EXHIBIT 2

(FILED UNDER SEAL)

HC-AEO

UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

CONCORD MUSIC GROUP, INC., et al., Plaintiffs, v. ANTHROPIC PBC, Defendant.	Case No. 5:24-cv-03811-EKL-SVK

EXPERT REPLY REPORT OF ABHISHEK NAGARAJ, PH.D.

Signed in Tokyo, Japan on February 13, 2026



Abhishek Nagaraj, Ph.D.

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I. INTRODUCTION

A. Qualifications

1. I previously provided my qualifications in Section I.A of my Opening Report dated on December 19, 2025. My CV in Appendix A of my Rebuttal Report is unchanged.

B. Assignment

2. I have been asked by Counsel for Anthropic PBC ("Anthropic") to analyze economic issues related to fair use factor 4, which is "the effect of the use upon the potential market for or value of the copyrighted work."[1] As a part of this assignment, I submitted my Opening Report on December 19, 2025. I understand that Plaintiffs' experts also submitted their Opening Reports on December 19, 2025. I was then asked by Counsel to evaluate the opinions and conclusions made by Dr. Smith, as well as certain opinions made by Dr. Ben Zhao and Mr. Joshua Dennis. As a part of this assignment, I submitted my Rebuttal Report on January 23, 2026.

3. I understand that on January 23, 2026, Plaintiffs' expert Dr. Michael Smith also submitted his Rebuttal Report (the "Smith Rebuttal Report"), which reviewed and responded to sections of my Opening Report.[2] For this present report, I have been asked by Counsel to also evaluate the opinions and conclusions made by Dr. Smith in his Rebuttal Report.

C. Summary of Opinions

4. Dr. Smith contends that my Opening Report erred[3] in assessing three actual or potential markets to determine "the effect of the use upon the potential market for or value of the copyrighted work"[4] of the Plaintiffs' Works-in-Suit. In fact, Dr. Smith's own market definition is flawed. Dr. Smith incorrectly describes the good at issue in this case as the right to "use the copyrighted works for ***any purpose***;"[5] he also includes in his market

[1] Opening Report of Abhishek Nagaraj, 19 Dec 2025 ("Nagaraj Opening Report"), at ¶6.

[2] *See* Rebuttal Report of Michael D. Smith, 23 Jan 2026 ("Smith Rebuttal Report"), at ¶2.

[3] *See* Smith Rebuttal Report, at ¶¶9-14.

[4] *See* 17 U.S. Code § 107, "Limitations on exclusive rights: Fair use" ("In determining whether the use made of a work in any particular case is a fair use the factors to be considered shall include…the effect of the use upon the potential market for or value of the copyrighted work.").

[5] Smith Rebuttal Report, at ¶15 (emphasis added).

analysis too many buyers (i.e., developers of what he calls "AI models")[6] and too few sellers (solely Plaintiffs). [7]

5. I begin my analysis in Section II.A with a discussion of the active market for display of lyrics that encompasses "lyric aggregators, lyrics websites, digital platforms, and other online services that allow users to access or view lyrics on the internet."[8] Dr. Smith erroneously suggests that the market for lyrics for display purposes is relevant to any (hypothetical) markets for lyrics as training data.[9] I look at the relevant question for the market to license lyrics as display: whether Claude outputs lyrics that substituted for these websites, platforms, and services. Because this is an actual market, the question of harm is an empirical one and is answered by my empirical analyses, which did not find any harm to Plaintiffs in this market.[10]

6. Next, in Section II.B, I turn to Dr. Smith's critiques of the two purported markets I also examined in my Opening Report: "(a) any real or potential market for the data needed to train a general-purpose LLM [and] (b) any real or potential market for lyric training data."[11] Again, Dr. Smith contends the relevant buyers here are developers of "AI models"[12] and the relevant sellers are solely Plaintiffs.[13] Relying on economic theory, I explain why the boundaries of any purported markets are defined by specific buyers and sellers if and only if transactions between them are relevant to the price of any hypothetical transaction between Anthropic and Plaintiffs. I detail why the goods (textual data for training a general-purpose LLM), buyers (Anthropic's competitors), and sellers

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[6] Smith Rebuttal Report, at ¶15.

[7] *See, e.g.,* Smith Rebuttal Report, at ¶7 ("For the purpose of this rebuttal report, I focus on Dr. Nagaraj's 'factor four analysis' opinions related to the 'effect of [Anthropic's] use on the potential market for and value of' ***Publishers' copyrighted works***.") (emphasis added); *see also* Smith Rebuttal Report, at ¶10 ("First, Dr. Nagaraj narrowly defines the relevant market to include only a small 'buyer' class of 'companies like Anthropic that are building general-purpose LLMs,' while excluding all other potential 'buyers' of ***the copyrighted works at issue***.") (emphasis added).

[8] Nagaraj Opening Report, at ¶85.

[9] *See* Smith Rebuttal Report, at ¶15.

[10] I discuss my empirical analyses further in Section III of this Reply Report.

[11] Nagaraj Opening Report, at ¶14.

[12] *See* Smith Rebuttal Report, at ¶15.

[13] *See, e.g.,* Smith Rebuttal Report, at ¶7.

(providers of textual inputs beyond just Plaintiffs) that I have defined in these two purported markets are the proper ones when considering potential harm to Plaintiffs.[14]

7. Then, in Section II.C, I address the flaws in Dr. Smith's claim that transaction costs are not prohibitive[15] in the two purported markets I identify in my Opening Report—for all of the data needed to train a general-purpose LLM and for lyrics data as part of a larger training corpus. I review the evidence that transaction costs are infeasibly high in these markets *relative to* the value of the good to a developer like Anthropic. In particular, I respond to Dr. Smith's erroneous claim that transaction costs will inevitably fall in these markets, and I offer examples of potential markets in which transaction costs have persistently hindered meaningful economic exchange.

8. In Section II.D, I consider the deals that Dr. Smith claims demonstrate the existence of my purported markets for all of the data needed to train a general-purpose LLM and for lyrics as training data. I detail the many and significant differences between these deals and a hypothetical license for Anthropic to use Plaintiffs' lyrics as training data. I also rebut Dr. Smith's flawed contention that a general-purpose LLM developer could feasibly assemble a training corpus from a combination of public domain data and additional deals.[16] This argument overlooks the fact that the few deals Dr. Smith identifies only make sense as "gap-filling" or "last mile" licenses for extremely valuable data.

9. Finally, in Section II.E, I discuss Dr. Smith's view that my prior research contradicts my Opening Report conclusions,[17] and I show instead that papers I have co-authored are mutually consistent with my opinions in this case. In Section II.F, I address additional markets—the labor market and the market for music—that Dr. Smith mistakenly contends will be harmed by Anthropic's conduct.

10. In Section III, I respond to Dr. Smith's critiques of the empirical analysis I conducted in my Opening Report.[18] I note that virtually across the board, Dr. Smith levels these

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[14] *See* Nagaraj Opening Report, at Section III.B.2 ("What I have seen in both sets of revenue does not conclusively show that Plaintiffs have been harmed. . . . If Plaintiffs' theory of harm were correct, as traffic to Claude increased, I would expect to see a corresponding decrease in existing ways for users to access lyrics on the internet. To empirically test this theory, I use granular data on the usage of Claude and on two of the primary means for users to access lyrics: lyrics websites and Google search. Based on these empirical analyses, I find no evidence that either traffic to lyrics websites or lyrics-focused Google searches decreased as usage of Claude increased.").

[15] Smith Rebuttal Report, at ¶39.

[16] Smith Rebuttal Report, at ¶58.

[17] Smith Rebuttal Report, at ¶33.

[18] Smith Rebuttal Report, at ¶8.

criticisms without subsequently conducting the analysis that he alleges would be needed to fix the supposed errors he identifies. By contrast, I do extend my analyses to address Dr. Smith's untested concerns, and I conclude that my results do not change.

II. IN DISCUSSING THE MARKETS FOR THE WORKS-IN-SUIT, THE SMITH REBUTTAL REPORT FAILS TO CORRECTLY ANALYZE THE RELEVANT BUYERS AND SELLERS

11. Dr. Smith argues that I err "by focusing the bulk of [my] 'factor four' analysis on two markets—neither of which bear on the 'potential market for and value of' Publishers' lyrics, the copyrighted works at issue."[19] Dr. Smith and I disagree about how to define the markets at issue in this case. I begin my definition with Plaintiffs' claims. Plaintiffs in this case "allege that Anthropic's use of these textual lyrics data in Claude's training corpus and Claude's display of outputs harmed them in one or more potential markets for their copyrighted works."[20] Accordingly, I focus my analysis on examining the potential markets in which Plaintiffs could possibly claim to experience harm to prices for their copyrighted works, i.e., the Works-in-Suit, as a result of Anthropic's alleged conduct. As I stated in my Opening Report, those potential markets include the purported market for all the data needed to train a general-purpose LLM, and a supposed market for licensing lyrics for training a general-purpose LLM, as well as the existing market for online display of lyrics.

12. Dr. Smith criticizes my analysis on the grounds that "the relevant market [I] should be analyzing is the market for ***Publishers' lyrics,***"[21] and that I should consider "all other buyers who would use the copyrighted works for ***any purpose.***"[22] As I explain further in Section II.A and Section II.B, Dr. Smith's suggestion that there is a single narrowly-scoped market for the purchase of their specific lyrics for ***any purpose*** is erroneous. It improperly conflates the use of lyrics for meaningfully different purposes.

13. Dr. Smith also claims that the relevant markets I propose clash with the market proposed by Ms. Julie Davis. It appears to me that Dr. Smith mischaracterizes Ms. Davis's opinions. I do not read Ms. Davis's Opening Report as offering any opinion on or

[19] Smith Rebuttal Report, at ¶8 (emphasis removed).

[20] Nagaraj Opening Report, at ¶25.

[21] Smith Rebuttal Report, at ¶22.

[22] Smith Rebuttal Report, at ¶15 (emphasis added).

definition of the relevant market for factor 4 analysis. Rather, it appears to me that Ms. Davis is responding to the claim made by *Plaintiffs* that there has been harm to the market for licensing the lyrics of the Works-in-Suit.[23] Ms. Davis points out in her Opening Report that, "[f]or this analysis, I consider whether the Plaintiffs' financial data support ***their claim*** that there has been harm to the market for licensing the lyrics of the Asserted Works."[24]

14. I do not read Ms. Davis's analysis as being inconsistent with the analysis in Section II.B.2.a of my Opening Report. There, I investigated "Plaintiffs' revenue statements associated with the 499 Works-In-Suit"[25] by using Plaintiffs' lyric revenue data that Ms. Davis also examined. She and I separately came to the same conclusion that Plaintiffs' revenue data do not support Plaintiffs' theory of harm. Furthermore, in my Rebuttal Report, I further tested whether "there [was] an overall harm to Plaintiffs' works as Dr. Smith argues"[26] and found that statistical evidence did not support this claim. In short, in my view, Ms. Davis does not attempt to define a market, and our conclusions regarding economic harms to Plaintiffs are consistent with one another's.

15. In sum, Dr. Smith has not attempted to define the proper markets for factor 4 analysis. Contrary to Dr. Smith's claims, I was not asked to assess "whether a market for Publishers' lyrics exists."[27] Rather, the appropriate factor 4 analysis requires me to consider any actual or hypothetical market where the value of Plaintiffs' works could be impacted due to Anthropic's alleged conduct.[28] In Section II.A, I examine the actual market for lyrics for display purposes. Then, in Section II.B.1, I examine buyers in two purported markets for training data for a general-purpose LLM: the purported market for all data needed to train that LLM, which in my opinion is the relevant market, and in the alternative, a supposed market for lyrics data to train that LLM. In Section II.B.2, I look at sellers in those same two purported markets. As I note in my Opening Report,

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[23] First Amended Complaint and Demand for Jury Trial, 25 Apr 2025 ("Amended Complaint"), at ¶13 ("Indeed, there is an existing market through which Publishers license their copyrighted lyrics… Anthropic is depriving Publishers and their songwriters of control over their copyrighted works and the hard-earned benefits of their creative endeavors. . .").

[24] Opening Report of Julie L. Davis, 19 Dec 2025 ("Davis Opening Report"), at pp. 48-49 (emphasis added).

[25] Nagaraj Opening Report, at ¶94.

[26] Rebuttal Report of Abhishek Nagaraj, 23 Jan 2026 ("Nagaraj Rebuttal Report"), at ¶141.

[27] Smith Rebuttal Report, at ¶23.

[28] 17 U.S. Code § 107, "Limitations on exclusive rights: Fair use" ("In determining whether the use made of a work in any particular case is a fair use the factors to be considered shall include . . . the effect of the use upon the potential market for or value of the copyrighted work.").

prohibitively high transaction costs are likely to keep both of these purported markets from emerging. Thus, in Section II.C, I respond to Dr. Smith's contentions that transaction costs are not prohibitively high in these markets. In Section II.D, I respond to Dr. Smith's critique that I failed to adequately consider existing deals for licensing data for LLM training, which Dr. Smith contends are evidence that a licensing market currently exists. In Section II.E, I respond to Dr. Smith's erroneous claims that my past statements about markets for training data contradict the conclusions in my Opening Report. And finally, in Section II.F, I address Dr. Smith's concerns about other, broader markets for music and labor that are completely unrelated to my factor 4 analysis.

A. The Market for the Display of Lyrics Is Separate From Any Purported Market for Lyrics as Training Data and Must Be Analyzed Separately

16. As I note above, Dr. Smith's view is that the relevant buyers of Plaintiffs' copyrighted works include all "buyers who would use the copyrighted works ***for any purpose.***"[29] This definition includes a number of buyers who purchase lyrics for display, including digital distribution platforms like Spotify[30] and lyrics websites such as [31]Lyric Find.[32] Under Dr. Smith's very expansive view, one would have to consider buyers for ***all use cases*** for Plaintiffs' data—even if Anthropic's alleged actions had no bearing on the price that those buyers would pay. For example, Dr. Smith's list of purported buyers would include self-evidently irrelevant use cases such as the licensing of lyrics "for use in church services" (as Plaintiff CCMG offers).[33] Dr. Smith therefore overstates the extent of the relevant market by grouping buyers of licenses for lyrics display—including churches—with hypothetical buyers of licenses for training data.

17. Dr. Smith implies that that all licensors are relevant to his analysis merely because they all do licensing deals with Plaintiffs. However, this is not true from an economics perspective. Not all licensing deals are equivalent, because the licenses in question may contain different rights, and those rights may have different value to different buyers and

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[29] Smith Rebuttal Report, at ¶15 (emphasis added).

[30] Smith Rebuttal Report, at ¶16 ("Similarly, in my initial report, I also highlighted Publishers' various (and lucrative) deals with digital distribution platforms, including deals with Apple, Google, Spotify, and Meta").

[31] Smith Rebuttal Report, at ¶16 ("Similarly, in my initial report, I also highlighted Publishers' various (and lucrative) deals with digital distribution platforms, including deals with . . . online lyric-display websites like LyricFind, MusixMatch, and Genius").

[32] Smith Rebuttal Report, at ¶16 ("Similarly, in my initial report, I also highlighted Publishers' various (and lucrative) deals with digital distribution platforms, including deals with . . . online lyric-display websites like LyricFind, MusixMatch, and Genius").

[33] Declaration of Kenton Draughon in Support of Plaintiffs' Motion for Preliminary Injunction, 16 Nov 2023, at ¶11.

sellers. To understand whether a given music licensing deal is relevant to potential licenses of the Works-in-Suit to Anthropic for training Claude, one must look at the specific rights granted in those deals. Consider, for example, the Licensing Agreement between Musixmatch SRL[34] and Universal Music Publishing Limited, which [redacted]”[35] The agreement expressly excludes [redacted]”[36] These rights are very different from the right to use lyrics text as training data for an LLM. This variation in the rights granted in licensing agreements is [redacted].[37] That license grants Genius [redacted]”[38] Again, this deal confers a specific set of rights that is substantially different from the right to use the lyrics text as AI training data. Dr. Smith errs in arguing that the presence of deals licensing one set of rights to the Works-in-Suit supports the possibility of deals licensing an *entirely different* set of rights to the Works-in-Suit.

[34] UMPG_0000000335, at Section 1 (“[redacted]”).

[35] UMPG_0000000335, at Section 2.1 [redacted]

[36] UMPG_0000000335, at Section 2.3.6.

[37] UMPG_0000000311, at UMPG_0000000311. [redacted]’).”).

[38] UMPG_0000000311, at Section 2; *see also* UMPG_0000000311 at Section 7 ([redacted] *see also* UMPG_0000000311 at Section 7. [redacted]” *See* UMPG_0000000311 at Section 1(h).

18. In my Opening Report, I do consider the market for the online display of lyrics[39] in order to conduct a factor 4 analysis of the impact on the "existing market for the online display of lyrics."[40] As I explained in my Opening Report, this market currently exists and encompasses "lyric aggregators, lyrics websites, digital platforms, and other online services that allow users to access or view lyrics on the internet."[41] I analyzed this market to evaluate the hypothetical possibility that Claude *outputs* could serve as substitutes for lyrics websites and therefore pose a potential threat to existing market for licensing lyrics for online display. However, as noted above, this market for display of lyrics cannot be conflated or commingled with any purported market that includes lyrics to train a general-purpose LLM. Dr. Smith does not address the existing market I have described for the online display of lyrics in his criticism of my factor 4 analysis. Instead, he draws incorrect conclusions about the analyses that I designed to evaluate the empirical question of whether there is harm to Plaintiffs in this market, which I respond to further in Section III below.

B. Dr. Smith's Critique That the Relevant Market for AI Training Should Consider Licenses "For Any Purpose" Contradicts Basic Economic Principles

19. I now turn to an explanation of the economic principles that underpin the opinions I offered in my Opening Report regarding purported markets for training data. I disagree with Dr. Smith that I ought to analyze a market for factor 4 analysis that contains "other types of AI models"[42] as relevant buyers and that contains only Plaintiffs as sellers. As I explain below, Dr. Smith's argument is at odds with economic principles.

20. Under the very economic concepts Dr. Smith also relies on,[43] any potential or hypothetical market of interest should include other buyers and sellers if and only if transactions between them are relevant to the price of any hypothetical transaction between Anthropic and Plaintiffs. The relevant purported buyers are only that subset of AI companies that could be affected in interactions with Plaintiffs in terms of price, based on Anthropic's alleged conduct in this case—chiefly, Anthropic's *competitors*. The

[39] *See* Nagaraj Opening Report, at Section III.B.

[40] *See* Nagaraj Opening Report, at Section III.B.1.

[41] Nagaraj Opening Report, at ¶85.

[42] Smith Rebuttal Report, at ¶15.

[43] *See* Smith Rebuttal Report, at ¶¶18-19 (discussing, e.g., Pindyck and Rubinfeld definition of market).

relevant purported sellers are copyright holders that could sell *potential substitutes*[44] for the training data to firms training general-purpose LLMs.

21. I address the relevant buyers and sellers below in Section II.B.1 and Section II.B.2 respectively. In particular, I respond to Dr. Smith's claims that single-purpose AI tools like Udio and Klay are relevant buyers in the same market for training data as Anthropic because they are "specifically designed for songwriting" and compete with Anthropic for the use case of songwriting.[45]

22. Before doing so, I discuss economic principles regarding the good that these buyers and sellers are trading: the licensing of intellectual property for use as training data. This is a non-rivalrous good with a zero marginal cost of reproduction.[46] I explain this to lay a foundation for why interactions between developers of single-purpose AI audio tools and Plaintiffs are not relevant.

23. In general, prices for most goods are determined by buyers' willingness to pay and by supply constraints. Suppose an apple vendor has five crates of apples, and the marginal cost of each crate to the vendor is $50. Assume that a buyer is willing to pay $100 per crate for all five crates. Selling a crate to *any* buyer who values it at less than $100 would present an opportunity cost for the vendor, since the vendor could have made more by selling it to a higher-valuation buyer who was willing to pay $100 per crate. In this scenario involving a rivalrous good (i.e., a crate of apples), customers who are willing to pay less than the highest-valuation buyer will not be able to obtain apples from that vendor.

24. However, in markets for non-rivalrous goods like licenses to intellectual property, supply constraints are largely irrelevant because the marginal cost of reproduction is zero or very close to zero. For instance, if I am the publisher of an e-book, I can produce another copy at essentially no cost, and there is no fixed supply of e-books. As a result, selling to one additional buyer does not impose any opportunity cost in terms of foregone sales. In such situations, prices are driven primarily by each individual buyer's willingness to pay,

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[44] N. Gregory Mankiw, Principles of Microeconomics, 6th ed., 2012, at p. 492 ("substitutes: two goods for which an increase in the price of one leads to an increase in the demand for the other").

[45] Smith Rebuttal Report, at ¶19.

[46] A key economic fact about data is that it is "non-rivalrous," meaning that one person's possession of the data does not keep another person from also possessing it. In contrast, in a market for a tangible, rivalrous good like steel or corn, whichever buyer is willing to pay the most determines the price for the good, and he or she will get the good and exclude others from using it.

rather than by marginal production costs.[47] In other words, licensors of data will look at how much each buyer values the data when setting prices.[48]

25. To illustrate this, consider the intellectual property right in the trademark to Mickey Mouse. Disney does not charge the same rate to license a Mickey Mouse image for use on a T-shirt as it does to license the character in a movie, because the value of the content differs across the potential downstream uses.[49] Interactions in one downstream use of the Mickey Mouse trademark need not significantly affect licensing prices in other uses.

26. Similar considerations are relevant for any purported market for training data. Licensing rights for lyrics are a non-rival good, and therefore the use of lyrics for *one purpose* does not constrain prices for another purpose. Prices for such intellectual property rights are determined by the product's value to the relevant user, not by (the zero) marginal cost to the supplier. Therefore, defining the market around copyrighted works for "any purpose," as Dr. Smith does, is not correct. Rather, economic theory suggests that prices that Plaintiffs would face in this market do not depend on buyers who use the good for "any purpose," but actually on the value of lyrics *for the specific purpose for which they will be used by the potential licensor.* Thus, contrary to what Dr. Smith argues,[50] when considering the market for a non-rival good, a buyer's needs are highly relevant to how one should define the market, while the needs of other potential buyers are irrelevant.

27. In my opinion, the relevant market participants are AI companies whose actual or prospective licensing arrangements with licensors would be affected in terms of price

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[47] Economist Hal Varian discusses this concept, noting that "[o]ne prominent feature of information goods is that they have large fixed costs of production, and small variable costs of reproduction." Varian explains that "value-based pricing" is more appropriate in this context given the variance in buyers' willingness to pay. *See* Hal R. Varian, "Versioning Information Goods," 13 Mar 1997, at p. 1, available at https://people.ischool.berkeley.edu/~hal/Papers/version.pdf.

[48] Differential pricing is also known as price discrimination, whereby sellers try to gain as much revenue as possible by adjusting the price each customer pays. As Varian notes, "There are many forms of differential pricing [including] quality discrimination or versioning. These terms describe situations in which the producer provides different qualities/versions of a good which sell at different prices . . . [T]he point of versioning is to get the consumers to sort themselves into different groups according to their willingness to pay. Consumers with high willingness to pay choose one version, while consumers with lower willingnesses to pay choose a different version. The producer chooses the versions so as to induce the consumers to 'self select' into appropriate categories." *See* Hal R. Varian, "Versioning Information Goods," 13 Mar 1997, at p. 1, available at https://people.ischool.berkeley.edu/~hal/Papers/version.pdf.

[49] *See generally* "Welcome to The Walt Disney Studios Licensing Website," The Walk Disney Studios, available at https://www.disneystudiolicensing.com/, accessed on 9 Feb 2026 ("Q: What will it cost to license a clip or still from Disney Studios Licensing? A: Licensing costs vary depending on the media, term, and territory rights required for your project."); *see also* Cyrus Moulton, "Mickey Mouse raises question: What is the difference between copyright and trademark? It's a 'gray' area, expert says," 5 Jan 2024, available at https://news.northeastern.edu/2024/01/05/mickey-mouse-public-domain-copyright-trademark/, accessed on 9 Feb 2026 ("To protect its brand, Disney has many trademark registrations for an image of Mickey used in connection with games, toys, hotel services, theme parks and all kinds of things . . . ").

[50] *See* Smith Rebuttal Report, at ¶22.

based on Anthropic's alleged conduct. This set of AI companies' willingness to pay is shaped by the characteristics and competitive conditions for their downstream product[51]—a general-purpose LLM. Therefore, Anthropic's competitors—and those competitors' willingness to pay for training data—are relevant to the hypothetical market at issue.

28. To illustrate this, consider the range of licensing deals Plaintiffs might engage in for the rights to lyrics for display. In one case, an apparel manufacturer might license the words to the Rolling Stones song "Sympathy for the Devil" in order to reprint the lyrics on a t-shirt.[52] At the same time, a karaoke application might want to license the rights of "Sympathy for the Devil" so that users who want to sing the song with the displayed lyrics can do so. These two purchasers—an apparel manufacturer and a karaoke application—do not compete with one another because they are not in the same fundamental markets. The license the manufacturer purchases to display "Sympathy for the Devil" on a T-shirt would not influence the price a karaoke application would pay for rights to the same song. However, if one karaoke application licenses the rights of "Sympathy for the Devil," that purchase is relevant to the actions of another karaoke application, because both karaoke firms compete for the same use case for the lyrics in the downstream market. The second karaoke company, on seeing that the first has licensed "Sympathy for the Devil," may decide it does not want to lose customers, and may therefore also seek a similar license with similar rights to display.

29. Since competitors in downstream markets are the main relevant parties, one must consider whether Anthropic and single-purpose AI audio tools compete with one another. As discussed in my Opening Report, Rebuttal Report, and here in Section II.B.1 below, I conclude that firms with specialized audio AI tools such as Udio have goods that are distinct from those of general-purpose LLMs. These tools and Claude are different in terms of inputs, technology, outputs, products, use cases, and customer bases. Therefore, contrary to what Dr. Smith claims (but does not demonstrate), Anthropic's primary use

[51] N. Gregory Mankiw, Principles of Microeconomics, 6th ed. (2012), at pp. 393 and 379 ("The demand for factors, such as labor, is a derived demand that comes from firms that use the factors to produce goods and services. Competitive, profit-maximizing firms hire each factor up to the point at which the value of the marginal product of the factor equals its price."; "[t]he value of the marginal product of any input is the marginal product of that input multiplied by the market price of the output.").

[52] *See* Deposition of William Pittenger, 7 Oct 2025, 98:11-24 (Senior Vice President, General Counsel and Business Development at ABCKO states that "[redacted]")

cases and markets are not competing with the primary markets and applications for single-purpose AI companies like Udio.

30. As a general-purpose LLM developer, Anthropic requires data to train its models, and it evaluates inputs based on their value within a large and diverse training corpus.[53] As a result of its need for vast and diverse data, Anthropic can substitute among different textual data sources with overlapping informational content (see Section II.B.2). Furthermore, as discussed in Section II.C, the value of lyrics to Anthropic is very low. On the other hand, as discussed in my Rebuttal Report, "the value of what Udio and Klay are receiving in these deals is relatively greater as compared to the value of lyrics text to Anthropic."[54] Therefore, Anthropic's hypothetical willingness to pay for lyrics text as training data is significantly lower compared to Udio's or Klay's willingness to pay (see Section II.C.2.a).

31. In addition to helping define Anthropic's willingness to pay for given tokens, that Anthropic can substitute among different textual data sources is also of use in determining relevant sellers. The economic concept of reasonable interchangeability (or substitutability) of use[55] dictates that sellers of goods that are seen as reasonably equivalent should be included in the same market. If the purported market for all of the data needed to train a general-purpose LLM at issue existed, the sellers of substitutes for Plaintiffs' lyrics would need to be considered part of it; these substitutes could affect the price at which Anthropic would be willing to license Plaintiffs' lyrics. Even if the relevant purported market were limited to lyrics as training data, it would necessarily include all sources of licensable lyrics data, not solely Plaintiffs' works. Furthermore, training a

[53] *See, e.g.,* Nagaraj Opening Report, at footnote 80 [redacted]

[54] Nagaraj Rebuttal Report, at ¶96.

[55] "4.3: Market Definition," Antitrust Division, U.S. Department of Justice, available at https://www.justice.gov/atr/merger-guidelines/tools/market-definition, accessed on 12 Feb 2026 ("The outer boundaries of a relevant product market are determined by the 'reasonable interchangeability of use or the cross-elasticity of demand between the product itself and substitutes for it.'").

general-purpose LLM requires massive quantities of unique data, but that data can be sourced from multiple places.[56] With respect to lyrics, any informational utility they provide could be obtained from many alternative sources, so lyrics text specifically may not be imperative for the training of a general-purpose LLM. Accordingly, the set of data relevant for training a general-purpose LLM extends far beyond lyrics text. Therefore, as discussed in my Opening Report, the most appropriate market encompasses *all* data used to train a general-purpose LLM, rather than (solely) lyrics data.[57]

1. Dr. Smith Improperly Includes Irrelevant Buyers in His Analysis of a Market for Training Data

32. A key argument in Dr. Smith's Rebuttal Report criticizing my factor 4 analysis is that I "exclude[d] all other buyers who would use the copyrighted works for any purpose, including to train other types of AI models."[58] Within the context of training data, Dr. Smith considers different types of AI—both single-purpose AI audio tools and general-purpose LLMs—as buyers in the relevant market. I disagree with Dr. Smith that aggregating all licensors in *one* market as relevant buyers is the correct approach for a factor 4 analysis. Doing so mistakenly collapses into a single market economically distinct buyers whose data needs, downstream uses, and competitive constraints differ.

33. Dr. Smith erroneously conflates all "AI companies"[59] that participate in any market for AI training data, and his approach is overly expansive and inconsistent with economic principles. Rather than grouping these firms together as "AI companies," one must consider the underlying economic principles to define a market. This includes examining whether Anthropic and other potential buyers overlap in terms of the types of data needed or the downstream customers served.

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[56] *See, e.g.,* Nagaraj Opening Report, at ¶22 ("Diverse, high-quality textual data is essential for training an LLM with general knowledge."); Nagaraj Opening Report, at ¶38 ("As Dr. Kaplan stated, 'any functional general-purpose LLM requires a very diverse set of training data to gain a sufficiently precise understanding of the full range of human language and human experience."); Nagaraj Rebuttal Report, at ¶23 ("[D]evelopers of general-purpose LLMs like Anthropic because such developers must be able to acquire a large and diverse set of training data. . .").

[57] *See* Nagaraj Opening Report, at Section III.A.

[58] Smith Rebuttal Report, at ¶15.

[59] *See* Smith Rebuttal Report, at ¶18 ("Even if Dr. Nagaraj wanted to focus his analysis only on the market for Publishers' works as AI training data, specifically, he should have included ***other types of AI companies*** in his analysis, including what he refers to in his report as 'single-purpose generative AI companies like Klay, Wondera, and ElevenLabs.'") (emphasis added).

34. To start, a clear definition of what constitutes "AI" is notoriously elusive.[60] The term could encompass everything from simple classifiers (used in technologies like spam filters)[61] to a variety of different types of foundation models including large-language models, which themselves form a family of technologies with different architectures, data needs, and potential markets.[62] For example, multi-modal models that produce images and video in addition to text are quite different from a text-only model like Claude.[63]

35. Nonetheless, Dr. Smith specifically asserts that single-purpose AI audio tools like Udio and general-purpose LLMs are relevant buyers in the same market for training data because they are "AI companies" like Anthropic.[64] He argues that "AI models that are specifically designed for songwriting (like Udio and Klay) are [] potential 'buyers' in the same market for Publishers' lyrics" because they "compete" with Anthropic for the use case of songwriting.[65] In other words, he contends that these companies "will use those

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[60] *See generally* "One Hundred Year Study on Artificial Intelligence (AI100)," Stanford University, 6 Mar 2024, available at https://ai100.stanford.edu, accessed on 5 Feb 2026; Marko Grobelnik, Karine Perset, and Stuart Russel, "What is AI? Can you make a clear distinction between AI and non-AI systems?," OECD.AI Policy Observatory, available at https://oecd.ai/en/wonk/definition, accessed on 5 Feb 2026; Deni Ellis Béchard, "Each Time AI Gets Smarter, We Change the Definition of Intelligence," Scientific American, 20 Nov 2025, available at https://www.scientificamerican.com/article/every-ai-breakthrough-shifts-the-goalposts-of-artificial-general/, accessed on 10 Feb 2026.

