Before the
UNITED STATES COPYRIGHT ROYALTY JUDGES
THE LIBRARY OF CONGRESS
Washington, D.C.

In the Matter of	)	
DETERMINATION OF ROYALTY RATES FOR DIGITAL PERFORMANCE IN SOUND RECORDINGS AND EPHEMERAL RECORDINGS (WEB IV)	)	**Docket No. 14-CRB-0001-WR (2016-2020)**

REBUTTAL TESTIMONY OF JOHN R. HAUSER, SC.D.

FEBRUARY 23, 2015

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I. INTRODUCTION

A. Qualifications

1. I am the Kirin Professor of Marketing at the Massachusetts Institute of Technology ("MIT") Sloan School of Management. The principal focus of my research and teaching at MIT has been in the areas of marketing management, new product and service development, consumer satisfaction, marketing research, research methodology, and competitive marketing strategy. My research includes the evaluation of consumer decision-making, product and service development, customized communications designed around customers' cognitive styles, and determination of relative feature preferences and implicit product valuations. I have conducted research on consumer products and services in intellectual property and false advertising in multiple industries, including satellite and online radio and music services as well as online retail, fashion, and luxury goods. I have evaluated the factors that influence consumer purchasing decisions, consumer preferences, and consumer impressions in a variety of matters related to pricing, distribution, and advertising. I have testified about the use of conjoint analysis to measure consumers' willingness to pay for and willingness to buy product and service features.
2. I have testified on matters related to my research, which includes retail products and luxury goods. My testimony history includes, but is not limited to, matters on behalf of SiriusXM, Dish Network, Tivo, WE Woman's Entertainment, Louis Vuitton, Apple Inc., Microsoft, Johnson & Johnson, and Procter & Gamble. My testimony in these matters has addressed trademark infringement, patent infringement, and false advertising, among other issues. In addition, I provide strategic market-research-based consulting to numerous consumer products, technology/software, and durable goods manufacturers, including American Airlines, Johnson & Johnson, IBM, Procter & Gamble, Fidelity Investments, Pacific Gas & Electric Company, Ford Motor Company, General Motors, and Chrysler.
3. I have served as Editor-in-chief of *Marketing Science* and have held senior editorial positions with *Management Science*, the *Journal of Marketing Research*, and the

Journal of Product Innovation Management. I have received numerous awards for excellence in research and teaching in marketing and was recognized by the American Marketing Association with the Paul D. Converse Award for "outstanding contributions to marketing scholarship."[1] In 2001, I received the Parlin Award, which is a "preeminent national honor . . .[awarded for] outstanding leadership and sustained impact on advancing the evolving profession of marketing research over an extended period of time," according to the American Marketing Association.[2] In 2011, I received the Churchill Lifetime Achievement Award of the American Marketing Association for contributions to marketing research. In 2013, I was awarded the Buck Weaver Award by the Institute for Operations Research and the Management Sciences ("INFORMS") Society of Marketing Science ("ISMS"), for lifetime contributions to the theory and practice of marketing science.[3] I am a Fellow of INFORMS and an Inaugural Fellow of the ISMS. I am President of the ISMS. I have also served as a Trustee of the Marketing Science Institute.

4. I am the co-author of two textbooks, *Design and Marketing of New Products* and *Essentials of New Product Management*, as well as more than 80 articles and papers, including articles on various methods used to determine the importance of product features in consumer decision-making. I have developed market research techniques that enable marketing researchers, experts, and managers to predict the value of individual features in both existing and hypothetical products. These methods have been employed numerous times by academic researchers, as well as

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1 "The Paul D. Converse Awards," *American Marketing Association*, https://archive.ama.org/Archive/ Community/ARC/Pages/Career/Awards/Converse.aspx (last visited on Feb. 15, 2015).

2 "Parlin Award 2010," *American Marketing Association*, https://www.ama.org/AboutAMA/Pages/Parlin-Award.aspx (last visited on Feb. 16, 2015).

3 "Buck Weaver Award," *INFORMS*, https://www.informs.org/Recognize-Excellence/ Community-Prizes-and-Awards/Marketing-Science-Society/Buck-Weaver-Award (last visited on Feb. 15, 2015).

practitioners from major international corporations. Many of these papers have been recognized with national and international awards.[4]

5. My curriculum vitae is attached as Appendix A, and my testimony at deposition or trial within the last five years is attached as Appendix B.

B. Assignment

6. I was asked by counsel for the National Association of Broadcasters and iHeartMedia to review and comment on the Testimony of Professor Daniel L. McFadden in the matter of Determination of Rates and Terms for Digital Performance in Sound Recordings and Ephemeral Recordings (Web IV).[5] In particular, I have been asked to assess the scientific validity of Professor McFadden's survey methodology, design, and results.

7. Part of the work for this investigation was performed under my direction by others at Analysis Group, Inc. ("AG"), an economic and litigation consulting firm headquartered in Boston, Massachusetts, as well as Applied Marketing Science ("AMS"), a market research and consulting firm.[6] My rate of compensation is $950

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[4] Olivier Toubia, John R. Hauser & Duncan I. Simester,"Polyhedral Methods for Adaptive Choice-Based Conjoint Analysis," Journal of Marketing Research, Vol. 41 (1), Feb. 2004, at 116-31; Michael Yee, Ely Dahan, John R. Hauser & James Orlin,"Greedoid-Based Non-compensatory Two-Stage Consideration-then-Choice Inference," Marketing Science, Vol. 26 (4), (2007) at 532-49.; Olivier Toubia, Duncan I. Simester, John R. Hauser & Ely Dahan Fast Polyhedral Adaptive Conjoint Estimation, Marketing Science, Vol. 22 (3), (2003), at 273-303; Ely Dahan & John R. Hauser The Virtual Customer, Journal of Product Innovation Management, Vol. 19 (5), (2002), at 332-54; Olivier Toubia, John R. Hauser & Rosanna Garcia Probabilistic Polyhedral Methods for Adaptive Choice-Based Conjoint Analysis: Theory and Application, Marketing Science, Vol. 26 (5), (2007), at 596-610.

[5] Testimony of Daniel L. McFadden, In the Matter of Determination of Rates and Terms for Digital Performance in Sound Recordings and Ephemeral Recordings (Web IV), No. 14-CRB-0001-WR, Oct. 6, 2014 ("McFadden Testimony").

[6] *See* Applied Marketing Science overview. http://ams-inc.com/overview-main (last visited Feb. 15, 2015). In 1989 I helped to found AMS and I retain a small amount of stock in AMS. I do not receive compensation from AMS that is directly related to this survey, nor do I participate in day-to-day management decisions. I am listed on their website as "consultant/co-founder." I avoided speaking directly to the interviewers in this study to maintain a double-blind protocol. However, I did review the interviews to ensure that my instructions were implemented appropriately.

per hour. In addition, I receive compensation based on the professional fees of AG. No compensation is contingent on the nature of my findings or on the outcome of this litigation. Hourly rates for other staff at AG working on this matter range from $270 to $625 per hour, depending upon the level and experience of the staff involved.

8. Appendix C contains a list of materials relied upon in this report. I reserve the right to continue my evaluation of the studies cited in this report and may conduct additional research. My conclusions and opinions may be updated if additional information is made available.

II. SUMMARY OF OPINIONS

9. Professor McFadden's survey data are not reliable.
10. Professor McFadden's survey relied on complicated feature descriptions that were long, overlapping, and jargon-heavy. These descriptions were prone to confusion and heterogeneous interpretation and required careful evaluation of respondent understanding; an evaluation which Professor McFadden failed to implement.
11. Professor McFadden's high dropout rate between Part A and Part B of the study suggests that respondents found his study burdensome and/or confusing.
12. Professor McFadden attempted to implement incentive alignment, but he was not successful in encouraging respondents to think hard and accurately and to answer questions in a manner that reflected their true preferences. A thorough evaluative qualitative research study of target respondents, that I performed to test the understanding of target respondents, indicates that an unacceptable three-quarters of these qualitative study participants found Professor McFadden's incentive alignment language confusing. In some instances, my qualitative study respondents explained how they would adapt their answers to match their misunderstandings of the instructions.
13. My qualitative study of the feature descriptions also indicates that the vast majority of my study respondents were confused by one or more of Professor McFadden's feature definitions.

a. An analysis of interview transcripts reveals that 68 percent of my qualitative study participants explicitly acknowledged confusion or provided interpretations of one or more features or feature levels inconsistent with Professor McFadden's definitions.[7] For example, 60 percent of study respondents were unable to accurately characterize the meaning of a playlist generated by a tastemaker.

b. An evaluation of the video tapes of my qualitative interviews reveals an even greater rate of confusion. Respondent intonation, facial expression, and body language as well as responses to probing questions revealed confusion about many of the features about which Professor McFadden attempted to measure preferences. In fact, with this additional information, blind coders assessed that confusion related to specific features ranged from 11 percent for the most well-understood feature to 87 percent for the most confusingly presented feature. For example, with the additional information provided through visual and auditory cues, coders found 85 percent of qualitative study respondents were confused by the tastemaker playlist generation description.

c. Respondents had varied and meaningfully distinct interpretations of Professor McFadden's feature levels, which prevents one from mapping Professor McFadden's results to actual services in the manner used by Professor Daniel Rubinfeld. For example, while respondents generally understood that 1.5 to 3 minutes of commercial breaks per hour would mean that an advertisement or advertisements would occur periodically during an hour of otherwise free listening, there were six separate interpretations for how those 1.5 to 3 minutes of advertisements would occur.

The rate of respondent confusion found through my qualitative study of Professor McFadden's survey instrument undermines any conclusions drawn by Professor McFadden based on his respondents' answers. The results of the qualitative study reveal widely-varied interpretations of features and feature levels, making it exceptionally difficult, if not

[7] Only 17 respondents understood all seven of Professor McFadden's feature descriptions. The remaining 36 out of the total 53 respondents did not understand at least one of his feature descriptions. I use the term "feature" throughout this Testimony while Professor McFadden appears to use "feature" and "attribute" interchangeably.

impossible, to map the results to actual services in order to evaluate actual service values based on differentiated features. The confusing incentive-alignment language means that Professor McFadden cannot interpret respondents' reactions to the survey to be consistent with choices respondents would make with respect to real music services. The survey language — and specifically the incentive alignment language — appears to have caused demand artifacts,[8] which altered respondents' choices, making them explicitly inconsistent with actual consumer valuations of the features of music services. The overall confusion rate found in my study of Professor McFadden's survey instrument demonstrates that the data cannot be used in a scientific or reliable manner and that interpretations based on the data cannot be relied upon in this matter.

III. CASE BACKGROUND

A. Royalty Determination Proceedings

14. SoundExchange presented its Royalty Rate Proposal for eligible nonsubscription transmissions, transmissions made by a new subscription service, and ephemeral recordings for the period between 2016 and 2020 for commercial webcasters in October 2014.[9] In this submission, SoundExchange argues that "the market data supports a 'greater-of' rate structure that includes a minimum per performance rate and a percentage of the revenues of the service."[10]

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[8] In his seminal paper from 1975, Sawyer describes demand artifact to "include all aspects of the experiment which cause the subject to perceive, interpret, and act upon what he believes is expected or desired of him by the experimenter. According to the author, "[t]he effects of demand artifacts pose important threats to both internal and external validity." See Alan G. Sawyer Demand Artifacts in Laboratory Experiments in Consumer Research, Journal of Consumer Research, Vol. 1 (4), (1975), at 20-30. An example of a demand artifact would be a respondent who chooses a higher priced product in a survey compared to the real world because she thinks that the interviewer expects the respondent to spend a certain amount of money. See, for example, Section VI.A of this report.

[9] Introductory Memorandum to the Written Direct Statement of SoundExchange, Inc. at 1, In the Matter of Determination of Rates and Terms for Digital Performance in Sound Recordings and Ephemeral Recordings (Web IV), No. 14-CRB-0001-WR, Oct. 7, 2014, from here on "SoundExchange Introductory Memorandum."

[10] *Id.* at 3.

15. As part of its written direct statement submitted to the Copyright Royalty Judges, SoundExchange engaged economist Professor Daniel L. Rubinfeld to estimate the proposed royalty rates based on other license agreements between certain "on-demand" services and certain record labels, adjusted for differences between "on-demand" services that underlie those agreements and those services of statutory webcasters.[11] As part of his evaluation of the adjustments that he asserts are needed to adjust the benchmark from the royalty rates found in agreements for "on-demand" services as a basis for rates for statutory services, Professor Rubinfeld relied upon a conjoint survey conducted by Professor Daniel McFadden. Based on these survey data, Professor Rubinfeld "summed the average willingness to pay for various attributes — no advertising, on-demand listening, mobile service, playlist formation, catalog size, etc. — for hypothetical interactive and statutory services."[12] According to his calculations, he found "an interactivity ratio of 1.90," which Professor Rubinfeld asserts "indicates that the assumed interactivity ratio of 2.0 [which Professor Rubinfeld uses to adjust the on-demand service agreement rates] is conservative."[13]

B. Overview of the McFadden Survey

16. Professor McFadden conducted a "two-part" online survey "to perform an analysis of consumer demand for internet music streaming services" and "to estimate the relative value that consumers place on certain attributes commonly offered by music streaming services."[14] Professor McFadden conducted his survey as an online study, using YouGov®, a service with a prescreened online panel, the members of which are paid for participation in surveys via a point system. Specifically, the survey was

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[11] *Id.* at 2-3.

[12] Corrected Testimony of Daniel L. Rubinfeld at 52. In the Matter of Determination of Royalty Rates and Terms for Ephemeral Recording and Digital Performance of Sound Recordings (Web IV), No. 14-CRB-0001-WR, Oct. 6, 2014 ("Rubinfeld Testimony").

[13] *Id.*

[14] McFadden Testimony at 2.

conducted in two parts that were separated by at least two to three days.[15] The first part of the survey ("Part A") included background questions about music streaming habits, as well as screener questions to target "a population of the U.S. population over the age of 13 with exclusions for respondents with household members who were employed by an online streaming music service, a record company or other owner of copyrighted music, or a marketing research firm."[16] After Part A, respondents were asked to spend two to three days experimenting with streaming music services, such as Spotify and Pandora, to familiarize themselves with the features available.[17]

17. The second part of the survey ("Part B") included a description of Professor McFadden's "incentive alignment;" a conjoint choice-task section, which included definitions for key music streaming service features and a series of choice tasks during which respondents were requested to choose their preferred music streaming service repeatedly from different offerings; and a final section with questions on respondents' usage of music streaming services.

1. Incentive Alignment in the McFadden Survey

18. Professor McFadden's survey used a method called incentive alignment to ensure that, in Professor McFadden's words, his survey subjects were "careful and truthful in responding."[18] With respect to this incentive alignment, Professor McFadden further explained that "[i]n conjoint surveys, it is important to align the respondent's incentives with incentives they would face in the actual market to ensure they accurately reveal their preferences."[19] Based on this objective to accurately reveal preferences, Professor McFadden's survey described its specific incentive to respondents as follows:

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[15] *Id.* at 16.

[16] *Id.* at 11.

[17] *Id.* at 16.

[18] *Id.* at 4.

[19] *Id.* at 14.

> ***We offer you an incentive to participate in this survey****. Here's how it works. You will be shown 15 sets of choices of streaming music plans and you will be asked to choose your preferred plan within each set. One of the choices in each set will be a free plan.*
>
> *We will use a computer algorithm to understand your preferences for streaming music services. We will give you a gift that has a dollar value of $30* ***in total****. Based on your streaming music preferences in this survey, we will select a music streaming service among the ones currently available and give that to you, deducting its actual cost from the $30. Then we will give you the remaining amount as a VISA gift card.*
>
> *For example, suppose that your preferred service costs $10 a month. Then, we will give you this service plus the remaining amount of $20 ($30 minus $10) as a VISA gift card. If this service is actually worth more to you than $10 a month, then you are better off with the service and the $20 VISA gift card than you would be with a $30 gift card. Of course, if the service is actually worth less to you than $10 a month, then you are worse off with the service and a $20 gift card than with a $30 gift card. Everyone will get at least $15 in VISA gift cards.*
>
> ***To guarantee that you get a streaming service that is worth more to you than its cost, try to weigh service features and costs carefully and accurately so that the choices you indicate tell us whether various features of streaming service plans are truly worth their cost.***
>
> *In order to be eligible to receive the incentive, you must complete the survey within one hour of starting it. You will be prevented from moving through the questions too quickly and, if it appears that you are answering questions at random, you will not be eligible for the incentive.*
> ***Please press*** *the* ***forward arrow to start the survey***[20]

19. Incentive alignment for conjoint analysis is used increasingly in the marketing literature. The goal of incentive alignment comprises three components: "the respondents believe (1) it is in their best interests to think hard and tell the truth; (2) it is, as much as feasible, in their best interests to do so; and (3) there is no way, that is obvious to the respondents, they can improve their welfare by 'cheating.'"[21] To be successful, however, a respondent must understand the incentive-alignment

[20] *Id*. at App. B, B-vii (emphasis in original).

[21] Ding, Min, et al., "Unstructured Direct Elicitation of Decision Rules," *Journal of Marketing Research*, February 2011, pp. 116-127 at p. 120.

instructions, the instructions must be complete on all important elements, and they must reflect how choices are made among real music services. If the incentive-alignment instructions fail any of these criteria, then they can do more harm than good.

20. In addition to the general overview of the incentive alignment, Professor McFadden also provided respondents an example of how the actual cost of a currently available music streaming service can be deducted from the total gift amount. The example instructs respondents to think through how much the music streaming services displayed in the choice exercises are actually worth to them: "If this service is actually worth more to you than $10 a month, then you are better off with the service and the $20 VISA gift card than you would be with a $30 gift card."[22] Although it is natural to provide an example, this particular example is worded in a manner that asks his respondents directly to generate a willingness-to-pay for music services. Respondents generate this willingness to pay even though, as Professor McFadden acknowledged, sampled survey respondents "choose the free version [of the music service] decisively over the paid version" when asked which services they used at the time they answered questions in Part A of his study.[22] Thus, Professor McFadden's instructions likely induced a demand artifact that undermined the reliability of any measures of willingness-to-pay estimates that might be inferred from the survey.

2. Conjoint Task in the McFadden Survey

21. After introducing respondents to the incentive alignment, Professor McFadden provided respondents with names and definitions of features common to music streaming services, introductory instructions, and 15 choice tasks evaluating different potential music streaming services. Professor McFadden "focused on those

[22] McFadden Testimony at 17. "When there is a free and paid version of the same platform, consumers choose the free version decisively over the paid version." This result ranges from 86-95 percent, but varies by platform: 86 percent of Spotify users used the free version, 88 percent of Slacker users, 92 percent of Songza users, 93 percent of Pandora users, 95 percent of last.fm users, and 95 percent of Rdio users.

features not available under the statutory license"[23] in order to elicit respondents' willingness to pay for certain features of music streaming services.

22. First, Professor McFadden provided a page that listed seven of the features (excluding price) that would be offered in the choice tasks, along with definitions for each feature, stating "the following definitions may be helpful." The eighth feature, price, was not defined on this page. In most cases, the feature names on the definitions page differed from the feature names that were displayed to respondents in the actual choice screens, which means that respondents not only had to process two names for select features, but also had to invest cognitive effort if they wanted to reconcile the remembered feature names mentioned in the feature explanation section of the survey with the feature names shown during the conjoint task. The features Professor McFadden defined are: (1) "Playlist generation method" (*playlist method* in the choice tasks), (2) "Features available for streaming to a computer" (*on-demand track selection* in the choice tasks), (3) "Ability to listen offline" (*offline listening* in the choice tasks), (4) "Features available for streaming to mobile devices" (*mobile device streaming* in the choice tasks), (5) "Ability to skip songs" (*skip limits* in the choice tasks), (6) "Library size" (*available library size* in the choice tasks), and (7) "Advertising" (also *advertising* in the choice tasks).[24]

23. Professor McFadden does not include brand as a feature in each choice task. He states that his design "controlled for consumers' valuation of brand—Spotify, Pandora, or an unknown brand" by separating the choice tasks into three sets of five choice tasks each. His survey presented brand prompts prior to the actual choice screens.[25] Specifically, following the feature definition screen, Professor McFadden provided the following introductory instructions:

> *Assume that [Pandora/Spotify/one or more new services] is currently offering the plans on the following screens. Please review these plans and answer the questions that follow. If you currently have a plan with Pandora, all of your playlists, radio station, ratings and other settings will be preserved if you switch*

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[23] *Id.* at 7.

[24] *Id.* at App. B, B-viii – B-ix.

[25] *Id.* at 10.

to a different plan.[26] *Assume that any features that are not described are the same for all plans.*[27]

24. The choice tasks were broken into three sets of five choice tasks, each with a new introductory screen varying the brand defined as "[Pandora/Spotify/one or more new services]." The order in which the brand sets occurred was randomized by Professor McFadden. Professor McFadden's testimony does not provide any further information on how he accounted for this brand control in his analyses.

25. Following the introduction, respondents were presented with 15 choice tasks. At the top of each choice task an instruction read: "Assume that a streaming music provider is currently offering the 3 plans shown below." Below this instruction, a grid displayed four columns with the following headers: *Features*, *Plan A*, *Plan B*, and *Plan C*.[28] The "Features" column contained the shortened names for the features defined in the definition page. Each column was associated with the same brand — which was not displayed but defined in the instructions — and contained different options for these features. At the bottom, respondents were asked: "Among the 3 plans shown, which plan do you most prefer?"

26. The order in which the features were presented was randomized by Professor McFadden across each respondent. The feature levels themselves were varied subject to certain constraints. Every choice task included a free option on the far left hand side.[29] No feature available in the free plan could be unavailable or worse in a

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[26] In the absence of any detailed screenshots from Professor McFadden's materials relied upon, I assumed for my qualitative study that the instruction "If you currently have a plan with Pandora…" is updated with Spotify or the generic "new service" based on the brand set that is rotated for each respondent. *Id.* at App. B, B-viii.

[27] *Id.* at App. B, B-ix.

[28] "If the respondent was a current subscriber to Pandora or Spotify, their current plan was included in each of that brand's choice sets and was indicated as such" *Id.* at. 9.

[29] "The first plan displayed in the conjoint table was always a zero subscription price ("free") alternative, followed by two plans with positive subscription prices, with the lower-priced plan displayed in the middle column and the more expensive plan displayed in the final column. The experimental design ensured that the quality of these plans increased along with the price. This ordering mimicked the convenient lowest-to-highest price ordering that

more expensive plan. Professor McFadden "respected natural restrictions on feature combinations."[30] For instance, he notes that, "a plan could not have offline listening features, which require a mobile device, without also having the capability of listening to the service on such a device."[31] (The reverse was not true: a plan could include mobile streaming options but not offer offline listening.)

3. Music Streaming Questions in the McFadden Survey

27. After the final choice task in the conjoint choice exercise was completed, Professor McFadden's survey asked four more questions related to music streaming services. The first two questions assessed the duration and extent of respondents' music listening on Pandora and on Spotify. The third question assessed respondents' likelihood of signing up for their favorite plan of all the paid plans in the choice exercise, if it were offered to them. The final question of the survey assessed respondents' likelihood of signing up for their favorite plan of all free plans in the choice exercise, if it were offered to them.[32] Professor McFadden reports with respect to the likelihood of subscribing to a free service that "most individuals responded that they were somewhat or very likely to use a free service."[33]

28. In the discussions that follow, I first discuss best practices for survey design and development, and then evaluate Professor McFadden's survey with respect to these practices. I then describe the methodology that I used to evaluate the reliability of

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consumers often encounter in sales materials produced by firms to help consumers easily compare products" *Id.* at 10-11.

30 *Id.* at. 9.

31 *Id.*

32 The four questions that Professor McFadden asked were: (1) "During the past two days, how much (if at all) did you listen to music on Pandora?"; (2) "During the past two days, how much (if at all) did you listen to music on Spotify?"; (3) "We have asked you about many versions of paid music streaming services in this survey. If your favorite paid plan were to be offered, how likely would you be to sign up for this plan?"; and (4) "We have asked you about many versions of free music streaming services in this survey. If your favorite free plan were to be offered, how likely would you be to sign up for this plan?" *Id.* at App. B., B-ix, B-x).

33 *Id.* at 19.

Professor McFadden's survey instrument and the implications of that evaluation for the reliability and relevance of Professor McFadden's survey for opinions in this case.

IV. DESIGN AND DEVELOPMENT OF PROFESSOR MCFADDEN'S SURVEY

29. The basic survey methodology that Professor McFadden used is called conjoint analysis. Conjoint analysis was introduced in marketing in 1971 and is widely used by academics and practitioners to evaluate consumer preferences, forecast consumer response to new products, and determine the value that consumers place on features.[34] Conjoint analysis methods vary, but, if the survey is designed well and implemented well, most methods lead to reliable estimates. However, the analysis of the data, and any interpretation based on the analysis, presupposes that the survey is understood by consumers. Feature valuations are only reliable if consumers understand the features as described and defined in the survey. My own empirical research in this case indicates that respondents to Professor McFadden's survey understood neither the incentive alignment instructions nor the feature definitions sufficiently to complete the questionnaire in a reliable and consistent manner. As a consequence, the results from Professor McFadden's survey are unreliable and invalid.

30. In designing and implementing a survey, it is important to follow standard scientific methods to ensure the reliability and validity of the data collected by the survey. If the data are flawed, biased, or cannot be interpreted precisely, conclusions based on the survey have to be carefully scrutinized, and, if based on unreliable data sources such as a fundamentally confusing survey, need to be rejected. To assure that the survey data themselves are reliable, it is critical to adopt the guidelines set forth by market research scientists for surveys conducted for academic, commercial, and litigation purposes. Professor McFadden appears to agree with this premise and states: "The conditions under which conjoint analysis surveys have proven most consistently reliable are when product features and levels considered in the

[34] *Id.* at 4.

elicitations are complete, clear, and realistic."[35] He discusses some of the key design characteristics of a scientifically reliable study in his expert testimony, including, among other things, appropriate sample selection, use of a double-blind design, and the rotation of answer options. Professor McFadden followed some of these prescribed design procedures in the development of his survey instrument but ignored others. Critically, despite conducting a limited pilot study, he did not explore critical aspects of his survey and, hence, did not identify key areas of confusion among consumers, which render his survey data unreliable.

31. Critical survey design elements that were implemented by Professor McFadden are: (1) A *blind design* to ensure respondents' objectivity was not affected by knowledge of the survey's sponsor and/or purpose of the survey;[36] (2) *Introductory/screener questions* to help to identify members of the target population of the survey and determine whether respondents meet the criteria (i.e., "qualify") for inclusion;[37] and (3) *Rotation of answer options* to avoid order effects.[38]

32. The McFadden Testimony also discussed another element of survey design: pretests. Professor McFadden refers to his pretest interviews as a pilot survey. Pretests are useful in accurately designing surveys in both academia and litigation cases, particularly when the survey instrument is complex, as in the case of Professor McFadden's study. Pretests can be particularly important when the survey relies on industry specific terms or jargon which may not be understood by target respondents. A carefully conducted pretest informs the researcher whether a survey is well-constructed and provides the basic elements to produce reliable data.

33. As Shari Diamond points out in her guide to survey research in litigation, "[t]exts on survey research generally recommend pretests as a way to increase the likelihood

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[35] *Id.* at 4.

[36] *Id.* at 13.

[37] *Id.* at App. B, B-iv – B-vi.

[38] *Id.* at 14.

that questions are clear and unambiguous."[39] For example, questionnaires must use language that respondents find easy to understand. If the questions of interest are ambiguous or otherwise unclear, the results of the survey are likely to be distorted due to guessing or misunderstanding on the part of the respondent. In order to prevent such misunderstandings, to the extent possible prior to administering the final survey, it is important to evaluate (or "pretest") the proposed series of questions with a small sample of "the same type of respondents who would be eligible to participate in the full-scale survey."[40] Such pretests can also help to assess the potential for demand artifacts (including those related to guessing the purpose and sponsor of the study or artificially focusing on constructed willingness-to-pay) and recall issues, and to ensure that all survey questions were understood as intended.[41]

34. Professor McFadden conducted a limited pretest, which consisted of a pilot survey combined with a very small percentage of follow-up interviews. Specifically, he provided his survey to 52 respondents; 22 of whom agreed to be contacted with follow-up questions. Ultimately, nine out of the 22 contacted respondents responded to a phone interview after a certain time after the survey.[42] Thus, Professor McFadden had no information on comments that could have been made by over 80 percent of the pretest respondents. It is possible that the non-response could have been driven by confusion or difficulty in answering the survey's questions.

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[39] Diamond, Shari S., "Reference Guide on Survey Research," in *Reference Manual on Scientific Evidence*, Third Edition, Federal Judicial Center, 2011, pp. 229-276, at p. 248.

[40] Diamond, Shari S., "Reference Guide on Survey Research," in *Reference Manual on Scientific Evidence*, Third Edition, Federal Judicial Center, 2011, pp. 229-276, at p. 249.

[41] Diamond, Shari S., "Reference Guide on Survey Research," in *Reference Manual on Scientific Evidence*, Third Edition, Federal Judicial Center, 2011, pp. 229-276, at pp. 247-248.

