON SONSINI GOODRICH & ROSATI**

18 /s/ Lauren Gallo White  
19 Lauren Gallo White (State Bar No. 309075)  
lwhite@wsgr.com  
20 Wilson Sonsini Goodrich & Rosati PC  
One Market Plaza, Spear Tower, Suite 3300  
21 San Francisco, CA 94105  
Telephone: (415) 947-2000  
22 Facsimile: (415) 947-2099

23 Brian M. Willen, *pro hac vice*  
bwillen@wsgr.com  
24 Wilson Sonsini Goodrich & Rosati PC  
1301 Avenue of the Americas, 40th Floor  
25 New York, New York 10019  
Telephone: (212) 999-5800  
26 Facsimile: (212) 999-5899

27 <sup>2</sup> Available at  
28 <https://support.google.com/youtube/answer/6342839?sjid=15216197412039056947-NC>.

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28

Christopher Chiou (State Bar No. 233587)  
cchiou@wsgr.com  
Wilson Sonsini Goodrich & Rosati PC  
953 East Third Street, Suite 100  
Los Angeles, CA 90013  
Telephone: (323) 210-2900  
Facsimile: (866) 974-7329

**WILLIAMS & CONNOLLY LLP**

Joseph G. Petrosinelli, *pro hac vice*  
jpetrosinelli@wc.com  
Ashley W. Hardin, *pro hac vice*  
ahardin@wc.com  
WILLIAMS & CONNOLLY LLP  
680 Maine Avenue, SW  
Washington, DC 20024  
Tel.: 202-434-5000

**MORGAN, LEWIS & BOCKIUS LLP**

Yardena R. Zwang-Weissman (SBN 247111)  
yardena.zwang-weissman@morganlewis.com  
300 South Grand Avenue, 22nd Floor  
Los Angeles, CA 90071-3132  
Tel.: 213.612.7238

Brian Ercole, *pro hac vice*  
brian.ercole@morganlewis.com  
600 Brickell Avenue, Suite 1600  
Miami, FL 33131-3075  
Tel.: 305.415.3416

Stephanie Schuster, *pro hac vice*  
stephanie.schuster@morganlewis.com  
1111 Pennsylvania Avenue NW  
NW Washington, DC 20004-2541  
Tel.: 202.373.6595

*Attorneys for Defendants YouTube, LLC and  
Google LLC*

**VERIFICATION**

I, Bill Saphir, serve as Director of Software Engineering at YouTube, LLC. I am authorized to make this Verification for and on behalf of Google LLC and YouTube, LLC. I have read GOOGLE LLC AND YOUTUBE, LLC'S RESPONSES AND OBJECTIONS TO MDL PERSONAL INJURY AND LOCAL GOVERNMENT PLAINTIFFS' THIRD SET OF INTERROGATORIES, and know the contents thereof. Although I do not have personal knowledge of all of the factual matter in these Responses and Objections, I understand that the information contained therein is based on the companies' reasonable investigation to date. On that basis, I believe that the facts stated in the foregoing Responses and Objections are true based on the inquiry made by employees of Google/YouTube, and on those grounds certify or declare that the same are true and correct.

I declare under penalty of perjury under the laws of the United States that the foregoing is true and correct.

Executed on February 24, 2025 in San Bruno, CA.

Signed by:  
  
B1DD3C4AEF484A3...  
Bill Saphir