[61] *See, e.g.,* Ion Androutsopoulos et al., "Learning to Filter Spam E-Mail: A Comparison of a Naive Bayesian and a Memory-Based Approach," arXiv, 18 Sep 2000, available at https://arxiv.org/pdf/cs/0009009, accessed on 5 Feb 2026.

[62] *See, e.g.,* Rishi Bommasani et al., "On the Opportunities and Risks of Foundation Models," arXiv, 12 Jul 2022, available at https://arxiv.org/pdf/2108.07258, accessed on 5 Feb 2026.

[63] *See generally* Jobit Varughese, "What is a multimodal LLM (MLLM)?," IBM, available at https://www.ibm.com/think/topics/multimodal-llm, accessed on 7 Feb 2026 ("A multimodal LLM, or MLLM, is a state-of-the-art large language model (LLM) that can process and reason across multiple types of data or modalities such as text, images and audio. MLLMs can describe images, answer questions about videos, interpret charts, perform optical character recognition (OCR) tasks or even engage in real-time conversations that involve vision and speech."); "Multimodal AI Reigns: Why Text-Only Models Are Already Obsolete," Forbes Councils, 28 Nov 2025, available at https://councils.forbes.com/blog/multimodal-ai-reigns-why-text-only-models-are-already-obsolete, accessed on 7 Feb 2026 ("The future belongs to multimodal AI systems that can process text, images, audio, video, and sensor data simultaneously, creating a more complete understanding of context that text-only models simply cannot match. . . When an AI system can analyze a user's facial expression while reading their message, examine code alongside its visual output, or correlate audio patterns with textual sentiment, it gains contextual awareness."); Rina Diane Caballer and Cole Stryker, "What is Google Gemini?," IBM, available at https://www.ibm.com/think/topics/google-gemini, accessed on 7 Feb 2026 ("Gemini is Google's large language model (LLM). More broadly, it's a family of multimodal AI models designed to process multiple modalities or types of data, including audio, images, software code, text and video. . . Unlike generative pretrained transformer (GPT) models that take only text-based prompts or diffusion models used for image generation that take both text and image prompts, Google Gemini supports interleaved sequences of audio, image, text and video as inputs and can produce interleaved text and image outputs.").

[64] *See* Smith Rebuttal Report, at ¶18 ("Even if Dr. Nagaraj wanted to focus his analysis only on the market for Publishers' works as AI training data, specifically, he should have included ***other types of AI companies*** in his analysis, including what he refers to in his report as 'single-purpose generative AI companies like Klay, Wondera, and ElevenLabs.'") (emphasis added).

[65] Smith Rebuttal Report, at ¶19.

lyrics for the same or substantially similar purpose in AI training"[66] and compete for "whatever data is necessary to train an AI model to perform that task."[67]

36. However, this approach ignores meaningful differences in functionality, use cases, and competitive dynamics between single-purpose AI audio tools and general-purpose LLMs. Udio and Klay are AI-powered music platforms with generative AI tools that help users with specific tasks related to music creation and audio generation. Tools like Udio and Klay are therefore designed for completely different use cases than a general-purpose LLM like Claude.[68]

37. Udio and Klay also market their products very differently from the way general-purpose LLMs like Claude are marketed. Udio has positioned itself as an emerging AI music creation platform structured around a subscription service, where users can "customize, stream and share music."[69] Klay presents itself as a subscription service that is "advancing the state of the art in Music AI and innovating for the next generation of music experiences."[70] For generative AI music platforms like Udio and Klay, primary competitors include other companies—e.g., Suno, ElevenLabs Music, and Stability AI—that offer music-generation products.[71] For general-purpose LLM companies like Anthropic, the industry consists of a landscape that includes OpenAI (ChatGPT), Google (Gemini), Microsoft (Copilot), DeepSeek AI (DeepSeek-V3 and DeepSeek-R1), and others.[72]

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[66] Smith Rebuttal Report, at ¶19.

[67] Smith Rebuttal Report, at ¶19.

[68] *See* Opening Report of Jeffrey Bilmes, 19 Dec 2025 ("Bilmes Opening Report"), at ¶96. Specifically, as I understand from Dr. Bilmes's Opening Report, "[g]eneral-purpose LLMs, such as Open AI's GPT models, Meta's Llama models, Google's Gemini models, and Anthropic's Claude models, support a wide range of tasks such as summarization, question-answering, and text generation." *See* Nagaraj Rebuttal Report, at ¶40 ("Udio and Klay offer AI products that are specifically trained to generate music and other audio—not simply text.").

[69] *See* Anthropic_0000597939 at Anthropic_0000597939.

[70] "Music Technology Company Klay Signs First-of-its-Kind AI Licensing Deals with Universal Music Group, Universal Music Publishing Group, Sony Music Entertainment, Sony Music Publishing, Warner Music Group & Warner Chappell Music," Universal Music Group, 20 Nov 2025, available at https://www.universalmusic.com/music-technology-company-klay-signs-first-of-its-kind-ai-licensing-deals-with-universal-music-group-universal-music-publishing-group-sony-music-entertainment-sony-music-publishing-warner-music-g/, accessed on 29 Jan 2026.

[71] *See* Charlie Fink, "ElevenLabs Launches AI Music Platform, Enters Race with Suno and Udio," Forbes, 21 Jan 2026, available at https://www.forbes.com/sites/charliefink/2026/01/21/elevenlabs-launches-ai-music-platform-enters-race-with-suno-and-udio/, accessed on 29 Jan 2026.

[72] *See* Surbhi, "10 Powerful Claude Alternative Assistants in 2026," Digital Ocean, 24 Nov 2025, available at https://www.digitalocean.com/resources/articles/claude-ai-alternative-assistants, accessed on 29 Jan 2026.

38. Meanwhile, as I note in my Opening and Rebuttal Reports, Claude currently does not have music-generation capabilities, which reflects a deliberate decision on the part of Anthropic's leadership to focus on workplace use cases for Claude.[73] Indeed, as I point out in my Opening Report, Claude's primary uses are for business and enterprise purposes.[74] Furthermore, Claude is not a platform where users can share music. Claude is a general-purpose LLM marketed as a generative AI assistant that can help with a broad range of tasks.[75] Claude is also not meant to generate lyrics verbatim in its outputs (and actively seeks to prevent this),[76] whereas Udio and Klay have paid [redacted].[77] In fact, as further discussed in Section II.D, Udio's and Klay's licensing agreements with UMPG illustrate why single-purpose AI audio tools operate in a distinct market: [redacted].[78]

39. Given the differences in use cases and end customers, then, general-purpose LLM developers like Anthropic and single-purpose AI audio tool developers like Udio and Klay have a different demand for training data. In fact, firms like Udio demand data tailored to music generation and cannot substitute general text data for music-specific content in the same way. In other words, Anthropic and Udio do not demand the same product with respect to training data. These differences imply distinct substitution constraints and distinct levels of willingness to pay across buyers. Udio and Klay are licensing not just lyrics text, but also audio, and thus the value of what Udio and Klay are receiving in these deals is relatively greater as compared to the value of lyrics text to Anthropic. Consequently, transactions involving single-purpose AI developers are not informative about the competitive constraints relevant to Anthropic. I therefore disagree with Dr. Smith, and I see "no evidence suggesting that deals with multimedia generative

[73] Anthropic's CEO, Dario Amodei, testified that "one reason that Anthropic doesn't generate audio and video is that [Anthropic is] generally not aiming to [] produce content in creative industries," but rather focusing on "work and productivity-based activities." Deposition of Dario Amodei, 8 Jan 2026, 102:13-21.

[74] *See* Nagaraj Opening Report, at ¶18.

[75] *See* Anthropic_0000595834.

[76] *See* Nagaraj Opening Report, at ¶112-115 (discussing multiple Anthropic guardrails).

[77] *See* UMPG_0000024457; *see also* UMPG_0000025119.

[78] *See* UMPG_0000024457; *see also* UMPG_0000025119.

AI companies or AI-powered music generators—for which music (both lyrics and audio) is a valuable input in generating new songs—would be analogous to the needs of developers of general-purpose LLMs, like Anthropic's Claude."[79]

40. Furthermore, Dr. Smith's claim that I have artificially narrowed relevant buyers because there are only four general-purpose LLMs in the United States is unsupported.[80] The general-purpose LLM industry consists of a landscape that includes not only the four companies listed by Dr. Smith but also others such as Microsoft (Copilot), DeepSeek AI (DeepSeek-V3 and DeepSeek-R1), xAI (Grok), Alibaba (Qwen), Mistral AI (e.g., Mistral Large), and others all around the world.[81] Dr. Smith also does not explain why he restricts his assessment to the United States, despite citing deals in his Opening Report that involve sellers outside of the United States.[82] On the contrary, based on Dr. Smith's own

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[79] Nagaraj Rebuttal Report, at ¶96.

[80] *See* Smith Rebuttal Report, at ¶17 ("Dr. Nagaraj narrowly defines the relevant buyers to include only 'companies like Anthropic that are building general-purpose LLMs.' . . . While Dr. Nagaraj never identifies all of the buyers in this market, as far as I am aware, there are only four companies in the United States building AI models that fit Dr. Nagaraj's definition of 'general-purpose LLM,' and therefore the market he chooses to analyze includes only four potential buyers: Anthropic (Claude), Meta (Llama), Google (Gemini), and OpenAI (ChatGPT)."). Citations are omitted.

[81] *See, e.g.,* Surbhi, "10 Powerful Claude Alternative Assistants in 2026," Digital Ocean, 24 Nov 2025, available at https://www.digitalocean.com/resources/articles/claude-ai-alternative-assistants, accessed on 29 Jan 2026; Jordan Novet, "Microsoft starts testing AI model that could escalate competition with OpenAI," CNBC, 28 Aug 2025, available at https://www.cnbc.com/2025/08/28/microsoft-tests-mai-1-preview-ai-model-boost-to-copilot-rival-openai.html, accessed on 29 Jan 2026 ("On LMArena, Microsoft's new model was ranked 13th for text workloads on Thursday, below models from Anthropic, DeepSeek, Google, Mistral, OpenAI and xAI."); Kyle Wiggers, "Snowflake releases a flagship generative AI model of its own," TechCrunch, 24 Apr 2024, available at https://techcrunch.com/2024/04/24/snowflake-releases-a-flagship-generative-ai-model-of-its-own/, accessed on 29 Jan 2026 ("Snowflake, the cloud computing company, today unveiled Arctic LLM, a generative AI model that's described as 'enterprise-grade'. . . . Arctic LLM's context is between ~8,000 and ~24,000 words, dependent on the fine-tuning method — far below that of models like Anthropic's Claude 3 Opus and Google's Gemini 1.5 Pro."); "NVIDIA Nemotron," NVIDIA, available at https://www.nvidia.com/en-us/ai-data-science/foundation-models/nemotron/, accessed on 29 Jan 2026 ("Designed for advanced reasoning, coding, visual understanding, agentic tasks, safety, speech, and information retrieval, Nemotron models are openly available and integrated across the AI ecosystem so they can be deployed anywhere—from edge to cloud."); *see*, Kelly Ng et al., "DeepSeek: The Chinese AI app that has the world talking," BBC, 4 Feb 2025, available at https://www.bbc.com/news/articles/c5yv5976z9po, accessed on 29 Jan 2026 ("DeepSeek, a Chinese artificial intelligence (AI) startup . . . released its latest model, DeepSeek R1, which it said rivalled technology developed by ChatGPT-maker OpenAI in its capabilities, while costing far less to create."); "Alibaba's large language model tops global ranking of AI developer platform Hugging Face," Yahoo Finance, 28 Jun 2024, available at https://finance.yahoo.com/news/alibabas-large-language-model-tops-093000912.html, accessed on 29 Jan 2026 ("Alibaba Group Holding's family of large language models (LLMs)—the technology underpinning generative artificial intelligence (AI) services like ChatGPT—has been ranked among the world's top 10 open-source models."); Kai Nicol-Schwarz, "French AI lab Mistral releases new AI models as it looks to keep pace with OpenAI and Google," CNBC, 2 Dec 2025, available at https://www.cnbc.com/2025/12/02/mistral-unveils-new-ai-models-in-bid-to-compete-with-openai-google.html, accessed on 29 Jan 2026.

[82] *See* Opening Report of Michael D. Smith, 19 Dec 2025 ("Smith Opening Report"), at Exhibit A; *see, e.g.,* Louis Dreyfus and Jérôme Fenoglio, "Le Monde and OpenAI sign partnership agreement on artificial intelligence," Le Monde, 13 Mar 2024, available at https://www.lemonde.fr/en/about-us/article/2024/03/13/le-monde-signs-artificial-intelligence-partnership-agreement-with-open-ai_6615418_115.html, accessed on 6 Feb 2026 ("This multi-year agreement, the first between a French media organization and a major AI player, will enable OpenAI to draw on our newspaper's corpus to establish and enhance the reliability of the answers of its ChatGPT tool, in return for a significant source of additional revenue."); Matilda Battersby, "Academic authors 'shocked' after Taylor & Francis sells access to their research to Microsoft AI," The

approach to deals, there would be no reason to exclude such buyers. In fact, the breadth of the landscape can be demonstrated by public evaluation platforms such as LMArena.ai. LMArena.ai benchmarks hundreds of models from various developers based on those models' text-generation capabilities. Many of these developers offer text-only, general-purpose LLMs comparable to Claude.[83] The "text arena" on LMArena.ai lists 303 models built by 45 unique LLM companies.[84]

41. In sum, I do not agree with Dr. Smith's contention that the market for fair use factor 4 analysis should include as buyers any company that would license the right to the copyrighted works for ***any purpose***. I offer further evidence regarding the differences between general-purpose LLMs and single-purpose AI audio tools in Section II.D.

2. Dr. Smith Fails to Recognize That the Relevant Market for Training Data Contains a Broad Set of Potential Suppliers

42. While Dr. Smith defines the "market" as a "[c]ollection of buyers and sellers that, through their actual or potential interactions, determine the price of a product or set of products,"[85] he largely ignores half the market—sellers. His report focuses on Plaintiffs as the only relevant sellers and the Works-in-Suit as the only relevant goods.[86] As discussed above in Section II.B, this is incorrect due to the economic concept of reasonable interchangeability of use.

Bookseller, 19 Jul 2024, available at https://www.thebookseller.com/news/academic-authors-shocked-after-taylor--francis-sells-access-to-their-research-to-microsoft-ai, accessed on 7 Feb 2026 (Taylor and Francis is owned by Informa PLC, which is registered in England and Wales; *see* "Taylor & Francis," Informa, available at https://www.informa.com/divisions/taylor-and-francis/, accessed 7 Feb 2026); Scott Roxborough, "U.K. Media Groups, Including Sky News and The Guardian, Partner With 'Ethical AI' Company," 20 Nov 2024, available at https://www.hollywoodreporter.com/business/business-news/uk-media-sky-guardian-ft-ai-partnership-1236067245/, accessed on 7 Feb 2026.

[83] *See generally* "Text Arena," Arena, 29 Jan 2026, available at https://arena.ai/leaderboard/text, accessed 4 Feb 2026; *see, e.g.,* "Model Cards & Prompt formats: Llama 4," Meta, available at https://www.llama.com/docs/model-cards-and-prompt-formats/llama4/, accessed on 4 Feb 2026 ("Output: Text-only"); Dave Bergmann, "DeepSeek: Sorting through the hype," IBM, available at https://www.ibm.com/think/topics/deepseek, accessed on 4 Feb 2026 ("DeepSeek-V3, the backbone of DeepSeek-R1, is a text-only, 671 billion (671B) parameter mixture of experts (MoE) language model."); "Gemma model card," Google AI for Developers, available at https://ai.google.dev/gemma/docs/core/model_card, accessed 4 Feb 2026 ("[The Gemma models] are text-to-text, decoder-only large language models, available in English, with open weights, pre-trained variants, and instruction-tuned variants. Gemma models are well-suited for a variety of text generation tasks, including question answering, summarization, and reasoning.").

[84] "Text Arena," Arena, 29 Jan 2026, available at https://arena.ai/leaderboard/text, accessed 4 Feb 2026. I note that Text Arena is regularly updated and the exact number of models and unique LLM companies varies over time. My count of 303 models and 45 unique LLM companies was determined as of 4 Feb 2026.

[85] Robert S. Pindyck and Daniel L. Rubinfeld, Microeconomics, 8th ed. (2013), at p. 7. Dr. Smith relies on this definition in his report. *See* Smith Rebuttal Report, at ¶18.

[86] *See, e.g.,* Smith Rebuttal Report, at ¶7 ("For the purpose of this rebuttal report, I focus on Dr. Nagaraj's 'factor four analysis' opinions related to the 'effect of [Anthropic's] use on the potential market for and value of' ***Publishers' copyrighted works***.") (emphasis added); see also Smith Rebuttal Report, at ¶10 ("First, Dr. Nagaraj narrowly defines the relevant market to include only a small 'buyer' class of 'companies like Anthropic that are building general-purpose LLMs,' while excluding all other potential 'buyers' of ***the copyrighted works at issue***.") (emphasis added).

43. In any hypothetical market considered, the sellers of substitute goods affect the price. In fact, Robert Pindyck and Daniel Rubinfeld—authors of one of the textbooks Dr. Smith relies on—note that any seller "must understand who its actual and potential competitors are for the various products that it sells or might sell in the future."[87] To determine which sellers compete in a given market, one would need to build an understanding of what buyers need in this market.

44. As discussed in my Opening Report, building a general-purpose LLM "requires an enormous amount of training data."[88] To create such a model, developers need an "immense and incredibly diverse"[89] dataset, which must include "tokens generated from an enormous quantity of human-generated text, like software code, books, articles, web pages, and blog posts."[90] Without knowing that they can "acquire a large enough set of training data to train a capable general-purpose AI model,"[91] general-purpose LLM developers will not participate in any hypothetical market for the "trillions of tokens [that] could come from different sources or providers [but] form a common input that are combined to train the final model."[92] Therefore, what matters in any purported market for LLM training data is not the presence of individual pieces of content in isolation, but the availability of a large quantity of tokens from various sources in aggregate. As long as the overall dataset is rich enough in quantity and variety, individual works or tranches of works may be able to substitute for other sets of works in training a general-purpose LLM.

45. Indeed, Dr. Bilmes stated in his Opening Report that "[d]ata diversity depends on both the number of sources and their distinctiveness: two datasets may each be high quality on their own, but if their information content significantly overlaps, there is little value from using both rather than one."[93] Therefore, in the context of training general-purpose LLMs, the relevant substitutes for the Works-in-Suit are other textual inputs that provide overlapping or comparable informational content that could be used in place of Plaintiffs'

[87] Robert S. Pindyck and Daniel L. Rubinfeld, Microeconomics, 8th ed. (2013), at p. 10.

[88] Nagaraj Opening Report, at ¶22.

[89] Nagaraj Opening Report, at ¶33.

[90] Nagaraj Opening Report, at ¶32.

[91] Nagaraj Opening Report, at ¶34.

[92] Nagaraj Opening Report, at ¶34.

[93] Bilmes Opening Report, at ¶320.

lyrics. Those hypothetical substitutes plausibly consist of both lyrics[94] and non-lyrics text data, corresponding to the information I discuss in my first purported market.[95]

46. In fact, in my Opening Report I explained that "song lyrics have low value for training general-purpose LLMs because there are other ways to help train LLMs to answer user prompts regarding songs and songwriting."[96] Dr. Bilmes also points out that, to the extent it is useful for a general-purpose LLM to understand music, lyrics, and song structure, this information is also available from other sources, including books and internet text.[97] Thus, there are many other substitutes for lyrics data from Plaintiffs' copyrighted works, which Dr. Smith fails to consider.

47. In sum, Dr. Smith ignores the fact that the relevant sellers are those with viable substitutes for Plaintiffs' Works-in-Suit as training data. In fact, even if the relevant market were limited to lyrics text data, it would necessarily include all sources of lyrics text data (such as lyrics to songs owned by other music labels), not solely Plaintiffs' works. As discussed throughout my Opening Report and Rebuttal Report,[98] developers of general-purpose LLMs need to build a vast and diverse training corpus through a mix of textual data originating from different sources or providers, not only Plaintiffs. At the same time, including data from two content suppliers with significantly overlapping information provides little additional value. Lyrics in particular are not a unique or indispensable input, as their informational content can be replaced by other textual sources. Accordingly, Dr. Smith errs in overlooking the role of substitutes to Plaintiffs' Works-in-Suit and fails to recognize that Anthropic could substitute Plaintiffs' Works-in-Suit

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[94] For example, lyrics from other publishers and songwriters could substitute for the Works-in-Suit, including lyrics in the public domain.

[95] *See* Nagaraj Opening Report, at Section III.A.2.

[96] *See* Nagaraj Opening Report, at ¶60.

[97] *See* Bilmes Opening Report, at ¶330 ("To the extent that it is helpful for Claude to understand music, lyrics, and the structure of songs as part of Anthropic's goal of creating a versatile, general-purpose model, there are ample data sources in Claude's training corpus—other than the song lyrics themselves—where this information is available. These alternative sources, such as books, the internet, and open-domain lyrics, would suffice to enable Claude to understand those concepts.").

[98] *See* Nagaraj Opening Report, at Section II.B; Nagaraj Rebuttal Report, at ¶102 ("As I stated in my Opening Report, in a purported market for all of the data needed to train a general-purpose LLM, the transaction costs would dwarf the value of the data, because the 'data needed to train a general-purpose LLM is immense and incredibly diverse, and the potential holders of rights in that data are enormous and highly distributed.'"); Nagaraj Rebuttal Report, at ¶121 ("LLM developers like Anthropic are likely to place a low value on lyrics given how small a lyrics dataset would be in comparison to the size needed to train a general- purpose LLM. . . . [Song lyrics] tend to include a far narrower range of topics, which minimizes the diversity that they contribute. For this reason, they add little to the range and diversity of knowledge that a general-purpose LLM like Claude needs."); Nagaraj Rebuttal Report, at footnote 188 ("Ironically, the larger and more diverse that the dataset on which a generative model was trained is, the less likely are infringing outputs."). Citations are omitted.

with other text sources—including text that does not consist of lyrics—to train its general-purpose LLM.

C. Dr. Smith's Discussion of Transaction Costs Is Erroneous

1. Dr. Smith's Overall Opinion on Transaction Costs Is Flawed

48. In his Rebuttal Report, Dr. Smith critiques the market I consider to be most relevant to training data, which is the purported market for all the data needed to train a general-purpose LLM,[99] and claims that my opinion about the high transaction costs in such a market "collapses into circularity."[100] He further notes that a "general-purpose LLM developer, like Anthropic, could have decided to license copyrighted content first instead of obtaining it without licensing it. Had any of the buyers in Dr. Nagaraj's market chosen to do so, then, by definition, a market for licensing that content would exist."[101] But Dr. Smith fails to grapple with my conclusion that, assuming the relevant market is for all data needed to train a general-purpose LLM, the transaction costs of acquiring the trillions of tokens needed would be insurmountable and likely prevent a market from forming.[102]

49. His contention ignores the many factors I point to in my Opening Report that contribute to these high transaction costs: the vast scale of the data needed,[103] the diversity of the data required,[104] the large number of rightsholders involved,[105] the difficulty of locating

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[99] *See* Smith Rebuttal Report, at ¶8 ("Dr. Nagaraj errs by focusing the bulk of his 'factor four' analysis on two markets-neither of which bear on the 'potential market for and value of' ***Publishers' lyrics***, the copyrighted works at issue-and both of which lead him to misleadingly conclude that 'there can have been no harm to Plaintiff s in ***these*** (nonexistent) markets.'") (emphasis in original); *see also* Smith Rebuttal Report, at Section II.A.

[100] Smith Rebuttal Report, at ¶39.

[101] Smith Rebuttal Report, at ¶41.

[102] *See* Smith Rebuttal Report, at ¶42 ("Dr. Nagaraj's opinions regarding 'prohibitively high transaction costs' are irrelevant to his stated assignment. Whether transaction costs would prohibit a specific class of developer from assembling 'All of the Data Needed' to train a specific type of AI model does not mean that a 'potential market" for Publishers' lyrics does not or cannot exist . . . .").

[103] *See, e.g.,* Nagaraj Opening Report, at Section II.B ("Training an LLM requires trillions of tokens to allow the model to recognize the patterns and relationships between words and phrases, and to eventually develop a comprehensive map of how language works."); Nagaraj Opening Report, at ¶¶36-37 ("According to Anthropic's Chief Science Officer, Dr. Kaplan, LLMs like Claude must be 'shown a vast dataset consisting of hundreds of millions, if not billions, of pieces of content.' . . . Anthropic's Claude 3.5 Sonnet model, for example, contained a training dataset of [redacted]." and Nagaraj Opening Report, at ¶47 ("[E]even the largest rightsholders represent only a fraction of the data needed to train a general-purpose LLM such as Claude. . . . One of the reasons the [OpenAI and *The New York Times*] deal fell through, according to OpenAI, was that even a highly regarded corpus like the one belonging to *The New York Times* did not represent a large enough dataset relative to OpenAI's overall data needs.").

[104] *See* Nagaraj Opening Report, at ¶38 ("As Dr. Kaplan stated, 'any functional general-purpose LLM requires a very diverse set of training data to gain a sufficiently precise understanding of the full range of human language and human experience.' Without using a variety of sources for training datasets, developers find that their models degrade.").

[105] *See* Nagaraj Opening Report, at ¶42 ("[B]ecause of the scale of training data required for general-purpose LLMs, developers would need to make deals with hundreds of millions of different rightsholders.").

all rightsholders[106] (including the problem of identifying who can sub-license which rights),[107] and the lengthy negotiations often required in contracting around licensing.[108] That is, my Opening Report takes up the question of whether an LLM developer would decide to license all the data the company needed by negotiating individual deals with "hundreds of millions"[109] of different rightsholders. Identifying each rightsholder, contacting that person or entity, and entering into (often unsuccessful) negotiations would simply not be feasible. A rational general-purpose LLM developer, then, would be highly unlikely to enter into any purported market for all data needed to train the LLM, knowing that it could not feasibly engage in hundreds of millions of negotiations. Furthermore, as I discussed in detail in my Rebuttal Report, Dr. Smith offers no evidence that the existence of concentrated rightsholders or collective licensing agreements will reduce transaction costs enough to enable a market for all data needed to train a general-purpose LLM to emerge.[110]

50. Dr. Smith raises another overarching point regarding my conclusion that transaction costs are prohibitively high in any purported market for all of the data needed to train a general-purpose LLM. He notes that in the wake of new technologies, parties become more proficient in negotiating deals involving that technology.[111] I agree with him that this

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[106] *See* Nagaraj Opening Report, at ¶43 ("[I]dentifying and locating each of these counterparties would be prohibitively expensive given the sheer number of rightsholders. In the context of copyright, there is a well-known problem of 'orphan works'—materials whose rightsholders are extremely difficult to identify or impossible to locate.").

[107] *See* Nagaraj Opening Report, at ¶¶44-46 ("[A] counterparty may possess only certain rights to a particular work. . . . As a result, some rightsholders may not be able to license a work for general-purpose LLM training.").

[108] *See* Nagaraj Opening Report, at ¶¶48-49 ("Scaling this effort [to negotiate a license agreement] to hundreds of millions of rightsholders, many of whom would be individuals with no relevant experience or expertise, simply will not be feasible.").

[109] *See* Nagaraj Opening Report, at ¶42.

[110] *See* Nagaraj Rebuttal Report, at ¶¶101-108. First, Plaintiffs as concentrated rightsholders would not come anywhere close enough to supplying enough text to train a general-purpose LLM. *See* Nagaraj Rebuttal Report, at ¶104. Second, even concentrated rightsholders of other types of text may not be able to sub-license that text as training data. *See* Nagaraj Rebuttal Report, at ¶105. Third, the only examples of relevant collective rights organizations that Dr. Smith discusses are in the music industry. *See* Nagaraj Rebuttal Report, at ¶107. He further does not establish that these organizations hold rights to sub-license lyrics as training data, nor does he demonstrate that large rightsholders like Plaintiffs are even open to collective intermediation of this kind. In fact, there is evidence to the contrary; Plaintiff UPMG has offered public commentary suggesting that it does not find such schemes appropriate. *See* Nagaraj Rebuttal Report, at ¶108.

[111] Smith Rebuttal Report, at ¶51 ("Dr. Nagaraj emphasizes the complexity of rights negotiations, . . . but that is common and to be expected in new markets. Indeed, this was the case in the early days of essentially every new digital distribution channel, but in each case early entrants figured out how and what to negotiate, markets emerged, and future negotiations became more routine with lower transaction costs. As a result, today consumers enjoy licensed services for consuming music via online purchase, online streaming, Internet Radio, online video platforms like YouTube, and for using licensed music via a variety of user-generated content platforms. Dr. Nagaraj does not account for any of this before jumping straight to his conclusion that a market cannot emerge in the future in this setting, nor does he explain why this setting is fundamentally different from prior licensing markets."); *see also i*Smith Rebuttal Report*,* at ¶59 ("And finally, Dr. Nagaraj does not discuss how rights negotiations become increasingly simpler and more routine as a market develops and a new technology becomes better understood, as with negotiations with digital distribution platforms like Spotify, YouTube, TikTok, and other platforms that now regularly and routinely renew licensing contracts.").

often occurs when new technologies emerge.[112] However, Dr. Smith has offered no evidence that high transaction costs will decrease over time in the case of general-purpose LLMs, much less that they will decrease enough for a market to form. In Dr. Smith's telling, the development of a licensing market for lyrics data to train general-purpose LLMs would be inevitable if not for Anthropic's actions. Recounting past technological developments, he states that "in each case early entrants figured out how and what to negotiate, markets emerged, and future negotiations became more routine with lower transaction costs."[113] In giving examples of online radio and music, Dr. Smith ignores other cases where such markets have not arisen even after decades have passed.

51. For example, there are millions of valuable books that cannot be found for purchase via Amazon and other online booksellers.[114] High transaction costs owing to lengthy negotiations with a large number of license holders—combined with low individual value for each work—have meant that such markets fail to form.[115] The same is the case with markets for personal data. Millions of individuals hold valuable data in terms of their medical information, purchasing history, demographic data, hobbies and interests, photos, and messages, and yet it is not possible for buyers to license this content at low transaction costs, even though the internet has existed for almost 30 years. A buyer that had to contact millions of individuals and conclude deals with each would face prohibitively expensive costs.[116] In short, Dr. Smith's suggestion that transaction costs in a market associated with a new technology will inevitably fall to manageable levels is not borne out in all instances.

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[112] *See* Nagaraj Opening Report, at ¶69 ("Relatedly, when a new technology emerges in the marketplace, it can be difficult to arrive at agreement on what bundle of rights come standard in a negotiation.").

[113] *See* Smith Rebuttal Report, at ¶51.

[114] *See* Christopher Buccafusco and Paul J. Heald, "Do Bad Things Happen When Works Enter the Public Domain?: Empirical Tests of Copyright Term Extension," 15 Jul 2017, available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2130008; *see also* Rebecca J. Rosen, "The Missing 20th Century: How Copyright Protection Makes Books Vanish," 30 Mar 2012, available at https://www.theatlantic.com/technology/archive/2012/03/the-missing-20th-century-how-copyright-protection-makes-books-vanish/255282/, accessed on 6 Feb 2026; *see also* Paul J. Heald, "Do Bad Things Happen When Works Fall into the Public Domain: The Market for Audiobooks," UC Economics Dept Seminar Series, 16 Mar 2012 (posted 17 Mar 2012), available at https://youtu.be/-DpfZcftI00, accessed on Feb 10 2026.