[42] For a very simple survey with non-ambiguous, relatively easy-to-understand content, a relatively small number of pretest candidates may suffice if none of the candidates indicates difficulties with understanding the survey and its instructions. However, in this case, Professor McFadden interviewed only a small percentage of the number of pilot respondents to his pilot.

According to Professor McFadden's summary of his pretest, interviewers discussed with these nine respondents (1) whether the respondents "understood the choice tasks generally;" (2) "whether there were any attributes that they considered important that they had not been asked about;" (3) whether they were familiar with music streaming services; (4) and whether they became "bored with the presentation of the choice tasks or found the survey too lengthy."[43] It is notable that Professor McFadden does not state explicitly that the respondents understood the features of the music services or that they understood the incentive-alignment instructions. Professor McFadden did not provide detailed information on follow-up questions, answers, or comments that were part of the interview with the nine respondents.[44]

35. According to his testimony, Professor McFadden "simplified the description and number of levels of the playlist attributes and simplified the language about incentives."[45] One can assume such changes were in response to respondents experiencing trouble understanding the playlist feature and the incentive alignment. Professor McFadden provides no evidence, however, that his changes to the survey were pretested or that the changes were sufficient to remove respondent confusion. My qualitative study suggests that the changes were not adequate and that there remained substantial confusion among respondents.

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[43] McFadden Testimony at 15.

[44] Pretest interviews need not be recorded. The survey expert can prepare a summary of what was learned from the pretests and what changes were made as a result. However, the survey expert should be able to defend the pretest and be confident that, were someone else to do a parallel and unbiased pretest, the auditing researcher would not find confusion.

[45] McFadden Testimony at 15-16. Based on information provided by Professor McFadden, he also made substantial edits to the language of the *on-demand track selection* and *mobile device streaming* definitions as well as minor edits to all feature definitions and the names of the features as listed on the definitions page. See "Pilot Survey Questions," SNDEX0018484.txt.

V. THE RESULTS OF PROFESSOR MCFADDEN'S LIMITED PRETEST, CONFUSING FEATURE DESCRIPTIONS, AND HIGH DROP-OUT RATES INDICATE THE SURVEY INSTRUMENT LIKELY PROVIDED DATA THAT WERE NOT RELIABLE

A. Confusing Feature Descriptions

36. When reviewing Professor McFadden's survey implementation, I discovered that several of his features were described using potentially hard-to-understand language, were referred to inconsistently throughout the survey, appeared to be partially overlapping in their descriptions, or were potentially incomplete. Such feature descriptions may have caused confusion for respondents or left substantial room for interpretation.

37. While some of Professor McFadden's features were generally self-explanatory, other features were complicated and described in potentially difficult-to-understand language. For example, Professor McFadden's description of the *playlist method* is relatively brief but uses terms and ideas that may be unfamiliar to average consumers. Such terms include "curated," "music tastemakers," and "computer algorithm."[46] These terms are industry-specific terms that may seem easy to understand to someone who has carefully evaluated service options and features, or studied streaming music services, but may be beyond the vocabulary of a casual streaming user. I assessed Professor McFadden's description of *playlist method* using the Flesch Reading Ease scale and the Flesch-Kincaid Grade Level. These metrics are commonly relied upon to assess the readability of a fragment of text or a document.[47] Professor McFadden's passage on music tastemakers scores a 13.2 on the Flesch Reading Ease scale. This result is concerning, as a score below 30 on the Flesch Reading Ease scale indicates that the text fragment is best understood by university graduates, which means that individuals with a lower education level are less likely to understand and comprehend the same text. That same passage on music tastemakers scores a 21.1 on the Flesch-Kincaid Grade Level, a measure that

[46] McFadden Testimony, Appendix B, p. B-viii.

[47] Zamanian, Mostafa and Pooneh Heydari, "Readability of Texts: State of the Art," *Theory and Practice in Language Studies*, 2(1), January 2012, pp. 43-53, at p. 44.

relates readability to a particular US grade level; a score of 21 indicates a level of difficulty of the 21st grade (equivalent to graduate education). Although language complexity and complex instructions do not make a survey per se unreliable, it is a cause for concern and normally indicates the need for a thorough pretest of the survey to establish ease of understanding among typical survey respondents. If only a small fraction of the target population can comprehend descriptions that are crucial to understanding the survey and, more specifically, the valuation of a feature in a conjoint analysis, then the results from the conjoint study are likely to be unreliable. The preferences of respondents cannot be reliably assessed if the respondents do not understand the feature for which their preferences are intended to be measured.

38. Another reason for concern is that Professor McFadden referred to features inconsistently throughout the survey. Professor McFadden defined all features in the introductory screens, but referred to these features during the choice tasks by using a shorthand that was not defined as part of the overall definitions.[48,49] In some cases, this shorthand could be tied back to the definitions easily (e.g., "library size" vs. "available library size"), but in others the undefined shorthand could have caused additional confusion or bias for respondents. The feature "ability to skip tracks" on the definitions page is listed as "skip limits" on the choice tasks. This changes the framing of the feature from a positive connotation (an ability to skip) to a negative connotation (a limit to the ability to skip). Such framing could affect the valuation of this feature.[50]

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[48] Unless otherwise noted, throughout this report, I will refer to features using the shorthand versions from the choice task screens.

[49] Sometimes feature descriptions are long or presented with videos, animations, or pictures. In this case, the survey may use a shorthand (or icons) to represent the features. The shorthand simplifies the choice screens. However, whenever shorthand is used, the shorthand must be explained to the respondent and pretests must ensure that the respondent can reliably interpret the choice screens using the shorthand. In such cases, it is common to make it easy for the respondent to refer back to the original descriptions at any point in the survey.

[50] Tversky, Amos and Daniel Kahneman, "The Framing of Decisions and the Psychology of Choice," *Science*, Vol. 211(4481), 1981, pp. 453-458, at p. 456. "Outcomes are commonly

39. Other features had little relationship between their names: for example, "features available for streaming to a computer" as defined on the definitions page is referred to as "on-demand track selection" in the choice tasks. This name is so different from the name in the definitions that it may be very difficult for respondents to relate the two concepts. Moreover, the ability to select tracks on demand is only one of the possible options of this feature. In fact, Professor McFadden sets "album, artist, and song selection on demand" as the highest-priced level for this feature in his choice tasks, thus framing it as the premium option. Referring to the feature broadly as "on-demand track selection" rather than the more neutral "features available for streaming to a computer" reinforces the premium character and potentially changes the valuation of the feature, potentially biasing responses in favor of that level of functionality relative to neutrally named features.

40. Aside from concerns regarding the framing of features, the existence of two names means additional cognitive load for respondents. A potential consequence of additional cognitive load and cognitive depletion may, in fact, be frustration, lack of attention, and the tendency to abandon the survey. If some respondents abandon the survey because they find the features confusing, such abandonment could skew the sample towards people who are more expert and enthusiastic about the topic at hand. Such respondents could very well value these features differently than non-expert, less enthusiastic respondents. Confusion, and potentially increased cognitive effort, can also lead to changes in choice behavior. For example, respondents may spend less time trading off features and instead make very quick, superficial choices that do not reflect their true underlying preferences.

41. In addition, some features had similar and/or overlapping options. For example, the features *on-demand track selection* and *mobile device streaming* displayed very similar options. Both features included options for "playlists generated by the service" and "album, artist, and song selection on demand." This is liable to cause

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perceived as positive or negative in relation to a reference outcome that is judged neutral. Variations of the reference point can therefore determine whether a given outcome is evaluated as a gain or as a loss." In other words, according to the authors, specific framing can potentially "reverse the preference order between options."

confusion. The mere similarity between these different features could have caused significant confusion among respondents and may have led them to mix up features during their trade-off and product evaluation process, which, in turn, would affect the estimation of the value of these features using a statistical model. Not only did these features have overlapping options, but both features offered the option "playlists generated by the service," which itself potentially overlaps with the *playlist method* feature. Professor McFadden did not specify or clarify whether these playlists were generated in the same manner as specified in the *playlist method* feature for any given plan. Respondents could interpret the vague feature descriptions in many different ways, making it virtually impossible to compare any willingness to pay estimates among features or among respondents.

B. Feature Descriptions Allowing Varied and Substantially Distinct Interpretations

42. Other feature descriptions potentially suffered from a lack of specificity that could affect the value placed on the feature by respondents. If this happened, the lack of specificity would make any interpretation of results unreliable in the context of real music streaming services. For example, features such as *offline listening* were described as simple yes/no features without further details on potentially important feature levels that are inherent to the feature and cannot be considered self-explanatory. For example, it likely matters whether the ability to listen to songs offline during a flight includes 20, 100, or 1,000 songs.

43. Moreover, Professor McFadden's Testimony notes that *offline listening* is only applicable when using a mobile device,[51] but this is never specified in any feature descriptions or instructions in his survey instrument. His respondents were not informed of this restriction, and may have tried to reconcile the feature with their computer-based streaming behavior.

[51] McFadden Testimony at 9.

44. In addition, even features that did seem self-explanatory at the first glance were missing a depth of information that is likely necessary for consumers' decision-making processes. Consider, for example, the "feature" of having to listen to advertising. For some respondents, the possibility to listen to *1.5 to 3 minutes of ads per hour* in 2 blocks is much less burdensome than being interrupted 10 times for a total of 1.5 to 3 minutes; for others, the relationship might be reversed. Consequently, the feature *1.5 to 3 minutes of ads per hour* is likely to generate very different utilities across consumers for two reasons. Similarly, consider different interpretations of the word "tastemaker." If a consumer is encouraged to interpret a tastemaker to be a celebrity such as Beyoncé, the respondent may receive value from the fact that the respondent can participate in the celebrity's taste. If, however, the same respondent is encouraged to interpret a tastemaker as an unspecified person who works at the streaming service, the respondent may perceive a different value because the respondent does not participate in the celebrity's taste. One cannot know which interpretation the respondent had in mind: Without knowledge of which respondents interpreted tastemaker either way, it is not possible to reliably estimate respondents' valuations and match their preferences to the actual features in the marketplace. Perhaps the survey was relying on terms of art that are known in an industry, but there is no reason that consumers would be experts in such terms of art. Consumers rely on their own language, which is why good survey practice requires a survey designer to first determine the words and phrases that consumers use to describe features and then use those words and phrases in the same manner in the survey.[52]

45. For people who interpret the feature in (almost) the exact same way, Professor McFadden can determine to what extent their preferences, and therefore their underlying feature valuations, differ from one another. Professor McFadden's statistical model relies on determining the true variation in feature valuations among consumers, provided that the premise of a singular interpretation of the feature or feature level holds true. If, however, respondents interpret features or feature levels

[52] Payne, Stanley L., *The Art of Asking Questions*, Princeton University Press, 1980.

differently, then the estimates of feature valuation, and the manner in which such valuation vary among consumers, is confounded with differing interpretations of the meanings of features. Such confounding renders the statistical model unreliable. The statistical model cannot determine whether the variation in utilities is caused by true preference differences or simply by distinct interpretations of the feature definition. When there are distinct interpretations of a feature, the estimated feature valuation might be more strongly driven by differences in the interpretation of features rather than by valuations of those features.[53]

C. Professor McFadden's Final Feature Definitions and Incentive Alignment Were Not Tested

46. If respondents indicate significant problems with a survey in a pretest, then it is best practices to modify the survey and retest the survey. When problems are significant, it may be useful to continue pretesting until respondents no longer indicate any noteworthy problems with the survey. Professor McFadden found problems, attempted corrections, but did not pretest his corrections.

47. Based on a review of his production materials, Professor McFadden altered the definitions of every single feature in his study, changed the names of all but one of his features, and changed both the language and the mechanism of the incentive alignment between the end of his pretest and the actual launch of his survey. In his testimony, Professor McFadden does not explain these substantial changes.

48. Professor McFadden claims that he "simplified the description and number of levels of the playlist attributes and simplified the language about incentives."[54] An example of what he may have meant by simplification is the *playlist method* feature. After his pretest, Professor McFadden apparently reduced the three elements in his feature levels to two elements, dropping "playlists customized by your votes and

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[53] Slight variations in interpretations of feature descriptions should be expected and can be considered measurement noise. When there is slight variation, the results from the statistical models should not be affected in a substantial manner. If, however, the variation is substantial, then the statistical estimates cannot be interpreted reliably.

[54] McFadden Testimony at 15-16.

preferences of users with similar tastes, or playlists customized using your votes and song attributes" in favor of "[playlists] generated by a computer algorithm customized by the user's preferences or feedback (often provided by 'like' or 'dislike' votes)." As my qualitative study of Professor McFadden's survey instrument demonstrates, the resulting change did not eliminate substantial confusion.

49. While attempting to simplify the incentive alignment language, Professor McFadden actually *added* substantial content to his description of the incentive alignment. The pilot version of his incentive alignment was much shorter and, rather than suggesting the respondent would receive a customized plan, instead claimed that the respondent would randomly be selected to receive "one of two gifts: (1) a $30 VISA gift card or (2) a $30 gift card to one of several possible popular music streaming services. [The respondent's] streaming music preferences [would] determine the chance that [the respondent would] receive each of the two gifts."[55] This incentive structure is different from the incentive alignment presented in his final survey, which involves deducting the cost of a selected music streaming service gift card from a second gift card with a cash value. Professor McFadden also added the example of a hypothetical respondent whose "preferred service costs $10 a month"[56] after conducting his limited pretest. This new example included the accompanying discussion of whether the respondent did or did not value the service more than $10 and, thus, whether they would or would not be better off with the deal than with a $30 VISA gift card. This language is technical and includes economic concepts like willingness-to-pay and evaluating but-for options. Without careful wording and

[55] "We will choose at random between one of two gifts: (1) a $30 VISA gift card, or (2) a $30 gift card to one of several possible popular music streaming services. Your streaming music preferences will determine the chance that you receive each of the two gifts" ("Pilot Survey Questions," SNDEX0018484.txt).

[56] McFadden Testimony, App. B, B-vii.

extensive pretesting, such concepts may be difficult to explain to typical survey respondents.[57]

50. In addition to the changes that Professor McFadden explicitly mentioned in his testimony, he also changed the names of all of the features except for *advertising*, without changing the names in the accompanying choice tasks. In his pilot survey, the feature names on Professor McFadden's definitions page matched the names in his choice tasks, but in his final survey most of these names were not matched.

51. Finally, Professor McFadden added or altered language in all of his remaining feature descriptions. In some cases the changes were minor: for *offline listening,* he changed the name from "offline listening" to "ability to listen offline" and the definition from "users can download and listen to a selection of the service's music when internet access is unavailable" to "ability to download and listen to a selection of the service's music when internet access is unavailable." In other cases, the changes were more substantial. He changed the name of "on-demand track selection" to "features available for streaming to a computer" and completely reworked the definition, adding a new sentence and altering the existing sentence substantially. The pilot survey definition was "Users can select a particular track (songs) to hear on-demand, users can listen to an entire album on-demand, and users can create their own playlists." The new definition starts with a new sentence and alters the language to the existing sentence: "Using desktop software or a web interface from a computer, users may be able to access playlists generated by the

[57] In addition to a number of other changes, Professor McFadden added two complete paragraphs: "For example, suppose that your preferred service costs $10 a month. Then, we will give you this service plus the remaining amount of $20 ($30 minus $10) as a VISA gift card. If this service is actually worth more to you than $10 a month, then you are better off with the service and the $20 VISA gift card than you would be with a $30 gift card. Of course, if the service is actually worth less to you than $10 a month, then you are worse off with the service and a $20 gift card than with a $30 gift card. Everyone will get at least $15 in VISA gift cards.

To guarantee that you get a streaming service that is worth more to you than its cost, try to weigh service features and costs carefully and accurately so that the choices you indicate tell us whether various features of streaming service plans are truly worth their cost." See McFadden Testimony, App. B, B-vii, and "Pilot Survey Questions," SNDEX0018484.txt.

streaming service and/or play specific tracks 'on demand.' With 'on demand' features, users can listen to particular tracks (songs) or an entire album on request and users can create their own playlists."[58]

52. Professor McFadden made substantial changes to his feature definitions and incentive alignment process and language, all of which are crucial aspects of his survey. In cases with complex instructions and language, with such extensive changes following a pretest, it is best practice to re-test the survey to assess whether the new language is understandable to respondents. I have seen no evidence that Professor McFadden has done such retesting.

D. Professor McFadden's Pretest Appears To Have Indicated that Respondents Had Trouble Understanding Key Aspects of the Survey

53. Of the 52 respondents who took Professor McFadden's pilot survey, almost 60 percent did not wish to be re-contacted. Ultimately, less than 20 percent of his pilot respondents were interviewed as part of his pretest. It is possible that these self-selected interviewed respondents were exactly the respondents who were less bored with the survey than those who refused further contact. If this were the case, then one cannot project to the universe of survey respondents any statements that the respondents were not bored with the survey.[59] A more appropriate methodology for recruiting pretest participants is to formally invite people to participate in a pretest process before they embark on the pilot study. Such an approach would avoid potentially-systematic nonresponse bias that arises from attempting to contact respondents after the pretest.

54. Given the large number of changes that Professor McFadden implemented following his pilot study, even these respondents who agreed to be contacted must have indicated sufficient difficulty with the survey to prompt these changes to the survey.

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[58] See McFadden Testimony, App. B, B-viii, and "Pilot Survey Questions," SNDEX0018484.txt.

[59] Olson, Kristen M., "Survey Participation, Nonresponse Bias, Measurement Error Bias, and Total Bias," *Public Opinion Quarterly*, 70(5), 2006, pp. 737-758.

55. None of the evidence provided by Professor McFadden after his pilot study addresses potentially fundamental issues of survey construction, such as the difficult and likely confusion-inducing language describing the incentive alignment and feature characteristics.

E. High Drop-out Rate of Respondents in the McFadden Survey

56. In reviewing Professor McFadden's survey, I took note of Table 3 in his testimony, reproduced below:

Table 3: Disposition of Sample Respondents

	Adults	*Teens*
Total Contacted:	5,163	1,255
Total Who Started Part A:	3,598	574
Total who Completed Part A (excludes ineligible respondents and those who declined or did not complete the survey):	1,419	239
Total Who Finished Part B:	906	77
Completes Over Part A Finishers	64%	32%

57. The drop-out rate within Part A (from "Total Who Started Part A" to "Total who Completed Part A […]") is potentially reasonable because it includes respondents who were not eligible for the survey. However, the high drop-out rate between Part A and the end of Part B is a concern.[60]

58. Table 3 of Professor McFadden's testimony enables us to calculate drop-out rates and to do so for adults and teens separately. According to the data in the table, only 59 percent of people who completed Part A also completed Part B, which means that 41 percent of respondents did not complete Part B of the survey. For teens, the dropout rate is 68 percent. In my experience, these rates are unusually high for an online conjoint analysis survey.

59. The typical causes for high drop-out rates include poorly programmed surveys, lengthy surveys, tedious and repetitive questions, confusing instructions, or any

[60] Based on a review of Professor McFadden's backup, I cannot determine with certainty what share of dropped out respondents is attributable to those respondents who never started Part B as opposed to those respondents who started, but did not finish, Part B.

difficulties that increase cognitive load to a point where respondents would rather abandon the survey than finish it.[61] The high drop-out rates in Professor McFadden's survey suggest that one or more of these problems occurred. In best practice, a carefully conducted pretest should have identified any problems that were causing the high drop-out rates. The pretest should have led to changes in the survey to reduce drop-out rates. If respondents are dropping out because they do not understand the feature descriptions and/or the incentive-alignment instructions, then the survey completers are a self-selected sample that does not represent the population of music-streaming consumers. My qualitative study, akin to a more complete pretest, of Professor McFadden's survey demonstrates that there was a substantial amount of confusion, which is consistent with the high dropout rates observed in Professor McFadden's survey.

VI. ASSESSING PROFESSOR MCFADDEN'S SURVEY INSTRUMENT USING AN EVALUATIVE QUALITATIVE STUDY

60. To better understand whether and to what extent respondents were confused by, or did not understand, Professor McFadden's survey, I conducted a thorough evaluative qualitative study of the survey instructions and questions using videotaped in-person interviews (See Exhibits 1.a and 1.b for examples).[62] At my direction, an experienced, professional marketing research firm, Applied Marketing Science ("AMS"), presented Professor McFadden's survey questions to a set of 53 respondents in the Boston Metro region and Denver, CO. I replicated Professor McFadden's survey questions using standard online methods because survey computer code was not provided by Professor McFadden.[63] My qualitative study

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[61] Diamond, Shari S., "Reference Guide on Survey Research," in *Reference Manual on Scientific Evidence,* Third Edition, Federal Judicial Center, 2011, pp. 229-276, at pp. 245-246.

[62] All videotapes and associated interview transcripts are included in my production materials.

[63] Under my guidance, AMS replicated Professor McFadden's survey based on Appendix B in the McFadden Testimony, and a mock-up or screenshot of one choice exercise as displayed on p. 10 of the McFadden Testimony. I did not receive any materials with further detail on the construction of Professor McFadden's survey. It is my understanding that Counsel for

respondents, who were selected using the same screening criteria as Professor McFadden's respondents, took Part A of the survey on a computer at their home and took Part B on a computer on-site. They were then interviewed by double-blind interviewers on-site according to a qualitative research questionnaire that I designed (included as Appendix D). More specifically, respondents were asked about their understanding of the gift-card incentive (incentive alignment), their understanding of the various features in the survey, and their ease or difficulty in navigating the survey. Unlike in Professor McFadden's pretest, where he was only able to interview a small portion of his test respondents, I was able to interview all of the 53 participants who took Part B of Professor McFadden's study as part of my qualitative study, avoiding any potential drop-out bias in responses.[64]

61. My qualitative study followed Professor McFadden's survey methodology as closely as feasible: it included Professor McFadden's original screening survey, the two-to-three day waiting period, and a full replication of his "Part B" survey, including the conjoint choice tasks. Screenshots of my replication are included as Appendix E. At my direction, AMS worked with Fieldwork, a market research firm that specializes in recruiting and provides interview facilities,[65] to interview 53 respondents who finished the first portion of Professor McFadden's survey and then came to research facilities for the second portion of the survey. Of these 53 qualitative study candidates, 29 came to Waltham (near Boston) and 24 came to Denver. Similar to Professor McFadden's YouGov® panel, these respondents were

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SoundExchange indicated that all materials necessary to replicate Professor McFadden's survey had been provided as part of their production.

64 11 additional respondents started Part A of Professor McFadden's survey in connection with my qualitative study. These respondents did not participate in Part B and were not interviewed.

65 Fieldwork's rigorous recruiting process includes quality checks such as constant database updates, tracking for participation and undesirable respondents, extensively training recruiters for high recruiting integrity, careful screening processes, commitment to the MRA standards of ethics in data collection, and numerous other techniques to ensure a high quality of recruited respondents. For further information, see "Fieldwork Recruiting," http://www.fieldwork.com/recruiting, (last visited on Feb. 15, 2015).

pre-screened and reimbursed for their time. Because this study asked people to visit the interview facility, respondents were offered $100 in compensation for their time and efforts, in addition to the $30 gift-card incentive offered by Professor McFadden's survey.[66]

62. My qualitative study respondents took Part B of the online survey on laptop computers provided by AMS at the interview site, with interviewers following along on a separate laptop synchronized to the first. The interviewer was provided with a script of questions and instructions for how to conduct the interview.

63. It is important when conducting qualitative research to ensure that research be done carefully and in an unbiased manner. I took several measures to ensure that this was the case for my qualitative study. Following standard scientific protocol, my qualitative study was conducted as a double-blind study: AMS provided six experienced interviewers who were not informed of the purpose of the qualitative study, and instead were instructed to "pretest" a general market research survey. Supervisors to the interviewers were similarly kept blind to the purpose, the sponsor, and the litigation parties involved in this case in order to avoid any demand artifacts. Similar to the interviewers conducting the study, recruited qualitative study candidates were informed that they were participating in a general market research survey. The interview script was carefully constructed to include double-sided questions that did not suggest a correct or preferred answer (e.g., "Do you understand or do you not understand…"). Interviewers were instructed not to provide confirming responses such as "correct" or "yes" after respondents answered questions and to assure respondents that there were no right or wrong answers.

64. When asked about features, instructions, or the choice tasks in the replicated survey, study respondents were allowed to go back to prior pages of the questionnaire by using the back button in the web browser. Therefore, qualitative study respondents had the opportunity to reflect on a question — and the survey — before making

[66] It is standard practice to provide monetary incentive to respond to surveys, aside from any incentive alignment. Professor McFadden's YouGov® survey also provided monetary reward in the form of YouGov® "points" which can be redeemed for gift cards or merchandise.

statements to the interviewer. The advantage of this method is twofold. First, the qualitative study respondents were given the time to literally "re-view" details of the survey, providing them time to digest the information. Second, this method puts an emphasis on providing true thoughts rather than on remembering correctly.

65. The transcripts and videos of my qualitative study interviews are considered qualitative data. There is a long tradition in marketing and other social sciences of analyzing qualitative data and, as a result, methodologies have been developed to assure independent and unbiased analyses of qualitative data.

- First, qualitative data require human judgment. Information is communicated by the qualitative study respondents by their words expressed in an open-ended (non-categorical) manner. Information is also expressed by intonation, facial expression, and body language. Thus, we need human "judges" to interpret, or at least categorize, the data.
- Second, neither I nor Professor McFadden are blind to the hypotheses of the "pretest." Thus, we need the judges to be independent and blind to the hypotheses of the study.
- Third, it is the nature of qualitative data that some quotes can be "cherry-picked" out of context. We must take steps to prevent such cherry-picking. The independent-judging methodology provides the means to identify representative quotes. Specifically, after the judges establish categories of responses and assign respondent responses to those categories, we can choose examples in the categories to illustrate the categorization as long as we also report how often respondent responses fall into these categories. For example, if 60 percent of respondent responses fall into category "A," we can reasonably give an example quote from that category and indicate that the quote is typical of 60 percent of respondents. By the same token, if only one percent of respondent responses fall into category "B," we, as research scientists, can provide the quote from the 1 percent of respondents, but we must be careful to not represent the quote as applying to a larger fraction or to respondents in general.

Thus, following scientific procedures from the social sciences, I implemented a double-blind, independent judges methodology. Although I personally reviewed representative videos to assure that the interviewers and judges followed the instructions I set forth scientifically, the assignment of respondent responses to categories is based on the result of the judging methodology rather than my not-blind-to-the-hypotheses judgments. These steps assure that I have not biased the results in any way.

66. Under my instruction, temporary and permanent employees at Analysis Group, who were blind to my assignment in this case as a rebuttal expert and to the sponsor/author of the underlying survey instrument, were asked to review the videos and transcripts from my qualitative study. Two blind-to-the-purpose coders were asked to review the transcripts for all 53 respondents and group similar responses together. For any given feature, the coders separately reviewed all answers to probing questions on the meaning of the feature and created categories based on the different ways the respondents understood the feature. If all respondents understood in the same way, only one category would be created. If, however, at least one respondent interpreted the feature substantially differently from the other respondents, there would be two or more categories of response. No instruction was given regarding the "correct" number of categories. Based on the objective of focusing on the verbatim answers in order to allow for reasonable grouping, wherever possible, responses were put into categories. A respondent who indicated an element of confusion after several probing questions could still be placed into a category of a correct definition if his verbatim answers contained recognizable thoughts that reflected the intended meaning of Professor McFadden's definitions.

67. My qualitative study determined that the overall methodology of a conjoint study (i.e., the choice tasks) was clear to respondents and generally well-suited to evaluate consumer preferences. For example, one respondent stated:

A: I like that it had all three plans laid out, and it had different amounts of prices.[67]

Another respondent answered:

Q: How easy or difficult did you find this exercise to answer?

A: Easy. . .It's simply laid out, so it's easy to read all of it.[68]

A third respondent reflected the same opinion:

Q: How easy or difficult did you find this exercise to answer?

A: It was pretty easy. . .The plans are laid out very well. Very easy to compare the three. That made it simple, just interpretive comparing.[69]

68. My qualitative study also determined, however, that many of Professor McFadden's feature descriptions were confusing to survey respondents and that only a small fraction of respondents understood the incentive alignment instructions.

A. Professor McFadden's Incentive Alignment Was Confusing

69. Professor McFadden states that he introduced an incentive alignment in his survey because "it is important to align the respondent's incentives with incentives they would face in the actual market to ensure they accurately reveal their preferences."[70] Incentive alignment is increasingly common when employing a conjoint survey, when feasible and when the instructions are understood by the respondents.[71] I have used incentive-aligned conjoint-analysis surveys in both my academic and consulting research. I am quite aware of both the advantages of incentive alignment and the challenges of identifying careful phrasing that aligns incentives for ordinary consumers.

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67 Combined transcripts from qualitative research interviews conducted by Applied Marketing Science on January 14-15, 2015, from here on "Transcripts," p. 17, Alexandra F.

68 Transcripts, p. 74, Bradley K.

69 Transcripts, p. 135, Chad H.

70 McFadden Testimony at 14.

71 Min Ding, An Incentive-Aligned Mechanism for Conjoint Analysis, *Journal of Marketing Research*, Vol. 44, (2007), pp. 214–23, at 215.

