

Exhibit C

**IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF CALIFORNIA**

PEOPLE OF THE STATE OF CALIFORNIA,
et al.,
Plaintiffs,

v.

META PLATFORMS, INC, Instagram, LLC,
Meta Payments, Inc., Meta Platforms
Technologies, LLC., et al.,
Defendants

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

THIS DOCUMENT RELATES TO:
4:23-cv-05448

MDL No. 3047

Case No. 4:23-cv-05448-YGR

Judge: Hon. Yvonne Gonzalez Rogers

Magistrate Judge: Hon. Peter H. Kang

**REBUTTAL TRIAL REPORT OF ARVIND NARAYANAN
JULY 30, 2025**

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answer to that would involve doing a similar calculation for all of the hundreds or thousands of posts retrieved by the candidate generators, not to mention diversity rules, business logic, and myriad other factors that affect ranking beyond the raw scores of individual posts.

50. Dr. Birnbaum and I do agree that the value models themselves are interpretable.³⁷ Though they are a small part of the overall system, and far from sufficient to understand the rankings of specific posts, they are useful for gaining some understanding of the system as a whole. That is precisely why it is significant that Meta has not published its value models in order to help users, journalists, researchers and others understand what their systems are optimized for.

VII. Safer alternatives to engagement-based ranking are widely known and readily implementable

51. In my initial report, I provided a detailed list of alternative algorithms and designs that exist and in many cases have been successfully deployed. This included (1) algorithms used by Meta themselves before they switched to engagement-based optimization; (2) changes Meta made belatedly in the last few years in response to public pressure, but either made too hard to find in the user interface (such as user controls) or deployed too infrequently (such as surveys); and (3) changes acknowledged as necessary in Meta's internal documents but then never deployed.³⁸

52. Meta's experts have ignored all this evidence and asserted that feasible alternatives do not exist.

53. For his part, Dr. Birnbaum repeatedly implies a false dichotomy between the status quo and reverse-chronological feeds, such as in this paragraph:

“Opinion 1. The vast volume of content available on modern social media services such as Meta's requires utilizing content recommendation systems to create a

³⁷ Birnbaum Report at ¶ 131.

³⁸ Narayanan Initial Report at § VIII.B.