Before the
UNITED STATES COPYRIGHT ROYALTY JUDGES
Washington, D.C.

In the Matter of: Determination of Royalty Rates and Terms for Transmission of Sound Recordings by Satellite Radio and "Preexisting" Subscription Services (SDARS III)	Docket No. 16-CRB-0001 SR/PSSR (2018-2022)

WRITTEN REBUTTAL TESTIMONY OF

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LIST OF APPENDICES

I. INTRODUCTION

1. My name is Ravi Dhar. I filed written direct testimony in this matter on October 19, 2016 (my "Initial Testimony" or "Dhar WDT"). A list of my deposition testimony since filing my Initial Testimony is listed in Appendix A. Since filing my Initial Testimony, I have reviewed the Written Direct Testimony of Joe Lenski ("Lenski WDT"), as well as the survey instrument ("Lenski Survey") and other supporting material provided by Counsel, as well as the Written Direct Testimony of Professor Carl Shapiro ("Shapiro WDT"). A list of the materials I reviewed in preparing this Testimony is listed in Appendix B.

2. In this Testimony, I provide an evaluation of the methodology and questions in the Lenski Survey. Specifically, I evaluate the questions relating to what audio services consumers listened to before using SiriusXM and/or Pandora, what they would listen to if SiriusXM and/or Pandora were no longer available, how they would allocate their listening across those services, and how much time respondents report listening to music overall, to SiriusXM, and to Pandora.[1] I was assisted in this matter by the Brattle Group. I reserve the right to supplement my testimony and this report in response to any further information provided by the parties, and/or in light of additional documents or testimony brought forth through the ongoing discovery in this proceeding, at the hearing, or otherwise, which may be brought to my attention after the date of my signature below.

3. The Lenski survey was designed as a Random Digit Dial (RDD) telephone survey of Americans ages 13 and older.[2] It includes 983 respondents who were categorized as SiriusXM listeners and 1,323 who were categorized as Pandora listeners.[3]

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[1] The Lenski Survey asks SiriusXM listeners and Pandora listeners similar questions. I will focus my evaluation of the Lenski Survey on his questions related to SiriusXM. My statements regarding questions and conclusions about SiriusXM apply equally to the Lenski Survey's questions about Pandora.

[2] Lenski WDT, p. 3.

[3] Lenski WDT, p. 3.

4. The Lenski survey purports "to provide information about what current SiriusXM listeners listened to before they began listening to SiriusXM and what they would listen to if SiriusXM were no longer available, and about what current Pandora listeners listened to before they began listening to Pandora and what they would listen to if Pandora were no longer available."[4]

5. The Lenski Survey also purports to measure how SiriusXM listeners would divide their listening to other types of audio if SiriusXM were no longer available and how Pandora listeners would divide their listening to other types of audio if Pandora were no longer available.[5]

6. The Lenski Survey first asks respondents about their past listening behavior before they "ever started" listening to SiriusXM.[6] Then, the Lenski Survey asks respondents to predict what audio services they would listen to if SiriusXM were no longer available. Immediately after asking respondents to predict what audio services they would listen to if SiriusXM were no longer available, the Lenski Survey asks them to predict how they would allocate their listening time across those services.[7] I understand that Professor Shapiro uses these results and cites the Lenski Survey in analyzing the extent to which SiriusXM "cannibalizes other record label revenue streams."[8]

II. SUMMARY OF OPINIONS

7. Based on my review of documents and my education, background, professional experience, and analysis, I have reached the following conclusions:

8. A key objective of the Lenski Survey is to determine which audio services respondents would listen to if SiriusXM were not available, and how they would

[4] Lenski WDT, p. 2.

[5] Lenski WDT, pp. 6-7.

[6] Lenski WDT, pp. 5, 8.

[7] Lenski WDT, pp. 5-6.

[8] Shapiro WDT, p. 56.

allocate their listening time across a set of alternate services if SiriusXM were not available (and comparing that to a similar analysis for Pandora). However, the Lenski Survey methodology is replete with significant flaws that render any conclusions drawn from the survey about these questions to be completely unreliable.

9. As discussed below, the Lenski Survey contains several methodological flaws that render the results invalid and any conclusions drawn from it completely unreliable. Specifically, the Lenski Survey's methodology fails to follow accepted survey practices by asking key questions that suffer from order effects, providing response options that are incomplete and ambiguous, and asking questions that require respondents to perform complex mental operations in order to provide valid and reliable answers. These critical flaws lead me to conclude that the survey is of no scientific value in answering the questions on what audio services respondents would listen to if SiriusXM were no longer available, or how they would divide their listening among other audio services if SiriusXM were no longer available.