1. Professor McFadden's Incentive Alignment Did Not Account for Common Pitfalls of Incentive Alignment

70. Incentive alignment is an increasingly common addition to conjoint analyses in certain settings, particularly when the product or service tested can be believably custom-tailored to a respondent's preferences. If, however, respondents misunderstand or misinterpret the incentive offered to them, inaccuracies can be increased, potentially rendering the study unreliable. If incentive alignment causes confusion and/or causes the respondent to make choices that systematically deviate from the choices the respondent would have made in the marketplace, then it can be counterproductive. Therefore, it is important for a researcher to pretest the incentive alignment carefully and, if confusion appears to exist, to reword the incentive alignment instructions until there are no signs of confusion and no counterproductive incentives that encourage respondents to deviate from their true preferences.

71. In implementing his incentive alignment, Professor McFadden cites a seminal paper on incentive alignment in conjoint analysis, "An Incentive-Aligned Mechanism for Conjoint Analysis" by Min Ding to support incentive alignment.[72, 73] Nonetheless, Professor McFadden's survey does not account for many of the specific warnings and potential pitfalls discussed in Ding's paper. In the following paragraphs I discuss some of these warnings and potential pitfalls.

72. **Believability**. Properly constructed incentive alignment mimics real world decisions by convincing respondents that their choices in the survey have real consequences. Respondents are promised a gift that is customized to their preferences based on the choices they make in the survey: in this way, the choices respondents make have a clear and direct consequence. Ding offered respondents an iPod along with a customized "package" of accessories. These accessories were all available on the

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[72] McFadden Testimony at 14. Min Ding, An Incentive-Aligned Mechanism for Conjoint Analysis, *Journal of Marketing Research*, Vol. 44, (2007), pp. 214–23, at 215.

[73] I have co-authored papers with Min Ding in which we used incentive alignment. I have discussed the challenges of incentive-alignment at length with Min Ding.

Apple website and were often sold in different package bundles.[74] Thus, the idea of receiving one's personal custom bundle was believable and helped the incentive alignment to work. Professor McFadden's incentive, however, is not as easily customizable. He did not pretest to establish whether or not respondents, customized based on their answers to the survey, believed that their favorite music streaming service could be identified from among existing services.

73. Professor McFadden also instructed respondents to assume that, if they are a current subscriber, "all of [their] playlists, radio station, ratings and other settings will be preserved if [they] switch to a different plan."[75] This is a reasonable assumption if respondents switch within services; however, if their choices indicate a preference for a service to which they do not currently subscribe, they may not believe that these preferences would transfer. [76]

74. **Familiarity.** In order to reasonably answer a survey, respondents must be familiar with the product features at issue. If they are too familiar with the products, they may disregard instructions given to them or overwrite them with their own outside knowledge. Ding specifically chooses a newly launched iPod Shuffle product to test his incentive alignment in order to avoid this potential familiarity bias.[77] Professor McFadden does not account for the issue of familiarity being dominant enough to overwrite his feature descriptions. My qualitative study, however, provides numerous examples where respondents interpret features either differently than intended by Professor McFadden or supplement their understanding with their own feature details as based on their own experiences with Spotify or Pandora. For

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[74] Min Ding, An Incentive-Aligned Mechanism for Conjoint Analysis, *Journal of Marketing Research*, Vol. 44, 214–23, (2007), at 217.

[75] McFadden Testimony at App. B, B-viii.

[76] One respondent said, "I thought it meant that my playlists or my radio stations on Pandora would show up and then I would go from there, but I don't think that's what it's saying. […] I think it would have been a little more helpful to clarify if I'm going to be logging into my Pandora account, or it's just going to be as an example." (Transcripts, p. 448, Julianna J.)

[77] Min Ding, An Incentive-Aligned Mechanism for Conjoint Analysis, *Journal of Marketing Research*, Vol. 44, 214–23, (2007), at 217.

example, because Professor McFadden did not specify the details of *advertising*, such as how often advertisement blocks occur, several respondents based their understanding of this feature on their previous experiences with different music streaming services:

> *Q: How many blocks of advertisements did you assume to be played when you read "1.5 to 3 minute of ads per hour"?*
>
> *A: I figured that would be at least 15 seconds an ad, so if they did one ad at a time, then—I think it was 30 seconds for Spotify, though—not Spotify, Pandora. I'm going to say a good ad is 15 seconds. Four a minute, 6 every minute and a half, so it'd be 6 to 12.*[78]

Or:

> *Q: Could you tell me in your own words what it means when there are 1.5 to 3 minutes of ads per hour?*
>
> *A: One and a half to 3 minutes of ads per hour seems pretty small, when an hour is 60 minutes. That's a very small fraction of an hour. I wouldn't find that—I'm not sure if that's currently what Pandora does, since I've used Pandora for years. Here and there, having a 30-second ad—that's just like five to ten, if they're 30 seconds. I think I did my math wrong. One to five minutes, I don't think that's—yeah, five, six ads, that doesn't bother me in an hour. It's such a small fraction.*[79]

75. As I will discuss in more detail in Section VI.E of this report, any substantial deviations from the intended meaning of the features create unreliable data that yield invalid statistical results.

76. **Endowment.** Incentive alignment attempts to mimic real world choices, but respondents are faced with a minor windfall in the form of their payment, or as Professor McFadden puts it, their "gift."[80] Ding notes that this may create a situation in which respondents "behave differently than they would in real life because of this potential gain."[81] This limitation is difficult to avoid in any incentive aligned study, and, in some cases, does not compromise incentive alignment. However, because of the endowment effect any specific incentive alignment must be carefully pretested

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78 Transcripts, p. 242, Edward B.

79 Transcripts, p. 110, Brian G.

80 McFadden Testimony at 14.

81 Ding, Min, "An Incentive-Aligned Mechanism for Conjoint Analysis," *Journal of Marketing Research*, Vol. 44, 2007, pp. 214–223, at p. 222.

before implementation. My study of Professor McFadden's incentive alignment language indicates that some of the respondents used the windfall to choose services that were not free, while stating that they would prefer a free service under normal circumstances.[82] For example:

Q: If you were presented with these options and had to spend your own money, would you choose the same options?

A: No, I would actually choose different options. It's your money, so you want something that is actually worth spending. You want something that doesn't have, like you get unlimited tracks in there and stuff. It just depends on what kind of plans they have on there.[83]

77. It appears that these respondents are affected by a demand artifact; that is, they attempt to please the researcher and mimic the choices of the person who has a real budget of $30 and makes choices accordingly. Another respondent volunteered, unprompted:

A: Maybe I should just pretend like I have money to have better answers.

Q: There's no right or wrong.

A: I know, but I feel bad because it [sic] not that it's a bad plan. It's because I'm broke.[84]

78. Professor McFadden's incentive alignment may cause at least some respondents to reveal preferences contrary to the preferences they would display if they were using their own money to choose among music-streaming services.

79. **Difficulty with Understanding.** Ding notes that an incentive alignment mechanism could have unforeseen consequences if it is poorly understood by survey respondents. For respondents who display confusion regarding their "gift," the incentive alignment may cause them to act according to their perceptions of the survey's hypotheses rather than their true preferences. My study showed that very few respondents understood the incentive alignment language.

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82 In response to the question "If you were presented with these options and had to spend your own money, would you choose the same options?" seven respondents answered "no" or "probably not," according to blind coders who were asked to review the videotapes.

83 Transcripts, p. 542, Lidia S.

84 Transcripts, p. 796, Toni V.

80. Professor's McFadden's incentive alignment description may induce some respondents to perceive a lock-in effect associated with his gift. Signing respondents up for monthly service is not as simple as a one-time transaction because it creates potential further transaction costs such as time and effort to cancel the service. In the same vein, receiving a gift card for a streaming service is not the same as receiving a tangible good because respondents would have to sign up for the service, potentially investing learning time and experiencing other externalities, such as the potential burden created by the data streaming onto a mobile device. The latter could be important if the respondent has a capped data plan. Professor McFadden's instructions do not clarify how the gift will address these issues; hence the respondents will make a variety of their own, unobserved, assumptions and take these factors in consideration. For example, in my qualitative study of the McFadden survey, one respondent expressed concern about the effort required to customize preferences:

> *A: Another thing, as I'm thinking about feedback on the gift card thing, I don't want to do it per month. The gift card, in my mind, that idea of a month, I'm not going to continue on it, but I want to do it because it's going to take a long time to set up my preferences and decide what music I want to listen to and all of those things.*[85]

In the same vein, another respondent clearly showed concern with respect to lock-in:

> *A. When I did the assignment and I was going through Pandora, I would've had to put in a credit card according to what I read and if I did it. I'm saying, how many times in my life have I accepted something for a 30-day trial, where if I don't cancel it, all of a sudden… [sic].*[86]

Another respondent expressed confusion about how the gift card mechanism would work, given that streaming services are priced on a monthly basis:

> *Q: With respect to the music streaming service gift mentioned on the prior screen, in your own words could you tell me what that particular gift comprises?*
>
> *A: It's a $30 gift card, and deducted from that is the cost of the streaming music that I would want. I would get the remainder as cash on the gift card. What*

[85] Transcripts, p. 170, Daniel D.

[86] Transcripts, p. 229, Edward B.

was confusing to me is that—because typically, these are per month, so it's essentially just the first month.[87]

81. Relatedly, Professor McFadden assumes that the option of a streaming service gift-card has value to respondents, but I see evidence that respondents did not value this service specific gift-card option and focused exclusively on the monetary reward. For example, one respondent admitted at the outset:

A. I don't know what questions you're going to ask me, but I would take the cash instead of signing up for a subscription service, if that's what you're asking me.[88]

When asked about their expected gifts, other respondents ignored the music streaming gift card. One respondent stated:

Q: How did you interpret it?

A: That we would be given a $30 gift card.

Q: In your words, what do you expect your personal gift to include?

A: Money.[89]

If there is no incremental value associated with the option of a service related gift-card, one has to assume that the incentive alignment cannot work as intended and respondents are, at best, no more likely to "accurately reveal their preferences" than without the attempted incentive alignment.[90]

82. I tested Professor McFadden's revised and final language in my qualitative study with 53 respondents. The qualitative study indicated clearly that Professor McFadden's incentive alignment was confusing to respondents. At a minimum, Professor McFadden's attempt at incentive alignment did not achieve its desired goal. Likely, the confusion caused by Professor McFadden's attempt at incentive alignment caused respondents to make choices in the conjoint exercise differently from how they would have chosen among real music-streaming services. Such confusion renders the answers to the conjoint-analysis survey unreliable.

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87 Transcripts, p. 184, Delia P.

88 Transcripts, p. 620, Nicole M.

89 Transcripts, p. 34, Alicia R.

90 McFadden Testimony at 14.

2. Professor McFadden's Incentive Alignment Did Not Properly Align the Choices of Respondents

83. Respondents in my qualitative study were asked a number of questions regarding the incentive alignment in order to gauge whether the respondents understood what they would be getting and how their choices could impact their compensation. After reading the screen describing the incentive alignment, respondents were asked: (1) "With respect to the music streaming service gift mentioned on the prior screen, in your own words, could you tell me what the particular gift comprises?" (2) "In your own words, what do you expect your personal gift to include?" and (3) "Is there any additional information or different words or phrases that would help you better understand the instructions?" Additionally, after answering the first choice task, respondents were asked: (1) "Do you think or do you not think that the question below the table with streaming plans relates to the gift mentioned earlier in the survey?" (2) "How does this question relate to the gift mentioned earlier in the survey?" and (3) "How does this question relate to your total compensation for taking this survey?"

84. As discussed in Paragraph 66 above, two coders, who were blind to the case, any hypotheses, and to the sponsor of the study being tested, reviewed these videos and transcripts and coded the respondents' answers.[91]

85. The results are attached as Exhibit 2. Out of 53 respondents, only nine (17 percent) appeared to understand the incentive alignment at a sufficient level for the incentive to result in respondents "accurately reveal[ing] their preferences" for a real music streaming service through their choices in the survey. These 17 percent of respondents were able to describe the relationship between the VISA gift card and

[91] Coding and coding reconciliation were done on a rolling basis. Blind coders discussed and refined classifications for each response by each qualitative study respondent after transcripts were reviewed independently. When coders were unable to evaluate the consistency of a response with Professor McFadden's intended definitions, the definitions and responses were reviewed with staff at Analysis Group to confirm their understanding of Professor McFadden's definitions. After these reviews, the coders conducted the final reconciliation of the transcription classifications between themselves.

the streaming music service gift card and relate it to their choices in the survey. For instance, one respondent stated:

Q: How does this question relate to that $30 gift? How would you say it?

A: Of the $30 gift, a proportion of that will go towards the plan that it ultimately chooses for you, or that I choose.[92]

Another respondent explained his understanding of the survey instructions:

Q: Could you tell me in your own words what the survey is asking you to do?

A: From what I got out of it, it's asking me to take a survey, and in the survey, read questions on different music streaming websites. Since most websites have a monthly fee, depending on how I answered the question, you guys are going to use an algorithm through the computer to decide what music streaming website I would prefer the most.

It seems as though the incentive to do this is I would get a gift card that would be worth the monthly payments of the website or the streaming website. Depending on how I choose my questions depends on how much money I would get on a gift card for—it's like $10 a month or something like that for a couple of months. If it appears that I'm answering questions at random or going too fast or not doing a thorough job of answering the questions, I won't get anything at all.[93]

86. These statements show some understanding of both the relationship between the two gift cards and that the study respondents' choices in the survey would affect how the $30 would be allocated between a complimentary service and the residual value on the VISA gift card. However, even among some respondents classified as understanding the incentive alignment, there was notable confusion regarding the mechanism of plan choice. For example, one respondent believed he would explicitly choose the music streaming service that he would receive as a gift rather than the results of his answers determining which service would be the best one for him:

Q: How does this question relate to the gift mentioned earlier in the survey?

A: The survey asked us that we would choose a streaming provider later, and I assumed that these are possibly plans from the later survey [sic].[94]

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92 Transcripts, p. 135, Chad H.

93 Transcripts, p. 149, Christopher N.

94 Transcripts, p. 392, Jacob K.

87. The remaining respondents misunderstood the incentive alignment, in varying ways. Five respondents (9 percent) did not acknowledge the presence of the incentive alignment at all, focusing on the $100 interview payment as their compensation.[95] The remaining 39 respondents (74 percent) acknowledged the presence of the incentive alignment instructions but fundamentally did not understand the concept. Within this category, there was substantial heterogeneity of understanding. Nine respondents explicitly acknowledged that they did not comprehend the instructions, two thought they were simply receiving a $30 gift card, ten discussed that the amount of the streaming service would be subtracted from the VISA gift card but did not indicate awareness that they would also receive the streaming service gift card, four interpreted the gift to be only the music streaming service without reference to a VISA gift card, nine understood the gift card language but could not relate it to their survey choices, and five otherwise misunderstood the mechanism.

88. These varied interpretations of the incentive alignment may lead to different answers to the choice tasks and thus may render the entire conjoint analysis unreliable. Professor McFadden, however, collected no data that would enable him to identify how these interpretations would have influenced the choice tasks specifically. Broadly, there are four possible responses:

- First, respondents may have completely disregarded the incentive alignment in making their choices. Five respondents appear to have explicitly ignored the incentive alignment. These respondents may have made the same choices they would have absent the incentive alignment screen. For such respondents, Professor McFadden did not achieve any greater accuracy by including the incentive alignment.
- Second, respondents may have reacted unpredictably in the face of confusion. Because these respondents recall reading the screen, but do not comprehend it, they may not fully disregard the incentive alignment and even try to reconcile it

[95] Although the interview payment can be considered a reward that is, in principle, similar to the point rewards in a consumer panel and this phenomenon may not have occurred in the on-line study, I do not include these respondents in my count of confused respondents related to incentive alignment.

throughout the choice exercise. As a consequence, these respondents likely behaved in unpredictable ways that are not externally valid.

- Third, some respondents may have chosen music streaming services that were specifically disconnected from their preferences. Choices by these respondents may have been driven by confusion, the aforementioned windfall effect, or the demand artifacts that encouraged them to overvalue music streaming services. I see evidence of these effects throughout the interviews, and consider such choices to be unreliable.
- Fourth, some respondents may have specifically acted according to their misinterpretation of the incentive alignment. For example, respondents who believed they were receiving only the remaining value, without the streaming service component, may have systematically chosen free plans in order to maximize their payout. Likewise, respondents who believed they were only receiving the music streaming component but not a residual value may have systematically chosen more expensive plans because they saw no consequence to choosing the expensive plan. Either type of respondent was likely to choose to make choices that do not reflect their true preferences.

89. At the end of my qualitative study, interviewers posed the question, "If you were presented with these options and had to spend your own money, would you choose the same options?" This one-sided question is purposefully biased toward a "yes" answer in which the respondent indicates he or she would be incentive aligned. Despite this bias, seven respondents (13 percent) stated that they would not, or would probably not, have chosen the same options. These respondents had varying levels of understanding of the incentive alignment, as established early in the qualitative study. In fact, two respondents were coded as understanding the alignment and, despite this understanding, still admitted that they did not make choices that were aligned with their preferences. Notably, given the confusion found with respect to feature definitions, it is unclear whether any of the respondents would have selected a real music-streaming service which matched his or her choice tasks.

B. Professor McFadden's Survey Features Were Unclear and Allowed for Extensive Variation in Respondent Interpretation of Features

90. As discussed in Section V of my report, my review of Professor McFadden's descriptions of the music-streaming features indicated that many descriptions were potentially confusing to respondents. In my qualitative study, I sought to answer two questions about respondent understanding: (1) Were respondents confused, or were they not confused, by the features? and (2) Did respondents understand, or did they not understand, the features in the same way as other respondents? Both of these aspects of understanding or misunderstanding are important to determining whether we can interpret Professor McFadden's results as reliable. Confusion can lead to unpredictable and unreliable decision-making in choice tasks. Differences of interpretation complicate the calculation of the valuation of features: the choices that respondents make will differ depending on their interpretation of the feature, but the calculation of the valuations of the features (partworths) assumes that all respondents are responding to the same interpretations of the features.

91. To test whether respondents in Professor McFadden's survey correctly interpreted the feature descriptions, respondents in my qualitative interviews were directly asked to explain the features in the survey in their own words. In some cases, a feature definition may be easy to parrot back to an interviewer, and it may sound as if the respondent understood the definition, but in fact was simply exercising recall. To distinguish simple verbal recall versus understanding, respondents were probed on the depth of their understanding of the features.

92. A summary of the results of the qualitative study is attached as Exhibit 3. This summary is based on the more-conservative coding of the qualitative data in which the judges based their categorizations on only the verbal statements. I discuss later more-comprehensive judging in which judges also use non-verbal cues.

93. The effectiveness and clarity of feature descriptions varies across Professor McFadden's seven features. Some features are clearly defined and well understood by participants. For example, all respondents to my qualitative study were able to explain *skip limits.* When probed they were appropriately able to distinguish *skip limits* for songs from skipping advertisements, another common feature in online

streaming. Other features, such as *mobile device streaming* or *offline listening*, seemed clearly defined at the high level, but when qualitative study respondents were probed on how they would use the feature, it became clear that their understanding of these features was superficial. Finally, some features were poorly understood by the respondents. More than half of respondents (60 percent) in my qualitative study were unable to correctly interpret *playlist method.*

94. In this section I discuss the results of my qualitative study for each of the seven features tested by Professor McFadden, assessing both the number of correct interpretations as in Exhibit 3, as well as the variety of different correct and incorrect interpretations based on a review of transcribed interviews. These results are based on the more-conservative coding that did not include non-verbal cues.

1. Playlist Method

95. Professor McFadden describes *playlist method* (listed as "playlist generation method" in the definitions) as follows: "Playlists offered to a user can either be curated by music tastemakers (such as Beyoncé or Rolling Stone Magazine) or generated by a computer algorithm customized by the user's preferences or feedback (often provided by 'like' or 'dislike' votes)."[96] The feature can take on three possible levels: (1) "Curated by music tastemakers"; (2) "Generated by a computer algorithm customized by your preferences"; and (3) "Curated by music tastemakers; Generated by a computer algorithm customized by your preferences," where the latter option is on a second line in the choice table. Thus, all choices include one of the playlist generation methods, while more expensive plans may allow for both.

96. Both the terms "music tastemaker" and "computer algorithm" are potentially confusing terms of art. Moreover, unless target respondents have a common understanding based on their experience with real music-streaming services, both descriptions are vague to respondents and lead to varied interpretations by

[96] McFadden Testimony at App. B, B-viii.

respondents. Thus, any estimation of the valuation of the feature is ambiguous and cannot be averaged over respondents.

97. To determine whether respondents understood these terms, respondents were asked about this feature in three separate questions: (1) "Could you tell me in your own words what the term *playlist method* means to you?"; (2) "Could you tell me in your own words what it means when the playlist is curated by music tastemakers?"; and (3) "Could you tell me in your own words what the term generated by a computer algorithm customized by your own preferences means to you?" Respondents were also asked to define "curate," "tastemaker," "computer algorithm," and "customized" as well as whether the service(s) they had tested over the testing period used these methods.

98. Exhibits 4.a and 4.b show the results of these questions. For clarity, the two levels of *playlist method* were broken out into separate questions. Exhibit 4.a shows the results for "playlists curated by music tastemakers." Specifically, answers to the question "Could you tell me in your own words what the term tastemaker means to you?" were coded. This coding reports a conservative estimate of understanding of "playlists curated by music tastemakers" by focusing on the definition of the term "tastemaker" and assuming that respondents who could explain tastemaker would also be able to explain what playlists curated by a tastemaker entailed. In total, 21 respondents (40 percent) interpreted music tastemakers correctly as either celebrities or music experts who created the playlists.[97] On the other hand, 60 percent of respondents could not correctly identify music tastemakers. These 32 respondents had wide-ranging interpretations of the meaning: three acknowledged that they did

[97] One respondent said, "Tastemaker means key influencer, somebody who is leading by example. You want to follow them, maybe." (Transcripts, p. 172, Daniel D.)

Another respondent said, "That people who have the job to look at taste in music would choose—work for the company and choose those music for people. […] To generate the taste in music, like something that takes your input and makes a taste out of it." (Transcripts, p. 747, Steven S.)

not understand or could not explain music tastemakers,[98] three thought the tastemakers were other users,[99] seven thought they themselves were the tastemakers,[100] eight understood another person was involved but considered it to be an unspecified person generating playlists based on this unspecified person's preferences,[101] three thought experts custom-tailored playlists for the user,[102] two

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[98] One respondent stated, "I don't know. Tastemaker. Again, somebody—I don't know. Going along the lines of whatever genre, whatever music that you're into, they give you along the lines of the same concept or the same ideas. I have no idea." (Transcripts, p. 256, Elizabeth V.)

Another gave a number of possible definitions, concluding with "I'm not really sure": "Tastemaker would be someone that you looked up to that maybe has similar taste or views as you. If your friends like it, I would probably like it also. [...] It could be, if you're following a certain artist like Bruno Mars. If Bruno Mars likes this, perhaps you would like it also. That's another thing that it could be. I'm really not sure." (Transcripts, p. 288, Frank B.)

[99] One respondent said, "I guess just another user. I'm not really sure." (Transcripts, p. 777, Thomas W.)

Another said, "The tastemakers are the people that are actually using the—Spotify." (Transcripts, p. 203, Donna C.)

[100] One respondent stated, "Almost exactly what that means to me is it means that it is—it's whatever I like that I can pick from their—make my own playlist. What I like, my taste versus their taste." (Transcripts, p. 566, Manuel R.)

Another respondent stated, "I would think that that means musical preferences that you have. If you like a little bit of rap, a little bit of Pavarotti, that's your taste. You're a tastemaker. […] Taste, preferences, what you prefer to listen to." (Transcripts, p. 625, Nicole M.)

[101] One respondent said, "Tastemaker, a group of things put together by people that like it or don't like it. Something that they personally like." (Transcripts, p. 91, Brandon R.)

Another respondent said, "Somebody with a taste for that type of music making the playlist for it." (Transcripts, p. 379, Iman D.)

[102] One respondent stated, "It was one thing that you—a tastemaker, I would say, is something that makes a playlist based on what it appears your taste in music is, what your preference is." (Transcripts, p. 189, Delia P.)

Another respondent stated, "Tastemaker would probably be someone that analyzes what stuff you like to listen to and knows where to find other music that's similar." (Transcripts, p. 437, Jordan P.)

mixed up tastemakers with computer algorithms,[103] and six respondents had even more varied responses that could not be broadly categorized.[104]

99. As I mentioned earlier in Paragraph 48, Professor McFadden edited the description of the *playlist method* substantially. Specifically, Professor McFadden removed an entire element to the feature: "playlists customized using your votes and preferences of users with similar tastes." Exhibit 4.a shows why this change is problematic. A number of respondents believed other users, themselves, or an unspecified person to be the tastemaker. In other words, three of the categories identified by blind coders relate to this deleted feature and contradict Professor McFadden's updated definition of music tastemakers.[105] Had Professor McFadden retested his survey after these substantial modifications of his feature descriptions, he likely would have been able to identify this problem. Exhibit 4.b shows the results for playlists "generated by a computer algorithm customized by your own preferences." In this case, 42 qualitative study respondents (79 percent) understood this aspect of the feature, although even within this group there were different interpretations of how the

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[103] One respondent said, "Tastemaker means the computer algorithm memorizing the bands and music you like. […] The computer saves your preferences, and instead of you always having to look up the songs of the same band, it just kind of shows you the options and the songs of the band." (Transcripts, p. 24, Alex S.)

Another respondent said, "Once again, going back to maybe based off the recent music that you listened to. It just puts all of the music that they think that you would like into that." (Transcripts, p. 122, Celine A.)

[104] One respondent said, "Tastemaker means to me that there's a certain—that there's an idea of what goes with what. If a person's taste in music is classical, these are things that they will like. That's what I think of when I think of tastemaker." (Transcripts, p. 107, Brian G.)

Another respondent said, "In the song venue, it would be certain choices people are making that they want to enjoy. […] It's an auditory thing. It's what you—it's like on weekends, when I'm scuttlebutting around, I might have on country or Motown from the '70s, because it's kind of upbeat and whatever. At night, my choices, they're not that. They're easy listening, whether be instrumental or just songs that are mindless that I don't have to think about." (Transcripts, p. 504, Kristin C.)

[105] In Exhibit 3.a, these categories appear as: (1) "Respondents who believed that playlists were generated by other users," (2) "Respondents who believed that playlists were generated by themselves," and (3) "Respondents who believed that playlists were generated by an unspecified person's preferences."

algorithm functioned with varying degrees of accuracy. Twelve respondents thought the algorithm suggested similar songs based on the user's selection of a genre or artist,[106] fifteen thought the algorithm suggested similar songs based on feedback (i.e., the thumbs-up, thumbs-down mechanism Professor McFadden intended),[107] and fifteen thought the algorithm suggested songs based on the user's prior listening history.[108] Additionally, eleven respondents substantially misunderstood the computer algorithm: two respondents acknowledged that they could not explain the concept;[109] three misinterpreted what an "algorithm" meant;[110] four believed they

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[106] One respondent stated, "Made by a computer algorithm means that you pick the genre and it just customizes it and plays whatever song. If I pick rock, they play Ozzy Osbourne, Rolling Stones, but the other one means that you pick the songs and it just plays it over and over again. It shuffles it." (Transcripts, p. 24, Alex S.)

Another respondent stated, "That would mean I go in and I pick—it tries to pick off my likes that I've shown it, so I'll go in and I'll pick artists, genre, whatever, and it will interpret what that means, and then pull some of its own also." (Transcripts, p. 471, Kelly B.)

[107] One respondent said, "To me, that makes me think of when it has like the thumbs-up or thumbs-down part on it, and it tells you—they get an idea of the song that you like, to play more of those or to play less of the songs that you don't like. […] Whether or not you like or dislike. The thumbs-up is that you like it; thumbs-down is that you don't like that song. Then, they try to skip that song if you still have skips, I think, or they just know that, and next time they won't play that particular song. Sometimes they do. I've seen that they do songs similar to it." (Transcripts, p. 8, Alexandra F.)

Another respondent said, "There is an equation somewhere that is taking what you like and don't like and is then coming up with music based on those preferences, but it's all based on a mathematical equation." (Transcripts, p. 593, Molly S.)

[108] One respondent stated, "That's cool, yeah. I think that computer takes all of my choices that I listened to—like last night. I'm sure when I go back in there if it's going to pop up with, 'This is what you enjoyed. Would you like the computer to store that information?' Then you can either keep it as your playlist or change it up." (Transcripts, p. 504, Kristin C.)

Another respondent stated, "Your computer will notice that you're doing something over and over again and find a common, and then try to help you out and give you options if you like this, you like this, don't like it." (Transcripts, p. 316, Hackeem A.)

[109] One respondent simply said, "I'm not sure." (Transcripts, p. 580, Michael B.)

Another respondent said, "No, I don't. […] I'm assuming it has to do something with the computer. I'm not really good with computers." (Transcripts, p. 761, Tanya R.)