[115] *See* Nagaraj Opening Report, at ¶¶51 and 53. *See, e.g.,* Michael A. Heller and Rebecca S. Eisenberg, "Can Patents Deter Innovation? The Anticommons in Biomedical Research," Science, Vol. 280, 1998, at p. 699 ("The tragedy of the anticommons refers to the more complex obstacles that arise when a user needs access to multiple patented inputs to create a single useful product. Each upstream patent allows its owner to set up another tollbooth on the road to product development, adding to the cost and slowing the pace of downstream biomedical innovation.").

[116] Dirk Bergemann et al., "Market Design for Personal Data", Yale Journal of Regulation, Vol 40, Summer 2023, p 1074 ("[T]he fixed bargaining and transaction costs required for a single web user to be compensated from a particular web service would likely be large relative to the payment at issue.").

52. Moreover, even if it is true that transaction costs will fall for parties acquiring training data for general-purpose LLMs, simply lowering prohibitively high transaction costs does not mean that the transaction costs would subsequently be low enough to enable a market to form. On the contrary, as I explain at length in my Opening Report, and as referenced in the examples above, there are reasons to believe that transaction costs will always be prohibitively high in a purported market for all data necessary to train a general-purpose LLM.[117] For instance, suppose the hundreds of millions of rightsholders magically organize into a far more concentrated set of 50,000 separate rightsholders. That still would likely remain a prohibitively large number of costly and complex negotiations for a single company to undertake.

53. Dr. Smith also mistakenly claims that I "limit[ed] my analysis to the year 2021."[118] This is simply incorrect and misleading. While I did consider the conditions Anthropic faced when it was first established in 2021, my analysis continues "even to this day."[119] On the contrary, my statement "that a market for lyrics training datasets did not exist in 2021 and is not likely to form in the future"[120] clearly reflects an assessment covering the period from 2021 to the present and forward.

2. Dr. Smith's Conclusion on Transaction Costs Regarding the Licensing of Lyrics is Flawed

54. Furthermore, Dr. Smith's remarks about the optimal way to assemble all the data needed to train a general-purpose LLM do not bear on the more specific question of whether Anthropic would want to pay *on the margin* for lyrics data to train its general-purpose LLM, and specifically whether it would want to pay for the rights to the Works-in-Suit. That is—whatever the means Anthropic used to assemble its overall training corpus—the question remains as to whether Anthropic would have concluded a deal for lyrics as training data generally, including with Plaintiffs for their lyrics (either for the lyrics to the specific Works-in-Suit or their entire catalog). Dr. Smith suggests repeatedly that Anthropic would and should have been willing to enter into a deal for licensing Plaintiffs'

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[117] *See* Nagaraj Opening Report, at Section III.A.2.

[118] Smith Rebuttal Report, at Section II.A.5.

[119] Nagaraj Opening Report, at ¶67 ("This would be particularly true in 2021, when Anthropic was first formed and LLMs were not very widely understood, and even to this day, when they remain a mystery to the lay person. In such situations, where value is difficult to assess, negotiations can take longer, thereby increasing transaction costs.")

[120] *See, e.g.,* Nagaraj Opening Report, at ¶53*; see also* Nagaraj Opening Report, at ¶¶9, 11, 12, 74, 145, and 146 (making similar predictions about the future formation of these markets).

catalogs as training data.[121] For instance, he rejects my argument regarding transaction costs in a market for all data needed to train a general-purpose LLM because, he reasons, "licensing *Publishers'* copyrighted works would not require dealing with 'hundreds of millions of different rightsholders.'"[122]

55. In my Opening Report, although I noted that the relevant purported market was one for all the data needed to train a general-purpose LLM, I also considered in the alternative whether Plaintiffs' purported market for lyrics as training data for general-purpose LLMs would emerge.[123] I concluded it would not, and so I disagree with Dr. Smith that regardless of how Anthropic gathered training data—whether through public domain sources, purchase of copyrighted data, or other methods—Anthropic would still have chosen to purchase lyrics data, including the lyrics text of Plaintiffs' songs, for use as training data.

56. Dr. Smith incorrectly claims that I "ignore[] the possibility that a market for Publishers' lyrics as training data could exist even if a market for all of the data needed to train a general-purpose LLM did not exist."[124] This assertion distorts my second market by describing it as the market for lyrics training data for a "general purpose LLM [that] could be trained only on song lyrics."[125] This is a mischaracterization. I do not focus the analysis in my Opening Report on the question of whether a general-purpose LLM could be trained *only* on lyrics;[126] rather, I examine the role and additional value of lyrics training data within a broader training corpus. Dr. Smith's criticism is therefore directed at a

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[121] *See*, *e.g.,* Smith Rebuttal Report, at ¶19 ("Anthropic therefore necessarily competes with those single-purpose models to acquire whatever data is necessary to train an AI model to perform that task, which reasonably would include song lyrics. Anthropic and other AI models that are specifically designed for songwriting (like Udio and Klay) are therefore potential 'buyers' in the same market for Publishers' lyrics and will use those lyrics for the same or substantially similar purpose in AI training."); Smith Rebuttal Report, at ¶93 ("To the contrary, because they compete in the same market for training data, it is an error to acknowledge that a licensing market exists for 'single-purpose' or 'niche' AI models but not for 'general-purpose LLMs.' The use cases for general-purpose models necessarily encompass the use cases for 'single-purpose' models and the general-purpose and single-purpose models compete with each other for customers drawn to those uses; it follows that these companies compete with each other for the data necessary to train models for those uses as well. Importantly, from the seller's perspective, there is no reason to differentiate between the two.").

[122] Smith Rebuttal Report, at ¶54 (emphasis in original); *see also* Smith Rebuttal Report at ¶58 ("[W]hat a specific company subjectively needs to meet a specific business objective does not foreclose the existence of a market for copyrighted works, and certainly not for Publishers' lyrics, as explained above."); Smith Rebuttal Report, at ¶59 ("Dr. Nagaraj cites no evidence that negotiations with *Publishers* would be 'incredibly time-consuming'…") (emphasis in original).

[123] *See* Nagaraj Opening Report, at Section III.A.3.

[124] Smith Rebuttal Report, at ¶23.

[125] Smith Rebuttal Report, at ¶68.

[126] My Opening Report does reference evidence that it would not be possible to train a general-purpose LLM on lyrics alone, since lyrics are not a diverse enough dataset. *See* Nagaraj Opening Report, at ¶57. However, this is just one among several arguments I offer in a discussion of a purported market for lyrics for use as training data.

position I do not advance. In fact, my second purported market directly corresponds to the very analysis Dr. Smith claims is missing from my Opening Report: a market for "music lyrics as AI training data"[127] as part of a larger training corpus.[128]

57. Dr. Smith also incorrectly claims that I suggest lyrics text has *no* value as training data to Anthropic.[129] Dr. Smith's counterarguments are irrelevant because I did not argue that lyrics text had no value to Anthropic. To the contrary, as I explained in my Opening Report, "[a] buyer might value a good more than the direct price charged for the good, but if total acquisition costs—i.e., the cost of the good and the associated transaction costs—exceed the buyer's value for the good, the buyer will not purchase it."[130] In this case, based on the evidence I have reviewed, the value Anthropic places on Plaintiffs' lyrics as training data was and still is extremely low, and so even moderate transaction costs would mean that a license to use the lyrics as training data would not be worth purchasing. Thus, I did not opine that the value of lyrics data is zero; my conclusion is that the value of lyrics data to general-purpose LLM developers is not high enough to overcome even moderate transaction costs. Dr. Smith's critique of a position I did not take is misplaced.

a) Contrary to Dr. Smith's Suggestions, Lyrics Have Low Value to Anthropic

58. Dr. Smith claims that my "opinions regarding the valuation of music lyrics rest on erroneous and conflicting assumptions"[131] because I view lyrics as having low value, in contrast to his view of the record as evidence that Anthropic highly valued lyrics.

59. As I explained at length in my Opening Report, I conclude based on the evidence I have reviewed that lyrics have low value to Anthropic as training data.[132] As I noted there, my understanding that lyrics were of low value to Anthropic was bolstered by Dr. Bilmes's

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[127] Smith Rebuttal Report, at ¶73.

[128] *See* Nagaraj Opening Report, at ¶55 ("From the perspective of an LLM developer building a general-purpose model, lyrics are unlikely to be especially valued and ***would comprise just one (extremely small) subset of the overall dat***a sought and needed to train a viable general-purpose AI model.") (emphasis added); *see also* Nagaraj Opening Report, at ¶64 ("lyrics("[L]yrics have minimal value to training a general-purpose LLM and, even on a catalog-size scale, lyrics comprise ***a very small portion of a training dataset.***") (emphasis added).

[129] *See, e.g.,* Smith Rebuttal Report, at ¶75 (counterfactually imagining what would happen "[i]f music and music lyrics were truly of no value to general-purpose LLM developers, as Dr. Bilmes and Dr. Nagaraj suggest").

[130] Nagaraj Opening Report, at ¶30.

[131] Smith Rebuttal Report, at Section II.B.3.

[132] Nagaraj Opening Report, at Section III.A.3.a ("The Value of Lyrics in Training General-Purpose LLMs is Low").

opinions, and I therefore concluded that "lyrics are themselves not a diverse dataset for the purposes of training a general-purpose LLM—they tend to be short on facts, repetitive, and limited in their vocabulary," as compared to other text in Anthropic's training corpus.[133]

60. Dr. Smith mischaracterizes my Opening Report's contentions about the value of lyrics in several ways. First, he claims that my Opening Report "assumes that music lyrics are low in value because they yield a relatively low number of tokens. But this way of valuing lyrics only makes sense if one assumes that all training data is valued equally."[134] In fact, my Opening Report relies upon neither of these assumptions. My Opening Report points out simply that "***on their own***, the lyrics to the songs Plaintiffs own rights to do not ***significantly contribute to the volume*** needed for a general-purpose LLM."[135] This is simply a factual statement that lyrics alone are not sufficient in scale to train a general-purpose LLM.[136] But that is not the *only* reason lyrics are not valuable as training data for general-purpose LLMs—the additional reasons, as Dr. Bilmes explains, involve their repetitive qualities and their relative lack of factual information.[137] I thus do not assume that all data has equal value; on the contrary, I discuss at length the sources of data that both the academic literature[138] and Anthropic's own employees[139] conclude are particularly valuable for AI training—sources that do not include the text of lyrics. Dr. Smith's critiques appear to ignore this evidence.

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[133] Nagaraj Opening Report, at ¶57.

[134] Smith Rebuttal Report, at ¶70.

[135] Nagaraj Opening Report, at ¶56 (emphasis added).

[136] *See* Nagaraj Opening Report, at ¶56 ("In fact, even if one were to acquire all one hundred million tracks that Spotify claims to have, they would still make up less than [redacted] Citations are omitted.

[137] *See* Bilmes Opening Report, at ¶20 ("Lyrics are also highly repetitive and low in factual content."); Bilmes Opening Report, at ¶324 ("Plaintiffs' lyrics (and lyrics in general), while stylistically rich, are short, repetitive, idiosyncratic, relatively homogeneous, and highly constrained in topical breadth.").

[138] *See, e.g.,* Nagaraj Opening Report, at footnote 33 (Wayne Xin Zhao et al. determined that "increasing the data source heterogeneity (e.g., including diverse data sources) is critical for improving the downstream performance of LLMs."); Nagaraj Opening Report, at footnote 52 (In particular, Shayne Longpre et al. concluded that developers who want to strengthen their models' performance should include "more diverse web and books content, which yield the largest benefits."); and Nagaraj Opening Report, at footnote 79 (Shayne Longpre et al. notes "we empirically validate that the inclusion of heterogeneous data sources, like books and web, is broadly beneficial and warrants greater prioritization.").

[139] *See, e.g.,* Nagaraj Opening Report, at footnote 80 ("Song lyrics are not weighted more than other text in Anthropic's training corpus, and a good model relies on both a large amount of data and a wide diversity of data."); Nagaraj Opening Report, at ¶58 [redacted] Nagaraj Opening Report, at footnote 90 and footnote 91 ([redacted].

61. Dr. Smith nevertheless maintains that lyrics are highly valuable. He asserts that "[t]heir value is primarily rooted in artistic expression, linguistic nuance, and cultural importance."[140] First, as I stated in my Rebuttal Report, "the evidence I reviewed from the record in *this case* shows "that Anthropic concluded the opposite and placed a low value on lyrics to train Claude."[141] Second, this claim about lyrics ignores that, as I point out in my Opening Report, there are many other sources of such value. Poetry and literature also offer artistic expression and linguistic nuance. And the cultural significance of lyrics is likely to be captured by other sources, as I note in my Opening Report.[142] If a developer would like a general-purpose LLM to be able to answer queries about the cultural significance of Katy Perry's "Roar," for instance, the developer might have more success training the LLM on articles about the song's impact than on the lyrics themselves.[143] Moreover, there are numerous lyrics in the public domain. To the extent that lyrics *as a class of texts* have value, Anthropic would be able to capture this value from publicly available sources, therefore devaluing the need to turn to Plaintiffs' copyrighted works to license for training data.

62. Dr. Smith furthermore contends that lyrics must have value because "Anthropic values 'human text,' like music lyrics, ahead of other sources of synthetic or boilerplate data."[144] He observes that this is why Anthropic "'cleans' its data to remove less-valuable data that may impair or negatively affect an LLM's performance."[145] But there is a difference between data that might be low value (such as lyrics) and data that developers determine can harm an LLM's performance (such as, for instance, repetitive boilerplate language, which an Anthropic employee testified was important to remove during pre-training

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[140] Smith Rebuttal Report, at ¶73.

[141] Nagaraj Rebuttal Report, at ¶122.

[142] Nagaraj Opening Report, at ¶60 ("I also understand that song lyrics have low value for training general-purpose LLMs because there are other ways to help train LLMs to answer user prompts regarding songs and songwriting. As Anthropic President Daniela Amodei noted in her deposition, a general-purpose LLM can learn about songs from a variety of sources beyond the lyrics themselves. My observations based on the record produced in this case are consistent with what I understand from Dr. Bilmes, that to the extent that it is helpful for a general-purpose LLM to understand music, lyrics, and the structure of songs, other data sources, such as books and the internet, offer this information.").

[143] *See e.g.*, Shannon Carlin, "Behind the Song: Katy Perry's 'Roar,'" CBS News, 2 Jan 2014, available at https://www.cbsnews.com/losangeles/news/behind-the-song-katy-perrys-roar/, accessed on 7 Feb 2026; Tom Breihan, "The Number Ones: Katy Perry's 'Roar,'" Stereogum, 14 Sep 2013, available at https://stereogum.com/2257090/the-number-ones-katy-perrys-roar/columns/the-number-ones, accessed on 7 Feb 2026; "Katy Perry On The 180 That Saved Her Career," NPR, 26 Oct 2013, available at https://www.npr.org/transcripts/240760441, accessed on 7 Feb 2026.

[144] Smith Rebuttal Report, at ¶71.

[145] Smith Rebuttal Report, at ¶71.

because it could "make[] the model dumber" [146]). As I explain in my Opening Report, Anthropic clearly had—and [redacted].[147]

b) Even Modest Transaction Costs Would Prevent Purchasing of Lyric Tokens to Train an LLM Given Their Low Value

63. Dr. Smith offers several arguments to suggest that transaction costs would be low if Anthropic were to strike a deal with Plaintiffs for lyrics as training data. First, he notes that Anthropic has entered into other deals for training data.[148] Second, he contends that Anthropic has [redacted][149] Third, he maintains that transaction costs cannot be high in a hypothetical deal between Anthropic and Plaintiffs because transactions would involve a limited number of counterparties[150]—counterparties that, he claims, Anthropic has already identified.[151] To bolster this point, Dr. Smith claims that transaction costs for conducting deals with Plaintiffs cannot be prohibitively high because other companies were able to conclude deals with Plaintiffs.[152] Finally, he implies that Anthropic has no evidence that transaction costs for licensing

[146] Dr. Smith cites the deposition of Dawn Drain, in which she notes that Anthropic removes some repetitive data from the training corpus because "they make the model dumber." *See* Deposition of Dawn Drain, 12 Nov 2025, 118:13-24 ("Q: And you say here 'Generic commoncrawl has all these garbage headers and footers. . . A: Yeah. Q: What did you mean by that? A: Um, so by 'garbage' here, I mean, um, if you train on it, it makes the model dumber, um, and you can look at the example here, there's this header, um, with all these like one- or two- or three-word lines, um, where pretty much every page on this website would have, um, a similar header and it would be very repetitive. And it's not like coherent sentences or anything so you wouldn't want to train a model on this.").

[147] Dr. Smith takes issue with the significance of this document. I understand that the credibility of the information in this document is a question for the finder of fact. My discussion of this document is premised on the idea that the finder of fact may conclude that [redacted] *See* Nagaraj Opening Report, at ¶¶58-59; *see also* Anthropic_0000228080, Exhibit 30 to the Deposition of Tom Turvey.

[148] Smith Rebuttal Report, at ¶50 [redacted]

[149] Smith Rebuttal Report, at ¶50 ("Anthropic . . . has entered into at least one [redacted] suggesting that, when Anthropic is willing, transaction costs are not a barrier to licensing lyrics.").

[150] Smith Rebuttal Report, at ¶54 ("In any case, licensing *Publishers'* copyrighted works would not require dealing with 'hundreds of millions of different rightsholders.'") (emphasis in original).

[151] Smith Rebuttal Report, at ¶55 ("[redacted]

[152] Smith Rebuttal Report, at ¶50 ("Dr. Nagaraj ignores the burgeoning licensing market and the dozens of cases where other AI companies, including general-purpose LLM companies, have surmounted transaction costs. As I discussed in my initial report and described in the charts above (see ¶ 26), transaction costs clearly have not stopped other AI companies, including Anthropic's general-purpose LLM competitors, from entering into licensing agreements for AI training data.").

Plaintiffs' works as training data are high because Anthropic never tried to license them for training.[153]

64. None of these arguments is economically sound because each overlooks that the transaction costs for a deal must not be prohibitively high *relative to the value of the data*. Dr. Smith observes that Anthropic's [redacted]."[154] But Dr. Smith ignores that Anthropic could rationally decide that lyrics are of high value for a purpose like bolstering guardrails, but of low value as training data. In addition, the cost of negotiating a single transaction with a single seller for a specific purpose [redacted] might be economically justified for Anthropic, [redacted] By contrast, licensing the rights for lyrics data for use in training could require negotiating with many counterparties at the same time because the significant number of rightsholders that exist.[155] This would render the transaction costs prohibitively high relative to the low value use of assembling a vast training corpus for a general-purpose LLM from scratch, as I discuss in Section II.D. Again, the evidence suggests that Anthropic believes that lyrics as training data have comparatively little value, as I discuss in Section II.C.2.a above.

65. Furthermore, my Rebuttal Report noted that based on [redacted][156] Dr. Smith claims that song lyrics provide "disproportionate economic value to Anthropic given their relative weight in the AI models."[157] But this contradicts my review of the evidence in the record. As I discuss in Section II.C.2.a, LLM developers like Anthropic do not place any special value on lyrics

[153] Smith Rebuttal Report, at ¶¶42-43 ("Dr. Nagaraj does not offer any evidence to support a conclusion that Anthropic, or any other buyer for that matter, has been unable to license Publishers' lyrics on account of prohibitively high transaction costs, and I am unaware of any such evidence in the record. In fact, Tom Turvey, Anthropic's Vice President of Data Partnerships, testified that Anthropic has never approached Publishers to license any of their works, let alone enter into negotiations with them.").

[154] Smith Rebuttal Report, at ¶50.

[155] *See* Nagaraj Opening Report, at Section III.A.3.b (discussing sources of moderately high transaction costs in the context of licensing lyrics as training data, including the millions of songs written by a "'long tail' of musicians who are unaffiliated with any music publishers whatsoever.").

[156] *See* Nagaraj Rebuttal Report, at ¶123.

[157] Smith Opening Report, at ¶55.

data compared to other textual data,[158] [redacted].[159] Additionally, UMPG and Concord would likely want a much larger sum to be willing to license their entire catalogs. As Dr. Smith himself points out, "[f]or transactions to occur within a licensing market, the bargaining set must not be empty—that is, the licensee's maximum willingness to pay must be equal to or greater than the licensor's minimum willingness to accept."[160] This lack of agreement on value between Anthropic's willingness to pay and a price at which UMPG and Concord would be willing to sell could very well prevent a transaction from occurring.[161] Moreover, a transaction would not occur when the transaction costs themselves outweigh what the buyer is willing to pay.[162]

66. Dr. Smith also contends that collective rights organizations will bring down transaction costs for training data.[163] But as Dr. Smith himself acknowledges, these organizations do not yet have workable solutions—in his own words, "industry participants in this market are actively considering and exploring potential solutions to the transaction-cost problem."[164] Dr. Smith has provided no evidence to suggest that these organizations will succeed in reducing transaction costs,[165] nor that, even if they do reduce those costs, the value of lyrics as training data to Anthropic would exceed the costs of doing deals.

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[158] *See* Nagaraj Opening Report, at Section III.A.3.a.

[159] *See* Nagaraj Opening Report, at ¶¶48-49 (noting that "even a single negotiation by an AI company can be incredibly time consuming. Based on public reporting, the licensing agreement between OpenAI and News Corp, a media company, took almost half a year to conclude."); Nagaraj Rebuttal Report, at ¶116 (discussing testimony suggesting that Anthropic negotiations were time-consuming).

[160] Smith Opening Report, at ¶107.

[161] *See* Nagaraj Rebuttal Report, at ¶100 (discussing Dr. Smith's "second precondition" regarding agreement on value).

[162] *See* Nagaraj Opening Report, at ¶49.

[163] See Smith Rebuttal Report, at ¶¶52-53.

[164] Smith Rebuttal Report, at ¶53.

[165] I address this issue in my Rebuttal Report. *See* Nagaraj Rebuttal Report, at ¶106 ("However, Dr. Smith does not make any attempt to demonstrate that these organizations have offered or will provide solutions in the case of licensing all of the data needed to train a general-purpose LLM. In fact, they may be unable to do so for the same reason that concentrated rightsholders are unable to: the fact that they do not own the underlying rights to sub-license text for training such LLMs."). Furthermore, as I note there, Plaintiff UMPG is on record as opposing such collective approaches to licensing lyrics as training data. *See* Nagaraj Rebuttal Report, at ¶108 ("It is also not at all clear that Plaintiffs and other rightsholders would be willing to participate in deals with collective licensing organizations for the rights to training data for use in a general-purpose LLM. Plaintiff UMPG and its parent company UMG, for instance, have argued against such a solution in public comments to the Copyright Office: 'A voluntary collective licensing scheme is not an appropriate solution to the use of musical content to train generative AI. Given its broad experience with licensing, UMG believes that direct and individually negotiated licenses are the best path forward for the music industry.'").

67. Finally, as in his Opening Report,[166] Dr. Smith repeats the erroneous conclusion that Anthropic increases transaction costs for Plaintiffs [redacted] As I explained in my Rebuttal Report, this argument does not make sense.[168] If, as I argue, prohibitively high transaction costs prevent a market from forming for all data required to train a general-purpose LLM, additional transaction costs from non-disclosure are inconsequential on the margin. Furthermore, Dr. Smith ignores that the makeup of the training corpus is a trade secret for Anthropic and a source of competitive advantage.[169]

D. The Smith Rebuttal Report Does Not Accurately Assess the Relevance of Existing Deals to the Markets in Question

68. In his Rebuttal Report, Dr. Smith contends that the conclusions in my Opening Report are undermined by more than 200 deals between "AI companies" (of all kinds) that create musical, visual, or textual content.[170] In his view, these deals are evidence that no purported market exists or is likely to emerge for either all of the data needed to train a general-purpose LLM or lyrics as training data for general-purpose LLMs. As I explain in further detail below, and consistent with the opinions in my Opening and Rebuttal Reports, the existing deals that Dr. Smith describes in his Rebuttal Report's Exhibit A[171] do not undermine the conclusions in my reports.

69. First, as I noted in my Opening Report, economic theory dictates that general-purpose LLM developers may make deals for licensing training data in certain circumstances, i.e., when "(1) they value the data very highly—either because the inherent value is high for the purposes of training a general-purpose LLM or because the data is unique or not publicly available; (2) transaction costs are low; and (3) other incentives create the

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[166] *See* Smith Opening Report, at ¶¶154-156 [redacted] increases discovery and search costs for rightsholders and further undermines trust and transparency in the market.").

[167] *See* Smith Rebuttal Report, at ¶49 (arguing that Anthropic's [redacted]

[168] *See* Nagaraj Rebuttal Report, at ¶118.

[169] Nagaraj Rebuttal Report, at ¶120.

[170] *See* Smith Rebuttal Report, at Exhibit A; *see e.g.,* Smith Rebuttal Report, at footnote 64; *see also* "AI Licensing by AI Companies," Copyright Alliance, available at https://copyrightalliance.org/artificial-intelligence-copyright/licensing/ai-companies/.

[171] *See* Smith Opening Report, at Rebuttal Exhibit A; *see also* "AI Licensing by AI Companies," Copyright Alliance, available at https://copyrightalliance.org/artificial-intelligence-copyright/licensing/ai-companies/.

opportunity for agreements."[172] Thus, the mere existence of some deals does not on its own indicate that either a purported market for all the training data needed to train a general-purpose LLM exists or that a purported market for lyrics text as training data exists.

70. Moreover, I also noted in my Opening Report that any such "gap-filling" or "last-mile" deals would only occur in a context where general-purpose LLM developers had *already been able* to amass the data needed to train the model.[173] In other words, in order for licensing deals to be feasible, there needs to already be a sufficiently large and diverse training corpus for a general-purpose LLM. Although Dr. Smith's Rebuttal Report purports to identify over 200 deals he claims are relevant and indicative that a licensing market exists, he fails to consider that these deals likely only exist because the developers licensing the data are adding to an *existing* training corpus comprised of trillions of tokens from millions—if not billions—of other sources.

71. That Dr. Smith identifies only around 200 deals is notable. These deals alone could not support the building of a multi-trillion-token corpus of a general-purpose LLM.[174] Put differently, if one were to agree with Dr. Smith that all data used to build a general-purpose LLM could be licensed or otherwise obtained from the public domain and that a market for doing so has already formed, then I would expect to see vastly more than 200 deals announced. There would need to be tens of thousands of deals, if not millions, to account for all the data needed to train general-purpose LLMs, not just from Anthropic but from all of the general-purpose LLM developers.

72. Dr. Smith's opinion necessarily assumes that a large training corpus can be formed with licensed data or data from the public domain, but this assumption is flawed because it would be infeasible for a developer to negotiate all the deals necessary to accumulate the

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[172] Nagaraj Opening Report, at ¶72; *see also* Nagaraj Opening Report, at Section III.A.4.

[173] *See* Nagaraj Opening Report, at ¶73.

[174] *See, e.g.,* Nagaraj Opening Report, at ¶37 ("[I]f we assume that an average newspaper publishes 50,000 words per day, as Anthropic estimated, then a full 100-year archive would amount to over 1.8 billion words—meaning that it would take over [redacted] archives of that size to match Claude's training dataset."); Nagaraj Opening Report, at ¶47 ("[E]ven the largest rightsholders represent only a fraction of the data needed to train a general-purpose LLM such as Claude. For example, OpenAI and *The New York Times* were in talks for months about licensing the newspaper's content, only for the potential deal to fail. One of the reasons the deal fell through, according to OpenAI, was that even a highly regarded corpus like the one belonging to *The New York Times* did not represent a large enough dataset relative to OpenAI's overall data needs."); Nagaraj Opening Report, at ¶56 ("If each song has approximately 300 words, there would be 1.9 billion words, or approximately 2.5 billion tokens, from the full catalog of UMPG and Concord songs. That would correspond to less than [redacted] of the tokens needed for a [redacted] token model.84 In fact, even if one were to acquire all one hundred million tracks that Spotify claims to have, they would still make up less than [redacted] training dataset.").

data needed for a general-purpose LLM's training corpus, for the reasons I have stated in my Opening Report. Dr. Smith assumes that in a world where LLM developers could only acquire data through licensing or from the public domain, a market would develop. But that inverts the analysis—a purported market for all the training data needed to train a general-purpose LLM would not develop in the first place because it would not be rational for a developer to pursue licenses for all the data needed given the significant transaction costs and relatively low value of any piece of data.

73. Dr. Smith further contends that I give "no compelling justification for why an LLM company would not or could not attempt to begin its training corpus with licensed content and then supplement with synthetic data or public domain data."[175] He also claims that I have "ignore[d] the possibility that a developer will attempt to develop a model with a smaller dataset if they are unable to license or otherwise legally obtain *all* of the data that they subjectively believe would be ideal for their intended purposes."[176] In fact, my Opening Report explains "that an LLM that is trained only on either data in the public domain or data licensed from a small set of copyright owners would not have a sufficiently large or diverse enough dataset to operate." [177] I further understand from the testimony of Dr. Jared Kaplan, Chief Science Officer at Anthropic, that models trained on smaller datasets cannot operate at the level of Claude.[178] Dr. Bilmes explains that this is because a large volume of text and data is required for general-purpose LLMs to generalize across many domains and tasks and that, "[w]ithout large [publicly available] text collections like Common Crawl and other large-scale web crawling efforts, it would be very difficult to obtain sufficient data for the types of advanced deep LLM training that has made."[179] Dr. Smith's suggestion that developers should instead build LLMs with

[175] Smith Rebuttal Report, at ¶89.

[176] Smith Rebuttal Report, at ¶31.

[177] Nagaraj Opening Report, at ¶38. Furthermore, in discussing synthetic data's role in training, I understand from Dr. Bilmes that "[s]ynthetic data may supplement real data in settings where acquiring or labeling real examples is costly." However "synthetic data is best used only as a supplement to, rather than a replacement for, real data."; *see* Bilmes Opening Report, at ¶70.

[178] *See* Nagaraj Opening Report, at ¶38 ("As Dr. Kaplan stated, 'any functional general-purpose LLM requires a very diverse set of training data to gain a sufficiently precise understanding of the full range of human language and human experience.' Without using a variety of sources for training datasets, developers find that their models degrade."); *see also* Nagaraj Opening Report, at footnote 54 ("[I]t is still the case that vast troves of training data are required to train general-purpose generative AI models like Claude. Again, while there are AI models trained on fewer tokens, those models have fewer capabilities and do not operate on the same scale as Claude. . . . [Some models] are specifically crafted to "memorize the test" in order to provide the appearance of strong performance, but they tend to generalize poorly and are of limited utility.").

[179] Bilmes Opening Report, at ¶100.

smaller training corpuses, which he acknowledges might affect the performance of the LLM,[180] is therefore an inadequate solution.

74. Individually negotiated deals with hundreds of millions of rightsholders, as I explain in Section II.C.1 above, would simply not be feasible, nor would collectively negotiated deals with tens of thousands of rightsholders. By contrast, occasional gap-filling deals to obtain data that is so valuable that it outweighs the cost of an individual transaction might be possible, *if* the vast bulk of the training dataset is already available.[181] Seen in this light, the deals Dr. Smith details in Exhibit A of his Rebuttal Report do not provide evidence of a marketplace for the tens or hundreds of thousands of deals that would likely be needed to assemble all the data required to train a general-purpose LLM. Instead, they look far more like the deals I described in my Opening Report that economic theory dictates could exist only after a general-purpose LLM developer has amassed an already sufficiently large corpus comprised of trillions of tokens' worth of data.[182]

75. Furthermore, the deals Dr. Smith describes do not suggest that there is, in the alternative, a marketplace specifically for lyrics text as training data for a general-purpose LLM.[183] That is because the vast majority of the deals Dr. Smith references in Exhibit A of his Rebuttal Report do not involve lyrics at all.[184] Closer examination of the deals he refers

[180] Smith Rebuttal Report, at ¶31 ("While training the model on a smaller dataset may affect performance…").

[181] *See* Nagaraj Opening Report, at ¶73.