10. In my evaluation of the Lenski Survey, I will discuss the significant concerns I have about the survey within the broadly discussed topics in my summary.

III. CRITICAL FLAWS IN SURVEY METHODOLOGY INVALIDATE THE CONCLUSIONS IN THE LENSKI REPORT ABOUT LISTENING TO OTHER AUDIO SERVICES AND ALLOCATION OF TIME LISTENING TO OTHER SERVICES

A. CONCLUSIONS ABOUT RESPONDENTS' LISTENING TO OTHER AUDIO SERVICES IF SIRIUSXM WERE NO LONGER AVAILABLE ARE UNRELIABLE

11. The Lenski Survey's measure of which audio services respondents would listen to if SiriusXM were no longer available, as asked in Question 8D,[9] is wholly unreliable, and any conclusions based on it are invalid. Question 8D suffers from a major flaw known as an "order effect" because it is preceded by a leading question (Question 8B) that asks respondents to think about their behavior in the past when several

[9] Lenski WDT, p. B-4.

response options (e.g., Spotify, Pandora, and podcasts) might not have been widely available. Hence, the sequence of asking Question 8B prior to Question 8D systematically biases responses toward traditional over-the-air AM/FM radio. Question 8D also suffers from additional major flaws such as omitting significant potential listening alternatives like Apple Music and YouTube, resulting in responses to Question 8D that are invalid. A third major flaw is that some of the response options that were provided are ambiguous, leading to differences in interpretation among survey respondents, which consequently lead to unreliable responses. I discuss these three major flaws in detail below.

12. The Lenski Survey purports to measure which audio services respondents would listen to if SiriusXM were no longer available, as asked in Question 8D. Question 8D asks respondents to "Now imagine that SiriusXM were no longer available. What would you do instead of listening to SiriusXM?" and presents them with a list of options related to audio listening. This question is preceded by Question 8B, which asks respondents "Now think about what you used to do before you ever started listening to SiriusXM. Which ONE of the following is SiriusXM **mostly replacing**" (emphasis in original). The respondent is then provided the following options: "Traditional over-the-air AM/FM radio stations"; "CDs or your own music downloads"; "Online radio services such as Pandora, Spotify, Rhapsody, iHeartRadio, or streamed AM/FM stations"; podcasts; new listening time not taken from other sources; or other.[10] The responses to Question 8D are critically flawed, resulting from what is a well-known bias in the survey methodology known as an "order effect." An order effect is a phenomenon in which the order in which preceding questions were asked systematically influences the answers provided by respondents to a subsequent question.[11] Question 8B biases the responses to

[10] Lenski WDT, pp. B-3 - B-4.

[11] See, e.g., Shari Seidman Diamond, "Reference Guide on Survey Research," *Reference Manual on Scientific Evidence*, Third Edition, Federal Judicial Center, 2011, pp. 395-396; Seymour Sudman and Norbert Schwartz, "Contributions of Cognitive Psychology to Advertising Research," *Journal*

Question 8D—which is a key question in the survey—because it prompts respondents to focus on their responses to the preceding question(s) and give those responses greater consideration when answering the subsequent question. As I discuss next, the response to Question 8B is likely to result in a high proportion of mentions related to traditional over-the-air AM/FM radio and a low proportion of mentions related to online radio services such as Pandora, Spotify, Rhapsody, iHeartRadio, or streamed AM/FM stations. Due to this order effect, the response to Question 8B subsequently influences the answers respondents give to Question 8D.

13. The wording of Question 8B biases respondents toward choosing traditional over-the-air AM/FM radio over other options. As noted above, Question 8B says: "Now think about what you used to do before you ever started listening to SiriusXM. Which ONE of the following is SiriusXM **mostly replacing**" (emphasis in original). It focuses respondents on when they first started listening to SiriusXM, which for some respondents may have been many years ago. This bias is particularly true for respondents who have been long-time subscribers to SiriusXM. Sirius and XM satellite radio service launched in the United States in 2002 and 2001,[12] respectively, years before streaming services became available (e.g., Spotify launched in the United States in July 2011[13]).