[110] One respondent stated, "I would think that if you go into a computer and then you would just organize it the way you want it, it would be easier." (Transcripts, pp. 38, Alicia R.)

could generate the playlist themselves;[111] and two believed that the algorithm selected songs based on any of their online history including activity outside of the service.[112]

100. In total, combining these two exhibits, 21 people (40 percent) understood how playlists were generated,[113] 21 (40 percent) understood the computer algorithm piece but misunderstood the music tastemaker piece,[114] and 11 (21 percent) did not

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Another respondent stated, "Generated by a computer algorithm is it'll pull other like media files together. […] The computer is doing it. If I just pull my own preferences, I'm just picking songs that I like instead of the computer." (Transcripts, p. 625, Nicole M.)

[111] One respondent said, "It's you looking for your own music. The music that you pick is the ones that you get. It's not picked by other people." (Transcripts, p. 122, Celine A.)

Another respondent said, "You could pick your own songs and put them into categories, like under your albums, artists, your favorite playlists, songs, yeah." (Transcripts, p. 423, Joe R.)

[112] One respondent stated, "I feel like that would mean through your searches of the computer, that music stored on your website would use your searches to create a playlist that you like. […] Through your past searches of any music streaming website or of YouTube or anything like that. Or looking up lyrics of a song or a song artist, buying concert tickets, stuff like that. I feel like the computer would use that to create something." (Transcripts, p. 302, Giana B.)

Another respondent said, "The program would follow the artists or songs that I'm listening to, and based upon that information I may provide to them when I log in to their site, or if they link into my social media sites, you get a little better feel as to who I am. My age, my demographics, the type of music I like, and even political views. With all of those tidbits of information, customize a playlist they believe would best suit me." (Transcripts, p. 288, Frank B.)

[113] For example, one respondent who understood both concepts of a music tastemaker and a computer algorithm explained a music tastemaker as: "A person who has a taste in a certain kind of thing—an art maker or a tastemaker, a cook, a chef. […] They have a specialty in what they are doing. They know a lot about sharing it with others." And a music-selecting computer algorithm as: "It uses what you've done in the past to let you know what you want in the future. […] It takes songs that you listen to and makes—it takes songs that you've been listening to and gives you more that it thinks you would like." (Transcripts, p. 395, Jacob K.)

[114] For example, although this respondent understood what a computer algorithm was ("It would be, basically, there's a set computer process that it goes through. It uses your likes and dislikes and changes the music based on what you like or dislike, but there's no human involvement; it's just done with a computer."), he misunderstood the concept of a music tastemaker ("It would be basically if I'm listening to a type of music and it's something that I like the best, I would try to choose what I think that other people are going to like that's going to be similar to what I like."). (Transcripts, p. 77, Bradley K.)

understand music tastemakers or computer algorithms.[115] (No one understood music tastemakers but not computer algorithms.)

101. The low level of understanding of the *playlist method* is consistent with the discussion earlier in this report. The *playlist method* feature was described using complex language, including industry-specific jargon. This was also one of the features for which Professor McFadden substantially adjusted the language following his pretest, which means he identified problems but did not test the changes.

102. Respondent understanding of this feature is arguably critical to the reliability of Professor McFadden's survey. Not only is *playlist method* given its own feature with various levels, but "playlists generated by the service" is a level available in both the *on-demand track selection* and *mobile device streaming* features. Confusion and misinterpretation with respect to the *playlist method* feature could easily contaminate both of these other features, because they include similar language and overlapping concepts.

2. On-Demand Track Selection

103. Professor McFadden describes *on-demand track selection* (listed as "features available for streaming to a computer" in the definitions) as follows: "Using desktop software or a web interface from a computer, users may be able to access playlists generated by the streaming service and/or play specific tracks 'on demand.' With 'on demand' features, users can listen to particular tracks (songs) or an entire album on request and users can create their own playlists."

104. The feature can take on two possible levels: (1) "Playlists generated by the service" and (2) "Playlists generated by the service. Album, artist, and song selection on

[115] For example, this respondent did not understand either concept of a music tastemaker ("Tastemaker? Again, it's probably what my tastes are in music, my likes and dislikes, my likes in listening in various categories of music.") or a computer algorithm ("Computer-generated? […] I would think it—but I can't see how, because they would just be able to change the tune of the music for you. […] Like being able to actually disc jockey your own music. […] That you're actually being able to do your playlist and the mode, the pace of the tunes."). (Transcripts, p. 717-718, Steve M.)

demand" where the latter option is on a second line in the choice table. All choices include the option to listen to playlists that are "generated by the service," while more expensive plans may also allow for on-demand track selection.

105. Notably, the *on-demand track selection* feature definition does not specify *how* the playlists are being generated by the service; Professor McFadden's survey leaves it to the respondent to guess at how the playlists were generated. Respondents may use outside knowledge to make that guess or may compare this feature to the *playlist method* options ("curated by music tastemaker" or "generated by a computer algorithm") and assume a connection between the two. Doing so is particularly problematic for the reliability of the survey because 60 percent of respondents failed to understand the *playlist method* options. Respondents may carry their misunderstanding from the playlist feature into the streaming feature.

106. Qualitative study respondents were asked to define *on-demand track selection* in two separate questions: (1) "Could you tell me in your own words what the term *on-demand track selection* means to you?" and (2) "Could you tell me in your own words what it means when there are playlists generated by the service and album, artist, and song selection on demand?"

107. The results of the second qualitative question regarding the specific feature option of "playlists generated by the service and album, artist, and song selection on demand" showed substantial confusion among qualitative study respondents. It was unclear, however, from a review of the interview transcripts whether this confusion was driven primarily by the description of the feature option itself or by the length and complexity of the qualitative question. Thus, responses to this question were not analyzed; instead, I focused on the responses to the first question defining *on-demand track selection.*

108. The results for the on-demand track selection feature are included in Exhibit 5. Although respondents may have had trouble interpreting how the service would select playlists, the majority of respondents (49 respondents, 92 percent) correctly interpreted that the feature *on-demand track selection* meant that the respondents could select and listen to any song they wanted. For example:

Q: Moving on, can you tell me in your own words what the term "on-demand track selection" means to you?

A: To me, that means that I can search for a specific song and play that specific song that I want to listen to.

Q: Could you elaborate on that just a little bit?

A: That means that if there was a specific country song I wanted to listen to, I could go into that music system. I could type it in. They would bring up the songs for me, and I would be able to play that specific song that I wanted to listen to without having to go through a whole playlist, without having to skip through a bunch of songs until I got to that one. It would just be I would be able to listen to that one song that I was looking for.[116]

And:

Q: Could you tell me in your own words what the term "on-demand track selection" means to you?

A: I choose when I want and what I want.

Q: Can you tell me a little bit more about that?

A: On demand would give me options, and I choose which song I want to listen to when I want to listen to it. It's on my demand, personal demand. It's not what they are putting out there and giving to me. It's my choice, and it's when I wanted to use it. [117]

109. Four people misinterpreted the concept of *on-demand track selection*: one person could not explain it in her own words;[118] one person believed he had to purchase the songs in order to play them;[119] and two people believed that the music streaming service selected the songs,[120] rather than the user.

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[116] Transcripts, p. 14, Alexandra F.

[117] Transcripts, p. 614, Nancy M.

[118] "It's using a music streaming website to—I opened the tab and now I can't remember. […] To be honest, I couldn't really tell you because that's not one of the things I focus on, and it doesn't really matter to me, I guess." (Transcripts, p. 308, Giana B.)

[119] "I think that's just all the ones you can purchase or buy." (Transcripts, p. 674, Samuel H.)

[120] "That you are not choosing it, they are." (Transcripts, p. 43, Alicia R.)

And: "On-demand track selection, to me, is, like I said, if it notices that you like a certain brand or a certain genre, it's just going to continue to give you things like that." (Transcripts, p. 321, Hackeem A.)

3. Offline Listening

110. Professor McFadden describes *offline listening* (listed as "ability to listen offline" in the definitions): "Users can download and listen to a selection of the service's music when internet access is unavailable." The feature can take on two levels: "Not available" or "Yes."[121]

111. This feature description references "a selection" of the music database, but gives no further instructions about how much music a user could expect to have access to offline.

112. Qualitative study respondents were asked "Could you tell me in your own words how you use the *offline listening* feature." Qualitative study respondents were also probed on their assumptions about the number of songs that would be available offline in four questions:

    1. "Could you tell me in your own words to how many albums you can listen offline?"
    2. "Could you tell me in your own words to how many artists you can listen offline?"
    3. "Could you tell me in your own words to how many songs you can listen offline?"
    4. "While making your choices in this survey, how many songs did you assume *offline listening* would include?"

    Qualitative study respondents were also asked about the importance of this information: "Could you tell me whether or not it matters to you to have a certain amount of songs available for *offline listening*?"

113. The results for this feature can be seen in Exhibit 6. For this feature, 40 respondents (85 percent) properly understood what *offline listening* meant. For example:

    Q: Now that you've made some more choices, we'd like to learn how you interpreted the various options. Could you tell me in your own words what the term "offline listening" means to you?

[121] In Professor McFadden's Table 1, which includes his feature descriptions and the levels, the second level of *offline listening* is listed as "Available." However, in his screenshot of an example choice task in Appendix B, p. B-ix, this is listed as "Yes." In my qualitative study I used the screenshot in Appendix B in order to replicate Professor McFadden's survey instrument.

A: Sure. If I'm in an area where I don't have Wi-Fi access the information is stored on whatever device I've been using, and I can listen to it without being connected to the Internet.

[…]

Q: Could you tell me in your own words to how many albums you can listen offline?

[…]

A: I would believe that would be based upon the number of songs that I have previously selected. I don't believe I would have access to the internal library of 20 million, or 1 million songs. It would be based on songs that I've selected added to the playlist that I would be able to listen to offline.

Q: Why do you say that?

A: Storage. A million songs, titles, albums, whatever, would be huge capacity. I'm guessing storage on my device, if I only have 64 gigs, 120 gigs, or whatever it might be, that at some point I'm going to run out of space.[122]

Even within these qualitative study respondents classified by coders as "correct," four participants believed they could listen to the entire database of songs offline, something that Professor McFadden's definition directly contradicts.[123]

114. An additional seven qualitative study respondents misunderstood the concept of *offline listening* in varying ways: one respondent could not explain *offline listening* in his own words;[124] two respondents conflated *offline listening* with listening on mobile devices;[125] one respondent believed *offline listening* referred to listening on

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[122] Transcripts, pp. 292-293, Frank B.

[123] For example:

Q: Could you tell me in your own words to how many songs you can listen to offline?

A: I would say as many as you want, I would think.

Q: While making your choices in this survey, how many songs did you assume offline listening would include?

A: Like I said, I think it would probably be all those songs you want when you're online.

(Transcripts, pp. 427-428, Joe R.)

[124] "If you're saying online listening, you're talking about the computer. Offline listening would be some other form, without using the Internet. I don't know how that would work. I don't really understand what offline means, I guess. [...] I'm unclear on what offline is, so I don't know." (Transcripts, p. 414, James H.)

[125] "Yes, it's when you can stream music from your computer at home onto your MP3 player or your mobile device." (Transcripts, p. 209, Donna C.)

the computer using other tabs or browser windows;[126] and one respondent believed *offline listening* meant that he did not have to sign in to the service.[127] Two respondents demonstrated that they did not understand *offline listening*, but their answers did not fall into an obvious category.[128]

4. Mobile Device Streaming

115. Professor McFadden describes *mobile device streaming* (listed as "Features available for streaming to mobile devices" in the definitions) as follows: "Users may be able to use the music streaming service on mobile devices, such as phones and tablets. The music streaming service may limit the features that are available on mobile devices. Users may be able to access playlists generated by the streaming service, pick the artist or album but hear tracks in a random order, and/or play specific tracks 'on demand.' With 'on demand' features, users can listen to particular tracks (songs) or an entire album on request and users can create their own playlists."

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[126] "You don't have to be on the actual site when you hear it. You can still be doing work on your computer" (Transcripts, p. 722, Steve M.)

[127] Specifically, the respondent stated:

Q: Could you tell me in your own words what the term "offline listening" means to you?

A: When you're not logged in, or to a general service, or if you don't have one, you can just go onto the website and stream its music.

[…]

Q: While making your choices in this survey, how many songs did you assume offline listening would include?

A: I was under the impression all—all of the songs.

(Transcripts, pp. 320-321, Hackeem A.)

[128] A review of these transcripts suggests that both unclassified respondents believe that *offline listening* means that services are <u>not</u> available when a device is not connected to Wi-Fi or cellular service. One respondent said, "If you're not on your mobile device's data you could not listen to that music." (Transcripts, p. 307, Giana B.)

Another respondent said, "I kind of feel like that means if you're able to listen to it in certain places. You'd be able to listen to it whenever, in other places you wouldn't be able to." (Transcripts, p. 539, Lidia S.)

116. This feature can take on four levels: (1) "Not available," (2) "Playlists generated by the service," (3) "Playlists generated by the service. Albums and artists chosen by you, but tracks are played in a random order," and (4) "Playlists generated by the service. Album, artist, and song selection on demand."

117. These feature descriptions do not specify how playlists are generated. Moreover, the feature descriptions overlap significantly with the descriptions for computer streaming.

118. Qualitative study respondents were asked two questions about mobile streaming: (1) "Could you tell me in your own words what the term *mobile device streaming* means to you?" (2) "Could you tell me in your own words what it means when *mobile device streaming* offers playlists generated by the service and album, artist, and song selection on demand?"

119. Exhibit 7 shows the results for *mobile device streaming.* The majority of qualitative study respondents (51 or 96 percent) were able to correctly explain the concept of *mobile device streaming*. For example, most qualitative study respondents answered similarly to the following:

> *It means to me whether you can stream it to your MP3 player or your iPhone or your Android.*[129]

120. When probed on the meaning of one of the levels of the feature "playlists generated by the service and album, artist, and song selection on demand," however, this apparent understanding fell apart. Respondents appeared taken aback or overwhelmed by the lengthy question used in my qualitative study. The question "Could you tell me in your own words what it means when *mobile device streaming* offers playlists generated by the service and album, artist, and song selection on demand?" is indeed complex, but it is simply a repetition of a feature level definition used by Professor McFadden. Only 29 respondents (55 percent) understood both aspects of the feature level;[130] 13 respondents (25 percent) were

[129] Transcripts, p. 202, Donna C.

[130] One respondent explained both feature levels as: "Generated by the service would be similar to listening to a radio station where they pick the music. You pick what type of radio station

able to explain one aspect of the level but not the other;[131] and 9 respondents (17 percent) misinterpreted or could not explain either feature levels in this context.[132]

121. This is a case where the concept of a mobile device is deceptively simple: mobile devices are ubiquitous and it is not surprising that respondents can explain what they are. When probed further, however, it becomes clear that many qualitative study respondents do not understand the feature *mobile device streaming* as intended by Professor McFadden.

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you want to hear, what type of music selection. The playlist on demand was the other one? […] Let's say I wanted to hear all The Beatles, then it would pick The Beatles albums, or if I had a particular album that I wanted to hear, this one particular album. The difference also became whether they randomly mixed the album or if it came out just as the album had been." (Transcripts, p. 519, Leanne G.)

[131] One respondent understood "playlists generated by the service" but not "album, artist, and song selection on demand":

A: Playlist generated—what did you say? By the computer?

Q: Generated by the service.

A: For whatever reason they put together a grouping of songs in a list, and just for instance, I was supposed to listen to Spotify. That's what they do. You say you want to listen to country or whatever and it says "Country Gold" and then there's 20 or 30 songs and those are the songs that they've decided what should go in there, as opposed to…

Q: It was playlist generated by the service and album, artist, and song selection on demand.

A: Okay, so that's just if you like a particular artist, you pop that in and out comes some songs. It seems like still the service selects which ones you get to do, if it's the album or the artist and it's separate from the song. It's just song.

(Transcripts, p. 188, Delia P.)

Another respondent understood "album, artist, and song selection on demand" but not "playlists generated by the service": "Playlist is, if you like a song, you could add it to a playlist, and you can go back and play that playlist where—what was the second one? […]That's like if you want to hear a certain artist at that moment; you can just go there and they have all of the songs that artist would sing, and you can listen to it on demand right then and there." (Transcripts, pp. 640-641, Rebecca C.)

[132] One respondent said, "It'll do a lot of artists—we'll use Celine Dion as an example. It'll pick similar artists that are in her category to play just to create a station. Just picking artists in that genre—or Metallica, and it will pull a bunch of other heavy metal artists." (Transcripts, p. 624, Nicole M.)

5. Skip Limits

122. Professor McFadden describes *skip limits* (listed as the "ability to skip songs" in the definitions) as follows: "Users can skip tracks (songs) that they do not want to hear and continue to the next track." The feature can take on two possible levels: "Limit of 6 skips per hour" and "Unlimited ability to skip tracks."[133] My qualitative study respondents were asked "Could you tell me in your own words what the term *skip limits* means to you?" and "Could you tell me in your own words what it means when there is a limit of 6 skips per hour?"

123. In some online streaming services, such as Pandora, users can skip an advertisement after listening to it for some period of time. Professor McFadden's definition of *skip limits* specifies that the limit applies to skipping tracks or songs, but the title "skip limits" is not necessarily evocative of this. In order to address this issue, respondents were also asked "Could you tell me whether or not skipping as mentioned in the survey allows you to skip over advertisements?"

124. Results for the *skip limits* feature are included in Exhibit 8. For this feature, using conservative coding, 100 percent of respondents understood and could explain what *skip limits* meant. A typical response was:

> *Skip limits is how many times I can skip. Skips would just be how many times a song comes up or any song comes up that I don't want listen to, that I'd be able to just skip it and go onto the next song—how many times I'm allowed to do that or not allowed to do that.*

Additionally, when probed, no respondents were confused by the relationship between skipping songs and skipping advertisements. Many respondents were not aware of the ability to skip advertising[134], but, among those who were aware of this

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[133] In Professor McFadden's Table 1, which includes his feature descriptions and the levels, the first level of *skip limits* is listed as "Up to 6 skips per hour." However, in his screenshot of an example choice task in Appendix B, p. B-ix, this is listed as "Limit of 6 skips per hour." In my qualitative study I used the screenshot in Appendix B in order to replicate Professor McFadden's survey instrument.

[134] One respondent said, "Skip limits means if you're not liking that selection, you can only do that—whatever the limit is. Up to six times is what was mentioned here a lot. After you reach that limit, it won't let you skip anymore. [...] I don't believe it does let you skip the advertisements." (Transcripts, p. 413, James H.)

potential feature, all were able to distinguish advertising-skipping from song-skipping.[135]

125. Of note, the understanding of the *skip limits* feature indicates that respondents to my qualitative study were capable of giving clear and accurate answers to well-defined features. Moreover, when faced with a potentially complicating question regarding skipping advertising, the participants responded appropriately and distinguished song skipping from advertising skipping. The 100 percent understanding of the skip limit feature is evidence that my qualitative study does not itself contain a demand artifact. The confusion identified by conservative coding, as identified through the qualitative research, can be reliably interpreted as being caused by Professor McFadden's survey instrument. Thus, when qualitative study respondents were unable to explain other concepts in their own words or indicated confusion, respondent reactions were due to actual confusion with the features and not due to any artifact of being questioned on the features. When presented with features that the qualitative study respondents understood, respondents answered accurately and confidently.

6. Available Library Size

126. Professor McFadden describes *available library size* (listed as "Library size" in the definitions and "music library size" in Table 1) as follows: "The number of tracks (songs) available in the service's database." The feature can take on four levels: "1

Another respondent said, "It means skipping a song. That's what I would think it means. I can skip six songs. […] As mentioned in the survey, I didn't see that you could skip it, but I did try to skip ads and I couldn't. I would say you can't, but it didn't say whether you could." (Transcripts, pp. 242-243, Edward B.)

[135] "Based on the plans, it's been based on an hour block and the number of times you can skip through a song within a playlist, so not really like fast-forwarding or rewind, but skipping the entire song as a whole and moving onto another song. [….] No, it didn't say that, but I do like the option of—for example, on YouTube when you're playing a video, you usually remove the ad itself, maybe 30 seconds or a minute, usually five seconds in you have the option to skip the ad. It did not clearly say that within the survey." (Transcripts, p. 459, Juliana J.)

million songs," "10 million songs," "20 million songs," and "More than 20 million songs."

127. Qualitative study respondents were asked: "Could you tell me in your own words what the term *available library size* means to you?" and "Could you tell me in your own words what it means when the *available library size* is 20 million songs?"

128. Exhibit 9 shows the results for this feature: 33 respondents (62 percent) understood *available library size*. For example:

> *Q: Now that you've made some choices, we would like to learn how you interpreted the various options. Could you tell me in your own words what the term "available library size" means to you?*
>
> *A: The available library size would be how many songs the company has that you could possibly listen to.*
>
> *Q: Could you tell me a little bit more about that?*
>
> *A: That the library size would be—if it was smaller, it wouldn't have as many songs in each genre. If you wanted to listen to something that was more off the beaten path, you might not be able to find it, whereas top 40 is going to be easy to find. That early punk track from the early '70s, you might not catch that one. That's what it makes me think of. It makes me think that there were some limitations to—if there's a small library size, there's going to be some limitations to what you will and will not be able to find. For me personally, I like to find lots of new things, things I haven't been exposed to before. Again, that's my personal preference, and a smaller library would mean that I'm probably going to get repeated content, repeated songs.*
>
> *Q: Could you tell me in your own words what it means when the available library size is 20 million songs?*
>
> *A: Twenty million songs sounds like a lot of songs. That sounds like an amazing amount of songs available. There's probably international artists, as well as U.S. artists, that if you heard about a great band from Japan, you could actually find them in there. Twenty million sounds really great, especially when it's compared to the 1 million. You're like, well, that's a lot less. There's 19 million more songs the other way.*[136]

The remaining respondents either misinterpreted the feature (32 percent) or gave answers too vague to categorize (6 percent). There were many types of misinterpretation: 15 respondents thought that *available library size* had some

[136] Transcripts, p. 106, Brian G.

Another respondent said, "The options of the songs that you're going to be able to be selecting. It's like 1 million, only 1 million songs you can choose from here all the time versus 20 million, like one of the other ones was. […] There's a lot of songs to choose from." (Transcripts, pp. 49-50, Ariana D.)

relationship to the number of songs the user could store, either on the cloud via the service (6 respondents),[137] download on their personal computer (3 respondents),[138] or with unspecified storage location (6 respondents).[139] Additionally, two respondents thought that *available library size* was genre-specific, such that a library size of 10 million songs would include 10 million songs per genre. For example:

Q: Now that you've made some choices, I want to learn how you interpreted some of the various options. Could you tell me in your own words what the term "available library size" means to you?

A: How many songs are in each genre.

Q: Could you tell me in your own words what it means when the available library size is 20 million songs?

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[137] One respondent stated, "How much music you would be able to listen to. […] If you would be able to save music, and they'd only allow you a certain amount to save for you." (Transcripts, p. 533, Lidia S.)

[138] For example:

Q: Could you tell me in your own words what it means when the available library size is 20 million songs?

A: That means that you'd be able to get 20 million songs in there.

Q: What do you mean by you can get them?

A: You have to download them.

(Transcripts, p. 36, Alicia R.)

[139] For example:

Q: Now that you've made some choices, I'd like to learn how you interpreted some of the various options. Could you tell me in your own words what the term "available library size" means to you?

A: As many songs as you want.

Q: Tell me why you say that.

A: Usually your library is where you keep your songs, and unlimited library size, so yeah.

Q: Could you tell me in your own words what it means when the available library size is 20 million songs?

A: That is the limit. You cannot have more than 20 million songs.

(Transcripts, p. 315, Hackeem A.)

A: I feel that would mean there's 20 million songs in each genre. They could be repeated songs through each genre, because I know that several songs do fall into different categories. They probably mean that.[140]

129. On its face, one would expect *available library size* to be an easy-to-understand feature. The amount of confusion only reinforces the importance of pretesting language, even on features that may seem self-explanatory to the author of the survey.

7. Advertising

130. Professor McFadden describes *advertising* as follows: "Plans may be ad-free or may have advertising breaks in between tracks." The feature can take on two levels: "1.5 to 3 minutes of ads per hour" or "No ads." This feature description does not distinguish whether it is possible to listen to these ads in one block, or whether they will be spread throughout the hour. Respondents were asked "Could you tell me in your own words what the term *advertising* means to you?" as well as questions to probe the frequency expected of these advertising breaks.

131. Exhibit 10 shows the results for this feature. All respondents were able to explain the concept of *advertising*. A typical response was:

> *To me, advertising is when a song finishes and you're stuck with 30 seconds of listening to some ad about something that you probably don't want to listen to.* [141]

132. However, there was substantial heterogeneity with respect to how often the qualitative study respondents expected to hear ads. Expectations of the number of times users would be interrupted by advertisements per hour ranged from once per hour (2 respondents)[142] to 12 or more times per hour (2 respondents.)[143] A large

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[140] Transcripts, p. 301, Giana B.

[141] Transcripts, p. 10, Alexandra F.

[142] For example:

Q: Could you tell me in your own words how many commercial breaks you'd expect these 1.5 to 3 minutes of ads per hour to occur in?

A: Every hour.

Q: How many blocks of advertisements did you assume to be played when you read "1.5 to 3 minutes of ads per hour"?

number of respondents (62 percent) expected 2 to 5 interruptions per hour,[144] while another substantial group (19 percent) thought it would be closer to 6 to 12 interruptions.[145] In this case, respondents completed a vague description of a feature with their own varied experiences and expectations. For example:

> *Q: Can you tell me in your own words what it means when there are one and a half to three minutes of ads per hour?*
>
> *A: Over the course of an hour, probably one and a half to three minutes' worth of ads will be either spread out throughout that hour in between songs, or—Spotify will say, "Watch this video and get an hour for free." You can opt to watch a longer advertisement for the next 30 minutes advertisement-free. You can watch it all up front, I guess. You could do it in a chunk.*[146]

133. Because it is possible that respondents value this feature differently depending upon the number of interruptions per hour, Professor McFadden cannot combine these varied respondent understandings for the purpose of analysis or opinions. I see evidence of these different valuations in qualitative study respondents' answers. One respondent said:

> *A: I would rather listen to it for three minutes and just get it over with than it interrupting you.*[147]

In contrast, another respondent said:

> *A: I would probably prefer if it was shorter blocks, just because it's only 30 seconds away from your music or whatever at a time.*[148]

[…]

A: One.

(Transcripts, p. 397, Jacob K.)

[143] One respondent said, "Those ads are short, so I would say, if they're going to do one every two minutes, you're going to do thirty. I would say probably 60. Probably 60 to 90 quick ads." (Transcripts, p. 644, Rebecca C.)

[144] One respondent stated, "They generally don't like to put a whole bunch of ads together, so I'm assuming that's probably three or four blocks." (Transcripts, p. 735, Steven J.)

[145] One respondent stated, "That kind of depends on the commercials. Sometimes they're 15 seconds; sometimes they're at least 30 seconds. It depends on what it is. […] At least ten." (Transcripts, p. 26, Alex S.)

[146] Transcripts, p. 141, Chad H.

[147] Transcripts, p. 275, Eric R.

[148] Transcripts, p. 440, Jordan P.

8. Most Qualitative Study Respondents Indicated at Least Some Confusion About Professor McFadden's Feature Definitions

134. The preceding paragraphs document considerable heterogeneity in the manner in which respondents interpret features. Different interpretations among respondents undermine any analyses of the data and undermine any interpretations and opinions based on those analyses. A common interpretation of feature descriptions is critical because the calculation of partworths and creation of estimated valuations of features depends on that common understanding of the features. If two distinct groups of respondents interpret features differently, they may systematically value these features differently. Because Professor McFadden has no way of knowing which respondents interpreted the features which way, he cannot reliably combine respondent answers into a single analysis to obtain reliable valuations of the features (or a probability distribution of those valuations as is the output of Hierarchical Bayes analysis).

135. The preceding paragraphs also document that many qualitative study respondents were confused by key feature descriptions in Professor McFadden's survey. Because of this confusion, any analyses of the answers to Professor McFadden's survey would lead to unreliable estimates of partworths and of the valuations that respondents place on the features. Professor McFadden has no way of knowing which respondents were confused; he cannot simply eliminate the confused respondents from his analyses to concentrate only on respondents who were not confused.

136. On many features, the level of confusion raises well above any noise levels that could reasonably be handled with a "zero-mean error term." The assumption of a zero-mean error term is an assumption that there is no bias, just "white" noise, in the respondent's answers. The assumption is violated if the confusion leads to biases or if the confusion leads to systematic and unobservable differences among respondents. If this assumption is violated, then the statistical analysis of the data from Professor McFadden's survey is not valid. Even if a zero-mean term could be assumed, which it cannot be, confusion would increase the magnitude of the error and substantially increase any reported precision of the estimates. With less

precision, results put forth as statistically relevant may not be statistically relevant and certainly cannot be claimed to be statistically relevant.[149] Because several features were interpreted by blind coders as having substantial variation in their meaning, the level of confusion raises well above the noise levels mentioned above. Taking into account that a number of interpretations for some features not only showed such variation, but were also frequently far off Professor McFadden's intended meaning, the coding of the qualitative research indicates that there was likely substantial confusion amongst respondents to Professor McFadden's study.