[182] *See* Nagaraj Opening Report, at ¶72.

[183] *See* Nagaraj Opening Report, at Section III.A.3.

[184] The only three deals that I am aware of that involve music at all are deals between Plaintiff UMPG and Udio, between Plaintiff UMPG and Klay, and between Warner Music and Suno. I discuss the Udio and Klay deals further below. I am not aware of any deals that are solely for lyrics text as training data.

to indicate that these licenses include content-types such as text-based news content,[185] images,[186] academic journals,[187] nonfiction books,[188] and even character likenesses.[189]

76. In addition, closer scrutiny of Exhibit A shows that many of the deals Dr. Smith cites explicitly license rights to display works in generative-AI *outputs*, regardless of whether they also include any explicit license for training (or input) uses.[190] For example, OpenAI's deals with Axel Springer, *Le Monde*, *The Financial Times*, Dotdash Meredith, NewsCorp, *The Atlantic*, Vox Media, Conde Nast, Hearst, Future, *The Guardian*, and *The Washington Post* all include the right to display summaries, snippets, and links to licensed work in ChatGPT outputs shared with users.[191] Likewise, Meta's partnerships with news outlets including CNN, Fox News, Fox Sports, *Le Monde,* People Inc., *The Daily Caller*, *The Washington Examiner*, *USA Today*, and the USA Today Network involve outputs. Licenses for both inputs and outputs cannot sufficiently inform any purported market

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[185] *See, e.g.,* "Dotdash Meredith Announces Strategic Partnership with OpenAI, Bringing Iconic Brands and Trusted Content to ChatGPT," Dotdash Meredith, 7 May 2024, available at https://dotdashmeredith.mediaroom.com/2024-05-07-Dotdash-Meredith-Announces-Strategic-Partnership-with-OpenAI,-Bringing-Iconic-Brands-and-Trusted-Content-to-ChatGPT, accessed on 13 Feb 2026.

[186] *See, e.g.,* "Apple's Shutterstock Deal Worth $25-50 Million Underscores Intense Competition for AI Training Data," Venture Beat, available at https://venturebeat.org/apples-shutterstock-deal-worth-25-50-million-underscores-intense-competition-for-ai-training-data/, accessed on 13 Feb 2026.

[187] *See, e.g.,* "Informa PLC: Press Release," Informa, 8 May 2024, available at https://www.informa.com/globalassets/documents/investor-relations/2024/informa-plc---market-update.pdf, accessed on 13 Feb 2026.

[188] *See, e.g.,* Faizan Farooque, "Microsoft Signs Deal with HarperCollins for AI Model Training," Yahoo! Finance, 20 Nov 2024, available at https://finance.yahoo.com/news/microsoft-signs-deal-harpercollins-ai-161159188.html, accessed on 13 Feb 2026.

[189] *See, e.g.,* "The Walt Disney Company and OpenAI reach landmark agreement to bring beloved characters from across Disney's brands to Sora," OpenAI, 11 Dec 2025, available at https://openai.com/index/disney-sora-agreement/, accessed on 13 Feb 2026.

[190] *See, e.g.,* "Bringing More Real-Time News and Content to Meta AI," Meta, 5 Dec 2025, available at https://about.fb.com/news/2025/12/bringing-more-real-time-news-and-content-to-meta-ai/, accessed on 13 Feb 2026.

[191] *See, e.g.,* "Partnership with Axel Springer to deepen beneficial use of AI in journalism," OpenAI, 13 Dec 2023, available at https://openai.com/index/axel-springer-partnership/, accessed on 13 Feb 2026; "Global news partnerships: Le Monde and Prisa Media," OpenAI, 13 Mar 2024, available at https://openai.com/index/global-news-partnerships-le-monde-and-prisa-media/, accessed on 13 Feb 2026; "Financial Times announces strategic partnership with OpenAI," Financial Times, 29 Apr 2024, available at https://aboutus.ft.com/press_release/openai, accessed on 13 Feb 2026; "A landmark multi-year global partnership with News Corp," OpenAI, 22 May 2024, available at https://openai.com/index/news-corp-and-openai-sign-landmark-multi-year-global-partnership/, accessed on 13 Feb 2026; "A content and product partnership with The Atlantic," OpenAI, 29 May 2024, available at https://openai.com/index/enhancing-news-in-chatgpt-with-the-atlantic/, accessed on 13 Feb 2026; "A Content and Product Partnership with Vox Media," OpenAI, 29 May 2024, available at https://openai.com/index/a-content-and-product-partnership-with-vox-media/, accessed on 13 Feb 2026; "OpenAI partners with Conde Nast," OpenAI, 20 Aug 2024, available at https://openai.com/index/conde-nast/, accessed on 13 Feb 2026; "OpenAI and Hearst Content Partnership," OpenAI, 8 Oct 2024, available at https://openai.com/index/hearst/, accessed on 13 Feb 2026; "OpenAI and Future partner on specialist content," OpenAI, 4 Dec 2024, available at https://openai.com/index/openai-and-future-partner-on-specialist-content/, accessed on 13 Feb 2026; "OpenAI and Guardian Media Group launch content partnership," OpenAI, 14 Feb 2025, available at https://openai.com/index/openai-and-guardian-media-group-launch-content-partnership/, accessed on 13 Feb 2026; "The Washington Post partners with OpenAI on search content," OpenAI, 22 Apr 2025, available at https://openai.com/global-affairs/the-washington-post-partners-with-openai/, accessed on 13 Feb 2026.

solely for training data, because the nature of the licensed rights are different. In particular, licenses for display allow the LLM to generate outputs that could be potential substitutes for rightsholders' work. If a user can obtain key points from a Vox article from Meta's general-purpose LLM Llama, for instance, the user may have a decreased demand for a Vox subscription. Thus, licenses for display that can potentially substitute for a seller's own display of copyrighted text would command a high price, increasing the relative value of the deal compared to the transaction costs. By contrast, a license only to train an LLM conveys far less value, while the transaction costs would remain relatively high. The ability to display whole passages of copyrighted text is therefore a different license, and would be valued and priced differently, than the ability to simply train on such text.

77. Likewise, several of the agreements in Smith's Exhibit A to his Rebuttal Report include access to APIs (Application Programming Interfaces) for content that is already publicly available.[192] For example, Google's agreement with Reddit grants Google access to Reddit's Data API for "efficient and structured access to fresher information, as well as enhanced signals," while specifying that "[t]his expanded partnership does not change Google's use of publicly available, crawlable content for indexing, training or display in Google's products."[193] The partnership also granted Reddit access to Google's Vertex AI integrations.[194] In these agreements, general-purpose LLM developers get additional value from the clean and accessible data. Again, then, these API deals include value beyond (solely) data for training a general-purpose LLM, and thus the licenses do not meaningfully illuminate general-purpose LLM developers' ability to participate in a purported market for training data.

78. I next examine the deals referenced by Dr. Smith in his Rebuttal Report that involve "one of the four general-purpose LLMs: Anthropic, Google, Meta and OpenAI," as reported by the Copyright Alliance.[195] Figure 1 below categorizes these deals. I find that more than

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[192] *See e.g.,* Rajan Patel, "An expanded partnership with Reddit," Google, 22 Feb 2024, available at https://blog.google/company-news/inside-google/company-announcements/expanded-reddit-partnership/, accessed on 10 Feb 2026; "OpenAI and Reddit Partnership," OpenAI, 16 May 2024, available at https://openai.com/index/openai-and-reddit-partnership/, accessed on 13 Feb 2026.

[193] Rajan Patel, "An expanded partnership with Reddit," Google, 22 Feb 2024, available at https://blog.google/company-news/inside-google/company-announcements/expanded-reddit-partnership/, accessed on 10 Feb 2026.

[194] Rajan Patel, "An expanded partnership with Reddit," Google, 22 Feb 2024, available at https://blog.google/company-news/inside-google/company-announcements/expanded-reddit-partnership/, accessed on 10 Feb 2026.

[195] Smith Rebuttal Report, at ¶27.

three quarters of these agreements involve licensing of copyrighted materials for display.[196] Beyond these deals for display, three deals are ones that general-purpose LLMs concluded with Shutterstock, the stock photography company, to allow LLMs to train on Shutterstock images. Of the five remaining deals, all involve various partnerships in addition to other rights. Wiley's agreement with Anthropic is a partnership that will allow university students researchers to access Wiley's database of academic articles and scholarly research using Claude.[197] OpenAI's partnership with Axios will allow Axios to build additional newsrooms in four American cities, as well as enabling OpenAI to display answers to "user queries with attributed summaries, quotes and links to Axios stories."[198] The Google-Reddit partnership will allow Google to display answers to questions on the Reddit platform as well as provide Google with access to Reddit's Data API, as discussed above.[199] Similarly, a Google-AP deal reportedly provides Google Gemini users with "up-to-date information," which suggests that the deal could use AP stories for display as well as training.[200] Finally, the OpenAI-Reddit deal allows OpenAI to "showcase Reddit content," gives OpenAI access to Reddit's API, and will involve further "advertising" agreements. Thus, these additional five deals involve rights beyond simply licensing data for training.[201] In sum, although Dr. Smith claims these deals "demonstrate the existence of a robust AI licensing market that includes general-purpose LLMs and which [] is growing rapidly,"[202] my review of the deals he references finds just

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[196] There are 38 deals listed under these companies, as of February 12, 2026. I exclude Meta's deal with Universal Music Group, because although details of the deal are not available to me, the public announcement suggests the deal is an expansion of "monetization opportunities for UMG, and its artists and songwriters" on Meta's Platforms. I also noticed that Copyright Alliance has a duplicate for OpenAI's deal for The Guardian (one for the news platform "The Guardian" and another for its parent company, "Guardian Media Group") with the same link on the website. I therefore removed one of those duplicates from my analysis. This resulted in an overall total of 36 deals considered in my analysis.

[197] "Wiley Partners with Anthropic to Accelerate Responsible AI Integration Across Scholarly Research," Wiley, 9 Jul 2025, available at https://newsroom.wiley.com/press-releases/press-release-details/2025/Wiley-Partners-with-Anthropic-to-Accelerate-Responsible-AI-Integration-Across-Scholarly-Research/default.aspx.This protocol allows AI applications to integrate more easily with data sources. *See* "What is the Model Context Protocol (MCP)?," Model Context Protocol, available at https://modelcontextprotocol.io/docs/getting-started/intro.

[198] Sara Fischer, "OpenAI to fund four new Axios Local newsrooms," Axios, 15 Jan 2025, available at https://www.axios.com/2025/01/15/open-ai-axios-local-newsrooms-funding-deal, accessed on 13 Feb 2026.

[199] Rajan Patel, "An expanded partnership with Reddit," Google, 22 Feb 2024, available at https://blog.google/company-news/inside-google/company-announcements/expanded-reddit-partnership/, accessed on 10 Feb 2026.

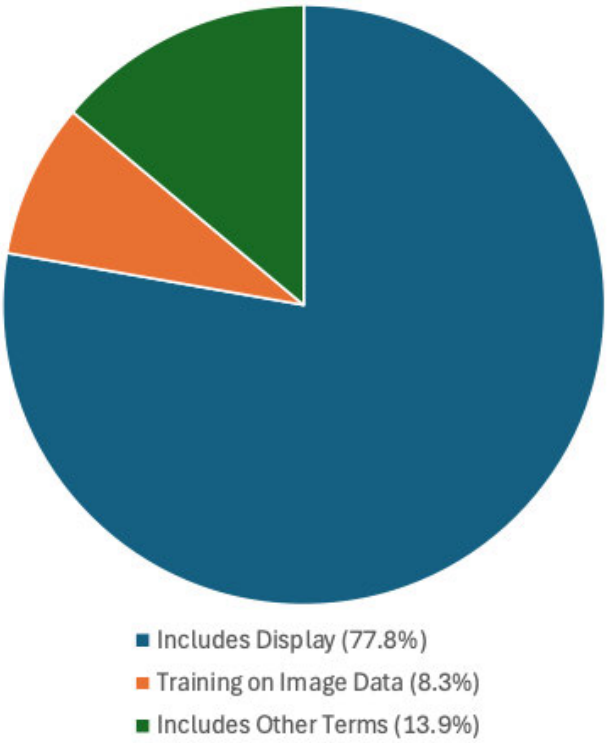
[200] Jaffer Zaidi, "Working with The Associated Press to provide fresh results for the Gemini app," Google, 15 Jan 2025, available at https://blog.google/products-and-platforms/products/news/associated-press-gemini-app/, accessed on 13 Feb 2026; *see also* Matt O'Brien, "Google signs deal with AP to deliver up-to-date news through its Gemini AI chatbot," 15 Jan 2025, available at https://www.ap.org/media-center/ap-in-the-news/2025/google-signs-deal-with-ap-to-deliver-up-to-date-news-through-its-gemini-ai-chatbot/, accessed on 13 Feb 2026.

[201] "OpenAI and Reddit Partnership," OpenAI, 16 May 2024, available at https://openai.com/index/openai-and-reddit-partnership/, accessed on 13 Feb 2026.

[202] Smith Rebuttal Report, ¶28.

36 deals involving general-purpose LLMs. Of those 36 deals, only three—the Shutterstock deals—appear to be limited to datasets solely for training purposes; the remaining 33 involve licenses that go beyond training data to include display rights or additional partnerships). Thus, these deals do not support the conclusion that either of the two purported markets for training data that I discussed in my Opening Report exists.

Figure 1: Category Breakdown of Licensing Deal Terms for Deals Involving General-Purpose LLMs Included in Dr. Smith's Review of Licensing Deals



79. Finally, as I noted in my Opening Report, some deals do not have sufficient public information for me to assess exactly which rights are involved. As I explain throughout my Opening and Rebuttal Reports, not all licensing deals are equivalent, and so the precise terms of the deals matter. In any case, I have not seen any evidence, nor has Dr. Smith offered any, that any deals have been concluded specifically for lyrics text as training data for a general-purpose LLM.[203]

80. I next turn to the limited number of deals by buyers that Dr. Smith contends are in the same market as Anthropic: companies with single-purpose AI audio tools. Dr. Smith

[203] Dr. Smith includes a deal between Meta and Universal Music Group in his list of existing deals. There is no indication that this deal includes a license to train on UMG's copyrighted content; as such, I have excluded it from my analysis. *See* "Meta and Universal Music Group announce expanded global agreement," Universal Music Group, 12 Aug 2024, available at https://www.umusicpub.com/us/News/2024/8/Meta-and-UMG-announce-expanded-global-agreement.aspx, accessed on 13 Feb 2026.

maintains that "Anthropic and other AI models that are specifically designed for songwriting (like Udio and Klay) are therefore potential 'buyers' in the same market for Publishers' lyrics and will use those lyrics for the same or substantially similar purpose in AI training."[204] However, as I discuss in Section II.B.1 above, I do not believe that these buyers are in fact in competition with Anthropic in such a way that any deals they conclude would affect the deal terms or prices Anthropic would pay in a (hypothetical) negotiation to license for lyrics text as training data. The evidence from UMPG's deals with Udio and Klay itself undermines Dr. Smith's view that all three buyers (Udio, Klay, and Anthropic) are in the same market. The Udio and Klay deals both involve tools that allow users to output music, a function that Claude lacks.

81. Moreover, the terms of the Udio and Klay deals show [redacted] UMPG's licensing deal with Udio [redacted].[206] The Udio deal explicitly allows [redacted]

[204] Smith Rebuttal Report, at ¶19.

[205] Notably, the agreements do not appear to [redacted]

[206] UMPG_0000024457 at UMPG_0000024461 (noting that [redacted]).

[207] UMPG_0000024457 at UMPG_0000024461; UMPG_0000024457 at UMPG_0000024462 (emphasis added).

[208] UMPG_0000024457 at UMPG_0000024458.

[209] UMPG_0000024457 at UMPG_0000024458.

[redacted].”[210] The rights explicitly granted [redacted]

82. In sum, the evidence does not support Dr. Smith’s argument that Anthropic and single-purpose AI song-generation platforms like Udio and Klay “will use those lyrics for the same or substantially similar purpose[s] in AI training.”[212] As discussed above, Anthropic’s alleged use of lyrics as part of a broad-based training corpus for a general-purpose language model is a much narrower use than Udio and Klay’s licensed rights to [redacted]. The value of complete song recordings as both training data and outputs to Udio and Klay is far greater than the value of song lyrics as training data to Anthropic, and it is not relevant to the specific needs of Anthropic, which only develops text-based general-purpose LLMs. The buyers of UMPG’s licensed data are also not competitors with Anthropic. Claude competes in a different market than Udio and Klay do because it is a text-based, general-purpose LLM that does not offer music generation or audio creation. The Udio and Klay deals are therefore not comparable to any hypothetical deals that Anthropic could conclude to license lyrics to the Works-in-Suit for training purposes, and the existence of those deals does not support the notion that a market for licensing lyrics or all data to train a general-purpose LLM exists.

E. Dr. Smith Misinterprets My Paper “Cloze Encounters”

83. Throughout his Rebuttal Report, Dr. Smith draws on references to (1) a recent working paper I released with Stella Jia (“Cloze Encounters”)[213] and (2) another paper I co-

[210] UMPG_0000025119, at UMPG_0000025119.

[211] UMPG_0000025119, at UMPG_0000025124.

[212] Smith Rebuttal Report, at ¶19.

[213] Anthropic_0000597354

authored with Pierre Azoulay and Joshua L. Krieger ("Old Moats") [214] to argue that the conclusions in my Opening Report are not consistent with my "prior publications . . . and statements."[215] I firmly disagree with this conclusion. There are no inconsistencies in my past statements, and Dr. Smith distorts the conclusions from my existing work. In this section, I first summarize "Cloze Encounters," the paper to which Dr. Smith primarily refers, and then examine each of his claims about the supposed inconsistency between statements made in "Cloze Encounters" and the statements made in my Opening Report. I then discuss the supposed inconsistency Dr. Smith identifies between statements made in "Old Moats" and statements made in my Opening Report.

84. My "Cloze Encounters" paper investigates the performance capability of general-purpose LLMs to regurgitate or "memorize" the data in their training corpora, as tested by a narrow metric called a "name cloze" word-prediction task.[216] (In the paper, we characterize performance as capacity for memorization.)[217] Dr. Smith makes a number of erroneous claims about the significance of our findings in "Cloze Encounters," as well as issues discussed in the paper in passing. Dr. Smith asserts that my Opening Report ignores what our "Cloze Encounters" paper described as "critical economic questions surrounding substitution and the potential for LLM outputs to cannibalize the market for original source material."[218] First, Dr. Smith selectively overlooks that my paper is explicit that it is ***not*** drawing any conclusions about whether the potential inclusion of Books3 in training data "affects sales or any downstream economic outcome that might

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[214] Pierre Azoulay et al., "Old Moats for New Models: Openness, Control, and Competition in Generative Artificial Intelligence," Entrepreneurship and Innovation Policy and the Economy, Vol. 4 Feb 2025.

[215] Smith Rebuttal Report, at ¶12. *See also* Smith Rebuttal Report, at ¶8, ¶33.

[216] Anthropic_0000597354, at Anthropic_0000597354 ("We assess book-level performance using the "name cloze" word-prediction task."); *see also* Anthropic_0000597354, at Anthropic_0000597364 ("Cloze comes from the word 'closure' which is used in Gestalt psychology to refer to the human tendency to see an unfinished template as a whole by filling it in with something it's familiar with. This mimics the observed tendency of LLMs to memorize content and output things based on highest probability.").

[217] This "name cloze" technique intends to test a model's ability to answer factual questions about a given book. As we explained in our paper, however, the "name cloze" test only serves as a rough proxy for LLM performance, as it faces limitations that we openly disclosed in the paper itself, "including the requirement for full text access, its narrow focus on name recognition as a performance measure, and its indirect relevance to broader economic questions like content substitution or a broad measure of intelligence or capability." *See* Anthropic_0000597354, at Anthropic_0000597364. To the extent that "Cloze Encounters" offered analysis of a technical question regarding general-purpose LLMs' abilities to memorize, I note that I do not rely on it for technical conclusions in this case. Instead, my opinions regarding technical questions rely on the conclusions of the technical experts in this case.

[218] Smith Rebuttal Report, at ¶95; *see also* Smith Rebuttal Report at ¶33.

cannibalize the market for the original content producers."[219] In other words, "Cloze Encounters" specifically states that one limitation of the paper is that it does not offer any empirical findings or conclusions about substitution.

85. The reason for this caveat is clear. Our paper measures the extent to which LLMs might, in theory, be able to reproduce content from books in their training data. In other words, our paper tested the technical capability of LLMs to reproduce content. But it did not attempt to evaluate whether and to what extent LLM users actually rely on LLMs to produce book information rather than consulting the relevant books directly. Evaluating that question depends on a number of factors, including whether any limited ability to memorize texts enables LLMs to reproduce text in other contexts, whether LLM developers take further steps to prevent regurgitation through guardrails or other technical methods, and whether—regardless of any guardrails—users *actually* substitute the LLM-provided output for the original material in practice. The "Cloze Encounters" paper does not address these factors, nor does it rely on any real-world user data or evaluate how users employ LLMs.[220] It therefore could not offer further conclusions about the substitution effect.

86. By contrast, my Opening Report and the empirical analyses contained therein do directly analyze these questions of substitution, in particular as applied to Plaintiffs' claim that Claude-generated lyrics could substitute for online display of the Works-in-Suit. The "critical economic questions surrounding substitution and the potential for LLM outputs to cannibalize the market for original source material"[221] are addressed in my Opening Report. Such questions are squarely relevant to my assignment to analyze factor 4 and any claimed harm to the market for the Works-in-Suit. My Opening Report analyses

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[219] Anthropic_0000597354, at Anthropic_0000597360 ("It is useful to note a few limitations of our work. . . . [W]e simply show that Books3 inclusion affects model performance– not that it affects sales or any downstream economic outcome that might cannibalize the market for the original content producers."). *See also* Jia and Nagaraj, at p. 17 ("Further, ***it remains unclear*** how this metric relates to the critical economic questions surrounding substitution and the potential for LLM outputs to cannibalize the market for original source material, ***as our test provides only an indirect measure of this elasticity***. Including more tasks, such as summarization or critical analysis at the book level could provide further insights.") (emphasis added).

[220] Dr. Smith ignores extensive caveats and limitations throughout our "Cloze Encounters" paper. As we note there, "First, our work provides only an indirect link between pirated data sources and model performance. . . . Further, we simply show that Books3 inclusion affects model performance – not that it affects sales or any downstream economic outcome that might cannibalize the market for the original content producers." *See* Anthropic_0000597354, at Anthropic_0000597360.

[221] *See* Nagaraj Opening Report, at Section III.B.

found no effect consistent with cannibalizing the market for the Works-in-Suit, as shown through the traffic analysis and Google Search analysis.[222]

87. In addition, in his Rebuttal Report, Dr. Smith refers several times to brief discussions of potential licensing markets in the "Cloze Encounters" paper.[223] In the paper, we referred to an "active licensing market" for training data[224] and noted the development of "a nascent market for licensing content."[225] We include examples of just three deals: one with the academic publisher Taylor and Francis for academic journals, one between Reddit and Google, and one with Wiley, another publisher of academic papers.[226] As I noted in my Opening Report[227] and discuss further in Section II.D above, the existence of occasional deals—such as the limited examples I provided in "Cloze Encounters"—does not show that a market for acquiring all the training data needed for building a general-purpose LLM was available when Claude was released, nor that any such market is likely to develop in the near future.

88. In fact, my Opening Report is consistent with the acknowledgment in "Cloze Encounters" that there are examples of *some* deals occurring for licensing data to train LLMs. However, as I explained in my Opening Report, and as discussed further in Section II.D above, the emergence of a handful of one-off deals for training data is not indicative that a market for all of the training data needed by a general-purpose LLM will form or is likely to form, because "such deals can only emerge in the context of a training dataset for a general-purpose LLM once developers have already assembled large enough datasets for its training corpus."[228] In other words, even though a few licensing deals exist (including the ones I described in "Cloze Encounters"), the reason a purported market for licensing data for use in general-purpose LLMs has not formed, and is not likely to form,

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[222] *See* Nagaraj Opening Report, at Section III.B.2.

[223] *See* Smith Rebuttal Report, at ¶33. ¶45, ¶50, ¶64, ¶88, ¶91.

[224] Anthropic_0000597354, at Anthropic_0000597357. I further observe that Dr. Smith failed to quote the caveats in the same paragraph that contained this sentence. There, we noted that, "[b]eyond generalities, these theoretical predictions are unlikely to apply uniformly, varying significantly depending on the substitutability of content and across different types of LLMs with different architectures and training approaches." Anthropic_0000597354, at Anthropic_0000597357.

[225] Anthropic_0000597354, at Anthropic_0000597362.

[226] Anthropic_0000597354, at Anthropic_0000597363 ("For example, the academic publisher Taylor and Francis is on record licensing its content covering over 3000 academic journals for about $10 million for the training of LLMs. Similarly, Reddit is reportedly licensing all its content to Google for about $60M per year, and Wiley is being paid about $23M for one-time access to previously published academic papers.").

[227] *See* Nagaraj Opening Report, at ¶33; *see also* Nagaraj Opening Report, at Section III.A.4.

[228] Nagaraj Opening Report, at ¶73.

is because an LLM developer first needs to amass an enormous amount of data from a vast and diverse array of sources to develop a training corpus, and that data cannot be acquired through deals and public domain data alone due to the high transaction costs associated with negotiating each of the tens or hundreds of thousands of deals that would be required.[229] Only *after* the LLM developer has amassed multiple trillions of tokens would it then consider filling in missing "gaps" in the training corpus by seeking to acquire or license specific data.[230] A developer would likely only consider a deal in limited instances where it needs to fill a specific, high-value need in the training data because then, and only then, would the value of that data exceed the transactional cost of negotiating a deal. Moreover, as stated elsewhere in my Opening Report, I expect that individual deals may be consummated for data to train general-purpose LLMs, but that these deals will only proceed if the relative value of direct access to those data is greater than the total transaction and purchase costs necessary to acquire such data. [231]

89. In another reference to "Cloze Encounters," Dr. Smith contends that my paper should be read as suggesting that lyrics must be high value inputs to training datasets for general-purpose LLMs, because they are "unique."[232] "Cloze Encounters" does not support this conclusion. As I have discussed at length in both my Opening Report[233] and Rebuttal Report,[234] both Dr. Bilmes's Report and the record support my conclusion that lyrics text, including the text of the Works-in-Suit, is not unique or valuable as training data for general-purpose LLMs like Claude (See Section II.C.2.a above).[235] In fact, although

[229] *See* Nagaraj Opening Report, at ¶38; *see also* Nagaraj Opening Report, at Section III.A.2.

[230] *See* Nagaraj Opening Report, at ¶73 ("I do not expect one to emerge because of the insurmountable transaction costs involved in assembling all of the data. However, once a developer has amassed multiple trillions of tokens, the developer may find there are gaps in the model's training corpus with respect to certain kinds of valuable data.").

[231] *See* Nagaraj Opening Report, at ¶72.

[232] *See* Smith Rebuttal Report, at ¶35 ("[W]hen Anthropic begins acquiring data to train a model, its data needs are necessarily less specific; once it has acquired a significant amount of data, the value of data that is unique from the data it already has increases. Indeed, this is also what Dr. Nagaraj concluded in his Cloze Encounters paper.").

[233] *See* Nagaraj Opening Report, at III.A.2.a; *see also* Nagaraj Opening Report, at ¶¶58-59.

[234] *See* Nagaraj Rebuttal Report, at ¶11, ¶121.

[235] *See, e.g.,* Nagaraj Opening Report, at Section III.A.3.a ("My opinion based on my understanding of the facts is supported by Dr. Bilmes's opinion that lyrics are themselves not a diverse dataset for the purposes of training a general-purpose LLM—they tend to be short on facts, repetitive, and limited in their vocabulary. They also tend to include a far narrower range of topics, which minimizes the diversity that they contribute."); Nagaraj Rebuttal Report, at ¶122 ("The evidence I reviewed shows that Anthropic concluded the opposite [of lyrics being important] and placed a low value on lyrics to train Claude, as demonstrated by a document in which the [redacted]

"Cloze Encounters" does not expressly discuss lyrics text as a source of training data, more general discussions in "Cloze Encounters" support my view on this point. As I note there, "[m]odels may not even need direct access, since content is often replicated elsewhere in training data through summaries and references."[236] As I have maintained in my reports, "summaries and references" to songs and lyrics abound across the internet, and poetry and other sources of literary language, writing about music, and public domain lyrics can teach Claude about music and thus provide other substitutes for Plaintiffs' lyrics as training data.[237] This is one of several reasons that the record shows that Anthropic placed a low value on lyrics as training data, as I discussed in Section II.C.2 above.

90. Lastly, Dr. Smith claims that my view that no purported market exists for all of the training data needed for a general-purpose LLM implies that I assume that "AI training data is fungible in its incremental value to improving model performance."[238] Dr. Smith mischaracterizes my Opening Report and my "Cloze Encounters" paper. To the extent Dr. Smith interprets our use of the word "performance" in "Cloze Encounters" to mean overall LLM proficiency, this misunderstands our paper, since we evaluate performance as the capacity for memorization. Further, as I explained in my Opening Report, LLMs require many orders of magnitude of data overall, and therefore "each piece of data on its own has very little incremental value to the training corpus."[239] Moreover, in the case of lyrics data, which have relatively low value compared to others,[240] that text may be fungible with other types of input texts that could equally train Claude on, for example,

Nagaraj Rebuttal Report, at ¶125 ("Dr. Smith also fails to consider that Anthropic never actually concluded a deal for lyrics to train Claude. This fact supports my view that Anthropic did not view lyrics as essential to training Claude. Mr. Turvey, Anthropic's Vice President of Product Partnerships, specifically noted that [redacted]

[236] Anthropic_0000597354, at Anthropic_00005973571.

[237] *See* Nagaraj Opening Report, at footnote 94. *See also* Bilmes Opening Report, at ¶20 ("the extent it is helpful for Claude to understand music, lyrics, and structure of songs as part of its general knowledge, there is a broad array of information available including from books and the internet, as well as open-domain poetry and songs, that allows Claude to understand those concepts."); Bilmes Opening Report, at ¶ 338; Bilmes Opening Report, at footnote 624.

[238] Smith Rebuttal Report, at ¶32.

[239] Nagaraj Opening Report, at ¶50.

[240] *See* Section II.D.2.a; *see also* Nagaraj Opening Report, at Section III.A.3.a.

the concepts of music or songwriting, or that could provide the vocabulary or grammar found in lyrics.[241]

91. Turning to the "Old Moats" paper that I co-authored with Pierre Azoulay and Joshua L. Krieger, Dr. Smith again implies that I (and my co-authors) believe a market for all the data needed to train a general-purpose LLM exists.[242] Our paper says nothing of the sort. The goal of the paper was to examine the emerging competitive landscape in the AI foundation model industry and propose policy solutions to encourage a competitive market. As such, the role of data was only one part of our overall framework—a framework that included five other factors.[243]

92. Smith's Rebuttal Report argues that "Dr. Nagaraj and his co-authors openly suggest that, given the unsettled state of copyright law, developers could 'mitigate legal risks by using data for which they have licenses or explicit permission to use for training data.'"[244] He then continues, "Dr. Nagaraj and his co-authors evidently agree that preventing lengthy and costly copyright litigation is sufficiently valuable to give rise to the emergence of a licensing market for AI training data in at least some circumstances."[245] As an initial matter, the notion that licensing could have some value to developers because it mitigates legal risks is not inconsistent with my opinions about transaction costs and value in the purported market for data needed to train a general-purpose LLM. Even if licensing offered some value to developers because it allowed them to avoid costly copyright litigation, that value must still be compared relative to the (high) transaction costs. Moreover, the mere suggestion that developers could mitigate legal risks by purchasing a license for some training data does not imply that I think a market is viable for all

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[241] *See* Nagaraj Opening Report, at Section III.A.3.a. *See also, e.g.,* Nagaraj Opening Report, at ¶56 ("In fact, even if one were to acquire all one hundred million tracks that Spotify claims to have, they would still make up less than 0.1% of a [redacted] training dataset. These calculations signify to me that, on their own, the lyrics to the songs Plaintiffs own rights to do not significantly contribute to the volume needed for a general-purpose LLM."); Nagaraj Opening Report, at ¶57 ("My opinion based on my understanding of the facts is supported by Dr. Bilmes's opinion that lyrics are themselves not a diverse dataset for the purposes of training a general-purpose LLM—they tend to be short on facts, repetitive, and limited in their vocabulary. They also tend to include a far narrower range of topics, which minimizes the diversity that they contribute. And in any case, in order for an advanced general-purpose LLM to respond to generalized questions—that is, give answers that are themselves diverse in the topics they address—it requires a highly varied dataset, and cannot rely on any one type of data for training.").