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of Advertising Research, Vol. 29, Issue 3, 1989, pp. 43-53; Jon A. Krosnick and Stanley Presser, "Question and Questionnaire Design," in *Handbook of Survey Research,* Second Edition, James D. Wright and Peter V. Marsden, eds., (Bingley: UK: Emerald Group Publishing Limited), 2010, pp. 291-294.

[12] XM Satellite Radio was the first to launch its U.S. digital satellite radio service on September 25, 2001. See "XM Satellite Radio Launches First U.S. Digital Satellite Radio Service," XM Satellite Radio press release, September 25, 2001, accessed February 13, 2017, https://web.archive.org/web/20020809083230/http://www.xmradio.com/newsroom/screen/pr_2001_09_25_launch.html. Sirius Satellite Radio started broadcasting in selected markets on February 14, 2002. See "Sirius Begins Service in Denver, Houston, Jackson and Phoenix," Sirius Satellite Radio press release, February 14, 2002, accessed February 13, 2017, http://www.prnewswire.com/news-releases/sirius-begins-service-in-denver-houston-jackson-and-phoenix-76011662.html.

[13] Spotify launched its invite-only beta phase in the U.S. on July 14, 2011. See "Hello America. Spotify here." Spotify News release, July 14, 2011, accessed February 14, 2017,

14. The order bias that Question 8B creates in the responses to Question 8D is especially exacerbated by the use of the phrase "before you ever started listening to SiriusXM." By telling respondents to think about what they did "before [they] ever started listening to SiriusXM," Mr. Lenski is focusing them potentially on a time even farther back in the past than when they first adopted SiriusXM, a period when several response options (e.g., Spotify, Pandora, and podcasts) might not have been available. By asking an irrelevant question that is likely to result in a high degree of mention of traditional over-the-air AM/FM radio, this question biases their responses to Question 8D toward such options (e.g., traditional over-the-air AM/FM radio).[14] As a result, the responses to Question 8D will systematically overstate mentions of traditional over-the-air AM/FM radio and understate services that were not available before respondents "ever started listening to SiriusXM." This bias will systematically influence the answer respondents give to Question 8D and, as I will discuss in Section III.B below, the responses to Question 8F.

15. Mr. Lenski could have easily avoided this critical flaw. I see no methodologically valid reason why Question 8B asked respondents to identify ONE source of audio they listened to before they "ever started listening to SiriusXM;" that analysis is not even used in Professor Shapiro's economic analysis. Neither Mr. Lenski nor Professor Shapiro evaluates the past behavior of SiriusXM listeners. The question of what SiriusXM users did before they "ever started listening to SiriusXM" serves only to bias the responses provided to the key questions that follow (Questions 8D and 8F). This sequence of questions primes respondents to be thinking about *only one specific service* they used in the past that SiriusXM replaced (Question 8B), which

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https://news.spotify.com/us/2011/07/14/hello-america-spotify-here/. The invitation requirement was dropped and the service was opened to all users on September 26, 2011. See "Great news for all U.S. users – no more invites!" Spotify News release, September 26, 2011, accessed February 14, 2017, https://news.spotify.com/us/2011/09/26/great-news-for-all-us-users-no-more-invites/.

[14] Question 8B allows respondents to choose only one service that Sirius XM is "mostly replacing." As discussed in Section III.B, allowing respondents to provide only one option also biases responses toward traditional over-the-air AM/FM radio.

biases respondents toward considering that one service to a great extent when answering Question 8D (about what they would do if Sirius XM were no longer available).

16. A second major flaw in the Lenski survey is the nature of response options provided for Question 8D. Question 8D is a closed-ended question; "closed-ended questions provide the respondent with an explicit set of responses from which to choose."[15] The responses to a closed-ended question are only meaningful if the list of choices is exhaustive, that is, if the choices cover all possible options a respondent might choose in response to the question. If a question presents respondents with an incomplete set of response options, the distribution of their responses is likely to be different in the survey than it would be if the set of the responses encompassed an exhaustive set of choices. Without a full set of response options, "a respondent may be forced to choose one that does not express his or her opinion."[16] As discussed below, the Lenski Survey does not include all relevant response options, thus increasing the likelihood that the choices selected will not represent the marketplace reality.