C. A Review of Videotapes Revealed Even Greater Confusion about Professor McFadden's Survey

137. The coding discussed in the prior section was based on the respondents' verbal responses. Although the discussion above showed likely confusion in respondents' understanding of the features, it is conservative (favors Professor McFadden's survey) because it does not take into account any confusion that is expressed by respondents' non-verbal cues such as intonation, facial expression, and body language. To assess whether the non-verbal cues indicated increased confusion or whether non-verbal cues suggested less confusion, the video recordings of the qualitative interviews were also evaluated by two blind judges.

138. In the coding of video recordings, two blind-to-the-purpose coders were asked to review the videos recordings of all 53 respondents and to assess the respondents' understanding of certain features and aspects of the survey using intonation, facial expression, and body language as well as the verbal responses. The coders were provided with the qualitative study interview script (Appendix D), a guide for coding which included the feature definitions provided by Professor McFadden (Appendix F), a screenshot of Professor McFadden's survey (Table 2 in his testimony), and an Excel file template. Each coder was asked to watch each video

[149] In classical statistics, statistically relevant would translate directly to statistically significant at some level of significance, say the 0.05 level. In Bayesian statistics, the interpretations are somewhat different in that we refer to the posterior distribution of the estimates. However, in either interpretation, this level of confusion means that any precision is grossly overstated.

and, for selected questions in the interview script, assess whether the respondent did or did not understand the feature being described. For each question for which the coders assessed understanding, respondents were graded on a five point scale: (1) understands; (2) probably understands or somewhat understands; (3) unsure/unclear; (4) probably does not understand or does not completely understand; and (5) does not understand. Although numbers are used in the prior sentence, such numbering was avoided with the scale for the coders, so as not to indicate that one end of the scale was preferable to the other.

139. Unlike the first set of coding, which focused exclusively on interpreting the transcribed answers, this video coding assessed qualitative study respondents on two levels: (1) correct or incorrect interpretation of the feature on the basis of Professor McFadden's definitions (similar to the prior coding);[150] and (2) certainty and confidence in response (assessed via intonation, facial expression, gesture, and wording.) Thus, a respondent who provided a confident, correct answer would be classified as "understands" while a respondent who provided a confident, incorrect answer would be classified as "does not understand." A respondent who expressed confusion or uncertainty (by saying "I guess?" or "I'm not sure" or via gestures or intonation), but gave an answer that was correct or mostly correct would be classified as "probably or somewhat understands" while a respondent who expressed confusion and gave a mostly incorrect answer would be classified as "probably does not understand or does not completely understand." A respondent who expressed confusion and could not answer the question or answered it entirely incorrectly would be classified as "does not understand." "Unclear/unsure" was

[150] Coders were provided with the definitions page from Professor McFadden's survey (App. B, B-viii) as well as accompanying verbal instructions. Coders were told to consider only these definitions, without regard to any outside information they might have about music streaming features. Coders met regularly with staff at Analysis Group to confirm their understanding of the features.

reserved for rare cases where the coders were unable to determine the respondents' understanding.[151]

140. Exhibit 11 shows the results of the video-recording coding related to confusion. These results are generally consistent with my results, above in Section VI.B, but reveal less overall understanding.[152] In the case of transcript-based feature interpretation, coders grouped all respondents into categories according to the content of their responses, regardless of confusion. Therefore, the feature interpretation coding discussed above was conservative: all qualitative study respondents were given the benefit of the doubt regarding their understanding regardless of intonation, facial expression, and body language. In the video-recording coding, coders classified qualitative study respondents as not understanding a feature when the coders observed confusion expressed through intonation, facial expression, and body language.

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[151] For questions on music streaming features, only two respondents were coded as "Unsure/Unclear": one respondent for music tastemakers and another respondent for *advertising*.

[152] In total, 361 responses were coded using both methods: there were 371 total responses (53 participants x 7 features). Six were excluded due to interviewer error and four due to unclear responses. Of these 361 responses, all but 4 of the responses were coded consistently between the two methods. 69 percent were coded identically between both methods ("understands" and "correct interpretation" or "does not understand" and "incorrect interpretation"). An additional 30 percent of responses revealed additional confusion when visual and verbal cues were considered. This result is consistent with the expectation that the holistic video coding would identify more confusion compared to the transcript coding method. Only four responses about specific features were categorized such that the video coding judged a response as "understands" or "probably understands," while the transcript categorization judged the response as "incorrect interpretation."

I carefully reviewed the video recordings and transcripts for the 1 percent of responses which were coded inconsistently between the two methods. The small number (approximately 1 percent) of discrepancies is understandable, likely expected noise, and certainly does not cause any concern with the reliability of either the coding of the verbal responses or the coding of video recordings.

141. Because of the 99 percent consistency, for the vast majority of respondents, any respondents classified as "understanding" in this exhibit are a subset of those respondents who were classified as having the correct interpretation in the prior exhibits.

142. For example, when asked to define *available library size* the following respondent was classified as "correct" in the first coding using the transcripts and "probably does not understand" in the second based on the raw videotape:

> *Q: Could you tell me in your own words what it means when the available library size is 20 million songs?*
>
> *A: That you could have up to 20 songs. [sic] Or to choose from?*
>
> *Q: Maybe I ought to repeat the question.*
>
> *[Moderator repeats question.]*
>
> *A: You have the option to add up to 20 million songs?*
>
> *Q: There are no right or wrong answers.*
>
> *A: That's my choice, that you have the 20 million songs, you have the option to down—you can't download them, but put them in you—I don't know how you word it. Choose from.*[153]

It is clear to the coders from the video recording that this respondent is confused by the term. But, ultimately, she gives an answer that is close to correct and, thus, was classified as correct in Exhibit 9, because the classification was based solely on the transcript.

143. There are higher levels of confusion found by judges who relied on video recordings than by judges who relied on verbal transcripts only. Thus, the transcript coding underlying Exhibits 3-10 was conservative. The video-recording coding reinforces the high level of confusion experienced by respondents when they attempted to answer Professor McFadden's survey. This high level of confusion renders the data obtained from Professor McFadden's survey unreliable and not indicative of respondents' true preferences for features of music-streaming services. Any estimates of feature valuations obtained by Professor McFadden and used by Professor Rubinfeld are, by implication, unreliable and not indicative of respondent's valuations.

[153] Transcripts, p. 606, Nancy M.

D. Professor McFadden's Brand Controls Likely Did Not Achieve the Effect Desired by Professor McFadden

144. Professor McFadden attempted to control for brand by varying the brand that respondents were told to keep in mind for each of three sets of choice tasks:

> *Although brand is not an attribute listed in Table 1, I controlled for consumers' valuation of brand—Spotify, Pandora, or an unknown brand—as follows. The respondent was presented with: (i) five choice sets in which s/he was required to choose among hypothetical (or actual) Spotify products; (ii) five choice sets in which s/he was required to choose among hypothetical (or actual) Pandora products, and (iii) five choice sets in which s/he was required to choose among hypothetical products of an unnamed brand. The order that these sets were presented was randomized across respondents.*[154]

145. Professor McFadden presents no further information about how his branded results compare to his non-branded results. In my qualitative study, after each of the sets of five questions, respondents were asked "was there or wasn't there a brand associated with your last five choices?" Respondents answered "no,"[155] referenced the same brand across all three sets of choice tasks,[156] or attempted to compare the choice sets to brands they were aware of in the real world,[157] often without making any reference to the introductory screen that sought to induce the brand variation. This screen did not register with respondents. As a result, Professor McFadden's survey did not control for a brand effect in the manner in which it was intended.

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[154] McFadden Testimony at 10.

[155] One respondent said the following after being asked whether their choices related to a brand: "No, I wouldn't say so. […] No, no brand. […] No, no brand." (Transcripts, pp. 22, 26, 28, Alex S.)

[156] One respondent said, "You mean a provider, like Spotify or Pandora? […] Probably Spotify. […] Probably Spotify. […] Yeah, it reminded me of Spotify." (Transcripts, pp. 775, 778, 781, Thomas W.)

[157] One respondent said, "[…] Rhapsody, Pandora, Spotify [...] I noticed that some of them I could identify what they were, by the description. There are some major differences." (Transcripts, p. 564, Manuel R.)

Another respondent said, "I guess it's kind of like Pandora in a way, or Spotify." (Transcripts, p. 435, Jordan P.)

Another said, "I go a lot with Pandora, so I kind of was comparing it to that." (Transcripts, p. 49, Ariana D.)

Moreover, respondents would repeatedly mention brands without prompting while thinking through their choices.[158]

146. Additionally, when features were unclear, as they often were, respondents may have overwritten the instructions using their personal knowledge.[159] Such personal knowledge varied among respondents and Professor McFadden has no way in his analysis to account for this variation in personal knowledge. Critically, because the effective brand anchor is not observed in Professor McFadden's survey and because personal knowledge varies among respondents, then, if the features in the conjoint survey have different meanings for different brands, Professor McFadden cannot combine these disparate respondents into a single analysis.

147. For example, consider the "playlists curated by music tastemakers" feature level. Both Spotify and Pandora offer playlists curated by music tastemakers, but the features are markedly different from each other. Spotify allows users to "follow"

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[158] For example:

Q: Please describe why you chose the option that you chose.

A: I chose plan A based on skips. That was the ultimate thing, because I know sometimes when I'm in certain moods, I just want to skip the regular songs, and I just want to listen to one specific song. If I was to listen to Pandora and that was the plan, I would've just picked that one, because no matter which plan I picked, I was only allowed to skip six songs per hour.

(Transcripts, p. 3, Alexandra F.)

"I notice that the words 'random order' are put in here with Spotify, which is something I noticed, too. That's something that my son has brought up, that with Pandora, a lot of times, you end up having the same artists in a row, which doesn't faze me, but I know that it's—it's interesting how they would put that in there. That is something that would cue me in that it was Spotify. A random order is something that seems to be a big push for them."
(Transcripts, p. 612, Nancy M.)

[159] For example:

Q: When it says on there "mobile device streaming," when it says "playlists generated by the service," could you tell me what that means?

A: Assuming for Pandora, because that's just what I thought of, the like and dislike, how it generates your playlist. It tries to put songs in categories, and then what categories you like or dislike, it tries to give you those kinds of songs.

(Transcripts, p. 668, Samuel H.)

other users, including celebrities, and listen to their playlists, whereas Pandora offers official playlists generated by non-celebrity experts.[160] This is prone to cause different interpretations among respondents, depending on the service with which they are more familiar, making an interpretation of Professor McFadden's statistical analyses difficult, if not impossible.

148. One respondent, who identified herself as a Pandora user, described her understanding based on her experiences with Pandora:

> *Q: Could you tell me in your own terms what the term "tastemaker" means to you?*
>
> *A: A tastemaker, I guess, is somebody that does a lot of research on music and would pick out what songs they think that I would like based on what topic of music I want to listen to.*
>
> *Q: What do you mean by that? Tastemaker—maybe flesh it out a little bit more. How would that end up working out?*
>
> *A: I see it as that's computer-generated. If I went to Pandora and I clicked I wanted country music, that they would just give me a whole list of songs to listen based on—if I picked the top 40 songs of country music right now, it would just bring it up automatically, that I wouldn't really have a say in that. It was just that's the topic that I picked, so that brought up a bunch of songs for me.*[161]

Meanwhile, a Spotify user focused her answer differently:

> *Q: Could you tell me in your own words what it means when the playlist is curated by music tastemakers?*
>
> *A: You know something? I don't know what it means, and I've always wanted to know what it means. I'm assuming that—I'm going to use Spotify for example because it just seems more relevant to all of these questions. What was the question again?*
>
> *[Moderator repeats question.]*
>
> *A: The tastemakers are the people that are actually using the—Spotify. May I use that example?*[162]

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[160] "FAQs: Why should my playlist be private while I am curating?" *Spotify.com*, http://www.spotifyartists.com/faq/#why-do-i-need-to-uncheck-the-option-to-make-playlists-public, (last visited Feb. 16, 2015); "Pandora Unveils Billboard Advertising Unit Featuring Lexus," *Pandora.com*, October 20, 2011, http://investor.pandora.com/phoenix.zhtml?c=227956&p=irolnewsArticle&ID=1619467,(last visited Feb. 16, 2015).

[161] Transcript, p. 7, Alexandra F.

[162] Transcript, p. 203, Donna C.

E. Professor McFadden's Willingness-to-Pay Values Are Likely Unreliable Because the Underlying Data Are Not Reliable. Thus, Professor Rubinfeld Cannot Rely upon Professor McFadden's Survey to Justify His Assumptions

149. Exhibit 12 presents a conservative summary of the confusion caused by the feature descriptions and incentive alignment instructions in Professor McFadden's survey. Exhibit 12 is conservative because it is based on the results of the coders who relied only on the respondent statements rather than relying as well on intonation, facial expression, and body language. As discussed above, when coders take into account non-verbal cues, respondents express even more confusion. Exhibits 1.a and 1.b provide video footage examples of confusion relating to respondents' understanding of Professor McFadden's incentive alignment and feature descriptions, respectively.

150. Of the fifty-three (53) respondents in my interviews, only six (11 percent) understood all seven features and incentive alignment. One can look at the results in many ways. For example, only 17 (32 percent) understood all seven features (not counting the incentive alignment) and 19 (36 percent) misunderstood at least two features. The overall implication of Exhibit 12 is that there is substantial confusion among respondents about the feature descriptions and the incentive alignment instructions. While one cannot expect every respondent to understand every feature, this level of confusion is quite high and undermines any claims that the data obtained by Professor McFadden's survey are reliable.

151. The failure of Professor McFadden's intended brand controls further undermines the reliability of the data. A key assumption in the statistical analysis of the data is that only the explicitly-varied features vary among the alternatives in each of the choice tasks. If unobserved brand features vary consistently with the stated levels of Professor McFadden's features, then any estimates are hopelessly confounded. It is likely that respondents did not hold brand constant and, instead, attributed brand features to various feature levels within the choice alternatives. Doing so strongly affects the choices that respondents make, leading to unreliable data and to the violation of assumptions that are critical to Professor McFadden's statistical analyses.

152. Because the underlying data are unreliable, any statistical summaries of the data, including the calculations of partworths from the data, are unreliable. Even if the data were reliable, which they are not, respondents vary considerably in how they interpret the feature descriptions. A reported valuation for a feature, say *offline listening*, is combining "apples and oranges," that is, the valuation is combining many different respondent interpretations into a single summary. Because Professor McFadden's analyses can identify neither which respondents have which interpretations nor how the differing interpretations affect the partworth, it is not appropriate to assume that the average interpretation is the same as that assumed by Professor McFadden. This variation undermines assumptions about "error terms" that are critical to the estimation and the interpretation of the results.

153. Because the data upon which Professor McFadden relies are unreliable and, by implications, the statistical analyses are unreliable, the reported valuations of the music-streaming features are unreliable. Thus, any ratios calculated by Professor Rubinfeld based on Professor McFadden's analyses are themselves unreliable.

154. Professor McFadden focuses his estimates on three non-statutory features of music streaming: *on-demand track selection* (which he calculates as the combined effect from both computer and mobile on-demand options), *offline listening*, and *skip limits*.[163] He then compares the values for these features to the values he calculates for "other features" that are "available to both statutory webcasters and streaming services that have directly negotiated licenses," which I will refer to as statutory features. Professor McFadden estimates that "45% = (3.89/(4.16+3.89+0.60)) of the value to future consumers is attributable to the non-statutory features.".[164] Professor Rubinfeld makes a similar calculation, asserting that "these calculations result in an

[163] McFadden Testimony at 25-26.

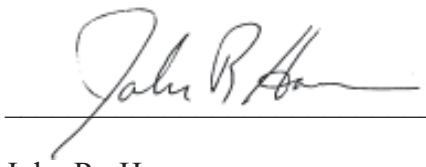
[164] McFadden Testimony at 24-28. In Figure 4 of his testimony, Professor McFadden lists three non-statutory features: On demand (desktop and mobile), Offline listening, and Unlimited skips. He also denotes six "other features" and associated feature levels that are available to both statutory webcasters and streaming services with directly negotiated licenses: Free plan, Playlist from tastemakers to algorithm, Catalog from 1M to 20M, Current plan, No advertising, and Addition of mobile services.

interactivity ratio of 1.9."[165] This estimate is highly unreliable. As the qualitative research demonstrates, the confusion among respondents is so high that any estimates based on the data from Professor McFadden's survey are likely to be biased substantially and in an unknown and unknowable direction.

155. The calculated ratio can be substantially smaller or substantially larger, even if only one feature in the survey would indicate substantial confusion. For example, if the valuation for *offline listening* is biased upwards, then the calculated interactivity ratio mentioned above would be inflated; if it is biased downward, the ratio would be deflated. However, the problems with the calculated ratio are far more severe than that. Wrongly estimating the valuation of one feature will affect the valuations of other features, especially when feature descriptions are very similar and when respondents mix up features during the choice task because of evident overlap in meaning. In addition, when multiple features are affected by confusion, it is literally impossible to reconstruct how features affect one another during the choice exercise and how the valuations for each feature are affected. The only conclusion that can be drawn is that true consumer preferences were not reliably assessed by the McFadden survey and that the bias from the incentive alignment and the feature descriptions appears to affect the valuations of all features.

[165] Rubinfeld Testimony at 52.

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



John R. Hauser

February 23, 2015

Date

Exhibit 1.a

Please see disk attached for video

Exhibit 1.b

Please see disk attached for video

Exhibit 2
Respondents' Understanding of Professor McFadden's Incentive Alignment
Sample of 53 Respondents in Professor Hauser's Qualitative Study
Transcript Coding[1]

	N	%
Respondents who understood the incentive alignment language and related the gift to their choices[2]	**9**	**17%**
Respondents who acknowledged the presence of, but did not understand the incentive alignment	**39**	**74%**
Respondents who acknowledged that they did not understand the incentive alignment language[3]	9	17%
Respondents who interpreted the gift to be only the $30 Visa gift card[4]	2	4%
Respondents who interpreted the gift to be only the residual value of the Visa gift card and assumed they would not receive their chosen service[5]	10	19%
Respondents who interpreted the gift to be only the music streaming service and did not mention any Visa gift card to be spent as cash[6]	4	8%
Respondents who understood the incentive alignment language but did not relate the gift to their choices[7]	9	17%
Respondents who otherwise misunderstood the gift card mechanism[8]	5	9%
Respondents who misinterpreted the interview payment and ignored the incentive alignment language[9]	**5**	**9%**
Total number of respondents	**53**	**100%**

Notes:

[1] The transcript coding was done by two blind-to-the-purpose coders, who reviewed the transcript responses for all respondents to categorize their interpretations of Professor McFadden's music streaming service features based on the content and similarities between responses.

[2] These respondents demonstrated that they understood both components of the incentive correctly and that their choices in the survey would affect their final gift.

[a] *Christopher N.* : "It seems as though the incentive to do this is I would get a gift card that would be worth the monthly payments of the website or the streaming website. Depending on how I choose my questions depends on how much money I would get on a gift card for - it's like $10 a month or something like that for a couple of months" (Transcripts, p. 149).

[b] *Chad H.* : "Of the $30 gift, a proportion of that will go towards the plan that it ultimately chooses for you, or that I choose" (Transcripts, p. 135).

[3] These respondents were unable to explain either the incentive description or their personal gift in their own words.

[a] *Giana B.* : "I don't know. I'm kind of lost. I don't know how to explain it. It's hard to explain. I don't know" (Transcripts, p. 298).

[b] *Elizabeth V.* : "One said $30, and then one said $15, and another one said $20, if I'm not mistaken. I didn't come away with it clear" (Transcripts. p. 250).

[4] These respondents understood their personal gift to be only a $30 Visa gift card.

[a] *Alicia R.* : "That we would be given a $30 gift card" (Transcripts, p. 34).

[b] *Michael B.* : "I think it's like a $30 gift card" (Transcripts, p. 577).

[5] These respondents understood their personal gift to be the dollar difference between the $30 Visa gift card and the cost of their chosen service. They did not indicate that they expected to receive their chosen service as part of their gift.

[a] *Kelly B.* : "It's a Visa card of $30, and then each of the different services will have a different value on it, and you pick the one that's most valuable to you. Each of them have a cost associated with it and you'll deduct that cost from the amount of the gift card. [...] I guess it means that I get a Visa card, and whatever I don't spend on whichever service that I pick, I get the remainder" (Transcripts, p. 467).

[b] *Thomas W.* : "It was a gift card minus the cost of the service. I think that was what from my understanding it was. It was a little confusing" (Transcripts, p. 772).

Exhibit 2
Respondents' Understanding of Professor McFadden's Incentive Alignment
Sample of 53 Respondents in Professor Hauser's Qualitative Study
Transcript Coding[1]

Notes (continued):

[6] These respondents understood their personal gift to be only the music streaming service and did not mention the Visa gift card.
[a] *Brandon R.* : "It will be for the service of a certain music streaming thing. I believe it said try to choose one that you feel most comfortable with" (Transcripts, p. 87).
[b] *Helen S.* : "I'm expecting that I would get the choice of what type of music streaming and, obviously, there would be limitations. I think the implication, at least my understanding is, it would be smaller packages. If I did $10, it would be a smaller package than the $20 Visa gift card. If I did the whole $30, I might have more privileges on music streaming. That was my understanding" (Transcripts, p. 357).

[7] These respondents were able to explain the components of the incentive correctly, but failed to demonstrate an understanding of how their choices in the survey would affect their final gift. Only after specific prompting, some of these respondents indicated that there may be a relationship between their choices and their gift.
[a] *Delia P.* : "I wasn't thinking about it so I—I guess it would relate in some fashion. [...] The gift was talking about at the beginning of the survey that whichever one you choose, it would be deducted from that gift, but that wasn't in my mind." (Transcripts, p. 186).
[b] *Interviewer:* "With respect to the music streaming service gift mentioned on the prior screen, in your own words can you tell me what the particular gift compromises [*sic*]?"
Molly S. : "A Visa gift card of at least $15 but it depends on which program you select. If you spend $10 on the music they'll give you $20. You have $30 to start."
Interviewer: "In your own words what do you expect your personal gift to include?"
Molly S.: "I have no idea."
(Transcripts, p. 588).

[8] These respondents did not demonstrate that they understood the incentive to be of a $30 total value with two components: a Visa gift card and a gift card to a music streaming service. Instead, these respondents explained their gift in a variety of ways:
[a] *Steve M:* "I started from—part one was I was getting a gift card to actually entice me into getting one of the plans that I would use the gift card on. I just checked on the free one, so I would use the gift card [...] One of the plans is $4.99 and the other one is $10.99, so you would use the gift card to use to pay one of those membership fees" (Transcripts, p. 714).
[b] *Kristin C.* : "I'm thinking that it looks as though they're going to defray the cost of membership [...] I'm not sure what they're offering me, if I can get something for free" (Transcripts, p. 497).

[9] These respondents were unable to distinguish the $100 incentive for participating in the survey from the additional $30 offered within the survey, or they did not expect to receive the $30 offered within the survey because they were not directly taking the survey.
[a] *Interviewer:* "With respect to the music streaming service gift mentioned on the prior screen, in your own words could you tell me what the particular gift comprises?"
Drew V.: "One hundred dollars."
(Transcripts, p. 215).
[b] *Interviewer* : "What do you expect your personal gift to be, for you, Lidia, when you're done with this survey?"
Lidia S. : "Nothing, really. Just to help you guys out with which service to choose."
(Transcripts, p. 530).

Sources:

[1] Testimony of Daniel L. McFadden, Before the Copyright Royalty Board, Library of Congress, Washington DC, October 6, 2014.
[2] Combined transcripts from qualitative research interviews conducted by Applied Marketing Science on January 14-15, 2015.

Exhibit 3
Respondents' Interpretations of Professor McFadden's Music Streaming Feature Descriptions
Sample of 53 Respondents in Professor Hauser's Qualitative Study
Transcript Coding[1]

	Respondents with a Correct Interpretation		Respondents with an Incorrect Interpretation		Total Respondents	
Feature Descriptions	N	%	N	%	N	%
Playlist Method[2]	21	40%	32	60%	53	100%
Curated by Music Tastemakers	21	40%	32	60%	53	100%
Generated by a Computer Algorithm	42	79%	11	21%	53	100%
On-Demand Track Selection	49	92%	4	8%	53	100%
Offline Listening[3]	40	85%	7	15%	47	100%
Mobile Device Streaming	51	96%	2	4%	53	100%
Skip Limits	53	100%	0	0%	53	100%
Available Library Size[4]	33	66%	17	34%	50	100%
Advertising	53	100%	0	0%	53	100%

Notes:

[1] The transcript coding was done by two blind-to-the-purpose coders, who reviewed the transcript responses for all respondents to categorize their interpretations of Professor McFadden's music streaming service features based on the content and similarities between responses.

[2] To assess Professor McFadden's music streaming service feature of *playlist method* , responses were coded according to the respondents' understanding of the underlying levels: "curated by music tastemakers" and "generated by a computer algorithm." For the purpose of this exhibit, the transcript coding for respondents' understanding of these two levels were combined. Respondents who had a correct interpretation of both the concept of a music tastemaker and a computer algorithm were categorized as having a "Correct Interpretation." If they had an incorrect interpretation of either concept, they were categorized as having an "Incorrect Interpretation."

[3] Six respondents were asked about "offline licensing" rather than "offline listening." These respondents are not included in the table above.

[4] Three respondents did not explain *available library size* sufficiently to determine understanding. These respondents are not included in the table above, unlike in Exhibit 9, where these respondents appear in a separate category.

Sources:

[1] Testimony of Daniel L. McFadden Before the Copyright Royalty Board, Library of Congress, Washington DC, October 6, 2014.

[2] Combined transcripts from qualitative research interviews conducted by Applied Marketing Science on January 14-15, 2015.

Exhibit 4.a
Respondents' Understanding of Professor McFadden's Description of Music Streaming Service Features
Sample of 53 Respondents in Professor Hauser's Qualitative Study
Playlist Method: Music Tastemakers
Transcript Coding[1]

Responses to "Could you tell me in your own words what the term *tastemaker* means to you?"	N	%
Respondents who interpreted tastemakers to be celebrities or music experts who create playlists	**21**	**40%**
Respondents who believed that playlists were generated by celebrities[2]	4	8%
Respondents who believed that playlists were generated by music experts[3]	17	32%
Respondents who had other interpretations of tastemakers, signaling their misunderstanding of the feature	**32**	**60%**
Respondents who acknowledged that they did not understand the concept of a tastemaker[4]	3	6%
Respondents who believed that playlists were generated by other users[5]	3	6%
Respondents who believed that playlists were generated by themselves[6]	7	13%
Respondents who believed that playlists were generated by an unspecified person's preferences[7]	8	15%
Respondents who believed that playlists were custom-tailored for them by music experts[8]	3	6%
Respondents who believed that playlists were generated by a computer algorithm[9]	2	4%
Respondents who otherwise misunderstood the concept of a tastemaker[10]	6	11%
Total number of respondents	**53**	**100%**

Notes:

[1] The transcript coding was done by two blind-to-the-purpose coders, who reviewed the transcript responses for all respondents to categorize their interpretations of Professor McFadden's music streaming service features based on the content and similarities between responses.

[2] These respondents understood the term tastemaker to mean celebrities.

[a] *Steven J.* : "That means that somebody, like Beyoncé—whoever that is. I know who she is, but somebody like Beyoncé has decided that—it says—I don't know if she knows anything about Motown, but when Beyoncé says, 'Here's my Motown playlist.' She's the person that picks which particular files goes into the Motown bucket. [...] Somebody who is suppose [*sic*] to be an authority" (Transcripts, p. 732).

[b] *Toni V.* : "Like I said before, I think it's playlists or options for listening to music based on either what the computer thinks or the program thinks the person who is using the streaming music personal is—or tastemaker is somebody that is a professional rock star, rock and roll music player, or whatever" (Transcripts, p. 800).

[3] These respondents understood the term tastemaker to mean music experts who specialize in selecting songs for playlists.

[a] *Nancy M.* : "Someone obviously who's knowledgeable in the music industry and watches patterns and realizes that if you like one band, you might possibly like another one. They study patterns and put them all together to give you options that you don't realize that you have" (Transcripts, p. 607).

[b] *Chad H.* : "Someone who is well versed in matching your tastes. That is a funny term" (Transcripts, p. 139).

Exhibit 4.a
Respondents' Understanding of Professor McFadden's Description of Music Streaming Service Features
Sample of 53 Respondents in Professor Hauser's Qualitative Study
Playlist Method: Music Tastemakers
Transcript Coding[1]

Notes (continued):

[4] These respondents acknowledged that they did not understand the term tastemaker.
[a] *Elizabeth V.* : "I don't know. Tastemaker. Again, somebody—I don't know. Going along the lines of whatever genre, whatever music that you're into, they give you along the lines of the same concept or the same ideas. I have no idea" (Transcripts, p. 256).
[b] *Frank B.* : "Tastemaker would be someone that you looked up to that maybe has similar taste or views as you. If your friends like it, I would probably like it also. [...] It could be, if you're following a certain artist like Bruno Mars. If Bruno Mars likes this, perhaps you would like it also. That's another thing that it could be. I'm really not sure" (Transcripts, p. 288).