[242] *See* Pierre Azoulay et al., "Old Moats for New Models: Openness, Control, and Competition in Generative Artificial Intelligence," Entrepreneurship and Innovation Policy and the Economy, Vol. 4, Feb 2025.

[243] Pierre Azoulay et al., "Old Moats for New Models: Openness, Control, and Competition in Generative Artificial Intelligence," Entrepreneurship and Innovation Policy and the Economy, Vol. 4, Feb 2025, at Figure 3.

[244] Smith Rebuttal Report, at ¶45.

[245] Smith Rebuttal Report, at ¶45.

training data needed to develop a general-purpose LLM. My Opening Report explained both that such a purported market did not exist and was not likely to emerge because of prohibitively high transaction costs,[246] and that some deals for last-mile or gap-filling data after a developer has assembled the full training dataset were possible.[247] Further, I am not aware of, nor does Dr. Smith describe, any cases in which a developer of a general-purpose LLM has licensed lyrics text for training—whether to mitigate legal risks or otherwise.

93. Finally, Dr. Smith refers to "Old Moats" to support his view that "general-purpose LLMs and single-purpose LLMs are […] competitors in the same market for AI training data."[248] He cites "Old Moats" because our paper notes that "a wide range of downstream applications" are built upon large, general-purpose LLMs like Claude—LLMs described as "foundation models."[249] Dr. Smith says, "[o]n this economic and technological backdrop, it is hard to see how Dr. Nagaraj could conclude that general-purpose LLMs and single-purpose LLMs are not competitors in the same market for AI training data."[250] This argument rests on flawed reasoning. As I note in Section II.B, these single-purpose AI audio tools do not compete with Anthropic because their inputs, outputs, products, use cases, and customer bases differ. Furthermore, the portions of my paper that Dr. Smith relies on also support this point. Even if AI audio tool applications did rest on "foundation models" like Claude, that would only suggest that Claude is an input in their production, rather than that the applications and foundation models must be in the same market. In fact, there are tens of thousands of applications that rely on general-purpose LLMs like Claude.[251] Following Dr. Smith's argument, one would need to include all of the companies developing these apps in the same market as Claude. This clearly does not make sense. Rather than undermining my arguments in the Opening Report regarding the buyers in a market for training data, my "Old Moats" paper strengthens my finding there

[246] *See* Nagaraj Opening Report, at Section III.A.1 - III.A.3.

[247] *See* Nagaraj Opening Report, at Section III.A.4.

[248] Smith Rebuttal Report, at ¶92.

[249] Pierre Azoulay et al., "Old Moats for New Models: Openness, Control, and Competition in Generative Artificial Intelligence," Entrepreneurship and Innovation Policy and the Economy, Vol. 4, Feb 2025, at p. 4.

[250] Smith Rebuttal Report, at ¶92.

[251] "GenAI's impact on network data traffic today," Ericsson, Jun 2025, available at https://www.ericsson.com/en/reports-and-papers/mobility-report/articles/genai-data-traffic-today-june-2025, accessed on 12 Feb 2026 ("The App Store and Google Play now offer over 29,000 mobile AI apps, of which, 14,000 were released in 2024.").

that the relevant buyers to consider in the purported market for the data needed to train a general-purpose LLM are developers of general-purpose LLMs.[252]

F. Harms to Other Markets the Smith Rebuttal Report Addresses Are Irrelevant

94. At several points in his Rebuttal Report, Dr. Smith argues that I ignore the effect of Anthropic's alleged conduct on other supposedly relevant markets. First, he asserts that I fail to engage "with the negative social and economic implications that would follow if Anthropic's conduct becomes widespread," claiming that the incentive for artists and creators to create new content is diminished and therefore harms the market for production of music.[253] Second, he contends that I do not consider the potential negative effects of generative AI on the labor market, nor "how [AI technology] will likely affect Publishers' business."[254] Furthermore, the Smith Rebuttal Report predicts sweeping downstream effects on all creators and music, [255] relying on speculative assumptions rather than evidence.

95. First, as he did in his Opening Report, Dr. Smith warns of "a substantial reduction in the intrinsic incentive among artists and creators to make new content."[256] As I note in my Rebuttal Report, economic evidence does not support the conclusion that either intrinsic or extrinsic incentives for creators drop because of a "loss of attribution"[257] or through any other mechanism. Dr. Smith does not offer a single example of a creator who no longer wants to "make new content" because of the alleged conduct of Anthropic, nor does he cite to any other evidence supporting this contention. Moreover, assertions regarding "intrinsic incentives" are not relevant when evaluating fair use factor 4, which asks me to examine the effect of the use upon the potential market *for or value of the copyrighted work.*[258] An effect on labor markets is irrelevant to my assignment.

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[252] *See* Nagaraj Opening Report, at Section III.A.

[253] *See* Smith Rebuttal Report, at ¶98.

[254] Smith Rebuttal Report, at ¶99.

[255] *See* Smith Rebuttal Report, at ¶¶98-99 (discussing asserted effects on artists, creators, and songwriters).

[256] *See* Smith Rebuttal Report, at ¶98.

[257] *See* Nagaraj Rebuttal Report, at Section IV.D.

[258] *See* 17 U.S. Code § 107, "Limitations on exclusive rights: Fair use," ("In determining whether the use made of a work in any particular case is a fair use the factors to be considered shall include…the effect of the use upon the potential market for or value of the copyrighted work.").

96. Second, Dr. Smith does not provide support for his view that AI technology is likely to displace musicians and songwriters, predicting that generative AI will have negative effects on the labor market and therefore on Plaintiffs' business.[259] My Rebuttal Report responds at length to this point. There, I discussed the various factors that can determine whether the positive or negative potential impacts of AI on labor markets dominate.[260] I explained that the labor market effects of AI are likely to vary depending "on the tasks related to a given job, the sector in which AI is deployed, and whether AI substitutes for or instead augments human judgment."[261] While AI can substitute for automating some tasks, it can also create productivity gains.[262] In fact, as I showed in my Rebuttal Report, many musicians and creators are already using AI tools to aid their creative workflows.[263] Furthermore, music industry intermediaries and gatekeepers, like Plaintiffs, are in a particularly powerful position to benefit from the new work created by musicians relying on such tools.[264]

97. Lastly, Dr. Smith argues that rightsholders lack meaningful tools to restrict online access to copyrighted content and may resort to imposing paywalls to prevent unlicensed use, which would have harmful effects both on rightsholders and downstream users.[265] In the Smith Rebuttal Report, he claims that he "do[es] not believe there is any practical way for Publishers to fully restrict access to their works that cannot be easily circumvented."[266] Yet he does not provide evidentiary support for this, and he overlooks any discussion of whether Plaintiffs in this case actually attempted to leverage robots.txt to restrict access to their lyrics.[267] As I addressed in my Rebuttal Report,[268] I understand from Dr. Bilmes that the [redacted]

[259] *See* Smith Rebuttal Report, at ¶99.

[260] *See* Nagaraj Rebuttal Report, at Sections II.B.1 and II.B.2.

[261] Nagaraj Rebuttal Report, at ¶55; *see also* Anthropic_0000606745.

[262] Menaka Hampole et al., "Artificial Intelligence and the Labor Market," National Bureau of Economic Research, w33509, Feb 2025, at p. 1, available at https://www.nber.org/papers/w33509 ("Despite strong substitution at the task level, overall employment effects are modest, as reduced demand in exposed occupations is offset by productivity-driven increases in labor demand at AI-adopting firms.").

[263] *See* Nagaraj Rebuttal Report, at Section II.B.2.

[264] *See* Nagaraj Rebuttal Report, at Section II.B.2.

[265] *See* Smith Rebuttal Report, at ¶¶97-98.

[266] Smith Opening Report, at ¶104.

[267] *See* Smith Opening Report, at ¶¶102-106.

[268] *See* Nagaraj Rebuttal Report, at ¶113.

[redacted][269] Therefore, Dr. Smith has not demonstrated that Plaintiffs lack effective mechanisms for restricting access to lyrics, and he has not established that their only recourse is to set up paywalls. Further, he has not provided any evidence that Plaintiffs have in fact set up such paywalls or even seriously considered doing so in response to Anthropic's use of lyrics text as training data.

98. In sum, Dr. Smith predicts a number of harms to markets that do not change my factor 4 analysis regarding the effect of Anthropic's alleged use on any actual or hypothetical market where the value of the Works-in-Suit could be affected. As I stated in my Rebuttal Report, I responded to these arguments and concluded that Dr. Smith's purported harms in these markets were overstated or otherwise unsupported by evidence. For the reasons set forth in my Rebuttal Report and above, Dr. Smith's contentions do not change my conclusions.

III. DR. SMITH'S CRITICISMS OF MY REGRESSION MODELS ARE FLAWED AND DO NOT CHANGE MY OPINIONS

99. In his report, Dr. Smith makes an array of flawed criticisms of my empirical analyses.[270] As a threshold matter, I note that he fails to test the validity of any of his critiques or directly engage with my empirical studies by using or testing the data from my Opening Report. In other words, rather than attempt to show that my analyses were flawed through direct empirical examination or testing, Dr. Smith's critiques are speculative and based on hypothetical conjectures rather than on demonstrated shortcomings.

100. In my response here, I take a two-pronged approach. In addition to explaining why Dr. Smith's criticisms are flawed in principle, I also re-analyze my data to directly test the robustness of my analyses in response to Dr. Smith's critiques. As I will show, these tests only serve to confirm the conclusions of my original analyses. I maintain my opinion from my Opening Report that there is no evidence of harm to Plaintiffs in the existing market for online display of lyrics.[271]

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[269] Bilmes Opening Report, at ¶306.

[270] *See* Smith Rebuttal Report, at Section II.E.

[271] Nagaraj Opening Report, at Section III.B.2.

A. The Analyses I Presented in my Opening Report Adequately Control for Demand Shocks

101. In the sections below, I take up Dr. Smith's primary criticism that "positive demand shocks" could influence the results of my empirical analyses.[272] Since Dr. Smith did not empirically assess the validity of his critiques, I re-analyze the traffic analysis and the Google search analysis I presented in my Opening Report in an effort to address this critique myself. I find that the results are robust to any such shocks and therefore withstand Dr. Smith's criticism. I also address additional points he makes in passing in his discussion of such shocks.

1. The Traffic Analysis I Presented in my Opening Report Adequately Controls for Demand Shocks

102. Dr. Smith contends that the design of my traffic analysis is flawed since it does not account for "positive demand shock[s]," which he explains are equivalent to an "increase in demand"[273] There could be many ways to determine what constitutes such a "positive demand shock," and Dr. Smith does not offer any specific definition. He provides a hypothetical example of a song "going viral" (which he also does not define) but offers no other examples of what a positive demand shock would be.[274] Dr. Smith does not empirically demonstrate that events that he considered as "positive demand shock[s]" had any bearing on my results, nor does he provide any examples of relevant real-world demand shocks in the data I analyze with the potential to cause the effects he describes.[275]

103. In any case, Dr. Smith's criticism does not apply to my analysis. First, shocks are normal in any analysis with real-world data. I am cognizant of this pattern in the data, and I have already employed standard tools from economics literature to account for such shocks in the original design of my web traffic analysis.[276] One prominent technique that economists typically use is temporal "fixed effects" (such as month-year fixed effects), which I included in both of my empirical studies and which I discuss further below.[277]

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[272] *See* Smith Rebuttal Report, at ¶106-109.

[273] Smith Rebuttal Report, at ¶106.

[274] *See* Smith Rebuttal Report, at ¶107.

[275] *See* Smith Rebuttal Report, at ¶107.

[276] *See* Nagaraj Opening Report, at ¶119; *see also* Nagaraj Opening Report, at Appendix C.

[277] *See, e.g.,* Tatyana Deryugina et al., "The mortality and medical costs of air pollution: Evidence from changes in wind direction," American Economic Review, Vol. 109, No. 12, Dec 2019, at pp. 4189 ("Finally, month-by-year fixed effects

104. Second, my traffic analysis is at the website-week level, not at the song level, meaning that I examine the *total* visits to lyrics display websites on any given week rather than looking at the demand for any individual song at a moment in time. For this reason—and given that I already account for temporal shocks through time-fixed effects—any potential demand shocks, such as one song going viral, are highly unlikely to influence the results of my analysis. For a demand shock to affect the results of my analysis, it would need to affect the overall traffic to lyrics display websites and Claude.ai in a way that is not captured by the time-fixed effects I use. Dr. Smith does not provide a real or hypothetical example of such a shock.

105. To illustrate the error in Dr. Smith's critique, I present two figures that track the following information over time: (1) the total traffic for the 26 lyrics websites considered in my Opening Report; (2) traffic to the two largest lyrics websites (Genius.com and AZLyrics.com); and (3) Google Trends lyrics search indices for two viral songs. The two viral songs with "positive demand shocks" that I select are "Closer to Fine" (Works-in-Suit 135),[278] and "Barbie Girl" (not in Works-in-Suit),[279] both of which went viral in the summer of 2023, in the middle of the time frame of my empirical analysis.[280] As I mention above, and as Figures 2 and 3 help illustrate, the virality of a song did not affect overall traffic to lyrics websites. As the data shows, the spike in popularity or demand that these songs experienced in the summer of 2023 has a negligible effect on total traffic to these websites, even though these spikes occur at the same time. And even then, I employ

control flexibly for common time-varying shocks, such as those induced by any Medicare or environmental policy changes during our sample"); Alan Barreca et al., "Adapting to climate change: The remarkable decline in the US temperature-mortality relationship over the twentieth century," Journal of Political Economy Vol. 124, No. 1, Feb 2016, at p. 123 ("The year-by-month fixed effects control for idiosyncratic changes in mortality outcomes that are common across states (e.g., the introduction of Medicare and Medicaid)"); Anthropic_0000606910, at Anthropic_0000606924 ("All regressions include year-month fixed effects to control for common, time-varying factors such as tax season or the end of the business quarter").

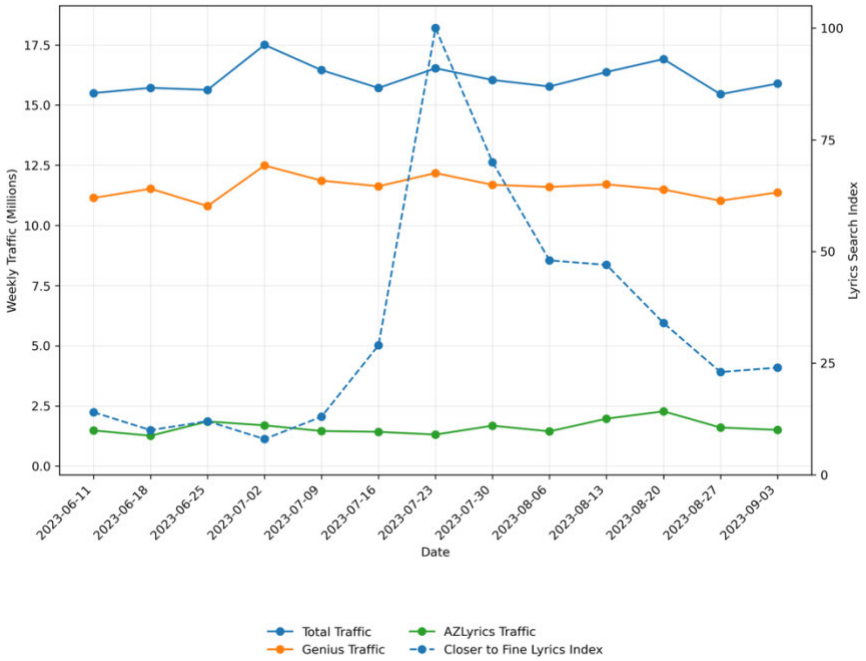
[278] *See* Dave Quinn, "Indigo Girls Reflect on *Barbie*'s Memorable 'Closer to Fine' Scene: 'A Huge Honor' (Exclusive)," People, 19 Mar 2024, available at https://people.com/indigo-girls-reflect-on-barbie-success-glitter-and-doom-film-exclusive-8610685, accessed on 10 Feb 2026 ("It all started with the Barbie movie in July 2023, when a cover of their 1989 hit "Closer to Fine" by Brandi Carlile and Catherine Carlile showed up in a memorable scene."); Trish Bendix, "How the Indigo Girls Brought Barbie 'Closer to Fine,'" 24 Jul 2023, available at https://www.nytimes.com/2023/07/24/arts/music/barbie-indigo-girls-closer-to-fine.html, accessed on 10 Feb 2026.

[279] *See* Alex Hopper, "Aqua's 'Barbie Girl' Goes Triple Platinum in the U.S.," American Songwriter, 10 Jul 2023, available at https://americansongwriter.com/aquas-barbie-girl-goes-triple-platinum-in-the-u-s/, accessed on 10 Feb 2026 ("Aqua's "Barbie Girl" has reentered the spotlight in the wake of Greta Gerwig's *Barbie* movie."); Sam Gutelle, "Barbiemania brings millions of views to YouTube music videos (including one from 1997)," Tubefilter, 27 Jul 2023, available at https://www.tubefilter.com/2023/07/27/barbie-girl-movie-youtube-music-video-views-aqua-triple/, accessed on 10 Feb 2026 ("According to data from VEVO, the "Barbie Girl" music video tripled its average day-to-day viewership in the week after *Barbie*'s theatrical release.").

[280] As shown in Figures 2 and 3, these two songs satisfy my identification methodology for "viral songs" introduced below for the analysis with Google Trends data in Section III.A.2. "Closer to Fine" is classified as viral at threshold 15, whereas "Barbie Girl" reaches virality at threshold 25.

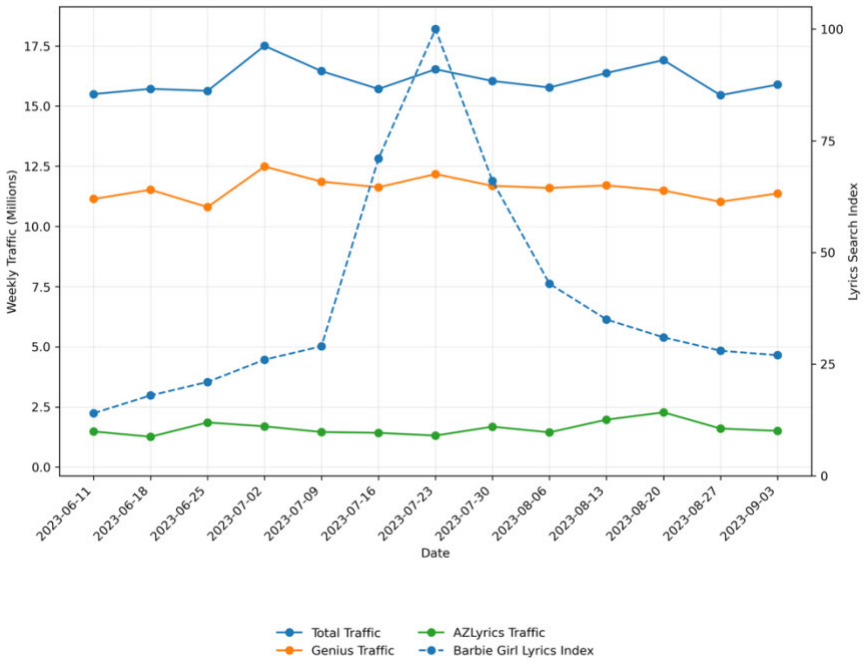
month-year fixed effects to account for possibility of any shock affecting the total traffic to lyrics websites. Songs that experienced a "positive demand shock" by going viral therefore do not undermine my traffic analysis.

Figure 2: Lyrics Traffic and "Closer to Fine" Lyrics Search Index[281]



[281] The Lyrics Search Index is obtained by getting Google Trends for "closer to fine lyrics" search term.

Figure 3: Lyrics Traffic and "Barbie Girl" Lyrics Search Index[282]



106. In my analysis, I accounted for potential demand shocks that could impact the variables of traffic to lyrics websites or the total traffic to the Claude.ai website. In my Opening Report, I expressly use time-fixed effects control for such shocks,[283] in particular by using month-year fixed effects, which are standard in academic literature.[284,285]

107. Dr. Smith argues that these month-year fixed effects "fail[] to control for positive demand shocks occurring across multiple months or within a particular month."[286] I do not agree with Dr. Smith for several reasons. First, as I describe above, month-year fixed effects are a standard approach in economics for dealing with the exact problem Dr. Smith points to. Rather than using all of the variation in the data, these fixed effects look at deviations

[282] The Lyrics Search Index is obtained by getting Google Trends for "barbie girl lyrics" search term.

[283] *See* Nagaraj Opening Report, at ¶102.

[284] *See* Nagaraj Opening Report, at ¶ 102, 119.

[285] *See, e.g.,* Tatyana Deryugina et al., "The mortality and medical costs of air pollution: Evidence from changes in wind direction," American Economic Review, Vol. 109, No. 12, Dec 2019, at pp. 4189 ("Finally, month-by-year fixed effects control flexibly for common time-varying shocks, such as those induced by any Medicare or environmental policy changes during our sample"); Alan Barreca et al., "Adapting to climate change: The remarkable decline in the US temperature-mortality relationship over the twentieth century," Journal of Political Economy Vol. 124, No. 1, Feb 2016, at p. 123 ("The year-by-month fixed effects control for idiosyncratic changes in mortality outcomes that are common across states (e.g., the introduction of Medicare and Medicaid)"); Anthropic_0000606910, at Anthropic_0000606924 ("All regressions include year-month fixed effects to control for common, time-varying factors such as tax season or the end of the business quarter").

[286] Smith Rebuttal Report, at ¶108.

from the average traffic that all websites experience during any given month in the data.[287] In other words, if, for example, there was a great deal of interest in lyrics across many songs in a given month, the regression would net out this effect and only analyze deviations from this (higher) average. Second, Dr. Smith merely hypothesizes that there might be shocks occurring across multiple months or occurring within a particular month. He offers no examples or evidence that any such shocks exist, let alone in sufficient quantity to bias my results. Regardless, my approach would account for any shocks even if they occurred across multiple months. Since I flexibly account for any shocks at the level of any given month in the data, if the trend continued across multiple or connected months, my analysis would account for this pattern as well. Therefore, Dr. Smith's critiques that I have not accounted for demand shocks across multiple months, or within a month, are unsupported and inaccurate.

108. Third, to further test Dr. Smith's critique, I have rerun the regression analyses I introduced in my Opening Report[288] using several other kinds of fixed effects. These additional models include month fixed effects using weekly traffic data, week-year fixed effects using daily traffic data, and week fixed effects using daily traffic data. If Dr. Smith's critique were accurate, then I expect my conclusions would be sensitive to the specific type of fixed effect I use. However, I find no relationship between usage of Claude.ai and the traffic to lyrics display websites across any of these additional models. As I explained in my Opening Report, the coefficient in a regression model measures the relationship between the independent and dependent variables.[289] The coefficients for the Log Claude Traffic variable reported in the tables below (Table 1-3) are statistically insignificant and therefore statistically indistinguishable from zero. This indicates that with a change in Claude.ai usage, there is no statistically discernible change in traffic to lyrics display

[287] Jeffrey M. Wooldridge, "Two-way fixed effects, the two-way mundlak regression, and difference-in-differences estimators," Empirical Economics, Vol. 69, No. 5, 27 Aug 2025, at p. 2546 ("As is well known, including unit fixed effects in a linear regression is identical to removing unit-specific time averages and applying pooled ordinary least squares (OLS) to the transformed data. Including time fixed effects then removes secular changes in the economic environment that have the same effect on all units"); *see* Daniele Girardi, "Econometrics (Econ 452), Ch. 8 – Panel Data," University of Massachusetts Amherst, at p. 32, available at https://danielegirardi.github.io/posts/documents/Econ452_FA2022_8_Panel_data.pdf, accessed on 10 Feb 2026 ("The time fixed-effects b_1 estimate can also be obtained by regressing "time-demeaned" Y on "time-demeaned" X, where "time-demeaned" means you subtract the time-specific average (=average of all observations for time t).").

[288] *See* Nagaraj Opening Report, at Table 1.

[289] *See* Nagaraj Opening Report, at ¶120 ("A coefficient is a number estimated by the regression model that measures the relationship between an independent variable and the dependent variable, holding all other variables constant. In this case, the coefficient measures how Claude affected traffic to lyrics websites, all other things being equal, since all of the coefficient estimates are not statistically significant.").

websites. Further robustness checks regarding the application of these fixed effects similar to the ones submitted in my Opening Report are provided in Appendix VI.A.1. I therefore conclude that Dr. Smith's critique of positive demand shocks affecting my analysis is unfounded.

Table 1: Regression Results for U.S. Lyrics Traffic on Claude Traffic (Month Fixed Effects for Weekly Traffic)

		Dependent Variable: Log Lyrics Traffic
		[A]
[1]	Log Claude Traffic	0.003
[2]	p-value	0.791
[3]	Observations	5,174
[4]	R Squared	0.837
[5]	Website FE	Yes
[6]	Month FE	Yes

Sources: Semrush Traffic Data
Data covers weekly traffic to 26 lyrics websites and Claude.ai for full weeks contained in January 2022 to October 2025. Claude.ai traffic is set to zero after [redacted] P-value is calculated using the wild cluster bootstrap method. Regression includes website fixed effects.
[B][1] Estimate of regressing log lyrics traffic on log Claude.ai traffic controlling for month fixed effects.
[B][2] p-value calculated using wild cluster bootstrap method shows that the coefficient at [B][1] is statistically insignificant.

Table 2: Regression Results for U.S. Lyrics Traffic on Claude Traffic (Week-Year Fixed Effects for Daily Traffic)

		Dependent Variable: Log Lyrics Traffic
		[A]
[1]	Log Claude Traffic	0.016
[2]	p-value	0.269
[3]	Observations	36,218
[4]	R Squared	0.749
[5]	Website FE	Yes
[6]	Week-Year FE	Yes

Sources: Semrush Traffic Data
Data covers daily traffic to 26 lyrics websites and Claude.ai for full weeks contained in January 2022 to October 2025. Claude.ai traffic is set to zero after [redacted] P-value is calculated using the wild cluster bootstrap method. Regression includes website fixed effects.
[B][1] Estimate of regressing log lyrics traffic on log Claude.ai traffic controlling for week-year fixed effects.
[B][2] p-value calculated using wild cluster bootstrap method shows that the coefficient at [B][1] is statistically insignificant.

Table 3: Regression Results for U.S. Lyrics Traffic on Claude Traffic (Week Fixed Effects for Daily Traffic)

		Dependent Variable: Log Lyrics Traffic
		[A]
[1]	Log Claude Traffic	0.002
[2]	p-value	0.900
[3]	Observations	36,218
[4]	R Squared	0.740
[5]	Website FE	Yes
[6]	Week FE	Yes

Sources: Semrush Traffic Data
Data covers daily traffic to 26 lyrics websites and Claude.ai for full weeks contained in January 2022 to October 2025.
Claude.ai traffic is set to zero after [redacted] P-value is calculated using the wild cluster bootstrap method. Regression includes website fixed effects.
[B][1] Estimate of regressing log lyrics traffic on log Claude.ai traffic controlling for week fixed effects.
[B][2] p-value calculated using wild cluster bootstrap method shows that the coefficient at [B][1] is statistically insignificant.

109. Finally, Dr. Smith levels an additional critique in his discussion of demand shocks related to my web traffic analysis. He states that my claim that "Claude does not act as a substitute to existing lyric websites is belied by simply reviewing the sample prompt-outputs produced by Anthropic."[290] That is, Dr. Smith is suggesting that if Claude outputs a line or two of a song, that is sufficient evidence to show that Claude substitutes for lyrics display websites. This criticism is unfounded. A single regurgitation of lyrics (as in the alleged regurgitation by Claude of lyrics to Gloria Gaynor's "I Will Survive" in October 2023)[291, 292]—or even a few such isolated cases—do not automatically mean that Claude was acting as a substitute for lyrics display. The relevant question is not whether Claude has the theoretical technical ability to produce lyrics, but whether end-users visit Claude instead of lyrics websites. The analyses I presented with real-world empirical data show that they do not, and my traffic analysis as I demonstrate above more than adequately controls for any purported "demand shocks".

2. The Google Search Analysis Presented in my Opening Report Also Adequately Controls for Demand Shocks

110. In addition to the website level analysis assessing impacts on traffic to lyrics display websites, my Opening Report also included analysis, using Google Trends data, that

[290] Smith Rebuttal Report, at ¶110.

[291] *See* Smith Rebuttal Report, at ¶ 111.

[292] Note that the regurgitation Dr. Smith refers to in this instance happened before the bolstering of Anthropic's guardrails. As I have stated in my Opening Report, my understanding of the guardrails that Anthropic bolstered [redacted] are highly effective at preventing any lyrics from being reproduced in outputs.

assessed the potential substitution effect by Claude on "a second traditional means for users to view lyrics: Google searches."[293] Unlike my website-level analysis, the Google Search analysis was conducted at the *song level*. In my Google Search analysis, similar to my findings for the traffic analysis, I found that there was no "*statistically significant effect of Claude usage on search interest for lyrics relative to interest in song searches*."[294] Dr. Smith's critique about "positive demand shocks" could theoretically apply to this analysis since this analysis is conducted at the song level. Here, however, the criticism is not relevant, as I show below. This is because (as mentioned in my Opening Report) my analysis using Google Trends data already controls for the song-level demand shocks that Dr. Smith hypothesizes about. In my Google Search study, I used "as a benchmark the search interest for the songs themselves (for which I use[d] the song index)," and therefore "the song index [was] an appropriate control to include in my model in order to account for the general interest in the song."[295]

111. Nevertheless, as I show in an empirical analysis below to further test Dr. Smith's claims regarding the potential for viral songs to affect the results of my study, I find that even when I account for sudden positive shocks in song demand for my Google Search analysis, my results do not qualitatively change.

112. Dr. Smith does not define or provide examples of what a "positive demand shock" could be, other than a song that goes viral and he does not provide a definition of what "going viral" means. Thus, for purposes of this analysis, I identify songs that experienced a sudden burst of virality, which represents a significant positive demand shock over a brief period. If Dr. Smith's hypothesis were correct, those would be the songs to which Dr. Smith's criticism would be most applicable. To identify "viral songs" among the Works-in-Suit, I isolate the sample period for each song for the weeks preceding its first highest Google Trends index of 100.[296] I then filter for songs whose index value, either for the song index or the lyrics index, was greater than 0 and less than or equal to 15 in the period

[293] Nagaraj Opening Report, at ¶122.

[294] Nagaraj Opening Report, at ¶139.

[295] Nagaraj Opening Report, at ¶137.

[296] A song's Google Trends index may be 100 on multiple weeks, indicating it garnered the same level of high popularity on those weeks. However, since I remove songs that satisfy my criterion of witnessing a "positive demand shock", having multiple episodes of shocks does not influence my analysis, since those songs are removed from my analysis anyway.