17. The set of response options provided in Question 8D includes the following: "Traditional over-the-air AM/FM radio"; "CDs or your own music downloads"; "Online radio services where <u>you</u> pick specific songs you want to hear, such as Spotify or Rhapsody"; "Online <u>streaming</u> radio services such as Pandora, iHeartRadio or the online streams of AM/FM radio stations"; "Podcasts"; and "Other types of audio that I have not already mentioned."[17] It does not include several significant

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15 Shari Seidman Diamond, "Reference Guide on Survey Research," *Reference Manual on Scientific Evidence*, Third Edition, Federal Judicial Center, 2011, p. 392.

16 See Shari Seidman Diamond, "Reference Guide on Survey Research," *Reference Manual on Scientific Evidence*, Third Edition, Federal Judicial Center, 2011, p. 393.

17 Lenski WDT, p. B-4.

potential options such as YouTube, the largest music streaming service.[18] This omission is despite the fact that, in other surveys it conducts, Mr. Lenski's firm does include YouTube when surveying people about how they listen to music.[19] In fact, Professor Shapiro reports that 8 percent of time spent listening to music happens on YouTube.[20] In addition, the Lenski Survey does not explicitly mention Apple Music as a potential response option.[21] The surveys cited above have found that Apple Music has brand awareness that is 67 percent, compared with 40 percent for Rhapsody, and that significantly more consumers listen to Apple Music in the prior month (12 percent) than listen to Rhapsody (less than 3 percent).[22] In addition, the Lenski Survey also omitted *purchasing* new CDs or music downloads from the options provided to respondents.[23] Omitting such relevant options, or grouping into broader categories in which significant examples were omitted, leads respondents into selecting one of the available options which they might not otherwise have selected, thereby biasing the results in the survey in comparison to what one might see in the marketplace.

18. A third major flaw in the Lenski survey is the ambiguous nature of several of the response options that were provided for Question 8D. A hallmark of good survey design is the use of clear, unambiguous, and precise questions. Questions that are unclear "may threaten the validity of the survey by systematically distorting responses if respondents are misled in a particular direction, or by inflating random

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[18] Shelby Carpenter, "More People Are Streaming YouTube Music But It's Paying Artists Less, Report Says," *Forbes*, July 12, 2016, accessed January 23, 2017, http://www.forbes.com/sites/shelbycarpenter/2016/07/12/more-people-streaming-youtube-music-paying-less-artists/#24963edc5555.

[19] See, e.g., "The Infinite Dial 2016," Edison Research and Triton Digital, pp. 34-3; "The Infinite Dial 2015," Edison Research and Triton Digital, pp. 29-30, 33-38.

[20] Shapiro WDT, p. 7. Figure 4 of Professor Shapiro's report also shows that YouTube accounts for 1% of time spent listening to music in cars or trucks. Shapiro WDT, p. 9.

[21] Lenski WDT, p. B-4.

[22] "The Infinite Dial 2016," Edison Research and Triton Digital, pp. 24-25.

[23] Lenski WDT, p. B-4.

error if respondents guess because they do not understand the question."[24] Several response options in Question 8D of the Lenski Survey are potentially ambiguous and omit critical information, leading to unreliable answers. For example, the response options included "Online radio services where you pick specific songs you want to hear, such as Spotify or Rhapsody" (emphasis in original) and "Online streaming radio services such as Pandora, iHeartRadio or the online streams of AM/FM radio stations" (emphasis in original).[25] The Lenski Survey did not provide respondents with any information about the price for any of the services. Also, Spotify, Pandora, and iHeartRadio offer both free and paid options with different features, so respondents may be uncertain as to whether those response options in the survey refer only to the paid or to the free versions of those services (or both). Survey responses to Question 8D are also likely to vary depending on how different respondents interpreted these ambiguous options, therefore making the provided responses unreliable. Furthermore, because respondents are not provided with the critical information about the prices of the services, some respondents may completely avoid choosing these options.[26]

19. To summarize, Question 8D suffers from severe methodological flaws and provides no useful information on how respondents' listening to audio services might change

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[24] Shari Seidman Diamond, "Reference Guide on Survey Research," *Reference Manual on Scientific Evidence*, Third Edition, Federal Judicial Center, 2011, p. 388. See also Floyd Jackson Fowler, Jr., "How Unclear Terms Affect Survey Data," *Public Opinion Quarterly*, Vol. 56, Issue 2, Summer 1992, pp. 218-231.

[25] Lenski WDT, p. B-4.