[5] These respondents understood the term tastemaker to mean other users of the music streaming service.
[a] *Thomas W.* : "I guess just another user. I'm not really sure" (Transcripts, p. 777).
[b] *Donna C.* : "The tastemakers are the people that are actually using the—Spotify" (Transcripts, p. 203).

[6] These respondents understood the term tastemaker to mean themselves.
[a] *Manuel R.* : "Almost exactly what that means to me is it means that it is—it's whatever I like that I can pick from their—make my own playlist. What I like, my taste versus their taste" (Transcripts, p. 566).
[b] *Nicole M.* : "I would think that that means musical preferences that you have. If you like a little bit of rap, a little bit of Pavarotti, that's your taste. You're a tastemaker. Taste, preferences, what you prefer to listen to" (Transcripts, p. 625).

[7] These respondents understood the term tastemaker to mean an unspecified person that selects songs that are similar to each other.
[a] *Brandon R.* : "Tastemaker, a group of things put together by people that like it or don't like it. Something that they personally like" (Transcripts, p. 91).
[b] *Iman D.* : "Somebody with a taste for that type of music making the playlist for it" (Transcripts, p. 379).

[8] These respondents understood the term tastemaker to mean music experts who create customized playlists based on the users' tastes.
[a] *Delia P.* : "It was one thing that you—a tastemaker, I would say, is something that makes a playlist based on what it appears your taste in music is, what your preference is" (Transcripts, p. 189).
[b] *Jordan P.* : "Tastemaker would probably be someone that analyzes what stuff you like to listen to and knows where to find other music that's similar" (Transcripts, p. 437).

[9] These respondents understood the term tastemaker to mean a computer algorithm which selected songs for a playlist based on the user's song preferences.
[a] *Alex S.* : "Tastemaker means the computer algorithm memorizing the bands and music you like. [...] The computer saves your preferences, and instead of you always having to look up the songs of the same band, it just kind of shows you the options and the songs of the band" (Transcripts, p. 24).
[b] *Celine A.* : "Once again, going back to maybe based off the recent music that you listened to. It just puts all of the music that they think that you would like into that" (Transcripts, p. 122).

[10] These respondents had other interpretations of the term tastemaker.
[a] *Brian G.:* "Tastemaker means to me that there's a certain—that there's an idea of what goes with what. If a person's taste in music is classical, these are things that they will like. That's what I think of when I think of tastemaker" (Transcripts, p. 107).
[b] *Kristin C.* : "In the song venue, it would be certain choices people are making that they want to enjoy. [...] It's an auditory thing. It's what you—it's like on weekends, when I'm scuttlebutting around, I might have on country or Motown from the '70s, because it's kind of upbeat and whatever. At night, my choices, they're not that. They're easy listening, whether be instrumental or just songs that are mindless that I don't have to think about" (Transcripts, p. 504).

Sources:

[1] Testimony of Daniel L. McFadden Before the Copyright Royalty Board, Library of Congress, Washington DC, October 6, 2014.
[2] Combined transcripts from qualitative research interviews conducted by Applied Marketing Science on January 14-15, 2015.

Exhibit 4.b
Respondents' Understanding of Professor McFadden's Description of Music Streaming Service Features
Sample of 53 Respondents in Professor Hauser's Qualitative Study
Playlist Method: Generated by a Computer Algorithm
Transcript Coding[1]

Responses to "Could you tell me in your own words what the term *generated by a computer algorithm customized by your own preferences* means to you?"	N	%
Respondents with a definition for computer algorithm generated playlists	**42**	**79%**
Based on the user's selection of a genre or artist, the computer algorithm suggests similar songs[2]	12	23%
Based on the user's feedback, the computer algorithm suggests similar songs[3]	15	28%
Based on the user's previous music listening history, the computer algorithm suggests similar songs[4]	15	28%
Respondents who did not understand the concept of a music selecting computer algorithm	**11**	**21%**
Respondents who acknowledged that they did not understand how a computer algorithm could generate a playlist[5]	2	4%
Respondents who did not appear to understand the term "algorithm"[6]	3	6%
Respondents who believed that they generated the playlist[7]	4	8%
Respondents who believed that the computer algorithm selects songs based on any of the user's online activities[8]	2	4%
Total number of respondents	**53**	**100%**

Notes:

[1] The transcript coding was done by two blind-to-the-purpose coders, who reviewed the transcript responses for all respondents to categorize their interpretations of Professor McFadden's music streaming service features based on the content and similarities between responses.

[2] These respondents believed that computer algorithms generate playlists based on the user's selection of a genre or artist.

[a] *Alex S.* : "Made by a computer algorithm means that you pick the genre and it just customizes it and plays whatever song. If I pick rock, they play Ozzy Osbourne, Rolling Stones, but the other one means that you pick the songs and it just plays it over and over again. It shuffles it" (Transcripts, p. 24).

[b] *Kelly B.* : "That would mean I go in and I pick—it tries to pick off my likes that I've shown it, so I'll go in and I'll pick artists, genre, whatever, and it will interpret what that means, and then pull some of its own also" (Transcripts, p. 471).

[3] These respondents believed that computer algorithms generate playlists based on the user's active "likes" and "dislikes" of currently playing songs.

[a] *Alexandra F.* : "To me, that makes me think of when it has like the thumbs-up or thumbs-down part on it, and it tells you—they get an idea of the song that you like, to play more of those or to play less of the songs that you don't like. [...] Whether or not you like or dislike. The thumbs-up is that you like it; thumbs-down is that you don't like that song. Then, they try to skip that song if you still have skips, I think, or they just know that, and next time they won't play that particular song. Sometimes they do. I've seen that they do songs similar to it" (Transcripts, p. 8).

[b] *Molly S.* : "There is an equation somewhere that is taking what you like and don't like and is then coming up with music based on those preferences, but it's all based on a mathematical equation" (Transcripts, p. 593).

Exhibit 4.b
Respondents' Understanding of Professor McFadden's Description of Music Streaming Service Features
Sample of 53 Respondents in Professor Hauser's Qualitative Study
Playlist Method: Generated by a Computer Algorithm
Transcript Coding[1]

Notes (continued):

[4] These respondents believed that computer algorithms generate playlists based on the user's listening history within the music streaming service.
[a] *Kristin C.* : "That's cool, yeah. I think that computer takes all of my choices that I listened to—like last night. I'm sure when I go back in there if it's going to pop up with, 'This is what you enjoyed. Would you like the computer to store that information?' Then you can either keep it as your playlist or change it up" (Transcripts, p. 504).
[b] *Hackeem A.* : "Your computer will notice that you're doing something over and over again and find a common, and then try to help you out and give you options if you like this, you like this, don't like it" (Transcripts, p. 316).

[5] These respondents acknowledged that they did not understand what a computer algorithm was nor how it could generate a playlist.
[a] *Michael B.* : "I'm not sure" (Transcripts, p. 580).
[b] *Tanya R.* : "No, I don't. […] I'm assuming it has to do something with the computer. I'm not really good with computers" (Transcripts, p. 761).

[6] These respondents did not understand the term algorithm as a way in which the computer selected songs for the user.
[a] *Steve M.* : "Computer-generated? [...] I would think it—but I can't see how, because they would just be able to change the tune of the music for you. [...] Like being able to actually disc jockey your own music. [...] That you're actually being able to do your playlist and the mode, the pace of the tunes" (Transcripts, p. 719).
[b] *Nicole M.* : "Generated by a computer algorithm is it'll pull other like media files together. […] The computer is doing it. If I just pull my own preferences, I'm just picking songs that I like instead of the computer" (Transcripts, p. 625),

[7] These respondents understood the term "computer algorithm" to mean themselves.
[a] *Celine A.* : "It's you looking for your own music. The music that you pick is the ones that you get. It's not picked by other people" (Transcripts, p. 122).
[b] *Joe R.* : "You could pick your own songs and put them into categories, like under your albums, artists, your favorite playlists, songs, yeah" (Transcripts, p. 423).

[8] These respondents believed that computer algorithms generate playlists by accessing both the user's information that the user provided to the music streaming service and publicly available information on other websites.
[a] *Giana B.* : "I feel like that would mean through your searches of the computer, that music stored on your website would use your searches to create a playlist that you like. [...] Through your past searches of any music streaming website or of YouTube or anything like that. Or looking up lyrics of a song or a song artist, buying concert tickets, stuff like that. I feel like the computer would use that to create something" (Transcripts, p. 302).
[b] *Frank B.* : "The program would follow the artists or songs that I'm listening to, and based upon that information I may provide to them when I log in to their site, or if they link into my social media sites, you get a little better feel as to who I am. My age, my demographics, the type of music I like, and even political views. With all of those tidbits of information, customize a playlist they believe would best suit me" (Transcripts, p. 288).

Sources:

[1] Testimony of Daniel L. McFadden Before the Copyright Royalty Board, Library of Congress, Washington DC, October 6, 2014.
[2] Combined transcripts from qualitative research interviews conducted by Applied Marketing Science on January 14-15, 2015.

Exhibit 5
Respondents' Understanding of Professor McFadden's Description of Music Streaming Service Features
Sample of 53 Respondents in Professor Hauser's Qualitative Study
On-Demand Track Selection
Transcript Coding[1]

Responses to "Could you tell me in your own words what the term o*n-demand track selection* means to you?"	N	%
Respondents who understood that *on-demand track selection* allowed them to select any song to listen to whenever they wanted[2]	**49**	**92%**
Respondents who did not understand the concept of *on-demand track selection*	**4**	**8%**
Respondents who acknowledged that they did not understand the term *on-demand track selection*[3]	1	2%
Respondents who believed that they had to purchase these songs to listen to them whenever they wanted[4]	1	2%
Respondents who believed that the music streaming service selected these songs[5]	2	4%
Total number of respondents	**53**	**100%**

Notes:

[1] The transcript coding was done by two blind-to-the-purpose coders, who reviewed the transcript responses for all respondents to categorize their interpretations of Professor McFadden's music streaming service features based on the content and similarities between responses.

[2] These respondents understood *on-demand track selection* to mean that they could choose to listen to any song whenever they wanted.
[a] *Nancy M.* : "I choose when I want and what I want. [...] On demand would give me options, and I choose which song I want to listen to when I want to listen to it. It's on my demand, personal demand. It's not what they are putting out there and giving to me. It's my choice, and it's when I wanted to use it" (Transcripts, p. 614).
[b] *Frank B.* : "Let's say let's listen to the hits by Bon Jovi, and I want to listen to 'Runaway.' I can scroll down, find 'Runaway,' boom. That's what I'm listening to" (Transcripts, p. 294).

[3] This respondent acknowledged that she did not understand the term *on-demand track selection* .
[a] *Giana B.* : "It's using a music streaming website to—I opened the tab and now I can't remember. […] To be honest, I couldn't really tell you because that's not one of the things I focus on, and it doesn't really matter to me, I guess" (Transcripts, p. 308).

[4] This respondent understood *on-demand track selection* to be the number of songs available for purchase.
[a] *Samuel H.* : "I think that's just all the ones you can purchase or buy" (Transcripts, p. 674).

[5] These respondents understood *on-demand track selection* to be the songs that the music streaming service chooses for the user to listen to.
[a] *Alicia R.* : "That you are not choosing it, they are" (Transcripts, p. 43).
[b] *Hackeem A.* : "On-demand track selection, to me, is, like I said, if it notices that you like a certain brand or a certain genre, it's just going to continue to give you things like that" (Transcripts, p. 321).

Sources:

[1] Testimony of Daniel L. McFadden Before the Copyright Royalty Board, Library of Congress, Washington DC, October 6, 2014.

[2] Combined transcripts from qualitative research interviews conducted by Applied Marketing Science on January 14-15, 2015.

Exhibit 6
Respondents' Understanding of Professor McFadden's Description of Music Streaming Service Features
Sample of 53 Respondents in Professor Hauser's Qualitative Study
Offline Listening
Transcript Coding[1]

Responses to "Could you tell me in your own words what the term *offline listening* means to you?"	N	%
Respondents who understood that they could listen to music without Internet access[2]	**40**	**85%**
Respondents who did not understand the concept of *offline listening*	**7**	**15%**
Respondents who acknowledged that they did not understand the term *offline listening*[3]	1	2%
Respondents who believed that *offline listening* was the ability to listen to music on their mobile devices[4]	2	4%
Respondents who believed that they could listen to music while using other programs or applications[5]	1	2%
Respondents who believed that they could listen to music without logging into their music streaming service account[6]	1	2%
Respondents who otherwise misunderstood the concept of *offline listening*[7]	2	4%
Total number of respondents	**47**	**100%**
Respondents excluded due to interviewer error[8]	6	

Notes:

[1] The transcript coding was done by two blind-to-the-purpose coders, who reviewed the transcript responses for all respondents to categorize their interpretations of Professor McFadden's music streaming service features based on the content and similarities between responses.

[2] These respondents understood the concept of *offline listening* . Four of these respondents believed that they would be able to access all of the songs available in the music streaming service's database through *offline listening*.

[a] *Elizabeth V.* : "That you don't have to be on Wi-Fi to listen to the music that you downloaded and saved. If you're traveling in an airplane you can listen to the music, as well" (Transcripts, p. 261).

[b] *Daniel D.* : "Offline means you can download it and you don't have to be connected to the Internet in any way" (Transcripts, p. 178).

[3] This respondent acknowledged that he did not understand what "offline" meant.

[a] *James H.* : "If you're saying online listening, you're talking about the computer. Offline listening would be some other form, without using the Internet. I don't know how that would work. I don't really understand what offline means, I guess. [...] I'm unclear on what offline is, so I don't know" (Transcripts, p. 414).

[4] These respondents believed that the concept of *offline listening* was the same as concept of *mobile device streaming* . One of these respondents believed that she would be able to access all of the songs available in the music streaming service's database through *offline listening*.

[a] *Donna C.* : "Yes, it's when you can stream music from your computer at home onto your MP3 player or your mobile device" (Transcripts, p. 209).

[b] *Alicia R.* : "Being able to listen to it on your phone. […] Just on your app" (Transcripts, p. 42).

Exhibit 6
Respondents' Understanding of Professor McFadden's Description of Music Streaming Service Features
Sample of 53 Respondents in Professor Hauser's Qualitative Study
Offline Listening
Transcript Coding[1]

Notes (continued):

[5] This respondent believed that *offline listening* was related to multi-tasking. One of these respondents believed that he would be able to access to all of the songs available in the music streaming service's database through *offline listening.*
[a] *Steve M.* : "You don't have to be on the actual site when you hear it. You can still be doing work on your computer" (Transcripts, p. 722).

[6] This respondent interpreted *offline listening* to mean the ability to listen to music online without having to log into an account with the music streaming service. This respondent also believed that he would be able to access all of the songs available in the music streaming service's database through *offline listening.*
[a] *Hackeem A.* : "When you're not logged in, or to a general service, or if you don't have one, you can just go onto the website and stream its music" (Transcripts, p. 320).

[7] These respondents had other interpretations of the term *offline listening.*
[a] *Giana B.* : "If you're not on your mobile device's data you could not listen to that music" (Transcripts, p. 307).
[b] *Lidia S.* : "I kind of feel like that means if you're able to listen to it in certain places" (Transcripts, p. 539).

[8] These respondents were not included because the interviewer asked them about their understanding of the term "offline licensing."

Sources:

[1] Testimony of Daniel L. McFadden Before the Copyright Royalty Board, Library of Congress, Washington DC, October 6, 2014.
[2] Combined transcripts from qualitative research interviews conducted by Applied Marketing Science on January 14-15, 2015.

Exhibit 7
Respondents' Understanding of Professor McFadden's Description of Music Streaming Service Features
Sample of 53 Respondents in Professor Hauser's Qualitative Study
Mobile Device Streaming
Transcript Coding[1]

Responses to "Could you tell me in your own words what the term *mobile device streaming* means to you?" and "Could you tell me in your own words what it means when *mobile device streaming* offers *playlists generated by the service* and *album, artist, and song selection on demand*?"	N	%
Respondents who understood that they could listen to music through an application on a mobile device	**51**	**96%**
In conjunction with mobile device streaming,…		
Respondents who understood both "playlists generated by the service" and "album, artist, and song selection on demand"[2]	29	55%
Respondents who understood "playlist generated by the service" but did not understand "album, artist, and song selection on demand"[3]	7	13%
Respondents who understood "album, artist, and song selection on demand" but did not understand "playlist generated by the service"[4]	6	11%
Respondents who did not understand either "playlists generated by the service" or "album, artist, and song selection on demand"[5]	9	17%
Respondents who did not understand or did not explain clearly the concept of *mobile device streaming*[6]	**2**	**4%**
Total number of respondents	**53**	**100%**

Notes:

[1] The transcript coding was done by two blind-to-the-purpose coders, who reviewed the transcript responses for all respondents to categorize their interpretations of Professor McFadden's music streaming service features based on the content and similarities between responses.

[2] These respondents understood the concept of *mobile device streaming* together with both "playlists generated by the service" and "album, artist, and song selection on demand."
[a] *Alexandra F.* : "That would be like picking the category. If I wanted to listen to country music, it would bring up whatever country music topic they wanted. It would also let me pick a song that I wanted to listen to and would let me play that as well" (Transcripts, p. 6).
[b] *Drew V.* : "Playlist part would mean that you can have it just stream a particular genre automatically. The artist selection means you can go down and pick whatever artist and listen to a full album, or a particular track, or whatever" (Transcripts, p. 218).

[3] These respondents understood *mobile device streaming* together with "playlists generated by the service," but misinterpreted or did not explain what they understood by the term "album, artist, and song selection on demand."
[a] *Delia P.* : "For whatever reason they put together a grouping of songs in a list, and just for instance, I was supposed to listen to Spotify. That's what they do. You say you want to listen to country or whatever and it says 'Country Gold' and then there's 20 or 30 songs and those are the songs that they've decided what should go in there, [...] that's just if you like a particular artist, you pop that in and out comes some songs. It seems like still the service selects which ones you get to do, if it's the album or the artist and it's separate from the song. It's just song" (Transcripts, p. 188).
[b] *Samuel H.* : "Assuming for Pandora, because that's just what I thought of, the like and dislike, how it generates your playlist. It tries to put songs in categories, and then what categories you like or dislike, it tries to give you those kinds of songs. [...] Pretty much also that's Pandora, where you can type in the artist and it has his own station" (Transcripts, p. 668).

Exhibit 7
Respondents' Understanding of Professor McFadden's Description of Music Streaming Service Features
Sample of 53 Respondents in Professor Hauser's Qualitative Study
Mobile Device Streaming
Transcript Coding[1]

Notes (continued):

[4] These respondents understood *mobile device streaming* together with "album, artist, and song selection on demand," but misinterpreted or did not explain what they understood by the term "playlists generated by the service."
[a] *Rebecca C.* : "Yep. Playlist is, if you like a song, you could add it to a playlist, and you can go back and play that playlist where—what was the second one? [...] That's like if you want to hear a certain artist at that moment; you can just go there and they have all of the songs that artist would sing, and you can listen to it on demand right then and there" (Transcripts, pp. 640-641).
[b] *Kevin H.* : "All I can think of is on demand means maybe voice-activated to be able to just play the songs that you want and add to your playlists. Available through, again, a phone or a tablet" (Transcripts, p. 485).

[5] These respondents understood *mobile device streaming* , but did not understand either "playlists generated by the service" or "album, artist, and song selection on demand."
[a] *Steve M.* : "Through your cell phone, you have access to stream through your phone. [...] I would assume that it means that the phone—actually, to me, it would mean the supplier, the make of the phone, has some sort of deal, like when iTunes or somebody was putting that Bon Jovi music on people's phones without them actually ordering it, that it's similar to that. That's what it makes me think of" (Transcripts, p. 717).
[b] *Tanya R.* : "Apps for the music. […] I'm not sure how to answer that one, either" (Transcripts, p. 760).

[6] These respondents did not understand or did not explain clearly the concept of *mobile device streaming* .
[a] *Blake B.* : "It's where you play the music. If it's not in your house, you can't listen to it unless you have—unless it's offline instead of online. [...] If you were in your house you'd be able to listen to it, but if you went outside it wouldn't be as strong of a connection" (Transcripts, p. 63).
[b] *Lidia S.* : "I'm not sure. […] I think that's where it allowed you how many tracks to skip" (Transcripts, p. 533).

Sources:

[1] Testimony of Daniel L. McFadden Before the Copyright Royalty Board, Library of Congress, Washington DC, October 6, 2014.
[2] Combined transcripts from qualitative research interviews conducted by Applied Marketing Science on January 14-15, 2015.

Exhibit 8
Respondents' Understanding of Professor McFadden's Description of Music Streaming Service Features
Sample of 53 Respondents in Professor Hauser's Qualitative Study
Skip Limits
Transcript Coding[1]

Responses to "Could you tell me in your own words what the term *skip limits* means to you?" and "Could you tell me whether or not skipping as mentioned in the survey allows you to skip over advertisements?"	N	%
Respondents who understood the term *skip limits* to refer to the number of songs that the user could skip over	**53**	**100%**
Respondents who understood *skip limits* and, when probed, distinguished it from skipping ads[2]	53	100%
Respondents who understood *skip limits* and, when probed, could not distinguish it from skipping ads	0	0%
Total number of respondents	**53**	**100%**

Notes:

[1] The transcript coding was done by two blind-to-the-purpose coders, who reviewed the transcript responses for all respondents to categorize their interpretations of Professor McFadden's music streaming service features based on the content and similarities between responses.

[2] These respondents understood the concept of *skip limits* and understood that this applied to songs and not advertisements.

[a] *Brian G.* : "Skip limits, to me, means that you're limited in when a song comes on that you can say, oh, I don't want to listen to this, and move to the next track that the service is going to give you. [...] I believe it said song skipping. It just meant that you could skip to the next song, but you can't skip the ads" (Transcripts, p. 111).

[b] *James H.* : "Skip limits means if you're not liking that selection, you can only do that—whatever the limit is. Up to six times is what was mentioned here a lot. After you reach that limit, it won't let you skip anymore. [...] I don't believe it does let you skip the advertisements" (Transcripts, p. 413).

Sources:

[1] Testimony of Daniel L. McFadden Before the Copyright Royalty Board, Library of Congress, Washington DC, October 6, 2014.

[2] Combined transcripts from qualitative research interviews conducted by Applied Marketing Science on January 14-15, 2015.

Exhibit 9
Respondents' Understanding of Professor McFadden's Description of Music Streaming Service Features
Sample of 53 Respondents in Professor Hauser's Qualitative Study
Available Library Size
Transcript Coding[1]

Responses to "Could you tell me in your own words what the term *available library size* means to you?"	N	%
Respondents who understood *available library size* to mean the total number of songs available for the user to access through streaming[1]	**33**	**62%**
Respondents who did not understand the concept of *available library size*	**17**	**32%**
Respondents who understood *available library size* to mean the total number of songs the user could store on the service[2]	6	11%
Respondents who understood *available library size* to mean the total number of songs the user can download from the service[3]	3	6%
Respondents who understood *available library size* to mean the total memory space available for the user to save songs[4]	6	11%
Respondents who understood *available library size* to mean the number of songs available in each music genre[5]	2	4%
Respondents whose explanation of the term *available library size* was insufficient to determine understanding[6]	**3**	**6%**
Total number of respondents	**53**	**100%**

Notes:

[1] The transcript coding was done by two blind-to-the-purpose coders, who reviewed the transcript responses for all respondents to categorize their interpretations of Professor McFadden's music streaming service features based on the content and similarities between responses.

[2] These respondents interpreted the term *available library size* to mean the total number of songs available in the service's database for the user to access.

[a] *Juliana J.*: "The term 'library size' is how much, how big the pool of music is available to you as a consumer" (Transcripts, p. 453).

[b] *James H.*: "Available library size means how many songs and what access you have to them. […] Basically, it's just a number driven if it's referring to the 10 million, or 20 million" (Transcripts, p. 409).

[3] These respondents interpreted the term *available library size* to mean the total number of songs that the user would be able to store in the service, for example, through saving songs to a playlist.

[a] *Christopher N.*: "It just means how much space is available for you to store your music. If you're a huge music junkie, you'd probably want to have the 20 million spaces for 20 million songs library" (Transcripts, p. 153).

[b] *Brandon R.*: "It's the amount of songs you're available to have on your certain playlist or on your device" (Transcripts, p. 89).

[4] These respondents interpreted the term *available library size* to mean the total number of songs that the user would be able to download from the service to their own devices.

[a] *Alex S.*: "Any type of songs you can download onto your app or account—a limit. […] It means I can download 20 million songs if you felt like it" (Transcripts, p. 23).

[b] *Rebecca C.*: "That I would think it would be how many songs could be downloaded and available for you to use or have just to play over if you wanted" (Transcripts, p. 640).

[5] These respondents interpreted the term *available library size* to mean the total memory space available for the user to store their music. These participants did not specify whether this space was hosted by the service or available on their own devices.

[a] *Kevin H.*: "Just the size given to you. I would think total space where a number of songs can fit into that total space. All songs are different and lengths of song. I just assume that you have a total size you can fit all your songs into, and your libraries into. [...] That it will hold up to 20 million songs regardless of the actual space" (Transcripts, pp. 484-485).

[b] *Edward B.*: "Available library size means how much space has been allocated, whether it's in a cloud for things online or how much space you're going to need on your computer" (Transcripts, p. 238).

Exhibit 9
Respondents' Understanding of Professor McFadden's Description of Music Streaming Service Features
Sample of 53 Respondents in Professor Hauser's Qualitative Study
Available Library Size
Transcript Coding[1]

Notes (continued):

[6] These respondents interpreted the term *available library size* to mean the number of songs available in each music genre.

[a] *Giana B.* : "How many songs are in each genre. I feel that would mean there's 20 million songs in each genre. [...] They could be repeated songs through each genre, because I know that several songs do fall into different categories. They probably mean that" (Transcripts, p. 301).

[b] *Steven J.* : "When you click on a playlist; for example, if you say I want 1960s Oldies. That one database has a million songs in it. Another one has two million. It's the scope, I guess" (Transcripts, p. 731).

[7] These respondents did not explain the term *available library size* clearly.

[a] *Celine A.* : "You can have as much songs as you want. For example, the one million—you could have up to one million songs" (Transcripts. p. 121).

[b] *Tanya R.* : "How many, I guess, artists that you can have on your app. [...] Different, I don't know how you say it, genres. [...] I guess it just means 20 million songs. It can be from a variety of different—it could be gospel, it could be rock, alternative; you could just have a variety of songs" (Transcripts, p. 760).

[c] *Helen S.* : "That's as many songs as you can store, I would imagine. I have two interpretations. I thought it was possibly that you could have that many in a library of songs, that you're categorizing songs, if you're having playlists and things like that. Or if that's what's available, that they actually have a library of 20 million songs that you could choose from" (Transcripts, p. 360).

Sources:

[1] Testimony of Daniel L. McFadden Before the Copyright Royalty Board, Library of Congress, Washington DC, October 6, 2014.

[2] Combined transcripts from qualitative research interviews conducted by Applied Marketing Science on January 14-15, 2015.

Exhibit 10
Respondents' Understanding of Professor McFadden's Description of Music Streaming Service Features
Sample of 53 Respondents in Professor Hauser's Qualitative Study
Advertising
Transcript Coding[1]

Responses to "Could you tell me in your own words how many commercial breaks you expect these *1.5 to 3 minutes of ads per hour* to occur in?" and "How many blocks of advertisements did you assume to be played when you read *'1.5 to 3 minute of ads per hour'*?"	N	%
Respondents' understanding of advertising frequency[2]	**53**	**100%**
Respondents who expected 1.5 to 3 minutes of advertisements to interrupt their music listening once per hour[3]	2	4%
Respondents who expected 1.5 to 3 minutes of advertisements to interrupt their music listening 2 to 5 times per hour[4]	33	62%
Respondents who expected 1.5 to 3 minutes of advertisements to interrupt their music listening 6 to 12 times per hour[5]	10	19%
Respondents who expected 1.5 to 3 minutes of advertisements to interrupt their music listening 12 or more times per hour[6]	2	4%
Respondents who did not specify how many advertisement interruptions per hour they expected[7]	2	4%
Respondents who acknowledged that they did not know how many advertisement interruptions per hour to expect[8]	4	8%
Total number of participants	**53**	**100%**

Notes:

[1] The transcript coding was done by two blind-to-the-purpose coders, who reviewed the transcript responses for all respondents to categorize their interpretations of Professor McFadden's music streaming service features based on the content and similarities between responses.

[2] All participants understood the concept of *advertising.*

[3] These respondents expected that they would experience one interruption per hour.

[a] *Thomas W.* : "Once per hour" (Transcripts, p. 779).

[b] *Jacob K.* : "Every hour" (Transcripts, p. 397).

[4] These respondents expected that they would experience two to five interruptions per hour.

[a] *Ariana D.* : "Probably, at least three to four" (Transcripts, p. 52).

[b] *Steven J.* : "They generally don't like to put a whole bunch of ads together, so I'm assuming that's probably three or four blocks" (Transcripts, p. 735).