4 to 6 weeks prior to the index peak.[297,298] In other words, I look at songs whose index value jumps (during its period of "virality") from a value that is less than or equal to 15 to a peak of 100. I select the number 15 out of convenience, but to ensure my analysis is robust, I also examine results with alternative higher thresholds, such as 25, 35, and 45.[299] For each of these thresholds mentioned, I find that 17, 42, 67, and 97 songs, respectively, exhibit a positive demand shock under the 'Title' specification,[300] with fewer songs identified in the other specifications. Put another way, I find 17 songs where users searching the songs' titles caused the popularity in the Google Trends title search to jump from under 15 to a peak of 100; I find 42 such songs whose popularity jumped from under 25 to a peak of 100; and so on. Fewer songs saw jumps in Google Trends using the other specifications I used in my Opening Report (which included search for songs by title and artist name and search for songs via a mix of title only and artist name and title together).[301]

113. Figure 4 illustrates the Google Trends indices for Work-in-Suit 135 ("Closer to Fine"), which satisfies the criteria for all four "virality" thresholds.

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[297] I require a threshold, such as 15, due to Google Trends providing rescaled (0-100) indices. If a song goes viral, the index on the week of maximum search interest will be 100, which implies that other weeks must be less than 100. Accordingly, the greater the search interest on this week, the lower the index value in other weeks of typical search interest, such as in the weeks prior to the demand shock. I choose the period between 4 to 6 weeks in order to allow a few weeks for the demand shock to elevate the index value from its base to its peak.

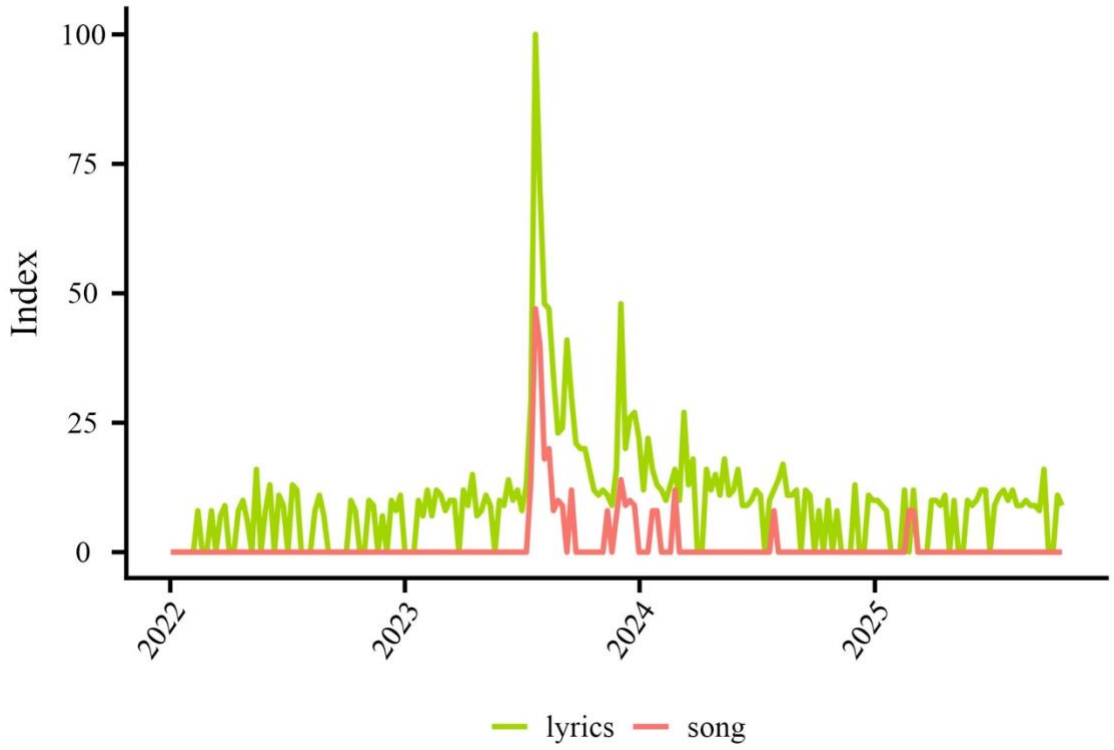
[298] Since Google Trends rescales all search interest indices to 0-100, the peak of 100 corresponds to the week of greatest search interest, the 100 index is not in itself indicative that the song went viral. I require the index to be greater than 0 so that I can remove songs that typically have no search interest. For these relatively unpopular songs, it is unclear whether reaching the peak of 100 indicates that the song truly witnessed a "positive demand shock" or simply garnered some search interest without going viral.

[299] I verified that a subset of songs identified from this approach did indeed exhibit a demand shock by searching on Google for the song's name and the year in which I observe the spike in the Google Trends index. Examples include "Closer To Fine" by Indigo Girls (Work-in-Suit 135), "God Only Knows" by The Beach Boys (Work-in-Suit 204), and "Songbird" by Fleetwood Mac (Work-in-Suit 403). For "Closer to Fine," *see* Dave Quinn, "Indigo Girls Reflect on Barbie's Memorable 'Closer to Fine' Scene: 'A Huge Honor' (Exclusive)," People, 19 Mar 2024, available at https://people.com/indigo-girls-reflect-on-barbie-success-glitter-and-doom-film-exclusive-8610685, accessed on 10 Feb 2026. For "God Only Know," *see* Tomas Mier, "Sting Honor Brian Wilson With Cover of Beach Boys' 'God Only Knows,'" Rolling Stone, 12 Jun 2025, available at https://www.rollingstone.com/music/music-news/sting-honors-brian-wilson-cover-beach-boys-god-only-knows-1235363031/, accessed on 10 Feb 2026. For "Songbird," *see* Peter Larsen, "Remembering Christine McVie, the 'Songbird' of Fleetwood Mac, upon her death at 79," Los Angeles Daily News, 20 Nov 2022, available at https://www.dailynews.com/2022/11/30/remembering-christine-mcvie-the-songbird-of-fleetwood-mac-upon-her-death-at-79/, accessed on 10 Feb 2026.

[300] The 'Title' specification as defined in my Opening Report at ¶133 compares Google Trends search query results in the form of "title lyrics" and "title song." Other specifications include 'Title Artist,' which compares "title artist lyrics" and "title artist song," and three "mixed" specifications, "Mixed 10," "Mixed 20," and "Mixed 30," which include combinations of the 'Title' and 'Title Artist' specifications based on the average gap between the two. All specifications are defined in ¶133 of my Opening Report. *See* also Nagaraj Opening Report, at Appendix C.

[301] *See* Nagaraj Opening Report, ¶133.

Figure 4 Example of Viral Song (Work-in-Suit 135: "Closer to Fine")



114. Across each of these thresholds, when I remove the Works-in-Suit that satisfy the "virality" criterion from the sample in the Google Trends analysis, I find that the results of my analysis do not qualitatively change (see Table 4 below). Thus, even when I screen out viral songs from my analysis to remove Dr. Smith's hypothesized mechanism for virality driving the results, my conclusion remains the same. I find that there is no statistically significant effect of Claude usage on search interest for lyrics relative to interest in song searches as evidenced by the statistically insignificant coefficient for my variable of interest—the interaction of Claude traffic and the lyrics index in my preferred specification (i.e., the Mixed specification).[302] Table 4 below presents the results using the threshold of 15. The results for the other specifications for threshold 15 as well results for the other thresholds are presented in Appendix VI.B.1. Further, my baseline analyses presented in my Opening Report include song fixed effects that already account variation in the virality among the songs for this analysis. Since I cannot find any evidence indicating that viral songs or positive demand shocks affect the results of my Google

[302] My preferred specification is Mixed (20) and the reasoning for my preferred specification is provided in my Opening Report, at ¶133; *see also* Nagaraj Opening Report, at Table 2.

Search analysis, which was conducted at the song level, I conclude that Dr. Smith's criticism is unfounded.

Table 4: Regression Results of Baseline Model Without Viral Songs at Threshold 15

		Title	Title Artist	Mixed (20)
	[A]	[B]	[C]	[D]
[1]	Lyrics x Claude Traffic	0.018***	0.002	0.002
[2]		0.003	0.002	0.002
[3]	Lyrics	11.731***	3.081***	3.492***
[4]		0.070	0.049	0.052
[5]	Claude Traffic	-0.022***	-0.002	-0.006*
[6]		0.005	0.003	0.003
[7]	Observations	191,438	197,408	195,418
[8]	R Squared	0.595	0.187	0.245
[9]	Song Count	481	496	491
[10]	Viral Songs Removed	17	2	7

Sources: Data from Opening Report; originally obtained from WIS Chart provided by Counsel; Google Trends data, accessed via SearchAPI.

Table results are obtained from estimates of my baseline regression model using 498 WIS provided by counsel, excluding songs I identify as viral. Viral songs are identified as those whose index value is greater than 0 and less than or equal to 15 during the period 4-6 weeks prior to the peak index value. Additionally, "Joy to the World" (Work-in-Suit 273) is excluded from estimation because it was not included in [redacted], as explained in Opening Report. Observations are at the week-WIS level. The specification includes song fixed effects and month-year fixed effects. The sample period is full weeks contained in January 2022 – October 2025. Lyrics is an indicator that equals 1 for lyrics queries and 0 for song queries. Claude Traffic is imputed 0 after [redacted], and rescaled to a range of 0-100. Standard errors are provided in the rows below coefficient estimates. Standard errors are heteroskedasticity-robust, and significance stars are reported at the 10% (*), 5% (**) and 1% (***) level.

[B] Title specification includes indices of queries "[title name] lyrics" and "[title name] song".

[C] Title Artist specification includes indices of queries "[title name] [artist name] lyrics" and "[title name] [artist name] song"

[D] Mixed (20) specification include indices of queries "[title name] lyrics" and "[title name] song" if the Index Gap is 20 or less, otherwise includes indices of queries "[title name] [artist name] lyrics" and "[title name] [artist name] song".

B. My Google Search Analysis is Accurate and Includes an Appropriate Control Group

115. Regarding the Google Search analysis I present in my Opening Report, Dr. Smith also contends that I do not provide any evidence to "determine whether the absence of the specific word "lyrics" in a Google search means the user is specifically *not* looking for lyrics."[303] He misunderstands my analysis of the Google Trends data, instead critiquing assumptions that I did not make and that are not necessary for my conclusions to hold.

116. I agree with Dr. Smith that one cannot decipher user intent behind every Google Search with absolute certainty. For that reason, I cannot, and do not, make the claim that a user is *definitely* not looking for lyrics if they do not mention the term "lyrics" in their Google Search. However, as I explained in my Opening Report, my analysis hypothesizes only that the "song index" consists of searches *likely* related to the audio of the song, and the

[303] Smith Rebuttal Report, at ¶119.

"lyrics index" consists of searches *likely* related to the lyrics to a song.[304] Therefore, as I explained in my Opening Report, my analysis is valid even though I do not know the exact user intent for each type of search. This requirement is entirely reasonable and is strengthened by the analysis I described in Appendix C of my Opening Report.[305] There, I noted that Google Trends has a "related searches" feature, so that I was able to see what other searches users conducted for 1) each song name and 2) a combination of artist and song name. As I observed there, "[t]he most common remaining words, other than simple articles, are 'lyrics' and 'song'," which was the basis for my creating a comparative index for song searches compared to lyric searches.[306] Finally, Dr. Smith has offered no evidence that contradicts the requirement that searches under the "song" index are more likely to be related to user intent for songs than searches under the "lyrics" index are related to user intent for songs.

117. Nevertheless, in response to Dr. Smith's criticism, I provide further evidence and analysis showing that "song" searches are less likely to be searches for lyrics than "lyrics" searches. Dr. Smith presents Google Search images of the results of searches for "7 rings Ariana grande song" and "7 rings song" to suggest that "both searches yield the same Musixmatch lyrics."[307] However, he fails to show the results of the equivalent "lyrics" searches. I therefore add two more images of Google Searches and show the results for "7 rings ariana grande lyrics" and "7 rings lyrics" as shown in the figures below. The results illustrate that the lyrics websites Genius.com and AZLyrics.com appear as the first two results, respectively, when I add the word "lyrics," and that YouTube.com does not appear in the first two results. Dr. Smith fails to point out that for the screenshot he provides of just the "song" searches, the YouTube link to the video of the song is the first link, followed by the lyrics; by contrast, if one searches only for "[song name] lyrics," the first link is to the lyrics on genius.com. Thus, even in Dr. Smith's example, it is clear that the "lyrics" search results cater towards prioritizing the display of lyrics text more than the "song" search results do—which is exactly what I would expect and what my analysis relies upon.

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[304] *See* Nagaraj Opening Report, at ¶¶126-127.

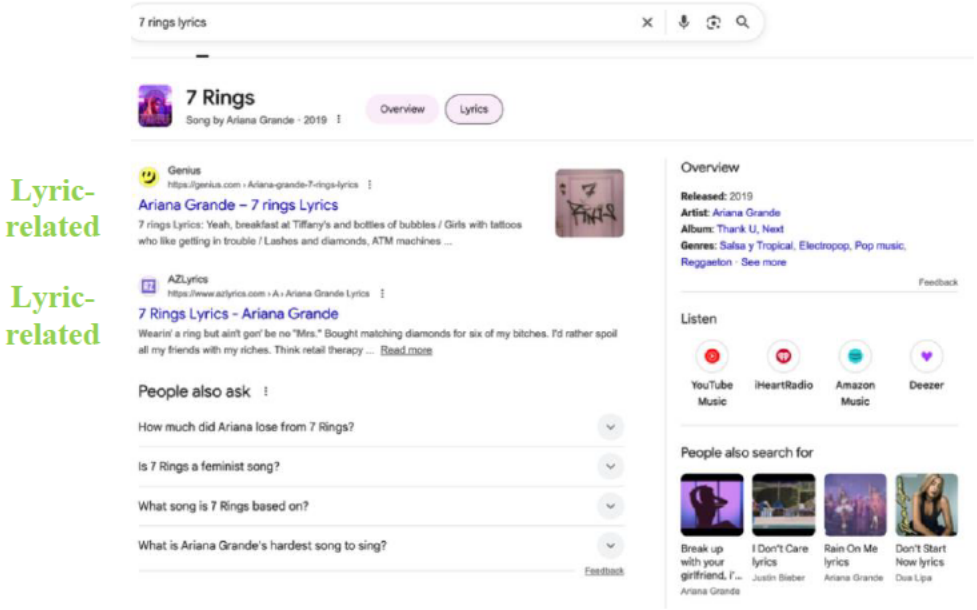
[305] *See* Nagaraj Opening Report, at Appendix C.4.c.

[306] *See* Nagaraj Opening Report, at ¶¶167-168

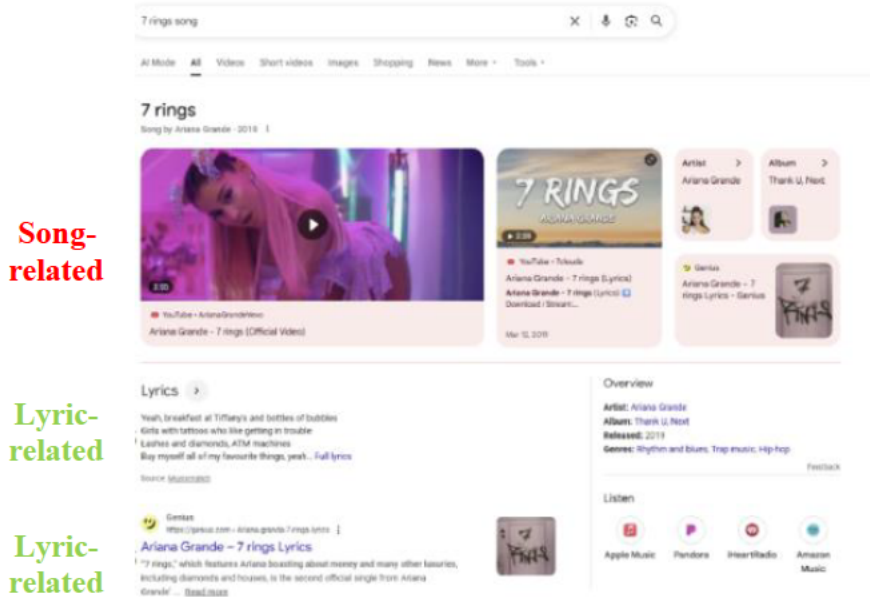
[307] Smith Rebuttal Report, at ¶117.

HC-AEO

Figure 5: Google Search for "7 rings lyrics" and "7 rings song"



Google search results for "7 rings lyrics"



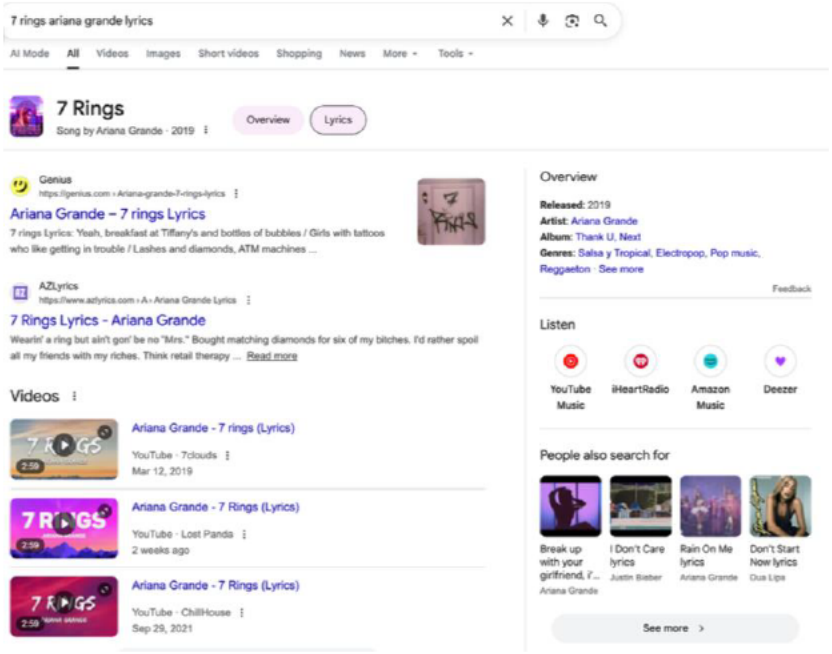
Google search results for "7 rings song" (screenshot of Dr. Smith Rebuttal Report)

HC-AEO

Figure 6: Google Searches for "7 rings ariana grande lyrics" and "7 rings ariana grande song"

Lyric-related

Lyric-related

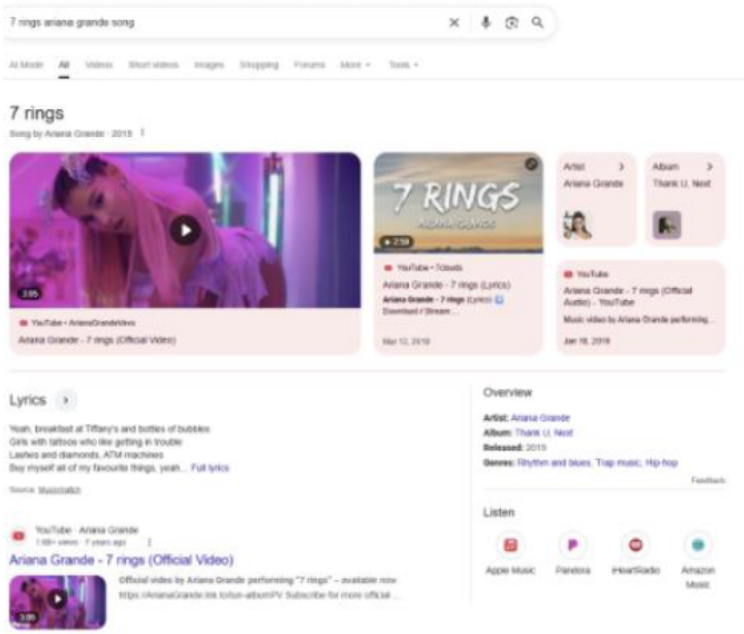


Google search results for "7 rings ariana grande lyrics"

Song-related

Lyric-related

Song-related



Google search results for "7 rings ariana grande song" (screenshot of Smith Rebuttal Report)

118. Next, I consider the "song" searches in Google that Dr. Smith submitted with his Rebuttal Report, and I extend his analysis by also looking at Google search results for "lyrics" searches.[308] Specifically, I compare the top "lyrics" result with the top "song" result, as well as the top three "lyrics" results with the top three "song" results.[309] Figure 7 displays a bar chart of the representation of top domains in the top one and top three Google Search results (respectively) for lyrics- and song-related searches. For the top result, Genius.com is the predominant result for the lyrics related searches, whereas YouTube is the predominant search result for song related searches. Similarly, for the top 3 searches, lyrics websites such as Genius.com and AZLyrics.com are the predominant results among lyrics searches, while YouTube.com again is the majority among Dr. Smith's song search results. In other words, users who include the word "lyrics" in their searches more frequently get steered to websites that feature lyrics display among the top results, and users who include the word "song" in their searches more frequently get steered to websites where they can stream the song with accompanying music. These results are consistent with Google's aim to return ranked results based on meaning, relevance, quality, usability, and content,[310] and are consistent with the fact that the top results on the Google Search page are heavily optimized since they get the most traffic.[311]

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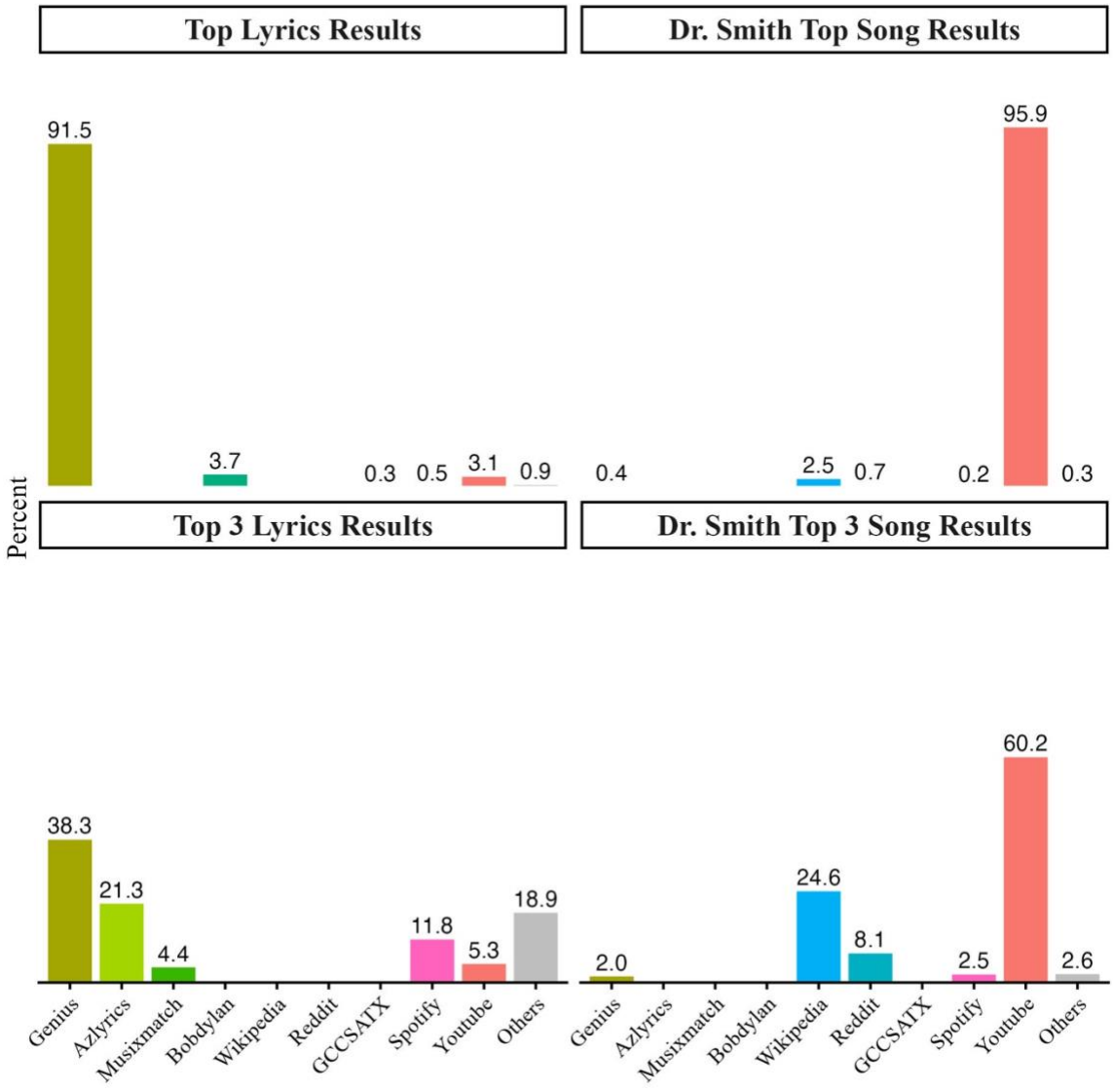
[308] *See* Smith Rebuttal Report, at ¶118.

[309] I cannot use Dr. Smith's code to produce the "lyrics" searches because Dr. Smith used the Google Developer application to scrape the data. However the Custom Search JSON API associated with the Google Developer Application is no longer available, *see* "Custom Search JSON API," Google for Developers, available at https://developers.google.com/custom-search/v1/overview, accessed on 10 Feb 2026. I therefore used SearchAPI ("Google Search API," SearchAPI, available at https://www.searchapi.io/) to get the results for the analogous lyrics searches. Materials are available in the Backup Book.

[310] "Automatically generating and ranking results," Google Search, available at https://www.google.com/intl/en_us/search/howsearchworks/how-search-works/ranking-results/, accessed on 10 Feb 2026. Specifically, Google states "[t]o return relevant results, we first need to establish what you're looking for - the intent behind your query. To do this, *we build language models to try to decipher how the relatively few words you enter into the search box* match up to the most useful content available." (emphasis added); "How does Google Search Works: Crawling, Indexing, Ranking and Serving," GeeksforGeeks, 23 Jul 2025, available at https://www.geeksforgeeks.org/techtips/how-the-google-search-works-crawling-indexing-ranking-and-serving/#ranking-how-are-urls-ranked-by-search-engines, accessed on 10 Feb 2026 ("Each web page receives a score from search engines based on their evaluation of its quality and relevancy. The page's ranking in the SERP is based on this score. Higher-scoring pages are ranked higher and show up first in the search results, whereas lower-scoring pages show up further down the page or even don't show up at all."); Bing Pan et al., "In Google We Trust: Users' Decisions on Rank, Position, and Relevance," Journal of Computer-Mediated Communication, Vol. 12, No. 3, 1 Apr 2007, at p. 802 ("All of the search engines noted above respond to a query with a ranked list of 10 abstracts in their default setting. The ranking reflects the search engines' estimated relevance of Web pages to the query.").

[311] "The Value of Page One: Why Your Search Rankings Matter," Amsive, 18 Jul 2022, available at https://www.amsive.com/insights/seo/the-value-of-page-one/, accessed on 10 Feb 2026 ("Securing a spot on page one is only half the battle. Securing the number one overall position for key terms is where the highest value lies. The exact numbers can vary from study to study, but the universal consensus is that the top three positions on Google account for nearly three-quarters of all traffic for a given term."); Thorsten Joachims et al., "Accurately interpreting clickthrough data as implicit feedback," SIGIR '05: Proceedings of the 28th annual international ACM SIGIR conference on Research and development in information retrieval, 15 Aug 2005, at p. 154 available at https://dl.acm.org/doi/epdf/10.1145/1076034.1076063 (Joachims et

Figure 7: Top Google Search Results for "lyrics" Compared to Dr. Smith's Google Search Results for "song"

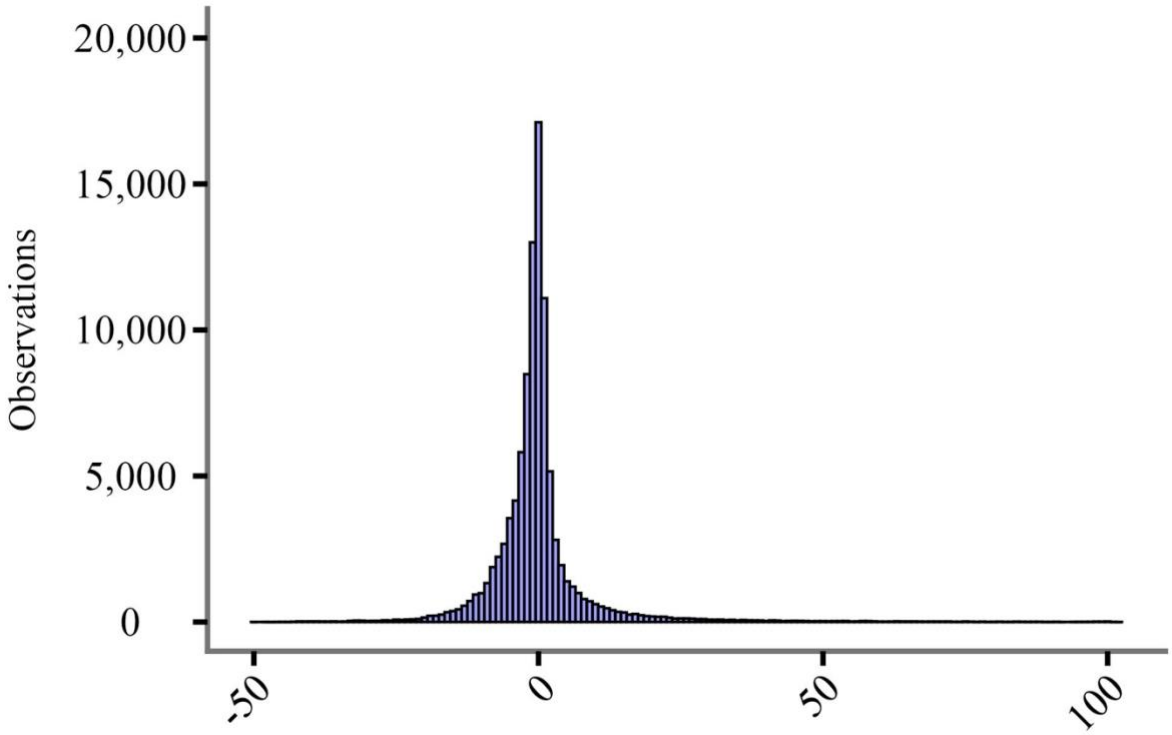


119. Next, I provide additional evidence with a more empirical approach to address Dr. Smith's concerns that users' search interest for lyrics may be a factor in the Google Trends "song" index being a valid control that I used as the benchmark in my analysis. In this approach, I remove any "lyrics" variation from the "song" index variable by

al. find conducting eye-tracking experiments of users of Google Search find a "trust" bias in which users are more likely to click on higher ranked search results relative to lower ranked search results); Bing Pan et al., "In Google We Trust: Users' Decisions on Rank, Position, and Relevance," Journal of Computer-Mediated Communication, Vol. 12, No. 3, 1 April 2007, at p. 801 ("An eye tracking experiment revealed that college student users have substantial trust in Google's ability to rank results by their true relevance to the query. When the participants selected a link to follow from Google's result pages, their decisions were strongly biased towards links higher in position even if the abstracts themselves were less relevant.").

estimating a regression of the song index on the lyrics index, including the same set of fixed effects as in the main specification. I capture the estimated errors, or residuals, of this regression, which explains all the variation that goes into the "song" index that is not explained by the "lyrics" index. This estimates the interest in music or the song that is unrelated to interest in lyrics. A histogram of the residuals is provided below in Figure 8.[312]

Figure 8: Histogram of Song-Week Residuals



120. After replacing the song indices in my original regression[313] with these residuals while keeping the lyrics indices the same, I do not find a change to the main qualitative results. The results do not indicate any negative effect of Claude traffic on search interest for "lyrics" relative to "song" queries as shown in Table 5 below. Specifically, I do not find a statistically significant effect of Claude usage on search interest for lyrics relative to interest in song searches as evidenced by the statistically insignificant coefficient for my variable of interest - the interaction of Claude traffic and the lyrics index in my preferred

[312] As Figure 8 shows, these data mostly show a normal distribution, centered around 0 with errors on both positive and negative sides of the x-axis.