[26] Offering response options with inadequate information has been shown to cause survey respondents to answer differently than when full information is provided. See Floyd Jackson Fowler, Jr., "How Unclear Terms Affect Survey Data," *Public Opinion Quarterly*, Vol. 56, Issue 2, Summer 1992, pp. 218-231. Additionally, when faced with ambiguity among choices, studies show that people tend to avoid options that are ambiguous or unfamiliar to them in favor of known or familiar options. See also Craig R. Fox and Amos Tversky, "Ambiguity Aversion and Comparative Ignorance," *The Quarterly Journal of Economics,* Vol. 110, No. 3, August 1995, pp. 585-603; A.V. Muthukrishnan, "Decision Ambiguity and Incumbent Brand Advantage," *Journal of Consumer Research*, Vol. 22, June 1995, pp. 98-109; and A.V. Muthukrishnan, Luc Wathieu, and Alison Jing Xu, "Ambiguity Aversion and the Preference for Established Brands," *Management Science*, Vol. 55, No. 12, December 2009, pp. 1933-194.

if SiriusXM were no longer available. Each of these flaws by itself would lead to a survey that has little marketplace validity. Taken together, the combination of an order effect, incomplete response options, and ambiguous descriptions of certain response options leads to unreliable responses and renders any conclusions based on the responses to Question 8D to be wholly invalid.

20. Setting aside all the flaws in Question 8D discussed above, some of which artificially deflate the number of respondents who choose streaming services and others that decrease the reliability of the data, it is important to note that Mr. Lenski still finds that a significant percentage of SiriusXM listeners would replace SiriusXM with a streaming music service: He finds that 49 percent of SiriusXM listeners would "replace [their] SiriusXM listening" with a Not-On-Demand music streaming service such as Pandora, iHeartRadio, or online streams of AM/FM radio stations, and 32 percent of respondents would substitute for an On-Demand music streaming service such as Spotify or Rhapsody.[27]

B. Conclusions About Respondents' Allocation of Listening Time to Other Services if SiriusXM Were No Longer Available Are Unreliable

21. Question 8F asks respondents "If SiriusXM were no longer available, how would you divide your listening to the other types of audio you just mentioned" in response to Question 8D.[28] The responses to Question 8F in the Lenski Survey are also critically flawed in several ways and any conclusions based on it are highly unreliable and invalid. The major flaws include: (1) the downstream impact of the order effect discussed in Section III.A; (2) the failure to recognize that responding to this question requires respondents to perform multiple complex mental operations, causing them to employ judgmental heuristics that likely result in inaccurate responses; and (3) the grouping of the music streaming response options that likely causes respondents

[27] Lenski WDT, p. 5, B-4.

[28] Lenski WDT, pp. B-4 - B-5.

to underestimate how much time they would spend listening to those audio services. These flaws completely invalidate any conclusions based on Question 8F.

22. As stated in the previous section, the responses to Question 8D are likely to be systematically biased away from selecting new ways of listening to music due to an order effect resulting from Question 8B. This bias is further exacerbated by the use of the phrases "which ONE of the following is SiriusXM **mostly replacing**" (emphasis in original) and "before you ever started listening to SiriusXM" in Question 8B.[29] As discussed in Section III.A, the choice of wording forces respondents to choose only one option, which biases the responses to Question 8D away from options such as On-Demand and Not-On-Demand streaming music services. It is important to note that the response options presented to respondents in Question 8F are constrained by their responses to Question 8D. Stated differently, if respondents did not choose a streaming option in Question 8D, they would not be asked about allocating their listening time to streaming in Question 8F. Since Question 8F focuses only on options respondents previously reported in response to Question 8D, the responses to Question 8F were systematically influenced by a question about past behavior (Question 8B). The responses to Question 8F are therefore unreliable and systematically biased toward options such as traditional over-the-air radio.

23. Setting aside the critical bias due to order effect and other problems with Question 8D that contaminate the response to 8F, consumers' predictions about how they would actually divide their time across multiple audio services in the future are highly unreliable.[30] Question 8F is particularly difficult to answer reliably (especially on the phone) as estimating the proportion of time for each type of audio requires multiple mental calculations. This is because the amount of time spent listening to

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[29] Lenski WDT, p. B-3.