[5] These respondents expected that they would experience six to 12 interruptions per hour.

[a] *Linda S.* : "Nine" (Transcripts, p. 552).

[b] *Alex S.* : "At least ten" (Transcripts, p. 815).

Exhibit 10
Respondents' Understanding of Professor McFadden's Description of Music Streaming Service Features
Sample of 53 Respondents in Professor Hauser's Qualitative Study
Advertising
Transcript Coding[1]

Notes (continued):

[6] These respondents expected that they would experience more than 12 interruptions per hour.

[a] *Rebecca C.* : "Those ads are short, so I would say, if they're going to do one every two minutes, you're going to do thirty. I would say probably 60. Probably 60 to 90 quick ads" (Transcripts, p. 644).

[b] *Zora H.* : "Maybe somewhere between 10 and 15" (Transcripts, p. 815).

[7] These respondents did not specify how many advertisement interruptions they expected per hour.

[a] *Helen S.* : "Well, hopefully, it's not—I guess it's good or bad. It could be potentially a 30-second spot or a 15-second spot, and a number of times a good selection. I would almost hope that they would offer an option of let me just listen to a three-minute spot or a one-minute spot three times in the hour, as opposed to 30 seconds every other song or every third or fourth song. I think, right now, what I currently see when Pandora is playing, I think it is an ad every 15 to 20 minutes and it's a relatively certain ad. It's about a 15-second spot" (Transcripts, p. 364).

[b] *Interviewer* : "Can you tell me in your own words how many commercial breaks you expect these one and half to three minutes of ads per hour to occur in?"

Lidia S. : "I feel like it would depend on how many tracks you skip, and then an ad could pop up, and it would take its time. It just depends on how many times you skip, or if you actually listen to a whole song."

Interviewer : "How many blocks of advertisements did you assume to be broadcasted when you read '1.5 to 3 minutes of ads per hour'?"

Lidia S. : "I feel like it would be a lot, because the ads are maybe 10, 15 seconds, so it's a lot of ads to be in an hour, because of the 1.5 or 3 minutes."

(Transcripts, p. 537).

[8] These respondents acknowledged that they did not know how many advertising interruptions they expected per hour.

[a] *Kelly B.* : "Again, that's what I have no idea, if they're little ten-second spots, and if they're ten-second spots and it goes up to three minutes, that's a ton of commercials" (Transcripts, p. 474).

[b] *Interviewer* : "Can you tell me in your own words how many commercial breaks you expect these one and a half to three minutes of ads per hour to occur in?"

[...]

Michael B. : "Maybe two."

Interviewer : "How many blocks of advertisements do you assume will be played when you read "one and a half to three minutes of ads per hour"?

Michael B. : "I'm not sure."

(Transcripts, p. 582).

Sources:

[1] Testimony of Daniel L. McFadden Before the Copyright Royalty Board, Library of Congress, Washington DC, October 6, 2014.

[2] Combined transcripts from qualitative research interviews conducted by Applied Marketing Science on January 14-15, 2015.

Exhibit 11
Respondents' Understanding of Professor McFadden's Music Streaming Features
Sample of 53 Respondents in Professor Hauser's Qualitative Study
Video Coding[1]

Music Streaming Features	Understands		Probably Understands		Unsure/Unclear		Probably Does Not Understand		Does Not Understand		Total Participants	Confused[2] Participants	
	N	%	N	%	N	%	N	%	N	%	N	N	%
Playlist Method[3]	7	13%	0	0%	0	0%	0	0%	46	87%	53	46	87%
Curated by Music Tastemakers	5	9%	2	4%	1	2%	13	25%	32	60%	53	45	85%
Generated by a Computer Algorithm	20	38%	12	23%	0	0%	10	19%	11	21%	53	21	40%
On-Demand Track Selection	14	26%	16	30%	0	0%	17	32%	6	11%	53	23	43%
Offline Listening[4]	8	17%	5	11%	0	0%	25	53%	9	19%	47	34	72%
Mobile Device Streaming	13	25%	14	26%	0	0%	16	30%	10	19%	53	26	49%
Skip Limits	44	83%	3	6%	0	0%	5	9%	1	2%	53	6	11%
Available Library Size	21	40%	8	15%	0	0%	11	21%	13	25%	53	24	45%
Advertising	32	60%	9	17%	1	2%	8	15%	3	6%	53	11	21%

Notes:

[1] The video coding was done by two blind-to-the-purpose coders, who reviewed the video responses for all respondents to judge the respondents' understanding of Professor McFadden's music streaming service features based on a five-point scale: "Understands," "Probably Understands or Somewhat Understands," "Unsure/Unclear," "Probably Does Not Understand or Does Not Completely Understand," and "Does Not Understand."

[2] Confused respondents include respondents who are classified as either "Probably Does Not Understand" or "Does Not Understand."

[3] To assess Professor McFadden's music streaming service feature of *playlist method* , responses were coded according to the respondents' understanding of the underlying levels: "curated by music tastemakers" and "generated by a computer algorithm." For the purpose of this exhibit, the video coding for respondents' understanding of these two levels were combined. Respondents who were judged to understand or probably understand both the concept of a music tastemaker and a computer algorithm were classified as "Understands." If they were judged to not understand or probably not understand both concepts, they were classified as "Does Not Understand." Respondents that were classified as "Unsure/Unclear" for one concept but were judged to understand the other concept were classified as "Understands."

[4] Six respondents were asked about "offline licensing" rather than "offline listening." These participants are not included in the table above.

Sources:

[1] Testimony of Daniel L. McFadden Before the Copyright Royalty Board, Library of Congress, Washington DC, October 6, 2014.

[2] Videos from qualitative research interviews conducted by Applied Marketing Science on January 14-15, 2015.

Exhibit 12
Count of Respondents Who Correctly Identified Varying Numbers of Music Streaming Features
Sample of 53 Respondents in Professor Hauser's Qualitative Study
By Correct and Incorrect Incentive Alignment Interpretation
Transcript Coding[1]

Number of Features[2] Correctly Interpreted	Correct Interpretation of Incentive Alignment	Incorrect Interpretation of Incentive Alignment	Ignored Incentive Alignment
7 of 7	6	10	1
6 of 7	2	13	2
5 of 7	1	13	1
4 of 7	0	0	1
3 of 7	0	3	0
2 of 7	0	0	0
1 of 7	0	0	0
Total	**9**	**39**	**5**

Notes:

[1] The transcript coding was done by two blind-to-the-purpose coders, who reviewed the transcript responses for all respondents to categorize their interpretations of Professor McFadden's music streaming service features based on the content and similarities between responses.

[2] The seven features included are *playlist method* , *on-demand track selection* , *offline listening* , *mobile device streaming* , *skip limits* , *available library size* , and *advertising.*

[3] To assess Professor McFadden's music streaming service feature of *playlist method* , responses were coded according to the respondents' understanding of the underlying levels: "curated by music tastemakers" and "generated by a computer algorithm." For the purpose of this exhibit, the transcript coding for respondents' understanding of these two levels were combined. Respondents who had a correct interpretation of both the concept of a music tastemaker and a computer algorithm were categorized as having a "Correct Interpretation." If they had an incorrect interpretation of either concept, they were categorized as having an "Incorrect Interpretation."

[4] Six respondents were asked about "offline licensing" rather than "offline listening." Unlike in Exhibits 3, 6, and 11 where these respondents are excluded, here these respondents are included and counted as having a correct interpretation of *offline listening.* Five of these respondents had an incorrect interpretation of the incentive alignment. Of these, one understood all seven features, three understood six of the seven features, and one understood five of the seven features. The sixth respondent ignored the incentive alignment but understood all seven features.

Exhibit 12
Count of Respondents Who Correctly Identified Varying Numbers of Music Streaming Features
Sample of 53 Respondents in Professor Hauser's Qualitative Study
By Correct and Incorrect Incentive Alignment Interpretation
Transcript Coding[1]

Notes (continued):

[5] Three respondents did not explain *available library size* sufficiently to determine understanding. Unlike in Exhibit 8 where these respondents appear in a separate category, here these respondents are counted as having a correct interpretation of *available library size* . All three respondents had an incorrect interpretation of the incentive alignment. Two of these respondents were also asked about "offline licensing" rather than "offline listening," and understood six of the seven features. The third respondent understood all seven features.

Sources:

[1] Testimony of Daniel L. McFadden Before the Copyright Royalty Board, Library of Congress, Washington DC, October 6, 2014.

[2] Combined transcripts from qualitative research interviews conducted by Applied Marketing Science on January 14-15, 2015.

APPENDIX A
ACADEMIC VITA

ACADEMIC VITA (long version, public)

John R. Hauser

Address

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hauser@mit.edu; web.mit.edu/hauser/www
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Education

Sc.D. M.I.T., 1975, Operations Research Dissertation: "A Normative Methodology for Predicting Consumer Response to Design Decisions: Issues, Models, Theory and Use."

Advisor: John D. C. Little. Committee members: Glen L. Urban and Moshe Ben-Akiva.

S.M. M.I.T., 1973, Civil Engineering (Transportation Systems Division)

S.M. M.I.T., 1973, Electrical Engineering

S.B. M.I.T., 1973, Electrical Engineering
Joint Thesis (S.M.'s and S.B.): "An Efficient Method to Predict the Impacts of Operating Decisions for Conventional Bus Systems." Advisor: Nigel Wilson.

Lifetime Achievement Awards

Buck Weaver Award 2013, INFORMS Society of Marketing Science (ISMS).This award recognizes lifetime contributions to the theory and practice of marketing science.

Parlin Award 2001, The American Marketing Association describes this award as "the oldest and most distinguished award in the marketing research field."

Converse Award 1996, the American Marketing Association, for "outstanding contributions to the development of the science of marketing."

Churchill Award 2011, the American Marketing Association, Market Research Special Interest Group, for "Lifetime achievement in the academic study of marketing research."

Fellow of the Institute for Operations Research and Management Science (INFORMS)

Inaugural Fellow of the INFORMS Society of Marketing Science (ISMS)

Highly Cited Researcher (ISI Web of Science), Since 2006.

Awards for Published Papers

INFORMS Society of Marketing Science (formerly The Institute of Management Science)	ISMS Long Term Impact Award, 2012, Finalist
	ISMS Long Term Impact Award, 2011, Finalist
	John D.C. Little Best-paper Award, 2009, Finalist
	John D.C. Little Best-paper Award, 2003, First Place
	John D.C. Little Best-paper Award, 1998, Finalist
	John D.C. Little Best-paper Award, 1994, Finalist

	John D.C. Little Best-paper Award, 1993, First Place John D.C. Little Best-paper Award, 1990, Honorable Mention Best paper in Marketing Sciences Literature, 1984, Honorable mention. Best Paper in Marketing Sciences Literature, 1983, First Place. Best Paper in Marketing Sciences Literature, 1982, First Place. Two published articles were cited in 2007 as one of "the top 20 marketing science articles in the past 25 years.
American Marketing Association:	Explor Award (Leadership is on-line market research), 2004, First-Place Finalist, Paul Green Award for contributions to marketing research, 2004 MSI Award for Most Significant Contribution to Practice of Marketing in 1996. Finalist, O'dell Award for best paper in the *Journal of Marketing Research*, published in 1986, awarded in 1991. One of the top 50 most prolific marketing scholars (top journals) in the last 25 years (1982-2006). Total articles, rate of publication, and author-adjusted rate.
Product Development Management Assoc.	Best Paper Award, Finalist, 2003. Best Paper Award, Finalist, 2002. One of ten most-cited papers in the *Journal of Product Innovation Management*. One of the top articles in educational citations in the last twenty years.
European Marketing Academy	Best Paper in IJRM, Finalist, 2014
Sawtooth Software Conference	Best Presentation and Paper, 2006; Runner-up, 2008.
European Society of Marketing Research	Best Paper at Rome conference, September 1984.
Emerald Management Reviews	2010 Citation of Excellence (top 50 of 15,000 published papers in 2009)
Doctoral Consortia Faculty	American Marketing Association, 1979, 1984, 1985, 1986, 1988, 1989, 1991, 1993, 1995, 1997, 1998, 2001, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2012, 2013, 2014. INFORMS Society of Marketing Science, 2002 (founding member), 2003, 2004, 2012, 2014. European Marketing Academy, 1985
Awards, Teaching	
MIT Sloan School of Management:	Nominated for Excellence in Teaching Award 2000, 2007, 2008. Named "Outstanding Faculty" by *Business Week Guide to the Best Business Schools* (1995). Excellence in Teaching Award 1994 (Awarded by the Master's Student class).
Awards for Thesis Supervision	
American Marketing Association (Ph.D.):	Winner John Howard Dissertation Award (2010, Matt Selove, Committee) Co-winner John Howard Dissertation Award (2005, Olivier Toubia) 1st Place (1981, Ken Wisniewski) Honorable Mention (1979, Patricia Simmie).
INFORMS (Ph.D.)	Winner of the Frank Bass Award (2004, Olivier Toubia, awarded 2005) Winner of the Frank Bass Award (1989, Abbie Griffin, awarded 1995)

MIT Sloan School of Management (Ph.D.): 1st Place (1987, Peter Fader)

MIT Sloan School of Management (Master's): 1st Place (1991, Jon Silver and John Thompson)
1st Place (1983, Steve Gaskin)
Honorable Mention (1982, Larry Kahn).

Awards, Other

Who's Who in America	Since 1997
Who's Who in Management Science	Since 2000
Who's Who in Economics	Since 2003
Who's Who in Finance and Business	Since 2009
Harvard Business School:	Marvin Bower Fellow, 1987 - 1988.
National Science Foundation Fellowship:	1971 - 1974.
M.I.T.:	National Scholar, 1967 - 1971.
Honor Societies:	Tau Beta Pi, Eta Kappa Nu, Sigma Xi

Directorships, Trustee, Advisory Board

1988 – Present	Founder, Principal, Board Member, Applied Marketing Science, Inc.
March 2003 – July 2009	Trustee, Marketing Science Institute

Academic Appointments

January 1989 - Present:	Kirin Professor of Marketing MIT Sloan School of Management Massachusetts Institute of Technology Cambridge, Massachusetts 02142
July 2010 – June 2011	Head, Marketing Group
July 2005 – June 2009:	Area Head, Management Science Area
July 1988 – June 2003:	Head, Marketing Group
September 1993 - May 2000:	co-Director, International Center for Research on the Management of Technology
September 1997 - May 2000:	Research Director, Center for Innovation in Product Development
June 2001 – June 2006:	Virtual Customer Initiative Leader, Center for Innovation in Product Development
July 1984 - January 1989:	Professor of Management Science MIT Sloan School of Management Massachusetts Institute of Technology Cambridge, Massachusetts 02142

July 1987 - June 1988:	Marvin Bower Fellow Harvard Business School Harvard University Cambridge, Massachusetts 02163
March 1985 - May 1985:	Visiting Lecturer European Institute of Business Administration Fontainebleau, FRANCE
September 1980 - June 1984:	Associate Professor of Management Science MIT Sloan School of Management Massachusetts Institute of Technology Cambridge, Massachusetts 02142
September 1975 - August 1980:	Assistant Professor of Marketing and of Transportation (granted tenure and promoted in 1980) Graduate School of Management and Transportation Center Northwestern University Evanston, Illinois 60201

Teaching Interests

Marketing Management, New Product and Service Development, Competitive Marketing Strategy, Marketing Models, Measurement and Marketing Research, Research Methodology, Marketing Analytics.

Research Interests

Consumer decision measurement: conjoint analysis, non-compensatory methods, adaptive methods, machine-learning methods, strategic importance of accuracy. Product forecasting: information acceleration, really-new products, incentive-aligned games. Consumer behavior: cognitive simplicity in decision making and in dynamic models, theory-based models, vivid stimuli. Morphing: website, banner, product assortment. Voice of the customer methods, defensive and competitive strategy, new product development, experimental and quasi-experimental methods.

Texts

Urban, Glen L. and John R. Hauser, *Design and Marketing of New Products*, Prentice-Hall, Second Edition 1993.

A comprehensive text that integrates advanced, state-of-the-art techniques to provide graduate-level students and marketing professionals with an understanding of the techniques and an operating ability to design, test, and implement new products and services.

This text has been honored by being selected for both the Prentice-Hall International Series in Management and the Series in Marketing. It has been adopted at a number of major universities. In a 1988 survey it was identified the 1980 version as the most widely used new product textbook at the graduate level.

The revision includes new material on designing for quality, reduced cycle times, prelaunch forecasting, quality improvement, defensive and competitive strategy, value mapping, the integration of marketing and engineering, new issues of organization, customer satisfaction, and new international examples. It is available in Korean and is being translated into Japanese and Chinese. We stopped revising the text when Glen Urban became Dean of the MIT Sloan School and I became editor of *Marketing Science*. Many current texts draw heavily from our material.

Third most cited work in the *Journal of Product Innovation*, 1984-2004. (Cited May 2010.)

Urban, Glen L., John R. Hauser, and Niki Dholakia, *Essentials of New Product Management*, Prentice Hall, 1986.

This is an undergraduate textbook which presents the essential concepts but written for a non-technical audience. It

has been translated to Japanese and has sold well in Japan.

Hauser, John R. and Glen L. Urban, *From Little's Law to Marketing Science: A Festschrift in Honor of John D.C. Little*, MIT Press, Cambridge, MA, 2015.

Hauser, John R., *Applying Marketing Management: Four Simulations*, Scientific Press, 1986.

This mini-text and software package contains four tutorial exercises for marketing management concepts. With this package students learn positioning, competitive strategy, new product development, and life cycle forecasting while using the personal computer to simulate marketing management problems. A detailed instructor's manual and transparency masters are also available. It is available in Japanese.

Hauser, John R., *ENTERPRISE: An Integrating Management Exercise*, Scientific Press, 1989.

This mini-text and software package contains a comprehensive competitive simulation. Students compete in six markets by making marketing and production decisions. A detailed instructor's manual and administrative software is also available. It is available in Japanese.

Journal Editor

Marketing Science, Editor-in-Chief for volumes 8, 9, 10, 11, 12, and 13 (1989-1994). Four issues per year including periodic editorials and journal management. Processed about 120 new papers per year. Special Editor for issues on the Theory and Practice of Marketing (2014) and Big Data (2015).

Journal Publications (Almost all available for download at web.mit.edu/hauser/www.)

Citations Reports: January 2015 Google Scholar; 18,171 citations and an H-index of 49 from http://scholar.google.com/citations?user=N6s8mO4AAAAJ&hl=en. ISI Web of Science (automated, January 2015): 4,184 citations with an H-index of 32. Not included in automatic ISI report: Design and Marketing of New Products (407 2E, 265 1E, 24 UG) Defensive Marketing Strategies (204), Testing Competitive Market Structures (80). Application of Defender (43), Dynamic Markov Application (28). Revised total of 5,235; revised ISI H-index of 35.

Lin, Song, Juanjuan Zhang, and John R. Hauser (2014), "Learning from Experience, Simply," *Marketing Science*, 34, 1, (January-February), 1-19.

Hauser, John R., Guilherme Liberali , and Glen L. Urban (2014), "Website Morphing 2.0: Switching Costs, Partial Exposure, Random Exit, and When to Morph," *Management Science*, 60, 6, (June), 1594–1616.

Hauser, John R. (2014), "Consideration-Set Heuristics," *Journal of Business Research,* 67 (8), 1688-1699.

Urban, Glen L., Guilherme Liberali, Erin MacDonald, Robert Bordley, and John R. Hauser (2014), "Morphing Banner Advertisements," *Marketing Science*, 33, 1.

Hauser, John R., Songting Dong, and Min Ding (2014), " Self-Reflection and Articulated Consumer Preferences," *Journal of Product Innovation Management*, 31, 1, 17-32.

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Finalist, IJRM Best Paper Award, 2014.

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Research Grants

July 2007 – June 2008	Understanding Non-compensatory Decision Making for Consideration Decisions (under Consortium with MIT Center for eBusiness and General Motors, Inc.)
June 2000 – May 2006	Center for Innovation in Product Development, MIT, Initiative Leader, Virtual Customer.
January 2001 – May 2002	eBusiness Center at MIT. Design and Delivery of Online Promotions. (with John Little, Duncan Simester, and Glen Urban).
January 1997 – May 2000	Center for Innovation in Product Development, Engineering Research Center Grant from the National Science Foundation. Research Director. In addition, research grants for non-monetary incentives, procurement metrics, and virtual customer methods.
June 1999 – May 2000	"Metrics Thermostat," International Center for Research on the Management of Technology (Principal Investigator).
June 1999- May 2001	"New Product Metrics at Ford and the US Navy," Center for Innovation in Product Development
June 1999- May 2001	"Lean Sustainment Metrics at the USAF," Lean Sustainment Initiative at MIT
June 1994 - May 1999	"Metrics to Value R&D," International Center for Research on the Management of Technology (Principal Investigator). General topic. Detailed proposals were for various aspects of the problem.
June 1991 - May 1994	"Customer Needs, Customer Satisfaction, Sales, and Profit: Providing the Right Incentives to Engineering and R&D," International Center for Research on the Management of Technology (co-Principal Investigator with Birger Wernerfelt)
January 1990 - June 1992	"Information Acceleration and Preproduction Forecasting of New Autos, Phases I and II." General Motors Electric Vehicle Project. (Associate)
December 1988 - June 1990	"Improved Methodologies to Measure Consumer Needs," Procter & Gamble Company. (Principal Investigator)
September 1981 - December 1985	"Prelaunch Forecasting System for New Consumer Durables and Its Applications to Auto Purchases," General Motors, Buick Division (co-Principal Investigator with Glen L. Urban).

January 1981 - May 1981	"Marketing Approaches in Travel Demand," United Parcel Service Grant (Faculty Advisor).
January 1979 - August 1980	"Monitoring the Implementation of Innovative Public Transportation Services" from University Research Program of the Urban Mass Transportation Administration (Principal Investigator).
July 1975 - September 1977	"Consumer-Oriented Transportation Service Planning." from the Program of University Research, U.S. Department of Transportation (Faculty Associate).
September 1977 - January 1978	"Consumer-oriented Transportation Service: Modification and Evaluation" from Program of University Research, USDOT (Faculty Associate).
May 1976 - September 1978	"Enhancement of Communications with a Small Scientific Community Using Slow-Scan Televideo Terminals and Voice-Grade Telephone Lines" from the National Science Foundation (Faculty Associate).
January 1976 - December 1976	"A Method for Assessing Pricing and Structural Changes on Transport Mode Use," U.S. Department of Transportation (Faculty Associate).
September 1976 - June 1977	"Prediction of Urban Recreational Demand" from the National Science Foundation (Faculty Consultant).

Invited Lectures (Outside the MIT Sloan School)

Carnegie Mellon University, April 10, 2015, “Learning from Experience, Simply.”

University of North Carolina, Kenan-Flagler Business School, Marketing Department. March 7, 2014. “Learning from Experience, Simply.”

Marketing Science Institute, November 2012, “Panel Discussion: Perspectives on Big Data from Marketing Scholars,” Cambridge, MA.

Wharton School, University of Pennsylvania, April 2009, “Website Morphing”

Max Planck Institute for Human Development, Center for Adaptive Behavior and Cognition, Summer Institute on Bounded Rationality in Psychology and Economics, August 2006, “Greedoid-Based Non-Compensatory Consider-then-Choice Inference.”

Northwestern University, Evanston, IL, April 2006, “Greedoid-based Non-compensatory Inference.”

University of Michigan, Seminar Series, October 2004, “Table Stakes: Non-compensatory Consideration-then-Choice Inference.”

Management Roundtable Special Conference on “Taking the Voice of the Customer to the Next Level,” Boston, MA October 2004, “The Virtual Customer.”

Marketing Science Institute Research Generation Conference, Atlanta, GA, May 2004, “New Products/Innovation,” (with Gerry Tellis).

Marketing Science Institute Conference on Emerging Approaches for Successful Innovation, Chicago, IL, May 2003, "'Listening-In' to Find Unmet Customer Needs and Solutions."

University of California at Los Angeles, "Polyhedral CBC (and other fun stuff), February 2003

New York University, "Polyhedral Methods," March 2003.

Industrial Liaison Program – Research Directors' Conference, April 2002, "The Virtual Customer."

University of Maryland, "Polyhedral Methods for Conjoint Analysis," March 2002.

Marketing Science Institute Trustees Meeting on Marketing Outside the Silo, Boston, MA, April 2002, "Challenges and Visions for Marketing's Role in Product Development Processes."

Managing Corporate Innovation -- ILP Symposium celebrating ten years of Management of Technology Research at MIT. "Dealing with the Virtual Customer: Fast Web-based Customer Input." April 2001

Epoch Foundation, Cambridge, MA, October 2000, "The Virtual Customer."

Yale University Research Seminar in Marketing, New Haven, CN, March 2000, "Metrics Thermostat."

Analysis Group Economics Seminar, Boston, MA, December 1999, "The Use of Marketing Research in Litigation." Also New York, NY, March 2000 and Washington, D. C., March 2002.

Boston Chapter of the Society for Concurrent Engineering, Waltham, MA, October 1999, "Metrics Thermostat."

University of Michigan DuPont Distinguished Speakers' Series, Ann Arbor, MI, March 1998, "New Product Metrics."

Kirin Brewery Co. Limited, Tokyo, JAPAN, December 1998, "You Are What You Measure!" and "Scientific Studies of the Voice of the Customer."

NEC Corporation, Tokyo, JAPA, December 1998, "Scientific Studies of the Voice of the Customer."

University of California at Los Angeles, Los Angeles, CA, February 1997, "Research, Development, and Engineering Metrics"

Stanford University, Stanford, CA, December 1996, "Metrics to Value R,D&E"

University of California at Los Angeles, Los Angeles, CA, February 1997, "Research, Development, and Engineering Metrics"

Duke University, Durham, NC, "Internal Customers and Internal Suppliers," Nov. 1995.

University of Minnesota, Minneapolis, MN, "Voice of the Customer," "Internal Customers and Captive Suppliers," May 1995.

Winter Retreat, University of Florida, Gainesville, FL, "Internal Customers and Captive Suppliers," December 1993.

Product Development Association - Boston, "Design and Marketing of New Products II: Advances in Product Development Management over the Last 13 Years," May 1993.

3M, Minneapolis, MN, "Incentives to Encourage a Long-term Perspective and a Customer Focus," Workshop on "Towards a World-class Research, Development, and Engineering Organization," November 1992.

Baxter Health Care, Orange County, CA, "The Voice of the Customer," August 1992.

TIMS College on the Practice of Management Science (*New Directions in Management Science*), Cambridge, MA: "The Voice of the Customer," October 1991.

IBM, Inc., Boca Raton, FL: "Voice of the Customer for Performance Graphics," May 1991.

Kirin Brewery Company, Ltd. Tokyo, JAPAN: "New Product Development" and "Customer Satisfaction and Customer Needs," April 1991.

American Iron and Steel Institute, Detroit, MI: "Satisfying the Customer -- Technical Issues," February 1991.

Warner Lambert, Inc., Mountain Laurel, PA: "Communication Among R&D and Marketing," October 1990.

Digital Equipment Corporation, Maynard, MA: "Voice of the Customer," May 1990.

Life Insurance Marketing and Research Association, Inc.: 31st Research Planning Conference, Boston, MA, "The House of Quality." June 1989.

University of Illinois: "Customer Driven Engineering." April, 1988.

Marketing Science Institute and IBM Thornwood Educational Facility: Quality through Customer Driven Engineering." April, 1988.

Harvard Business School: "Customer Driven Engineering: Integrating Marketing and Engineering." February, 1988.

Vanderbilt University: "Competitive Price and Advertising Strategies" and "Customer Driven Engineering." October, 1988.

Columbia University: "Price, Positioning, and Advertising Games: To Equilibrate of Not, Does it Pay to be Smart?" May, 1987.

New York Marketing Modelers' Club: "Would You Really Rather Have a Buick?: Prelaunch Forecasting of New Automobiles," May 1987.

M.I.T. Applied Economics: "Competitive Product Selection and Advertising Models." April, 1987.

Northwestern University: "Agendas and Consumer Choice," August, 1986.

AMA Faculty Consortium on Marketing Strategy at the University Tennessee, Knoxville. "Defender: Analyses for Competitive Strategy," July, 1986.

Ohio State University: "Defensive and Competitive Strategy." May, 1986.

Boston University: "Research in Competitive Strategy." November, 1985.

Midwest Electronics Association, Minneapolis, MN: "New Products for High-Tech Firms." October, 1985.

University of Pennsylvania: "Agendas and Consumer Choice," August, 1985.

Herstein Institute, Vienna Austria: "Competitive Strategy," May, 1985.

Cadbury-Schweppes, Birmingham, England: "New Product Development and Defensive Strategy." May, 1985.

Rhone-Poulenc and Aluminum Pechiney, Paris, France: "New Product Development." April, 1985.

University of Michigan: "Defensive and Competitive Strategy." February, 1985.

Marketing Science Institute Special Mini-Conference: "Defensive Marketing Strategies for Consumer Firms." September 1983.

University of Chicago, Graduate School of Business, Chicago, IL. "Agendas and Consumer Choice," May 1984.