[313] Nagaraj Opening Report, at ¶173.

specification (Mixed).[314] Therefore, to summarize, I conclude that my opinion in my Opening Report based on the Google Trends analysis was accurate, and I do not find any reason to change my opinions based on the criticisms raised by Dr. Smith. Further details on the methodology are provided in Appendix VI.B.2

Table 5: Regression Results for Baseline Model Using Song Indices Residuals Instead of Song Indices

		Title	Title Artist	Mixed (20)
	[A]	[B]	[C]	[D]
[1]	Lyrics x Claude Traffic	0.007**	0.000	0.000
[2]		0.003	0.002	0.002
[3]	Lyrics	23.041***	3.857***	4.876***
[4]		0.077	0.049	0.052
[5]	Claude Traffic	-0.014***	0.000	-0.004
[6]		0.005	0.003	0.003
[7]	Observations	198,204	198,204	198,204
[8]	R Squared	0.480	0.168	0.193

Sources: Data from Opening Report; originally obtained from WIS Chart provided by Counsel; Google Trends data, accessed via SearchAPI.

Table results are obtained from estimates of my baseline regression model using 498 WIS provided by counsel, using estimated residual song indices instead of song indices from the raw data. Residuals are estimated by regression the song index on the lyrics index, including the same set of fixed effects as in the baseline regression model (song fixed effects and month-year fixed effects). "Joy to the World" (Work-in-Suit 273) is excluded from estimation because it was not included in [redacted], as explained in Opening Report. Observations are at the week-WIS level. The sample period is full weeks contained in January 2022 – October 2025. Lyrics is an indicator that equals 1 for lyrics queries and 0 for song queries. Claude Traffic is imputed 0 after [redacted], and rescaled to a range of 0-100. Standard errors are provided in the rows below coefficient estimates. Standard errors are heteroskedasticity-robust, and significance stars are reported at the 10% (*), 5% (**) and 1% (***) level.

[B] Title specification includes indices of queries "[title name] lyrics" and "[title name] song".

[C] Title Artist specification includes indices of queries "[title name] [artist name] lyrics" and "[title name] [artist name] song"

[D] Mixed (20) specification include indices of queries "[title name] lyrics" and "[title name] song" if the Index Gap is 20 or less, otherwise includes indices of queries "[title name] [artist name] lyrics" and "[title name] [artist name] song".

C. Dr. Smith's Critique Regarding the Use of Claude.ai Traffic as the Independent Variable in my Traffic Analysis and Google Trends Analysis Lacks Any Merit

121. Dr. Smith next claims that Claude.ai traffic is not a valid independent variable. Specifically, he disputes the assumption he claims I make that "total Claude.ai traffic is an appropriate proxy for the true metric of interest, *lyric-related* Claude usage."[315] I disagree with Dr. Smith's premise that the total Claude.ai traffic is the wrong variable to consider. The total traffic is a proxy for the number of prompts being sent to Claude.ai, and it therefore represents the total *opportunity* that users have to substitute their demand

[314] For details on my preferred specification, see Nagaraj Opening Report, at ¶143.

[315] Smith Rebuttal Report, at ¶121.

for online lyrics display away from other sources and to Claude. If Plaintiffs' theory of harm were correct, I would expect that with the increased usage of Claude (as proxied by total traffic to Claude.ai), Claude would replace the lyrics display websites or Google searches for lyrics as the dominant medium for online lyrics display, and I would see a negative effect on traffic to lyrics display websites and Google searches for lyrics as a result. Although I do not use data on lyric-related Claude usage, I do use total traffic to Claude.ai, which should be positively correlated to the lyric-related Claude usage anyway. The fact that I do not see any such effect in any of my analyses using the variable for overall traffic indicates that there is unlikely to be any connection between lyrics interest on Claude and traffic to lyrics websites.

122. Once again, as a threshold matter, I note that although Dr. Smith could have conducted the analysis implied by this theory, he did not. I therefore perform a robustness analysis to further check my results. Even if I consider the "lyric-related Claude usage" that Dr. Smith's theory demands, I find no effect on the results of my analysis, and thus no change in my opinions in the matter.

123. To address Dr. Smith's concern regarding lyric-related Claude usage, I note that the Bray Opening Report provides the "Percent of Prompts Seeking Any Amount or Form of Lyrics Regurgitation" over time within the adjusted sample. My understanding is that Dr. Bray revised his numbers slightly, and found the following: 0.056% [redacted], 0.04% [redacted] 0.028% ([redacted], and 0.033% [redacted][316] If I multiply the Claude.ai traffic with these fractions [redacted], one of Anthropic's guardrails to prevent the reproduction of lyrics in the outputs, the implication of my results does not change for the web traffic analysis, as seen in Table 6 below.[317]The coefficients for the Log Claude Traffic variable reported in the table below is statistically insignificant and therefore statistically indistinguishable from zero. This indicates that with a change in Claude.ai usage adjusted for lyrics-related usage, there is no statistically discernible

[316] I understand that Dr. Bray re-ran his analyses from his Opening Report. The numbers provided here are what I understand to be the revised figures that reflect updates from the version of Table I in Dr. Bray's Opening Report. *See* Opening Report of Dr. Andrew Bray, 19 Dec 2025 ("Bray Opening Report"), Table I, at p. 43.

[317] Note that the analysis in the Bray Opening Report starts from Sep 22, 2023, and not July 11, 2023, when Claude.ai was first released. I therefore used the 0.056% to multiply the Claude.ai traffic from July 11, 2023, to [redacted]. In addition, the last period before Prompt Shield in Dr. Bray's analysis ends on [redacted] I therefore included [redacted] within that final period and applied the same 0.028% fraction to that date.

change in traffic to lyrics display websites. Further robustness checks similar to the ones submitted in my Opening Report are provided in Appendix VI.A.2.

Table 6: Regression Results for U.S. Lyrics Traffic on Claude Traffic (Claude Traffic is Scaled for Lyrics-Related Usage)

		Dependent Variable: Log Lyrics Traffic
		[A]	[B]
[1]	Log Claude Traffic		0.014
[2]	p-value		0.535
[3]	Observations		5,174
[4]	R Squared		0.844
[5]	Website FE		Yes
[6]	Month-Year FE		Yes

Sources: Semrush Traffic Data
Data covers weekly traffic to 26 lyrics websites and Claude.ai for full weeks contained in January 2022 to October 2025. Claude.ai traffic is scaled for lyric related usage and set to zero after [redacted] P-value is calculated using the wild cluster bootstrap method. Regression includes website fixed effects.
[B][1] Estimate of regressing log lyrics traffic on log Claude.ai traffic scaled for lyric related usage controlling for month-year fixed effects.
[B][2] p-value calculated using wild cluster bootstrap method shows that the coefficient at [B][1] is statistically insignificant.

124. The results for the Google Search analysis would also remain the same upon multiplying by a constant before the bolstering of guardrails on [redacted] since the Claude.ai traffic is rescaled from 0 to 100, as I explained in my Opening Report.[318] Therefore, using the lyrics-related Claude usage as Dr. Smith suggests has no meaningful effect on my results.

125. Additionally, Dr. Smith contends that "the Claude traffic variable is the only non-indicator independent variable (i.e., the only independent variable that does not exclusively take values of 0 or 1)" and that "only around 12.1% of observations in his web traffic regressions and around 9.5% in [my] Google Trends regressions are even relevant to the effect he is purporting to measure: weekly variations in lyric interest explained by changes in Claude usage."[319] However, having zeroes in the independent variable is a common feature of data used in many peer-reviewed academic articles.[320]

[318] Nagaraj Opening Report, at ¶135.

[319] Smith Rebuttal Report, at ¶131.

[320] *See, e.g.,* Daron Acemoglu et al., "Reversal of fortune: Geography and institutions in the making of the modern world income distribution," The Quarterly Journal of Economics, Vol. 117, No. 4, Nov 2002, at Appendix 3 (the authors report that their main independent variable "Base Urbanization Estimate in 1500" contains multiple zero values); Oeindrila Dube and Juan F. Vargas, "Commodity Price Shocks and Civil Conflict: Evidence from Colombia," Review of Economic Studies, Vol. 80, 15 Feb 2013, at p. 1415 available at http://odube.net/papers/Dube_commodities_conflict.pdf ("…we ensure that we include municipalities that have never experienced an attack during the sample period by coding them with zeroes"); Jiwon Choi et al., "Local economic and political effects of trade deals: Evidence from NAFTA," American Economic Review, Vol.

Dr. Smith does not explain why the presence of these zeroes represents anything problematic with the analyses.

126. Dr. Smith claims that the guardrails were ineffective, citing the Dennis Opening Report.[321] However, for purposes of my analysis, I assume that the guardrails (including both by [redacted] and by implementing Prompt Shield) were effective, which is supported by my understanding from Dr. Bray and Dr. Bilmes. I understand that Dr. Bray has already responded to the Dennis Opening Report and concluded that Mr. Dennis's analysis about Anthropic's guardrails was misleading.[322] I also understand that Dr. Bray will be submitting another expert report, in which Dr. Bray responds to Mr. Dennis's opinion from his Rebuttal Report regarding two examples of outputs purporting to provide lyrics to the Works-in-Suit after [redacted]. I understand Dr. Bray analyzed those two examples of outputs and found that they contained very short phrases used to contextualize the rest of the output. I further understand that these two examples of outputs do not change Dr. Bray's conclusions there that there were no outputs providing lyric regurgitation to the Works-in-Suit after [redacted], when the CCS Reference Corpus was expanded.

D. Dr. Smith's Critique of my Use of Fixed Effects is Misconstrued and, More Importantly, Irrelevant to the Results of my Analysis

127. In Section III.A.1 above, I discussed Dr. Smith's contention that my analysis of traffic to lyrics websites does not sufficiently consider demand shocks, which as I explained is resolved by the application of time-fixed effects. Dr. Smith also levels additional criticisms of my treatment of fixed effects in Section II.E.3 of his report. Specifically, he critiques my handling of time fixed effects and website fixed effects in the analysis of website traffic data as well as the song fixed effects and month-year fixed effects I incorporate in my Google Search analysis.

128. For both the traffic analysis and the Google Search analysis, my overall findings and my opinions are not sensitive to Dr. Smith's criticisms. For the traffic analysis, I re-run my analysis using alternate conceptions of time fixed effects, and I also use the aggregate traffic to lyrics website without website fixed effects. For the Google Search analysis, I

114, No. 6, Jun 2024, at p. 5 of Supplemental Appendix, available at https://www.aeaweb.org/articles?id=10.1257/aer.20220425 ("Note that we use log(1 + $Avg.Tariff_{j,1990}$) as our variable of interest because over forty percent of four-digit industry groups have zero average tariff in 1990.").

[321] Smith Rebuttal Report, at ¶128.

[322] Rebuttal Report of Dr. Andrew Bray, 23 Jan 2026, at Section VII.C, VIII.C.

re-run my analysis, omitting both the song fixed effects and month year fixed effects. For both sets of analyses I find no material change in my qualitative findings compared to the Opening Report, substantiating my view that Dr. Smith's critiques are irrelevant to my analysis.

1. The Usage of Fixed Effects in Website Traffic Analysis Follows Standard Academic Practice

129. Dr. Smith complains about the usage of fixed effects in my traffic analysis. Dr. Smith claims that my analysis uses "month-year fixed effects as a catchall method of controlling for any and all factors that might vary across time outside of Claude.ai usage" and that I do "not provide any supporting analysis to determine that time-dependent factors were significant nor that month-year fixed effects were the appropriate measure to address such factors, as compared to other approaches less susceptible to overfitting, such as seasonal indicator variables."[323] However, Dr. Smith ignores that time fixed effects and month-year fixed effects are routinely used in the economic literature to account for time-dependent factors, as I explain in Section III.A.1 above. These methods are often considered superior to other ways of controlling for confounding effects (such as linear controls for specific confounders) since they flexibly control for any and all factors that vary at the level of the fixed effect without necessarily listing out what all those confounders might be.[324] When used at the temporal level, they can therefore control for differences in trends or demand shocks, like I explain above.

130. Dr. Smith further mentions that using month-year fixed effects "can fail to capture the true relation between Claude usage and lyrics web traffic, potentially attributing monthly changes in lyrics web traffic to the numerous month-year variables" and that "[i]f Dr. Nagaraj believes Claude and lyrics website traffic would both increase in response to the release of a new song, it suggests demand for Claude and lyrics website traffic is related in some way. Yet, according to Dr. Nagaraj, his models would instead attribute this

[323] Smith Rebuttal Report, at ¶134.

[324] *See* Nick Huntington-Klein, *The Effect: An Introduction to Research Design and Causality,* 2nd ed., Chapman and Hall/CRC (2025), Chapter 16, available at https://theeffectbook.net/ch-FixedEffects.html ("There are two big problems we keep running into, though. First, what if we can't figure out the correct causal diagram that will tell us what to control for? And second, what if we can't measure all the variables we need to control for? In either of those cases, we can't identify our answer by controlling for stuff. Or can we? *Fixed effects* is a method of controlling for *all* variables, whether they're observed or not, *as long as they stay constant within some larger category.* How can we do that? Simple! We just control for the larger category, and in doing so we control for everything that is constant within that category.").

pattern to his month-year fixed effects."[325] I do not agree with Dr. Smith's criticism. First, I do not think it is likely that the release of a new song by a popular artist would affect the total Claude.ai traffic in the same way as it could potentially affect traffic to lyrics websites. Second, and as I mentioned in Section III.A.1, fixed effects look at deviations from the average traffic that all websites—including Claude.ai—experience during any given month. The question of interest for my analysis is whether increased usage of Claude is associated with a decrease in usage of lyrics display websites; it is not to test the impact of exogenous events on overall traffic levels. During the release of a new song, users may be going to lyrics websites to look at lyrics and to Claude.ai at the same time to know more about the artist or to try a new feature on Claude that might have released at the same time. In such circumstances, analyzing their relationship without adequately controlling for the shocks would suggest a relation where there is none (i.e., a spurious correlation).[326] The inclusion of month-year fixed effects in my analysis is not a flaw, as Dr. Smith suggests, but a deliberate feature of my analysis, allowing me to test for substitution between Claude and lyrics websites without conflating that question with shocks affecting the lyrics websites or Claude.

131. As I show above in Section III.A.1 that my analysis is robust to applying other conceptions of fixed effects such as month fixed effects, week fixed effects, and week-year fixed effects. The fact that these alternative applications of fixed effects do not change the results of my analysis further shows that the main implication of my analysis is not dependent on the particular type of fixed effect used.

132. Another criticism that Dr. Smith raises is that "excessive use of fixed effects also strips any long-term trends in that data."[327] He cites *Mostly Harmless Econometrics*: "[a] variant on the measurement error problem arises from that fact that the differencing and deviations-from-means estimators used to control for fixed effects typically remove both good and bad variation. In other words, these transformations may kill some of the omitted-variables-bias bathwater, but they also remove much of the useful information in

[325] Smith Rebuttal Report, at ¶135.

[326] "Spurious Correlation," Economics Terms Lexicon, available at https://economicstermslexicon.com/definitions/s/spurious-correlation ("A spurious correlation refers to a statistically significant estimated correlation between two random variables observed in a sample when the true correlation between these variables is zero. This phenomenon often arises in the statistical analysis of time series data where no genuine, causal relationship exists, despite apparent trends suggesting otherwise.")

[327] Smith Rebuttal Report, at ¶136.

the baby - the variable of interest."[328] While I agree with the theoretical point that Joshua Angrist and Jörn-Steffen Pischke make in the book, it does not take away the fact that fixed effects are routinely applied in econometrics—with good reason—in the manner that I employ.[329] Angrist and Pischke are commenting on extreme cases that do not apply to my analyses in this case. For instance, the example that Angrist and Pischke have in their book is about unit fixed effects when fixed effects are highly specific to specific entities in the data rather than the general time trends that I employ. In their example they are "estimating the returns to schooling using samples of twins, controlling for family fixed effects"[330] Further, this discussion is also moot since I show later in the section that aggregating the data and removing unit fixed effects has no effect on my findings.

133. Dr. Smith also complains about my panel data approach using website fixed effects without any supporting evidence or justification. He mentions that Genius.com constitutes 74.3% of the web traffic from my web traffic study, whereas the next largest site, AZLyrics, makes up 10% of the web traffic, and "19 of the 26 websites each constitute less than 1% of the web traffic."[331] While Genius.com constitutes a bigger share of web traffic, that does not invalidate a fixed effects approach. If anything, it makes controlling those unobserved website-specific traits even more critical. My model does not ignore that Genius.com is 74% of the market; rather, it controls for it by giving Genius.com its own fixed effect. Additionally, the use of logs in my preferred specification also controls for the variation in the absolute scales of these traffic websites, as I mentioned in my Opening Report.[332] I designed my analysis intentionally to cast a broad net to understand the market-wide dynamics. Such a set-up with panel data and unit fixed effects is routinely used in the academic literature.[333]

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[328] Smith Rebuttal Report, at ¶136.

[329] Jeffrey M. Wooldridge, "Two-way fixed effects, the two-way mundlak regression, and difference-in-differences estimators," Empirical Economics, Vol. 69, No. 5, 27 Aug 2025, at pp. 2545-2546 ("Regardless of the sizes of T and N, a very common approach to estimating a linear model is to include both unit fixed effects and time fixed effects in ordinary least squares estimation.")

[330] Joshua D. Angrist and Jörn-Steffan Pischke, Mostly Harmless Econometrics: An Empiricist's Companion, (2009), at Chapter 5.2, p. 168 ("Ashenfelter and Krueger (1994) and Ashenfelter and Rouse (1998) estimate the returns to schooling using samples of twins, controlling for family fixed effects.").

[331] Smith Rebuttal Report, at ¶137.

[332] Nagaraj Opening Report, at footnote 178.

[333] *See* Jeffrey M. Wooldridge, Econometric Analysis of Cross Section and Panel Data, The MIT Press (2001), Chapter 10, available at https://ipcid.org/evaluation/apoio/Wooldridge%20-%20Cross-section%20and%20Panel%20Data.pdf; Lesley Chiou and Catherine Tucker, "Paywalls and the demand for news," *Information Economics and Policy,* Vol. 25, No. 2, Jun

134. Secondly, Dr. Smith claims that "several of the small lyric websites" I use "appear to have highly volatile traffic,"[334] although he provides no evidence to this effect and no measure of volatility. While I do not dispute that traffic to some of these websites does appear volatile, such variation is common in online activity and does not, by itself, pose a problem for my econometrics analysis. Econometric methods based on panel data are designed to handle these changes over time, and economists routinely use such a set-up in their analysis.[335]

135. Even though Dr. Smith does not provide any measures of volatility in his report, I use one of the traditional measures of volatility, the Coefficient of Variation ("CoV").[336] The table below reports the CoV for the traffic series to the 26 websites considered in my analysis.[337,338]

2013, at p. 10, available at https://dspace.mit.edu/bitstream/handle/1721.1/110528/Tucker_EMB%20until%20June%202016%20Paywalls%20and.pdf?sequence=1&isAllowed=y ("The coefficient α represents website fixed effects… We employ a semi-log regression to account for differences in scale across the different sites. Since some states report no visits to a given sites within a month, we add a small positive number before taking the logarithm of visits.").

[334] Smith Rebuttal Report, at ¶137.

[335] *See* Lesley Chiou and Catherine Tucker, "Paywalls and the demand for news," *Information Economics and Policy,* Vol. 25, No. 2, Jun 2013, at p. 10, available at https://dspace.mit.edu/bitstream/handle/1721.1/110528/Tucker_EMB%20until%20June%202016%20Paywalls%20and.pdf?sequence=1&isAllowed=y ("We employ a semi-log regression to account for differences in scale across the different sites. Since some states report no visits to a given sites within a month, we add a small positive number before taking the logarithm of visits.").

[336] Hervé Abdi, "Coefficient of Variation," *Encyclopedia of Research Design* (Neil Salkind, Ed.), 2010, at p. 1, available at https://personal.utdallas.edu/~herve/abdi-cv2010-pretty.pdf ("The coefficient of variation measures the variability of a series of numbers independently of the unit of measurement used for these numbers. In order to do so, the coefficient o[f] variation eliminates the unit of measurement of the standard deviation of a series of numbers by dividing it by the mean of these numbers."); "Coefficient of Variation (COV)," Institute of Business Forecasting & Planning, available at https://ibf.org/knowledge/glossary/cov-52, accessed on 10 Feb 2026 ("[Coefficient of Variation] is commonly used as a measure of volatility.").

[337] I calculate an unbiased estimate for the CoV using the formula $\widehat{CoV} = \left(1 + \frac{1}{4N}\right) CoV = \left(1 + \frac{1}{4N}\right) \frac{\sigma}{\mu}$, where N is the sample size, s denotes the standard deviation, and m stands for the mean. This corresponds to equation (3) in Hervé Abdi, "Coefficient of Variation," Encyclopedia of Research Design, Neil Salkind ed., 2010, at p. 3, available at https://personal.utdallas.edu/~herve/abdi-cv2010-pretty.pdf, accessed on 12 Feb 2026

[338] While my analysis is conducted at the weekly level, which already accounts for short-term volatility through aggregation, I used the daily traffic to calculate the CoV to adopt a more conservative approach.

Table 7: Volatility of Daily Traffic across Lyrics Websites

	Lyrics website [A]	Volatility (CoV) [B]
[1]	seekalyric.com	22.697
[2]	lyricsdepot.com	5.929
[3]	woodyguthrie.org	3.386
[4]	lyricsify.com	3.374
[5]	lyricsmania.com	2.676
[6]	lyricsbox.com	2.492
[7]	eminem.com	2.167
[8]	letssingit.com	2.121
[9]	elyrics.net	2.046
[10]	allthelyrics.com	1.776
[11]	lyricsmode.com	1.659
[12]	lyricsfreak.com	1.618
[13]	lyricstraining.com	1.579
[14]	darklyrics.com	1.577
[15]	worshiponline.com	1.494
[16]	bobdylan.com	1.477
[17]	lyricfind.com	1.12
[18]	lyricsondemand.com	0.974
[19]	songlyrics.com	0.891
[20]	lyrics.com	0.754
[21]	multitracks.com	0.725
[22]	azlyrics.com	0.598
[23]	songmeanings.com	0.572
[24]	musixmatch.com	0.55
[25]	lyricstranslate.com	0.479
[26]	genius.com	0.179

Sources: Semrush Traffic Data
Data covers daily traffic to 26 lyrics websites for full weeks contained in January 2022 to October 2025.
[B] shows volatility measured by the Coefficient of Variation (CoV) for each of these 26 lyrics websites at the daily level.

136. Even when I remove the websites with high volatility (the first four websites in decreasing order of coefficient of variation; CoV > 3), my results remain qualitatively similar. The coefficient for Log Claude Traffic reported in the table below (Table 8) is statistically insignificant and therefore statistically indistinguishable from zero. This indicates that with a change in Claude.ai usage, there is no statistically discernible change in traffic to lyrics websites—even when I account for the most volatile websites by removing them. Further robustness checks similar to the ones submitted in my Opening Report are provided in Appendix VI.A.3.

Table 8: Regression Results for U.S. Lyrics Traffic on Claude Traffic (Lyrics Websites with CoV > 3 Excluded)

	Dependent Variable: Log Lyrics Traffic	
	[A]	[B]
[1]	Log Claude Traffic	0.012
[2]	p-value	0.243
[3]	Observations	4,378
[4]	R Squared	0.853
[5]	Website FE	Yes
[6]	Month-Year FE	Yes

Sources: Semrush Traffic Data
Data covers weekly traffic to 22 (4 websites with highest volatility removed) lyrics websites and Claude.ai for full weeks contained in January 2022 to October 2025. Claude.ai traffic is set to zero after [redacted] P-value is calculated using the wild cluster bootstrap method. Regression includes website fixed effects.
[B][1] Estimate of regressing log lyrics traffic on log Claude.ai traffic controlling for month-year fixed effects.
[B][2] p-value calculated using wild cluster bootstrap method shows that the coefficient at [B][1] is statistically insignificant.

137. Lastly, regarding Dr. Smith's criticism of my use of the panel data approach rather than aggregate traffic, I note that Dr. Smith could have run an analysis himself and does not do so. I, however, do implement his suggested approach, and my results remain similar as shown in Table 9 below, further underscoring the validity of my analysis. The coefficient for Log Claude Traffic reported in the table below is statistically insignificant and therefore statistically indistinguishable from zero. This indicates that with a change in Claude.ai usage, there is no statistically discernible change in traffic to lyrics display websites, even when accounting for the most volatile websites by removing them. Further robustness checks similar to the ones submitted in my Opening Report are provided in Appendix VI.A.4.

Table 9: Regression Results for U.S. Lyrics Traffic on Claude Traffic (Aggregated Traffic Across Lyrics Websites)

		Dependent Variable: Log Lyrics Traffic
		[A]
[1]	Log Claude Traffic	0.003
[2]	p-value	0.422
[3]	Observations	199
[4]	R Squared	0.838
[5]	Month-Year FE	Yes

Sources: Semrush Traffic Data
Data covers weekly aggregated traffic to 26 lyrics websites and Claude.ai for full weeks contained in January 2022 to October 2025. Claude.ai traffic is set to zero after [redacted]
[B][1] Estimate of regressing log lyrics traffic on log Claude.ai traffic controlling for month-year fixed effects.
[B][2] p-value shows that the coefficient at [B][1] is statistically insignificant.

2. The Usage of Fixed Effects in the Google Search Analysis Is Appropriate, and Results Are Robust to Non-Inclusion

138. Dr. Smith argues that song fixed effects and month-year fixed effects are inappropriate to include in my Google Search analysis, although they are standard in the academic literature, and Dr. Smith further does not offer any analysis of his own.

139. Dr. Smith claims that my models do not need a song-fixed effect because "Google Trends data already normalizes search volumes for each query on a 0-100 scale, which would account for differences in popularity across songs" and that my "models purport to measure each WIS's lyric index against a benchmark of the same WIS's song index, which should account for differences between songs."[339] The nature of Google Trends indices being rescaled does not necessarily obviate the need to include song fixed effects. Rescaling merely has the effect of adapting the range of the time series to 0 to 100; it is not equivalent to de-meaning and standardizing. Therefore, two songs can have the same range of values between 0 and 100 but have different means. For example, the first song may have exhibited a brief positive demand shock for lyrics (such as going "viral"), resulting in a few high popularity weeks or months that, after rescaling, result in a low average index over the sample period. At the same time the second song, not having had such a demand shock, may exhibit stable popularity levels and therefore have a relatively higher mean. Such cases, which are examples of "characteristics that are unique to

[339] Smith Rebuttal Report, at ¶138. Citations are omitted.

individual songs" as I stated in my Opening Report,[340] are present in the data and warrant the inclusion of song fixed effects despite the range of the two indices being the same and despite having the song-index as a control. Similarly, month-year fixed effects are also appropriate to account for months that exhibit elevated demand for music in general as stated in my Opening Report[341]. Regardless, as I have shown, the results of my analysis are not sensitive to the structure of fixed effects and are robust to alternate specifications.

140. Furthermore, the results of my analysis hold even if I take out the fixed effects that Dr. Smith argues are not necessary, as shown in Table 10. This table reflects the results of this alternate model without month-year fixed effects or song fixed effects. As shown below, the results for my coefficients of interest for the variable, which is the interaction of Claude traffic and the lyrics index, are similar to the results I submitted in the Opening Report in Table 2.[342] I therefore again conclude that Dr. Smith's criticisms are unfounded. Further robustness is presented in Appendix VI.B.3.

[340] Nagaraj Opening Report, at ¶138.

[341] *See* Nagaraj Opening Report, at ¶138.

[342] *See* Nagaraj Opening Report, at ¶143

Table 10: Regression Results of the Baseline Model without Month-Year Fixed Effects and Song Fixed Effects

		Title	Title Artist	Mixed (20)
	[A]	[B]	[C]	[D]
[1]	Lyrics x Claude Traffic	0.019***	0.002	0.003
[2]		0.004	0.002	0.002
[3]	Lyrics	11.438***	3.092***	3.500***
[4]		0.104	0.054	0.058
[5]	Claude Traffic	-0.013***	-0.003***	-0.003***
[6]		0.002	0.001	0.001
[7]	Observations	198,204	198,204	198,204
[8]	R Squared	0.065	0.018	0.020

Sources: Data from Opening Report; originally obtained from WIS Chart provided by Counsel; Google Trends data, accessed via SearchAPI.
Table results are obtained from estimates of my baseline regression model using 498 WIS provided by counsel, but do not include song fixed effects or month-year fixed effects. "Joy to the World" (Work-in-Suit 273) is excluded from estimation because it was not included in [redacted], as explained in Opening Report. Observations are at the week-WIS level. The sample period is full weeks contained in January 2022 – October 2025. Lyrics is an indicator that equals 1 for lyrics queries and 0 for song queries. Claude Traffic is imputed 0 after [redacted], and rescaled to a range of 0-100. Standard errors are provided in the rows below coefficient estimates. Standard errors are heteroskedasticity-robust, and significance stars are reported at the 10% (*), 5% (**) and 1% (***) level.
[B] Title specification includes indices of queries "[title name] lyrics" and "[title name] song".
[C] Title Artist specification includes indices of queries "[title name] [artist name] lyrics" and "[title name] [artist name] song"
[D] Mixed (20) specification include indices of queries "[title name] lyrics" and "[title name] song" if the Index Gap is 20 or less, otherwise includes indices of queries "[title name] [artist name] lyrics" and "[title name] [artist name] song".

IV. SUPPLEMENTAL STATEMENT TO MY OPENING REPORT

141. In my Opening Report, I refer to several of Dr. Bray's analyses that he conducted in connection with his Opening Report. I understand that Dr. Bray has revised his calculations. However, Dr. Bray's revised analyses do not change any of the opinions in my Opening Report.

142. In particular, I understand Dr. Bray re-ran his analyses with respect to the percentage of prompts seeking any amount or form of lyrics regurgitation (Question 1). I understand that in his revised analysis, he found only 1,034 prompts sought lyric regurgitation out of [redacted], or 0.047%. This revised finding remains consistent with my understanding that lyrics requests are not frequent use cases among Claude users, as I stated in my Opening Report.[343]

V. CONCLUSION

143. Dr. Smith erroneously defines the market for the purpose of factor four analysis regarding the "effect of the use upon the market for or value of the copyrighted work." As I

[343] Nagaraj Opening Report, at ¶¶62, 88.

demonstrate above, his choices to include buyers who purchase the Plaintiffs work for *any purpose*, on the one hand, and to limit sellers only to Plaintiffs, on the other, are unsupported by economic theory. This view also fails to disaggregate licenses for the display of lyrics from (hypothetical) licenses for lyrics as training data.

144. As I discussed in my Opening Report, the market for lyrics for display exists and is active. My empirical analyses examined whether there was any effect on that market or the value of the Plaintiffs' works in it. I found none.

145. Turning to the question of purported markets for lyrics as training data, I explain that economic theory requires me to look only at buyers and sellers whose transactions are relevant to the price of any hypothetical transaction between Anthropic and Plaintiffs. Thus, I show that the relevant buyers are Anthropic's competitors because only they can be affected by downstream demand for the product (general-purpose LLMs) they build using training data. Relevant sellers are those whose textual inputs could substitute for Plaintiffs' lyrics.

146. Dr. Smith fails to substantively respond to my contention from my Opening Report that prohibitively high transaction costs are likely to prevent a market from forming for all the data needed to train a general-purpose LLM, and in the alternative, for lyrics text as training data. He erroneously argues that such costs are not relevant to my factor four analysis. Once again, I explain why the market for all data needed to train a general-purpose LLM will likely not form because of prohibitively high transaction costs, and why the low value of lyrics for general-purpose LLMs can mean that even moderate transaction costs will prevent such a market from forming. I also describe why, contrary to Dr. Smith's contention, such costs will not inevitably fall simply because rights could be held in aggregate by a handful of entities.