[30] For example, academic research has found that people are better at predicting financial behavior than time allocation. See, e.g., Gal Zauberman and John G. Lynch, Jr., "Resource Slack and Propensity to Discount Delayed Investments of Time Versus Money," *Journal of Experimental Psychology: General*, Vol. 134, No. 1, 2005, pp. 23–37.

audio happens across many different instances (e.g., regular commuting to and from work, other planned and unplanned car trips, variable use of car on weekends), instances out of the home but not in the car (e.g., public transportation, exercising, etc.) and inside home (e.g., before work, after returning from work, during weekends, etc.). In order to reliably answer Question 8F, respondents need to (1) think of all relevant instances of the behavior (e.g., commuting time, exercise time, etc.), (2) assess the amount of time they listen to audio during each of those instances, (3) calculate total listening time for each audio service by adding time spent listening to that specific audio service across all instances (e.g., time spent listening to Spotify while commuting, etc.), (4) add total listening times for services grouped together in response options (e.g., Pandora, Spotify, Rhapsody, and other streaming), and (5) calculate the proportion of time for each audio service. It is absurd to think that respondents in a telephone survey have either the motivation or the ability to perform the cognitive operations required to answer the question reliably. They are likely to guess or rely on cognitive heuristics that the Nobel Laureate Daniel Kahneman has shown can be highly unreliable.[31] Hence, any estimates of time allocation in response to Question 8F are likely to be wholly unreliable.

24. The respondents' answers to Question 8F in the Lenski Survey are also likely to be unreliable as some of the response options group together different ways of listening. For example, the Lenski Survey provides one response option worded as "Online radio services where you pick specific songs you want to hear, such as Spotify or Rhapsody" (emphasis in original).[32] The Lenski Survey does not isolate paid and free services, such as "Paid version of an On-Demand streaming music service such as Spotify, Apple Music, or Rhapsody," "Free version of an On-Demand streaming music service such as Spotify," etc. It is well known from the academic

[31] Daniel Kahneman, *Thinking, Fast and Slow* (New York: Farrar, Straus and Giroux), 2011.

[32] Lenski WDT, pp. B-4 - B-5.

literature that if a response option groups several different options together, respondents are likely to underreport the proportion of time they would spend engaging in those activities.[33] As discussed in my discussion of Question 8D, because Question 8F does not provide specific types of audio listening services as explicit options and instead groups various options pertaining to On-Demand and Not-On-Demand services together, respondents are likely to underreport the amount of time they allocate to On-Demand and Not-On-Demand music streaming services.[34] Thus, Question 8F likely underestimates the amount of time that respondents would allocate to On-Demand and Not-On-Demand music streaming services in the absence of SiriusXM and cannot be relied on for any additional analyses.

25. To summarize, Question 8F is highly unlikely to produce reliable and valid estimates of how respondents would divide their listening time to other services if SiriusXM were no longer available. As I have just discussed, Question 8F is severely impacted by the order effect bias; by the complexity of mental operations required to answer this question, which forces consumers to engage in cognitive heuristics that are unreliable; and by the grouping of different response options into a single broad

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[33] See, e.g., Seymour Sudman and Norbert Schwartz, "Contributions of Cognitive Psychology to Advertising Research," *Journal of Advertising Research*, Vol. 29, Issue 3, 1989, pp. 43-53; Justin Kruger and Matt Evans, "If You Don't Want to Be Late, Enumerate: Unpacking Reduces the Planning Fallacy," *Journal of Experimental Social* Psychology, Vol. 40, 2004, pp. 586-598; and Darryl K. Forsyth and Christopher D.B. Burt, "Allocating Time to Future Tasks: The Effect of Task Segmentation on Planning Fallacy Bias," *Memory & Cognition*, Vol. 36, No. 4, 2008, pp. 791-798.

[34] A study by Kruger and Evans found that people allocated significantly shorter amount of time to single task than the total time they allocated to the individual subtasks. See Justin Kruger and Matt Evans, "If You Don't Want to Be Late, Enumerate: Unpacking Reduces the Planning Fallacy," *Journal of Experimental Social Psychology*, Vol. 40, 2004, 586-598. In a different study, Forsyth and Burt found that allocated time for a single task was significantly smaller than the total time allocated to the individual subtasks. See Darryl K. Forsyth and Christopher D.B. Burt, "Allocating Time to Future Tasks: The Effect of Task Segmentation on Planning Fallacy Bias," *Memory & Cognition*, 2008, Vol. 36, No. 4, 791-798. In addition, Sudman and Schwartz note that respondents reported a 27% increase in restaurant visits when asked to report separately about the number of times they had dinner in Chinese, Greek, Italian, American, Mexican, and fast-food restaurants, than when asked to answer a more general, unpacked question "How many times have you eaten dinner in a regular or fast-food restaurant?" See Seymour Sudman and Norbert Schwartz, "Contributions of Cognitive Psychology to Advertising Research," *Journal of Advertising Research*, Vol. 29, Issue 3, 1989, pp. 43-53.

category. Hence, the answer to this question cannot be relied upon to provide reliable or valid estimates of how respondents would allocate their listening time to other services if SiriusXM were no longer available.

C. ILLOGICAL RESPONSES IN THE LENSKI SURVEY DATA

26. The Lenski Survey also asks respondents several questions about how much time they spend listening to music and to SiriusXM specifically. For example, Questions 3 and 8A ask respondents how much time they spend listening to music and SiriusXM, respectively. Specifically, Question 3 asks "Thinking about all of the different ways you might listen to music, approximately how much time in hours or minutes do you spend listening to music in a typical day?", and Question 8A asks "Now I'd like you to think about your current listening to SiriusXM Satellite Radio. How much total time, in hours or minutes, would you say you spend listening to SiriusXM in a typical WEEK" (emphasis in original).[35] Questions that attempt to elicit "how much time in hours or minutes" people engage in activities such as listening to music are likely to generate unreliable data.

27. Evidence of the unreliability of the responses in the Lenski Survey can be seen in the responses to Question 3. For example, 31 respondents in the Lenski Survey reported listening to music for 24 hours or more in a typical day. Although the survey instructions indicated that respondents could not answer more than 24 hours, five respondents reported listening to music for *more* than 24 hours. Responses such as these undermine the validity of the data.

28. Data reliability may also be evaluated by comparing responses to multiple questions in the survey that ask about related information. For a significant number of respondents, the responses to Question 3 cannot be reconciled with their responses to Question 10A. Among survey respondents who were Pandora users, 164 (12 percent of Pandora users) reported spending more time listening to Pandora, in

[35] Lenski WDT, pp. B-2, B-3. Question 10A asks Pandora users a parallel question about how much time they spend listening to Pandora in a typical week. Lenski WDT, p. B-5.

Question 10A, than they did listening to music *overall,* in Question 3. It is not possible for the responses to both of these questions to be valid. That so many respondents provided responses that cannot be reconciled with one another indicates that it was difficult for survey respondents to provide accurate responses to the Lenski Survey, or that respondents did not understand the questions and could not provide meaningful answers.

29. Respondents also provided potentially inconsistent responses to other questions in the Lenski Survey, underscoring that the questions relating to listening time ask respondents to perform difficult mental tasks and/or that the survey is confusing. For example, respondents who answered Question 8D by saying that they would "listen to less audio overall …" if SiriusXM were no longer available were then asked to estimate "In hours or minutes, how much less time would you listen in a typical week" (Question 8E).[36] Twenty respondents reported that they would reduce their listening by *more* time than they reported listening to SiriusXM. These responses can be reconciled only if those respondents would not replace their listening to SiriusXM with any other audio service *and* they would further reduce listening to other audio services if SiriusXM were no longer available. There is no logical reason for this to happen. Moreover, respondents themselves suggested this would not happen: 19 of those 20 respondents also reported that they would replace SiriusXM with another service.[37] What is more logical is that the pattern of responses further highlights that one cannot rely on the survey results to draw meaningful conclusions about consumer use of audio services.

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[36] Lenski WDT, p. B-4.

[37] Responses of Pandora listeners exhibit the same problematic pattern: 28 respondents indicated that they would reduce their listening by *more* time than they reported listening to Pandora. Moreover, 27 of those 28 respondents also indicated that they would replace Pandora with another service.

IV. OTHER MAJOR FLAWS IN THE LENSKI SURVEY LEAD TO BIASED RESULTS

30. As discussed in Section III.A, including Question 8B in the Lenski Survey is problematic because it primes respondents into thinking about a service they used potentially long back in the past and systematically biases their responses to Questions 8D and 8F toward traditional over-the-air AM/FM radio. Furthermore, the results to Question 8B themselves are unreliable.