147. Concluding my discussion of the markets I contend are relevant for fair use 4 analysis, I examine in Section II.D Dr. Smith's claim that approximately 200 publicly-announced deals between AI companies and licensors undermine my conclusion that a market for all data needed to train a general-purpose LLM does not exist and is not likely to emerge, and (in the alternative), a market for lyrics as training data does not exist and is not likely to emerge. I demonstrate that of the 36 deals involving general-purpose LLMs that Dr. Smith references, all but three involve licenses that go beyond training data, and no deal involves lyrics as training data for a general-purpose LLM. Dr. Smith's discussion of

public deals again does not change my conclusion that occasional deals to license high-value "gap-filling" or "last-mile" training data are possible, but that these do not contradict my overall conclusions that high transaction costs will prevent either purported market for training data from emerging.

148. In addition to other critiques, Dr. Smith maintains that my prior work is not consistent with my opinions in this case. I explain in Section II.E why my earlier papers are in fact aligned with my views my Opening and Rebuttal Reports. In particular, Dr. Smith is wrong to suggest that my "Cloze Encounters" paper speaks to general-purpose LLM user's propensity to substitute away from works that have been part of those LLMs' training corpus. This conclusion rests on a number of unstated assumptions by Dr. Smith regarding the presence or absence of guardrails or other technical approaches to preventing regurgitation and consumer behavior in the real world around substitution. The analyses in my Opening, Rebuttal, and Reply reports, in contrast, address these empirical questions and do not find evidence consistent with Plaintiffs' theories of harm.

149. In addition to other harms he claims arise from Anthropic's purported use of Plaintiffs' Works-in-Suit, Dr. Smith also articulates a number of speculative claims about the impact of generative AI on markets for the production of music and for labor. While I did not address impacts on these markets in my Opening Report—because they are not relevant to a factor four analysis—I did respond to them at length in my Rebuttal Report, where I found them to be overstated.

150. In addressing the market for the online display of lyrics, I respond to Dr. Smith's criticisms both conceptually and empirically by re-running my analyses to incorporate the issues he raises. These additional analyses do not yield materially different results. Accordingly, Dr. Smith's criticisms do not alter my opinion, as stated in my Opening Report, that usage of Claude had no negative impact on the market for the online display of lyrics.

VI. APPENDIX

A. Details on the Traffic Analysis

1. Regression Results with Usage of Fixed Effects

151. The tables below present the robustness showing the effect of using the month fixed effects with weekly traffic data (Table A.1), and week fixed effects and week-year fixed effects with daily traffic data (Table A.2 and Table A.3 respectively). The estimated

coefficients on Log Claude Traffic and Claude Traffic remain statistically insignificant consistent with results presented in Section III.A.1.

Table A.1: Regression Results for U.S. Lyrics Traffic on Claude Traffic (Month Fixed Effects)

	Dependent Variable:	Log Lyrics Traffic	Log Lyrics Traffic	Lyrics Traffic
	[A]	[B]	[C]	[D]
[1]	Log Claude Traffic	0.000	0.007	
[2]	p-value	0.973	0.595	
[3]	Claude Traffic			-0.103
[4]	p-value			0.184
[5]	Observations	5,174	5,174	5,174
[6]	R Squared	0.838	0.840	0.970
[7]	Control Log Google Traffic	Yes		
[8]	Control Log Billboard Traffic		Yes	
[9]	Website FE	Yes	Yes	Yes
[10]	Month FE	Yes	Yes	Yes

Sources: Semrush Traffic Data

Data covers weekly traffic to 26 lyrics websites and Claude.ai for full weeks contained in January 2022 to October 2025. Claude.ai traffic is set to zero after [redacted] P-value is calculated using the wild cluster bootstrap method. Regression includes website fixed effects.

[B][1] Estimate of regressing log lyrics traffic on log Claude.ai traffic controlling for log visit to google.com and month fixed effects.

[B][2] p-value calculated using wild cluster bootstrap method shows that the coefficient at [B][1] is statistically insignificant.

[C][1] Estimate of regressing log lyrics traffic on log Claude.ai traffic controlling for log visit to billboard.com and month fixed effects.

[C][2] p-value calculated using wild cluster bootstrap method shows that the coefficient at [C][1] is statistically insignificant.

[D][3] Estimate of regressing lyrics traffic on Claude.ai traffic controlling for month fixed effects.

[D][4] p-value calculated using wild cluster bootstrap method shows that the coefficient at [D][3] is statistically insignificant.

Table A.2: Regression Results for U.S. Lyrics Traffic on Claude Traffic (Week-Year Fixed Effects for Daily Traffic)

	Dependent Variable:	Log Lyrics Traffic	Log Lyrics Traffic	Lyrics Traffic
	[A]	[B]	[C]	[D]
[1]	Log Claude Traffic	0.011	0.015	
[2]	p-value	0.414	0.273	
[3]	Claude Traffic			-0.004
[4]	p-value			0.623
[5]	Observations	36,218	36,218	36,218
[6]	R Squared	0.749	0.749	0.960
[7]	Control Log Google Traffic	Yes		
[8]	Control Log Billboard Traffic		Yes	
[9]	Website FE	Yes	Yes	Yes
[10]	Week-Year FE	Yes	Yes	Yes

Sources: Semrush Traffic Data

Data covers daily traffic to 26 lyrics websites and Claude.ai for full weeks contained in January 2022 to October 2025. Claude.ai traffic is set to zero after [redacted] P-value is calculated using the wild cluster bootstrap method. Regression includes website fixed effects.

[B][1] Estimate of regressing log lyrics traffic on log Claude.ai traffic controlling for log visit to google.com and week-year fixed effects.

[B][2] p-value calculated using wild cluster bootstrap method shows that the coefficient at [B][1] is statistically insignificant.

[C][1] Estimate of regressing log lyrics traffic on log Claude.ai traffic controlling for log visit to billboard.com and week-year fixed effects.

[C][2] p-value calculated using wild cluster bootstrap method shows that the coefficient at [C][1] is statistically insignificant.

[D][3] Estimate of regressing lyrics traffic on Claude.ai traffic controlling for week-year fixed effects.

[D][4] p-value calculated using wild cluster bootstrap method shows that the coefficient at [D][3] is statistically insignificant.

Table A.3: Regression Results for U.S. Lyrics Traffic on Claude Traffic (Week Fixed Effects for Daily Traffic)

	Dependent Variable:	Log Lyrics Traffic	Log Lyrics Traffic	Lyrics Traffic
	[A]	[B]	[C]	[D]
[1]	Log Claude Traffic	0.000	0.005	
[2]	p-value	0.986	0.730	
[3]	Claude Traffic			-0.107
[4]	p-value			0.176
[5]	Observations	36,218	36,218	36,218
[6]	R Squared	0.740	0.742	0.959
[7]	Control Log Google Traffic	Yes		
[8]	Control Log Billboard Traffic		Yes	
[9]	Website FE	Yes	Yes	Yes
[10]	Week FE	Yes	Yes	Yes

Sources: Semrush Traffic Data
Data covers daily traffic to 26 lyrics websites and Claude.ai for full weeks contained in January 2022 to October 2025. Claude.ai traffic is set to zero after [redacted] P-value is calculated using the wild cluster bootstrap method. Regression includes website fixed effects.
[B][1] Estimate of regressing log lyrics traffic on log Claude.ai traffic controlling for log visit to google.com and week fixed effects.
[B][2] p-value calculated using wild cluster bootstrap method shows that the coefficient at [B][1] is statistically insignificant.
[C][1] Estimate of regressing log lyrics traffic on log Claude.ai traffic controlling for log visit to billboard.com and week fixed effects.
[C][2] p-value calculated using wild cluster bootstrap method shows that the coefficient at [C][1] is statistically insignificant.
[D][3] Estimate of regressing lyrics traffic on Claude.ai traffic controlling for week fixed effects.
[D][4] p-value calculated using wild cluster bootstrap method shows that the coefficient at [D][3] is statistically insignificant.

2. Regression Results with Scaling the Claude.ai Traffic

152. The following table shows robustness checks for when Claude traffic is adjusted for lyric-related usage. The estimated coefficients on Log Claude Traffic and Claude Traffic remain statistically insignificant consistent with results presented in Section III.C.

Table A.4: Regression Results for U.S. Lyrics Traffic on Claude Traffic (Claude Traffic is Scaled for Lyric-Related Usage)

	Dependent Variable:	Log Lyrics Traffic	Log Lyrics Traffic	Lyrics Traffic
	[A]	[B]	[C]	[D]
[1]	Log Claude Traffic	0.011	0.014	
[2]	p-value	0.617	0.523	
[3]	Claude Traffic			31.277
[4]	p-value			0.488
[5]	Observations	5,174	5,174	5,174
[6]	R Squared	0.844	0.844	0.971
[7]	Control Log Google Traffic	Yes		
[8]	Control Log Billboard Traffic		Yes	
[9]	Website FE	Yes	Yes	Yes
[10]	Month-Year FE	Yes	Yes	Yes

Sources: Semrush Traffic Data
Data covers weekly traffic to 26 lyrics websites and Claude.ai for full weeks contained in January 2022 to October 2025. Claude.ai traffic is scaled for lyric related usage and set to zero after [redacted] P-value is calculated using the wild cluster bootstrap method. Regression includes website fixed effects.
[B][1] Estimate of regressing log lyrics traffic on log Claude.ai traffic scaled for lyric related usage controlling for log visit to google.com and month-year fixed effects.
[B][2] p-value calculated using wild cluster bootstrap method shows that the coefficient at [B][1] is statistically insignificant.
[C][1] Estimate of regressing log lyrics traffic on log Claude.ai traffic scaled for lyric related usage controlling for log visit to billboard.com and month-year fixed effects.
[C][2] p-value calculated using wild cluster bootstrap method shows that the coefficient at [C][1] is statistically insignificant.
[D][3] Estimate of regressing lyrics traffic on Claude.ai traffic scaled for lyric related usage controlling for month-year fixed effects.
[D][4] p-value calculated using wild cluster bootstrap method shows that the coefficient at [D][3] is statistically insignificant.

3. Regression Results Accounting for Volatility of Websites

153. The table below presents robustness checks for removing the four of the lyrics websites with CoV greater than 3 from the analysis. The estimated coefficients on Log Claude Traffic and Claude Traffic remain statistically insignificant, consistent with results presented in Section III.D.1.

Table A.5: Regression Results for U.S. Lyrics Traffic on Claude Traffic (Lyrics Websites with CoV> 3 Excluded)

	Dependent Variable:	Log Lyrics Traffic	Log Lyrics Traffic	Lyrics Traffic
	[A]	[B]	[C]	[D]
[1]	Log Claude Traffic	0.010	0.011	
[2]	p-value	0.321	0.237	
[3]	Claude Traffic			0.044
[4]	p-value			0.243
[5]	Observations	4,378	4,378	4,378
[6]	R Squared	0.853	0.853	0.970
[7]	Control Log Google Traffic	Yes		
[8]	Control Log Billboard Traffic		Yes	
[9]	Website FE	Yes	Yes	Yes
[10]	Month-Year FE	Yes	Yes	Yes

Sources: Semrush Traffic Data
Data covers weekly traffic to 22 (4 websites with highest volatility removed) lyrics websites and Claude.ai for full weeks contained in January 2022 to October 2025. Claude.ai traffic is set to zero after [redacted] P-value is calculated using the wild cluster bootstrap method. Regression includes website fixed effects.
[[B][1] Estimate of regressing log lyrics traffic on log Claude.ai traffic controlling for log visit to google.com and month-year fixed effects.
[B][2] p-value calculated using wild cluster bootstrap method shows that the coefficient at [B][1] is statistically insignificant.
[C][1] Estimate of regressing log lyrics traffic on log Claude.ai traffic controlling for log visit to billboard.com and month-year fixed effects.
[C][2] p-value calculated using wild cluster bootstrap method shows that the coefficient at [C][1] is statistically insignificant.
[D][3] Estimate of regressing lyrics traffic on Claude.ai traffic controlling for month-year fixed effects.
[D][4] p-value calculated using wild cluster bootstrap method shows that the coefficient at [D][3] is statistically insignificant.

4. Regression Results with Aggregating Lyrics Traffic

154. The tables below show the effect of Claude traffic on aggregated lyrics website traffic, including and excluding the four websites with high volatility. Table A.6 shows the robustness results for aggregating website traffics and Table A.7 shows the results for aggregating website traffic with the high volatility websites removed. The estimated coefficients on Log Claude Traffic and Claude Traffic in both tables remain statistically insignificant consistent with results presented in Section III.D.1.

Table A.6 Regression Results for U.S. Lyrics Traffic on Claude (Aggregated Traffic across Lyrics Websites)

	Dependent Variable:	Log Lyrics Traffic	Log Lyrics Traffic	Lyrics Traffic
	[A]	[B]	[C]	[D]
[1]	Log Claude Traffic	0.001	0.002	
[2]	p-value	0.645	0.563	
[3]	Claude Traffic			0.958
[4]	p-value			0.278
[5]	Observations	199	199	199
[6]	R Squared	0.908	0.844	0.839
[7]	Control Log Google Traffic	Yes		
[8]	Control Log Billboard Traffic		Yes	
[9]	Month-Year FE	Yes	Yes	Yes

Sources: Semrush Traffic Data

Data covers aggregated weekly traffic to 26 lyrics websites and Claude.ai for full weeks contained in January 2022 to October 2025. Claude.ai traffic is set to zero after [redacted]).

[B][1] Estimate of regressing log lyrics traffic on log Claude.ai traffic controlling for log visit to google.com and month-year fixed effects.

[B][2] p-value shows that the coefficient at [B][1] is statistically insignificant.

[C][1] Estimate of regressing log lyrics traffic on log Claude.ai traffic controlling for log visit to billboard.com and month-year fixed effects.

[C][2] p-value shows that the coefficient at [C][1] is statistically insignificant.

[D][3] Estimate of regressing lyrics traffic on Claude.ai traffic controlling for month-year fixed effects.

[D][4] p-value shows that the coefficient at [D][3] is statistically insignificant.

Table A.7: Regression Results for U.S. Lyrics Traffic on Claude Traffic (Aggregated Traffic across Lyrics Websites Excluding the Ones with CoV > 3)

	Dependent Variable:	Log Lyrics Traffic	Log Lyrics Traffic	Log Lyrics Traffic	Lyrics Traffic
	[A]	[B]	[C]	[D]	[E]
[1]	Log Claude Traffic	0.003	0.001	0.002	
[2]	p-value	0.424	0.649	0.566	
[3]	Claude Traffic				0.958
[4]	p-value				0.278
[5]	Observations	199	199	199	199
[6]	R Squared	0.837	0.908	0.843	0.839
[7]	Control Log Google Traffic		Yes		
[8]	Control Log Billboard Traffic			Yes	
[9]	Month-Year FE	Yes	Yes	Yes	Yes

Sources: Semrush Traffic Data
Data covers aggregated weekly traffic to 22 (4 websites with highest volatility removed) lyrics websites and Claude.ai for full weeks contained in January 2022 to October 2025. Claude.ai traffic is set to zero after [redacted].
[B][1] Estimate of regressing log lyrics traffic on log Claude.ai traffic controlling for month-year fixed effects.
[B][2] p-value shows that the coefficient at [B][1] is statistically insignificant.
[C][1] Estimate of regressing log lyrics traffic on log Claude.ai traffic controlling for log visit to google.com and month-year fixed effects.
[C][2] p-value shows that the coefficient at [C][1] is statistically insignificant.
[D][1] Estimate of regressing log lyrics traffic on log Claude.ai traffic controlling for log visit to billboard.com and month-year fixed effects.
[D][2] p-value shows that the coefficient at [D][1] is statistically insignificant.
[E][3] Estimate of regressing lyrics traffic on Claude.ai traffic controlling for month-year fixed effects.
[E][4] p-value method shows that the coefficient at [E][3] is statistically insignificant.

B. Details on the Google Search Analysis

1. Regression Results with Alternative Thresholds for Viral Songs

155. The table below presents the robustness for the model presented in Section III.A.2 with two alternate specifications of Mixed (10) and Mixed (30). The results do not show any meaningful difference to the results I present in the Section III.A.2 for the upper threshold of 15.

Table B.1: Regression Results of Baseline Model Without Viral Songs at Threshold 15

		Mixed (10)	Mixed (30)
	[A]	[B]	[C]
[1]	Lyrics x Claude Traffic	0.003	0.003
[2]		0.002	0.002
[3]	Lyrics	3.117***	4.464***
[4]		0.050	0.055
[5]	Claude Traffic	-0.002	-0.008**
[6]		0.003	0.004
[7]	Observations	195,418	193,428
[8]	R Squared	0.197	0.316
[9]	Song Count	491	486
[10]	Viral Songs Removed	7	12

Sources: Data from Opening Report; originally obtained from WIS Chart provided by Counsel; Google Trends data, accessed via SearchAPI.

Table results are obtained from estimates of my baseline regression model using 498 WIS provided by counsel, excluding songs I identify as viral. Viral songs are identified as those whose index value is greater than 0 and less than or equal to 15 during the period 4-6 weeks prior to the peak index value. Additionally, "Joy to the World" (Work-in-Suit 273) is excluded from estimation because it was not included in [redacted], as explained in Opening Report. Observations are at the week-WIS level. The specification includes song fixed effects and month-year fixed effects. The sample period is full weeks contained in January 2022 – October 2025. Lyrics is an indicator that equals 1 for lyrics queries and 0 for song queries. Claude Traffic is imputed 0 after [redacted], and rescaled to a range of 0-100. Standard errors are provided in the rows below coefficient estimates. Standard errors are heteroskedasticity-robust, and significance stars are reported at the 10% (*), 5% (**) and 1% (***) level.

[B] Mixed (10) specification include indices of queries "[title name] lyrics" and "[title name] song" if the Index Gap is 10 or less, otherwise includes indices of queries "[title name] [artist name] lyrics" and "[title name] [artist name] song".

[C] Mixed (30) specification include indices of queries "[title name] lyrics" and "[title name] song" if the Index Gap is 30 or less, otherwise includes indices of queries "[title name] [artist name] lyrics" and "[title name] [artist name] song".

156. The tables below provide the results of omitting viral songs for other upper thresholds of 25, 35, and 45, as discussed in Section III.A.2 for all the specifications including Title, Title Artist, Mixed (10), Mixed (20) and Mixed (30).

Table B.2: Regression Results of Baseline Model Without Viral Songs at Threshold 25

		Title	Title Artist	Mixed (10)	Mixed (20)	Mixed (30)
	[A]	[B]	[C]	[D]	[E]	[F]
[1]	Lyrics x Claude Traffic	0.018***	0.002	0.002	0.002	0.002
[2]		0.003	0.002	0.002	0.002	0.002
[3]	Lyrics	11.967***	3.105***	3.139***	3.474***	4.458***
[4]		0.074	0.049	0.050	0.052	0.056
[5]	Claude Traffic	-0.022***	-0.002	-0.002	-0.006	-0.008**
[6]		0.005	0.003	0.003	0.003	0.004
[7]	Observations	181,488	197,010	193,826	192,234	188,254
[8]	R Squared	0.599	0.187	0.192	0.237	0.306
[9]	Song Count	456	495	487	483	473
[10]	Viral Songs Removed	42	3	11	15	25

Sources: Data from Opening Report; originally obtained from WIS Chart provided by Counsel; Google Trends data, accessed via SearchAPI.

Table results are obtained from estimates of my baseline regression model using 498 WIS provided by counsel, excluding songs I identify as viral. Viral songs are identified as those whose index value is greater than 0 and less than or equal to 25 during the period 4-6 weeks prior to the peak index value. Additionally, "Joy to the World" (Work-in-Suit 273) is excluded from estimation because it was not included in [redacted], as explained in Opening Report. Observations are at the week-WIS level. The specification includes song fixed effects and month-year fixed effects. The sample period is full weeks contained in January 2022 – October 2025. Lyrics is an indicator that equals 1 for lyrics queries and 0 for song queries. Claude Traffic is imputed 0 after [redacted], and rescaled to a range of 0-100. Standard errors are provided in the rows below coefficient estimates. Standard errors are heteroskedasticity-robust, and significance stars are reported at the 10% (*), 5% (**) and 1% (***) level.

[B] Title specification includes indices of queries "[title name] lyrics" and "[title name] song".

[C] Title Artist specification includes indices of queries "[title name] [artist name] lyrics" and "[title name] [artist name] song"

[D, E, F] Mixed (10, 20, 30) specifications include indices of queries "[title name] lyrics" and "[title name] song" if the Index Gap is 10, 20, or 30 or less, respectively, otherwise includes indices of queries "[title name] [artist name] lyrics" and "[title name] [artist name] song".

Table B.3: Regression Results of Baseline Model Without Viral Songs at Threshold 35

		Title	Title Artist	Mixed (10)	Mixed (20)	Mixed (30)
	[A]	[B]	[C]	[D]	[E]	[F]
[1]	Lyrics x Claude Traffic	0.017***	0.002	0.002	0.002	0.002
[2]		0.003	0.002	0.002	0.002	0.002
[3]	Lyrics	12.184***	3.082***	3.103***	3.480***	4.433***
[4]		0.077	0.049	0.050	0.052	0.056
[5]	Claude Traffic	-0.020***	-0.002	-0.002	-0.005	-0.007*
[6]		0.005	0.003	0.003	0.003	0.004
[7]	Observations	171,538	196,214	192,632	191,040	186,264
[8]	R Squared	0.602	0.187	0.185	0.233	0.303
[9]	Song Count	431	493	484	480	468
[10]	Viral Songs Removed	67	5	14	18	30

Sources: Data from Opening Report; originally obtained from WIS Chart provided by Counsel; Google Trends data, accessed via SearchAPI.

Table results are obtained from estimates of my baseline regression model using 498 WIS provided by counsel, excluding songs I identify as viral. Viral songs are identified as those whose index value is greater than 0 and less than or equal to 35 during the period 4-6 weeks prior to the peak index value. Additionally, "Joy to the World" (Work-in-Suit 273) is excluded from estimation because it was not included in [redacted], as explained in Opening Report. Observations are at the week-WIS level. The specification includes song fixed effects and month-year fixed effects. The sample period is full weeks contained in January 2022 – October 2025. Lyrics is an indicator that equals 1 for lyrics queries and 0 for song queries. Claude Traffic is imputed 0 after [redacted], and rescaled to a range of 0-100. Standard errors are provided in the rows below coefficient estimates. Standard errors are heteroskedasticity-robust, and significance stars are reported at the 10% (*), 5% (**) and 1% (***) level.

[B] Title specification includes indices of queries "[title name] lyrics" and "[title name] song".

[C] Title Artist specification includes indices of queries "[title name] [artist name] lyrics" and "[title name] [artist name] song"

[D, E, F] Mixed (10, 20, 30) specifications include indices of queries "[title name] lyrics" and "[title name] song" if the Index Gap is 10, 20, or 30 or less, respectively, otherwise includes indices of queries "[title name] [artist name] lyrics" and "[title name] [artist name] song".

Table B.4: Regression Results of Baseline Model Without Viral Songs at Threshold 45

		Title	Title Artist	Mixed (10)	Mixed (20)	Mixed (30)
	[A]	[B]	[C]	[D]	[E]	[F]
[1]	Lyrics x Claude Traffic	0.017***	0.002	0.002	0.002	0.002
[2]		0.003	0.002	0.002	0.002	0.002
[3]	Lyrics	12.251***	2.992***	3.012***	3.289***	4.159***
[4]		0.081	0.049	0.050	0.052	0.057
[5]	Claude Traffic	-0.020***	-0.001	-0.001	-0.004	-0.007*
[6]		0.005	0.003	0.003	0.003	0.004
[7]	Observations	159,598	195,020	191,438	189,050	183,478
[8]	R Squared	0.597	0.184	0.182	0.222	0.292
[9]	Song Count	401	490	481	475	461
[10]	Viral Songs Removed	97	8	17	23	37

Sources: Data from Opening Report; originally obtained from WIS Chart provided by Counsel; Google Trends data, accessed via SearchAPI.

Table results are obtained from estimates of my baseline regression model using 498 WIS provided by counsel, excluding songs I identify as viral. Viral songs are identified as those whose index value is greater than 0 and less than or equal to 45 during the period 4-6 weeks prior to the peak index value. Additionally, "Joy to the World" (Work-in-Suit 273) is excluded from estimation because it was not included in [redacted], as explained in Opening Report. Observations are at the week-WIS level. The specification includes song fixed effects and month-year fixed effects. The sample period is full weeks contained in January 2022 – October 2025. Lyrics is an indicator that equals 1 for lyrics queries and 0 for song queries. Claude Traffic is imputed 0 after [redacted], and rescaled to a range of 0-100. Standard errors are provided in the rows below coefficient estimates. Standard errors are heteroskedasticity-robust, and significance stars are reported at the 10% (*), 5% (**) and 1% (***) level.

[B] Title specification includes indices of queries "[title name] lyrics" and "[title name] song".

[C] Title Artist specification includes indices of queries "[title name] [artist name] lyrics" and "[title name] [artist name] song"

[D, E, F] Mixed (10, 20, 30) specifications include indices of queries "[title name] lyrics" and "[title name] song" if the Index Gap is 10, 20, or 30 or less, respectively, otherwise includes indices of queries "[title name] [artist name] lyrics" and "[title name] [artist name] song".

2. Methodology for Estimating Residuals of Song Index Used in Alternate Regression Estimates of Google Trends Analysis

157. To re-run the Google Trends analysis with the song-index residuals, I first regress the song index on the lyrics index under the following specification:

$$Song\ Index_{s,t} = \alpha \times Lyrics\ Index_{s,t} + song_s + monthyear_t + \varepsilon_{s,t}$$

where:

158. $Song\ Index_{s,t}$ is the Google trends index for "song" queries for song s at week t

159. $Lyrics\ Index_{s,t}$ is the Google trends index for "lyrics" queries for song s at week t

160. $song_s$ is a fixed effect for song s

161. $monthyear_t$ is a fixed effect for month-year

162. $\varepsilon_{s,t}$ is the error term capturing all remaining variation in the Google trends 'song' index that is not already captured by the aforementioned variables.

163. Estimation of this regression provides estimate of α, which is the marginal change in the "song" index with a change in the "lyrics" index, controlling for song-specific and month-year specific factors. All other factors not captured by the "lyrics" index or the song or month-year fixed effects will be captured by the estimate of the error term, $\varepsilon_{s,t}$. Since the "lyrics" index term captures user search interest for lyrics, the residual therefore captures any user search interest for "song" that is not user search interest for "lyrics". These residuals are then used in place of the song indexes, along with the original "lyrics" Google indices, to form the new variable of interest in my baseline specification that I denote with $\widehat{Google\ Index}_{s,q,t}$. Specifically, this variable includes identical values to the original variable for "lyrics" (i.e. when q is "lyrics") but includes the residuals values of the prior regression model for the "song" (i.e. when q is "song"). I then re-estimate my baseline equation using this constructed variable:[344]

$$\widehat{Google\ Index}_{s,q,t} = \beta \times 1(Lyrics)_q \times Claude\ Traffic_t + \alpha \times 1(Lyrics)_q + \delta \times Claude\ Traffic_t + song_s + monthyear_t + \varepsilon_{s,q,t}$$

where:

a) $1(Lyrics)_q$ is an indicator variable that takes on the value 1 if the query q is for "lyrics" and 0 if the query is for "song". Accordingly, the "song" queries correspond to the benchmark to which the "lyrics" queries are compared.

b) $Claude\ Traffic_t$ is the indexed (0 – 100) measure of traffic to Claude in week t, with imputed value of 0 for all weeks after the implementation of guardrails, unless otherwise noted.

c) $song_s$ is a fixed effect for song s.

d) $monthyear_t$ is a fixed effect for the month-year.

e) $\varepsilon_{s,q,t}$ is the error term capturing all remaining variation in the $\widehat{Google\ Index}$ that is not already captured by the aforementioned variables.

[344] *See* Nagaraj Opening Report, at ¶173.

164. I find that using the "song" residuals as the control variable provides similar results to my baseline specification submitted in my Opening Report. The table below presents the robustness for the model presented in Section III.B with two alternate specifications of Mixed (10) and Mixed (30). The results do not show any meaningful difference to the results I present in the Section III.B.

Table B.5: Regression Results for Baseline Model Using Song Indices Residuals Instead of Song Indices

		Mixed (10)	Mixed (30)
	[A]	[B]	[C]
[1]	Lyrics x Claude Traffic	0.000	0.001
[2]		0.002	0.002
[3]	Lyrics	4.059***	6.482***
[4]		0.050	0.056
[5]	Claude Traffic	-0.001	-0.007*
[6]		0.003	0.004
[7]	Observations	198,204	198,204
[8]	R Squared	0.170	0.230

Sources: Data from Opening Report; originally obtained from WIS Chart provided by Counsel; Google Trends data, accessed via SearchAPI.

Table results are obtained from estimates of my baseline regression model using 498 WIS provided by counsel, using estimated residual song indices instead of song indices from the raw data. Residuals are estimated by regression the song index on the lyrics index, including the same set of fixed effects as in the baseline regression model (song fixed effects and month-year fixed effects). "Joy to the World" (Work-in-Suit 273) is excluded from estimation because it was not included in [redacted] as explained in Opening Report. Observations are at the week-WIS level. The sample period is full weeks contained in January 2022 – October 2025. Lyrics is an indicator that equals 1 for lyrics queries and 0 for song queries. Claude Traffic is imputed 0 after [redacted], and rescaled to a range of 0-100. Standard errors are provided in the rows below coefficient estimates. Standard errors are heteroskedasticity-robust, and significance stars are reported at the 10% (*), 5% (**) and 1% (***) level.

[B] Mixed (10) specification include indices of queries "[title name] lyrics" and "[title name] song" if the Index Gap is 10 or less, otherwise includes indices of queries "[title name] [artist name] lyrics" and "[title name] [artist name] song".

[C] Mixed (30) specification include indices of queries "[title name] lyrics" and "[title name] song" if the Index Gap is 30 or less, otherwise includes indices of queries "[title name] [artist name] lyrics" and "[title name] [artist name] song".

3. Regression Results without Using Fixed Effects

165. The table below presents the robustness for the model presented in Section III.D.2 with two alternate specifications of Mixed (10) and Mixed (30). The results do not show any meaningful difference to the results I presented in the Section III.D.2.

Table B.6: Regression Results of the Baseline Model without Month-Year Fixed Effects and Song Fixed Effects

		Mixed (10)	Mixed (30)
	[A]	[B]	[C]
[1]	Lyrics x Claude Traffic	0.003	0.004
[2]		0.002	0.003
[3]	Lyrics	3.131***	4.435***
[4]		0.054	0.064
[5]	Claude Traffic	-0.003***	-0.004***
[6]		0.001	0.001
[7]	Observations	198,204	198,204
[8]	R Squared	0.019	0.026

Sources: Data from Opening Report; originally obtained from WIS Chart provided by Counsel; Google Trends data, accessed via SearchAPI.

Table results are obtained from estimates of my baseline regression model using 498 WIS provided by counsel, but do not include song fixed effects or month-year fixed effects. "Joy to the World" (Work-in-Suit 273) is excluded from estimation because it was not included in [redacted], as explained in Opening Report. Observations are at the week-WIS level. The sample period is full weeks contained in January 2022 – October 2025. Lyrics is an indicator that equals 1 for lyrics queries and 0 for song queries. Claude Traffic is imputed 0 after [redacted], and rescaled to a range of 0-100. Standard errors are provided in the rows below coefficient estimates. Standard errors are heteroskedasticity-robust, and significance stars are reported at the 10% (*), 5% (**) and 1% (***) level.

[B] Mixed (10) specification include indices of queries "[title name] lyrics" and "[title name] song" if the Index Gap is 10 or less, otherwise includes indices of queries "[title name] [artist name] lyrics" and "[title name] [artist name] song".

[C] Mixed (30) specification include indices of queries "[title name] lyrics" and "[title name] song" if the Index Gap is 30 or less, otherwise includes indices of queries "[title name] [artist name] lyrics" and "[title name] [artist name] song".

C. Materials Considered

Materials Relied Upon

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