31. Question 8B asks respondents "Now think about what you used to do before you ever started listening to SiriusXM. Which ONE of the following is SiriusXM **mostly replacing**" (emphasis in original) and presents as options: "Traditional, over-the-air AM/FM radio stations"; "CDs or your own music downloads"; "Online radio services such as Pandora, Spotify, Rhapsody, iHeartRadio, or streamed AM/FM stations"; and "Podcasts."[38] By suggesting that SiriusXM is "mostly replacing" a single option, Question 8B is requiring the respondent to choose a single replacement option and is a highly improper way of uncovering listening habits. Thus, for example, given the nature of the service, respondents who have been long-time subscribers of SiriusXM very likely were "mostly replacing" AM/FM radio, even though they may also have spent significant time listening to CDs, downloads, or other services that they "replaced" with SiriusXM. However, they were not permitted to select any of those options, further exacerbating the priming problems discussed above. Moreover, the use of the phrase "before you ever started listening to SiriusXM" further increases respondents' likelihood of selecting traditional over-the-air AM/FM radio because it may lead respondents to think about their audio listening in the distant past, before other music streaming options were available.

32. In addition to the wording of the question that is leading and suggestive of certain options, Question 8B also used wording that can be seen as ambiguous. As noted above, good survey design calls for asking clear, unambiguous, and precise

[38] Lenski WDT, p. B-3.

questions. An example of the ambiguous wording of Question 8B can be seen in the phrase "mostly replacing." The word "mostly" is ambiguous and can have a different meaning for different respondents. Consumers do not ascribe the same quantitative probability to words such as "mostly."[39] For example, while one respondent may interpret the word "mostly" to mean "at least 51 percent of the time," another respondent may interpret it to mean "25 percent of the time" if SiriusXM were replacing many different services and that was the highest percentage. The ambiguous wording of this question would lead that person to select traditional over-the-air AM/FM radio if one listens to the traditional, over-the-air radio 51 percent of the time, and online radio services 49 percent of the time. By allowing only a single option to be selected, the Lenski Survey discounts completely important listening options simply because they are not the largest.

V. THE LACK OF ADEQUATE REPORTING OF SURVEY IMPLEMENTATION IMPEDES THE ABILITY TO ASSESS THE RELIABILITY OF THE SURVEY

33. In order to assess whether the data in the Lenski Survey can be relied upon to be representative of the marketplace, it is necessary to understand whether the survey followed accepted survey practice. In telephone surveys, it is good survey practice to report what happened to each telephone number included in the initial sample. This information allows a reviewer to assess whether the sample is representative or contains non-response error. This is usually accomplished with a call log, which typically provides information about every dial attempt, including the date and time the call was made, whether it was answered, and the disposition of the call.[40] I have

[39] See, e.g., Frederick Mosteller and Cleo Youtz, "Quantifying Probabilistic Expressions," *Statistical Science*, Vol. 5, No. 1, 1990, pp. 2-34; Floyd Jackson Fowler, Jr., "How Unclear Terms Affect Survey Data," *Public Opinion Quarterly*, Vol. 56, Issue 2, Summer 1992, pp. 218-231; Norbert Schwartz, "Self-Reports: How the Questions Shape the Answers," *American Psychologist*, Vol. 54, No. 2, February 1999, pp. 95-97; Norbert Schwartz and Daphna Oyserman, "Asking Questions About Behavior: Cognition, Communication, and Questionnaire Construction," *American Journal of Evaluation*, Vol. 22, No. 2, 2001, pp. 127–160.

[40] See, e.g., "Standard Definitions: Final Dispositions of Case Codes and Outcome Rates for Surveys," American Association for Public Opinion Research, Ninth Edition, Revised 2016, pp. 8,

been informed by counsel that Mr. Lenski did not retain a call log file that shows the result of each dial attempt. Without such a call log, it is impossible to know whether the survey was executed as intended. For example, for numbers that never answered the phone, such a file would show when numbers were dialed to ensure that (a) a sufficient number of attempts were made and (b) that those call attempts were made at different times of day and on different days of the week to minimize the chance of bias. More generally, the call log would allow one to determine whether the sampling protocol was followed properly and understand the time of day that the calls were made. Reviewing the call log is the only way to know if the survey was implemented according to best practices.

14-22; Shari Seidman Diamond, "Reference Guide on Survey Research," *Reference Manual on Scientific Evidence*, Third Edition, Federal Judicial Center, 2011, pp. 415-416.

Appendix A: Testimony Since October 19, 2016

1. FTC v. DirecTV, Inc. (Deposition)
2. Zakaria v. Gerber Products Co. (Deposition)

Appendix B: Materials Reviewed

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I declare under penalty of perjury that the foregoing testimony is true and correct.

Date: 2.17.17

Ravi Dhar