European Institute for Business Administration (INSEAD), Fontainebleau, FRANCE. "Agendas and Consumer Choice," June 1984.

University of Connecticut. "Defensive Marketing: Theory, Measurement, and Models," April, 1983.

University of Osaka, JAPAN "Defensive Marketing: Theory, Measurement, and Models," August, 1983.

Kao Soap, Ltd., Tokyo, JAPAN: "Defensive Marketing," August, 1983.

Johnson & Johnson, K. K., Tokyo, JAPAN: "Defensive Marketing," August, 1983.

Analog Devices, Inc., Norwood, MA. "New Product Development," May, 1982.

University of Rochester Research Seminar, "Prelaunch Forecasting of New Consumer Durables," April 1982.

Frito-Lay R & D Laboratory, Dallas, TX, "Marketing and R & D for New Products," October 1981.

University of California at Los Angels Research Seminar, "Defensive Marketing Strategies," July, 1981.

Purdue University Research Seminar, "Product Realization," October 1979.

Stanford University Research Seminar, "Product Realization," October 1979.

Elrick and Lavidge, Inc., Chicago, Illinois, "Product Realization," October 1979.

Booz, Allen and Hamilton, Inc., Chicago, Illinois, "New Service Planning for Hospitals," April 1979.

Cornell University Research Seminar, "Intensity Measures of Consumer Preference," February 1979.

University of Rochester Research Seminar, "Product Realization: Synthesis of Marketing and Economic Theory," December 1978.

Region VI Center of Health Planning, New Orleans, LA, "Finding the Linkage Through Marketing,: August 1978.

Nebraska Hospital Association, Kearney, NE, "Hospital Marketing Surveys," May 1978.

Executive Development Group, Waterloo Management Education Centre, Toronto, Ontario, Canada, "Designing New Industrial Products," February 1978.

Academic Update, Xavier University Graduate Program in Hospital and Health Administration, Cincinnati, OH, "Designing Hospital Services: A Marketing Approach," October 1977.

The Hospital Marketing Workshop, Ireland Educational Corporation, Chicago, Illinois, "Analyzing the Hospital Markets," January 1977 and May 1977.

Association for College Unions - International, 1976 Fall Conference in Green Bay, WI, Keynote Speech - "Designing Successful Services: A Marketing Approach," October 1976.

University of Chicago, Graduate School of Business, Research Seminar, "Testing Probabilistic Models," April 1976.

Council for the Advancement and Support of Education, Conference on Marketing Alumni Program, New York, NY, Keynote Speech, February 1976.

Presentations at Professional Meetings (No published proceedings, some co-presented or presented by co-author[s])*

INFORMS Marketing Science Conference, Baltimore MD, June 2015. Songting Dong, John Hauser*, Min Ding, Lixin Huang, and Holger Dietrich, "The Sleuth Game: Predicting Consumer Response to as-yet-unspecified Product Features for Really New Products."

AMA/Sheth Foundation Doctoral Consortium, Northwestern University, Evanston, IL, June 2014, "Bridging Empircs and Practice."

INFORMS Marketing Science Consortium, Emory University, Atlanta GA, June 2014, "Learning from Experience Simply."

AMA Summer Educators' Conference, San Francisco, CA, August 1-3, 2014. Guilherme Liberali,* Hauser, John R., and Glen L. Urban "Recent Advances in Morphing Theory: Challenges and Opportunities for Research."

INFORMS Marketing Science Conference, Atlanta, GA, June 2014. Aliaa Atwi* and John R. Hauser, "Exploration vs. Exploitation in Rapid Coupon Personalization."

AMA Sheth Foundation Doctoral Consortium 2013, University of Michigan, Ann Arbor, MI, June 6-9. "Managing Your Career (as a Marketing Academic)."

AMA Summer Educators' Conference, Boston MA August 9-11, 2013. Panel on "Academic Integrity in the Publication Process" with Robert Meyer, Richard Lusch, John Hauser.*

10th Marketing Dynamics Conference, The University of North Carolina at Chapel Hill, May 30 – June 1, 2013. Song Lin*, Juanjuan Zhang, and John Hauser, "Learning from Experience, Simply."

Joint Statistical Meetings 2013, Montreal, Ontario, August 2013. Song Lin*, Juanjuan Zhang, and John Hauser, "Learning from Experience, Simply."

2012 AMA Sheth Foundation Doctoral Consortium, Foster School of Business, University of Washington, June 2012, Panel: 10 Steps to Successful Publishing.

INFORMS Marketing Science Conference, Boston, MA, June 2012.

- Song Lin*, Juanjuan Zhang, and John R. Hauser, "Learning from Experience, Simply."
- Glen L. Urban, Guilherme Liberali, Erin MacDonald, Robert Bordley, and John R. Hauser*, "Morphing Banner Advertising"
- Matt Selove* and John R. Hauser, "The Strategic Importance of Accuracy in Conjoint Design."
- Panel: Research Opportunities at the Marketing/Operations Interface

The 2012 Theory & Practice in Marketing (TPM) Conference on Marketing Strategy, Harvard University, Boston, MA. May 2-3, 2012. Glen L. Urban, Guilherme Liberali, Erin MacDonald, Robert Bordley, and John R. Hauser*, "Morphing Banner Advertising."

New England Marketing Conference, Cambridge, MA, October 28, 2011. Gui Liberali, Glen L. Urban and John R. Hauser*, " Providing Unbiased Competitive Information to Encourage Trust, Consideration, and Sales: Two Field Experiments."

Yale School of Management, Center for Customer Insight, The Customer Insights Conference, New Haven, CT, May 12-14, 2011. John R. Hauser and Matthew Selove*, "The Strategic Importance of Accuracy in the Relative Quality of Conjoint Analysis."

INFORMS Marketing Science Conference, Cologne, Germany, June 2010 (*indicates primary presenter if not me)

- Liberali, Guilherme*, John R. Hauser, and Glen L. Urban, "Optimal Time-to-Morph and Cognitive Costs of Morphing."

- Liberali, Guilherme, Glen L. Urban, and John R. Hauser, "Do Competitive Test Drives and Product Brochures Improve Sales?"
- Urban, Glen L.*, Jong Moon Kim, Erin MacDonald, John R. Hauser and Daria Dzyabura, "Developing Consideration Rules for Durable Goods Markets."

2010 Advanced Research Techniques Forum, San Francisco, CA, June 6-9, 2010, "Unstructured Direct Elicitation of Non-compensatory and Compensatory Decision Rules," with Min Ding, Songting Dong*, Daria Dzyabura (listed as Silinskaia), Zhilin Yang, Chenting Su, and Steven Gaskin.

2009 AMA Sheth Foundation Doctoral Consortium, J. Mack Robinson College of Business, Georgia State University, June 2009. E-Commerce and Digital Marketing Topics.

INFORMS Marketing Science Conference, Ann Arbor, MI, June 2009 (* indicates primary presenter if not me)
- "An Empirical Test of Incentive-Compatible Direct Elicitation of Heuristic Decision Rules for Consideration and Choice," with Min Ding, Songting Dong, Daria Dzyabura, Zhilin Yang, Chenting Su, and Steven Gaskin
- "Adaptive Profile Evaluation to Identify Heuristic Decision Rules in "Large" and Challenging Experimental Designs," with Daria Dzyabura (formerly Silinskaia)* and Glen L. Urban..
- "Morphing Websites in the Presence of Switching Costs," with Guilherme Liberali* and Glen L. Urban.
- "Continuous-Time Markov-Process with Misclassification: Modeling and Application to Auto Marketing," with Glen L. Urban* and Guilherme Liberali.
- "An Incentive-Aligned Sleuthing Game For Survey Research," with Min Ding*
- "Would You Consider a Buick Even if It Were #1 in JD Power?" with Erin MacDonald* and Glen Urban
- "Cognitive Simplicity and Consideration Sets," with Rene Befurt*, Daria Dzyabura, Olivier Toubia, and Theodoros Evgeniou
- "John D. C. Little, a Pioneer in Marketing Science (Festschrift paper)," with Glen L. Urban

INFORMS Marketing Science Conference, Vancouver, B.C., June 2008 (* indicates primary presenter if not me)
- "Cognitive Styles and Website Design," with Michael Braun, Glen L. Urban, and Clarence Lee.
- Modeling Cognitive Complexity to Predict Consideration Sets," with Daria Dzyabura (formerly Silinskaia)*, Theodoros Evgeniou, Olivier Toubia, and Rene Befurt.
- "Morphing Websites to Match Individual Cognitive Styles," with Michael Braun*, Glen L. Urban, and Guilherme Liberali

Sawtooth Software Conference, Delray, FL, March 2009, "A Critical Review of Non-compensatory and Compensatory Models of Consideration-Set Decisions," with Min Ding and Steven Gaskin

AMA Doctoral Consortium, Robert J. Trulaske, Sr. College of Business, University of Missouri, June 2007, "Looking Ahead: Directions for Scholarly Research in Marketing" and "Building Teaching Effectiveness: Stimulating Student Interest."

Sawtooth Software Conference, Santa Rosa, CA, October 2007, "Two-Stage Models: Identifying Non-Compensatory Heuristics for the Consideration Set then Adaptive Polyhedral Methods Within the Consideration Set," with Steven Gaskin, Theodoros Evgeniou, Daniel Bailiff.

AMA Advance Research Technologies Forum, Sante Fe, New Mexico, June 2007, "Two-Stage Models: Identifying Non-Compensatory Heuristics for the Consideration Set then Adaptive Polyhedral Methods Within the Consideration Set," with Steven Gaskin, Theodoros Evgeniou, and Daniel Bailiff.

AMA Doctoral Consortium, W. P. Carey School of Business, Arizona State University, May 2007, "Consideration The New Battlefield in Product Development."

Agent-based Models of Market Dynamics and Consumer Behaviour, University of Surrey, Guildford, UK, January 2006, "Co-opetition for the Diffusion of Resistant Innovations: A Case Study in the Global Wine Industry using an Agent-based Model." with Rosanna Garcia. Also presented at the American Marketing Association's Advanced

Research Techniques (ART) Forum in June 2006 at Monterrey CA.

AMA Doctoral Consortium, University of Maryland, College Park, MD, July 2006, “Creating Value: Products and Brands.”

Marketing Science Conference, University of Pittsburgh, Pittsburgh, PA, June 2006, “A Truth-telling Sleuthing Game for Survey Research,” with Min Ding.

Marketing Science Conference, University of Pittsburgh, Pittsburgh, PA, June 2006, On Managerially Efficient Experimental Designs,: with Olivier Toubia.

Sawtooth Software Conference on Conjoint Analysis, Delray Beach, FL, March 2006, “Must Have” Aspects vs. Tradeoff Aspects in Models of Customer Decisions,” with Michael Yee, James Orlin, Ely Dahan.

AMA Doctoral Consortium, University of Connecticut, Storrs CT, June 2005, “The Virtual Customer.”

Marketing Science Conference, Emory, Atlanta, GA, June 2005, “Direct, Nonparametric Product Optimization Using Interactive Genetic Algorithms,” with Kamal Malek and Kevin Karty.

Marketing Science Conference, Emory, Atlanta, GA, June 2005, “Non-Deterministic Polyhedral Methods for Adaptive Choice-Based Conjoint Analysis: Application to the Diffusion of the New Wine Cork,” with Olivier Toubia and Rosanna Garcia.

Marketing Science Conference, Emory, Atlanta, GA, June 2005, “Greedoid-Based Non-compensatory Two-Stage Consideration-then-Choice Inference,” with Michael Yee, Jim Orlin, and Ely Dahan.

Marketing Science Doctoral Consortium, Rotterdam, The Netherlands, June 2004, “Research that Has Impact.”

Marketing Science Conference, Rotterdam, The Netherlands, June 2004, “Improving Choice-Based Polyhedral Methods by Taking Response Error into Account,” with Olivier Toubia.

Marketing Science Conference, Rotterdam, The Netherlands, June 2004, “The Dream Versus Reality of CRM,” with Glen L. Urban, Eric Bradlow, and, Mahesh Kumar.

Marketing Science Conference, Rotterdam, The Netherlands, June 2004, “Non-compensatory Consideration-then-Choice Adaptive Conjoint Analysis,” with Michael Yee and James Orlin.

AMA Doctoral Consortium, Texas A&M University, College Station, TX, June 2004, "Virtual Customer Initiative."

AMA Advanced Research Techniques Forum, June 2004, “Conjoint Adaptive Ranking Database System (CARDS),” with Ely Dahan, James Orlin, and Michael Yee.

AMA Doctoral Consortium, University of Minnesota, Minneapolis, MN, June 2003, "The Review Process."

Marketing Science Doctoral Consortium, University of Maryland, June 2003, “Roots of Marketing Science Thought,” with John Little.

Marketing Science Conference, University of Maryland, June 12-15, 2003, "Individual-level Adaptation of Choice-Based Conjoint Questions: More Efficient Questions and More Accurate Estimation," (with Olivier Toubia and Duncan Simester).

Marketing Science Conference, University of Alberta, Canada, June 28, 2002, "Configurators, Utility Balance, and Managerial Use," (with Duncan Simester and Olivier Toubia).

Marketing Science Doctoral Consortium, University of Alberta, Canada, "Helping Managers Structure and Make Decisions," June 27, 2002. (Founding Consortium).

Marketing Science Conference, University of Alberta, Canada, June 28, 2002, "Adaptive Choice-Based Conjoint Analysis with Polyhedral Methods," (with Duncan Simester and Olivier Toubia*).

Advances in Marketing Research and Modeling: The Academic and Industry Impact of Paul E. Green, Wharton, Philadelphia, PA, May 2002, "New Methods of Data Collection and Estimation Using Polyhedral Estimation Techniques."

Production and Operations Management Society (POMS) Conference 2002 - High Tech POM, San Francisco, CA, April 2002, "The Virtual Customer," (with Ely Dahan*).

Product Development Association (PDMA) International Research Conference, Santa Clara, CA, October 2001, "The Virtual Customer," (with Ely Dahan*).

New England Marketing Conference, Cambridge, MA, September 2002, "Fast Polyhedral Adaptive Conjoint Estimation," (with Ely Dahan, Duncan Simester, and Olivier Toubia).

Marketing Science Conference, Wiesbaden, Germany, July 2001, "Empirical Test of Web-based Conjoint Analysis Including ACA, Efficient Fixed Designs, Polyhedral Methods, and Hybrid Methods," (with Ely Dahan, Duncan Simester, and Olivier Toubia*)

Marketing Science Conference, Wiesbaden, Germany, July 2001, "Evaluation of Fast Polyhedral Adaptive Conjoint Estimation," (with Duncan Simester and Olivier Toubia).

The 12th Annual Advanced Research Techniques Forum, Amelia Island, Florida, June 2001, "The Virtual Customer: Communication, Conceptualization, and Computation," (with Ely Dahan*).

AMA Doctoral Consortium, University of Miami, June 2001, "Role of Technology in Marketing."

Marketing Science Conference, UCLA, June 2000, "Applications of the Metrics Thermostat."

Marketing Science Conference, UCLA, June 2000, "The Virtual Customer." (with Ely Dahan and Duncan Simester).

Marketing Science Institute Marketing Metrics Workshop, Washington, D.C. October 1999, "Metrics for New Product Development: Making Agency Theory Practical," Plenary Speaker.

Marketing Science Conference, Syracuse, NY, May 1999, “Balancing Customer Input, Speed to Market, and Reduced Cost in New Product Development: What is the Most Profitable Strategy”

ICRMOT Conference on Technology Alliances and New Product Development: A Cross-cultural Perspective, Mishima, JAPAN, December 1998, “You Are What You Measure!”

AMA Doctoral Consortium, Athens, Georgia, August 1998, “Quantitative Advances in Marketing Models.”

AMA Winter Educators’ Conference, Austin, TX, February 1998 (Plenary Speaker), “New Challenges in the Marketing-Product Development Interface.”

AMA Doctoral Consortium, Cincinnati OH, August 1997, "Working with Industry."

Marketing Science Conference, Berkeley CA, March 1997, “Cultivating Technological Managers for Customer Expertise.”

Marketing Science Institute Conference on Interfunctional Interfaces: The Management of Corporate Fault Zones, Palo Alto, CA, December 1996, “Multi-Stage Modeling of R&D/Marketing Interfaces in New Product Development.”

Marketing Science Conference, Berkeley CA, March 1997, “Cultivating Technological Managers for Customer Expertise.”

Envisioning the Future on Internet Marketing: Research and Strategy Implications, M.I.T., September 1996, “Agents and Intermediaries: Roles, Trust, and Value.”

"Can R&D be Evaluated on Market-Driven Criteria?," (with Florian Zettelmeyer). Marketing Science Conference, University of Florida, Gainesville, March 1996

"Information Acceleration," (with Glen Urban, William Qualls, Bruce Weinberg, Jon Bohlmann, and Roberta Chicos). Wharton Conference on Innovation in Product Development, Philadelphia, PA, May 1995.

"Metrics by Which Managers Evaluate R&D Groups," (with Florian Zettelmeyer). Association of Consumer Research, Boston, MA, October 1994.

"Satisfying the Internal Customer," (with Birger Wernerfelt and Duncan Simester) Marketing Science Conference, University of Arizona, Tucson, AZ, March 1994.

"Customer-Satisfaction Based Incentive Systems," AMA Educator's Conference, Boston, MA, August 1993.

"Marketing in the 1990s: Emerging Issues," AMA Doctoral Consortium, University of Illinois, August 1993.

"Quality Function Deployment and the Voice of the Customer," Pharmaceutical Management Science Association, Phoenix AZ, May 1993.

"In a World of Active Time-constrained Customers, How Can a Firm be the Great Communicator," (with Birger Wernerfelt), Marketing Science Conference, Washington University, St. Louis, MO, March 1993.

"Customer Needs, Customer Satisfaction, Sales, and Profit," (with Birger Wernerfelt, Ronit Bodner, and Duncan Simester), ORSA/TIMS Joint National Conference, San Francisco, CA, November 1992.

"Customer Satisfaction and Employee Rewards," (with Birger Wernerfelt, Ronit Bodner, and Duncan Semester), Marketing Science Conference, London, England, June 1992.

"Information Acceleration and Preproduction Forecasting of Electric Autos," (with Glen L. Urban and Bruce Weinberg), Marketing Science Conference, London, England, June 1992.

"The Voice of the Customer and Customer Satisfaction," ORSA/TIMS Joint National Meeting, Anaheim, CA, October 1991.

"Modeling Marketing Phenomena," AMA Doctoral Consortium, University of Southern Calif. August 1991.

"Relationship of Satisfaction to Customer Needs and to Market Share," 1st Congress on Customer Satisfaction and Market-Driven Quality, American Marketing Association, Orlando FL, May 1991.

"Time Flies When You're Having Fun: How Consumers Allocate Their Time When Evaluating Products" (with Bruce Weinberg, Glen Urban, and Miguel Villas-Boas), Marketing Science Conference, Wilmington, DL, March 1991.

"Information Acceleration and Preproduction Forecasting of New Autos," (with Glen Urban, and Bruce Weinberg), Marketing Science Conference, Wilmington, DL, March 1991.

"Beyond Quality Function Deployment," ORSA/TIMS Joint National Meeting, Philadelphia, PA October 1990. (Conference-wide Tutorial)

"Competitive Marketing Strategies," Operations Research 1990 (Osterreichische Gesellschaft fur Operations Research), Vienna, Austria, August 1990. (Invited Speaker)

"New Product Development: A Quantitative Analysis of Interfunctional Communication" (with Abbie Griffin), Marketing Science Conference, Urbana, IL, March 1990.

"Integrated Product Development: New Methodological Developments" (with Abbie Griffin), Marketing Science Conference, Durham, N.C., March 1989.

"Customer Driven Engineering" (with Gregory Cirmak and Robert Klein), ORSA/TIMS Joint National Meeting, Washington, D.C., April 1988.

"Competitive Advertising and Pricing in Duopolies" (with Birger Wernerfelt), Marketing Science Conference, Seattle, Washington, March 1988.

"Customer Driven Engineering" (with Abbie Griffin), Marketing Science Conference, Seattle, Washington, March 1988.

"Customer Needs," Visions of Design Practices for the Future, Newton, MA, October 1987.

"Effective Strategies in Oligopoly" (with Peter Fader), ORSA/TIMS Joint National Meeting, Miami Beach, Florida, November 1986.

"Competitive Strategy Contest: Result and Analysis" (with Peter Fader), Marketing Science Conference, Dallas, TX, March 1986.

"The PC As a Tool to Teach Complex Marketing Science Concepts," Marketing Science Conference, Dallas, TX, March 1986.

"The Coming Revolution in Marketing Theory," Plenary Speaker, European Marketing Conference, Bielefeld, West Germany. April 1985.

"Defensive Strategy" Confer. on Economics of the Firm, Universite de Paris X, Nanterre, France, April 1985.

"Competitive Marketing Strategies" Marketing Science Conference, Nashville, Tennessee, March 1985.

"Developing New Product Management: Past Progress, Current Efforts, Current Needs" (Panel) Marketing Science Conference, Nashville, Tennessee, March 1985.

"Testing Competitive Marketing Structures: Theory and Applications" (with Glen Urban) ORSA/TIMS Joint National Meeting, Dallas, TX November 1984.

"Competitive Strategy," ORSA/TIMS Joint National Meeting, Dallas, Texas, November 1984.

"Forecasting Automobile Sales: An Application of a Value Priority Algorithm," (with Glen Urban), John Roberts and John Dabels), TIMS XXVI International Meeting, Copenhagen, Denmark, June 1984.

"Consumer Durables: The Actual Consumer Budgets Compared to the Value Priority Model," (with Glen Urban), Marketing Science Conference, Chicago, Illinois, March 1984.

"Defensive Strategy Models: Application and Predictive Text," (with Steven Gaskin, and Karl Irons) ORSA/TIMS Joint National Meeting, Orlando, Florida, November 1983.

"New Product Research: Focus on Defensive strategies," Roundtable Program, ORSA/TIMS Joint National Meeting, Orlando, FL, November 1983.

"Intensity of Preference," (with Steven Shugan) ORSA/TIMS Joint National meeting, San Diego, CA, October 1982.

"Measurement Error Theories for von Neumann-Morgenstern Utility Functions," (with Jehoshua Eliashberg) ORSA/TIMS Joint National Meeting, San Diego, CA, October 1982.

"Consumer Preference Models: Axioms and Statistics," ORSA/TIMS Joint National Meeting, Houston, Texas, October 1981.

"Economic Models of Consumer Behavior," (panel discussion), ORSA/TIMS Joint National Meeting, Houston, Texas, October 1981.

"Defensive Marketing Strategies, Part II," (with Steven Shugan), ORSA/TIMS Joint National Meeting, Houston, Texas, October 1981.

"Agendas and Choice Probabilities," (with Amos Tversky), Association of Consumer Research, St. Louis, Missouri, October 1981, and Special Conference on Choice Theory, Durham, North Carolina , June 1981.

"Strategic Response to Competitive New Products," (with Steven Shugan), ORSA/TIMS Joint National Meeting, Toronto, Ontario, Canada, May 1981.

"Applications of a Dynamic Semi-Markov Model of Consumer Choice," (with Ken Wisniewski), ORSA/TIMS Joint National Meeting, Colorado Springs, Colorado, November 1980.

"Models of Consumer Behavior," (panel discussion), ORSA/TIMS joint National Meetings, Colorado Springs, Colorado, November 1980.

"Dynamic Semi-Markov Models of Consumer Behavior," (with Ken Wisniewski) TIMS International Conference on Marketing, Paris, June 1980.

"Profit Maximizing Perceptual Positioning," (with Patricia Simmie) TIMS International Conference on Marketing, Paris, June 1980.

"An Error Theory for von Neumann-Morgenstern Utility Assessment," (with Jehoshua Eliashberg), ORSA/TIMS Joint National Meeting, Washington, D.C., May 1980.

"Defender: Defensive Strategies Against New Products" (with Steven Shugan), ORSA/TIMS Second Special Interest Conference on Marketing Measurement and Analysis, Austin, Texas, March 1980.

"Adaptive Control of New Product Launches," (with Ken Wisniewski), ORSA/TIMS Joint National Meeting, Milwaukee, Wisconsin, October 1979.

"The Value of Up-front Research in New Products," (with Glen Urban), TIMS International Meeting, Honolulu, Hawaii, June 1979.

"Methods for Computing Probabilities of Choice," (with Steven Shugan), TIMS International Meeting, Honolulu, Hawaii, June 1979.

"Forecasting and Improving the Adoption of New High Technology Products," (with Pat Lyon), ORSA/TIMS Joint National Meeting, New Orleans, Louisiana, May 1979.

"A Methodology for Product Realization: Multi-method Procedures," (with Patricia Simmie), ORSA/TIMS Joint National Meeting, Los Angeles, California, November 1978.

"Searching for Marketing Segments" (with Ken Wisniewski), ORSA/TIMS Joint National Meeting, New York, New York, May 1978.

"P.A.R.I.S.: An Interactive Market Research System," (with Steven Shugan), ORSA/TIMS Joint National Meeting, New York, New York, May 1978.

"Extended Conjoint Analysis," (with Steven Shugan), ORSA/TIMS Joint National Meeting, Atlanta, Georgia, November 1977.

"Consumer Preference Functions: Theory, Measurement, Estimation , and Application," (with Steven Shugan), ORSA/TIMS Joint National Meeting, Atlanta, Georgia, November 1977.

"Measuring Consumer Preferences for Health Care Plans," (with Glen Urban), ORSA/TIMS Joint National Meeting, San Francisco, California, May 1977.

"Improved Transportation Design with Consumer Response Models: An AMTRAK Example" (with Frank Koppelman), ORSA/TIMS Joint National Meeting, Miami, Florida, November 1976.

"A Comparison of Statistical and Direct Multiattribute Utility Assessment Procedures," (with Glen Urban), ORSA/TIMS Joint National Meeting, Las Vegas, Nevada, November 1985.

"Measuring Consumer Preferences: An Axiomization for Describing Choice," ORSA/TIMS Joint National Meeting, Las Vegas, Nevada, November 1975.

"Modeling Consumer Response to Innovations," (1) Milwaukee Chapter of ORSA/TIMS, November 1985; (2) Chicago Chapter of ORSA/TIMS, December 1975.

"Modeling Decisions of Choice Among Finite Alternatives: Applications to Marketing and to Transportation Demand Theory," ORSA/TIMS Joint National Meeting, San Juan, Puerto, Rico, October 1974.

"An Efficient Model for Planning Bus Routes in Medium Sized Communities," ORSA/TIMS Joint National Meeting, San Diego, CA, November 1973.

Professional Affiliations

The Institute for Operations Research and Management Science

American Marketing Association

Product Development and Management Association, Certified New Product Development Professional

Professional Services

President, INFORMS Society of Marketing Science (January 2014 –December 2015). President-elect (a board position, January 2012 – December 2013).

Secretary, INFORMS Society of Marketing (January 2002 – December 2005). Founding Officer.

Advisory Council, INFORMS College of Marketing (1994 - 2002)

Council of The Institute of Management Sciences (1987 - 1989)

Associate Editor for Marketing, *Management Science*, (1980 - 1981)

Department Editor for Marketing, *Management Science*, (1982 - 1988)

Editor-in-Chief, *Marketing Science*, (1989 - 1994)

Editor, Special Issue on Big Data, *Marketing Science*, 2015. Associate Editor, Special Issue on the Theory and Practice of Marketing, *Marketing Science*, 2014.

Editorial Advisory Board, *Sloan Management Review* (2000-2002).

Associate Editor, *Journal of Marketing Research* (April 2006 – June 2009). First time in journal history that Associate Editors had been appointed.

Senior Advisory Board, *Journal of Marketing Research* (July 2009 – 2014). First time such an advisory board was formed.

Advisory Board, *Marketing Science* (2010 – 2014).

Advisory Board, *Journal of Product Innovation Management* (2011 – 2014)

Emeritus Editorial Board, *Marketing Science* (includes active reviewing of papers).

Editorial Boards, *Marketing Science*, (1980 – 1988, Editor 1989-1995, 2003- 2008, including acting Area Editor), *Journal of Product Innovation Management* (1997 - 2010), *Journal of Marketing* (2005- 2008, outstanding reviewer 2006), *European Management Journal* (advisory, 1998 - 2002), *International Journal for Research in Marketing* (2007 – 2014).

Reviewer: *Advances in Consumer Research, Applications in Management Science, European Journal of Research in Marketing, Journal of the Academy of Marketing Science,* Journal *of Consumer Research, Journal of Marketing, Journal of Marketing Research, Journal of Mathematical Psychology, Journal of Product Innovation Management, Management Science, Marketing Science, Operations Research, Review of Marketing, Sloan Management Review, Transportation Research Record, Transportation Science,* AMA Dissertation Prize, AMA Educators' Conference, American Institute of Decision Sciences Dissertation Prize, Nicholson Dissertation Prize, Marketing Science Institute Dissertation Award, Product Development Management Association Dissertation Prize, Prentice-Hall Books, National Science Foundation.

Conference Chairman: Conference Chair, Profitable Customer-Driven Organizations: Developing the Blueprint, Management Roundtable, May 1994.

Segment Chairman: Yale School of Management, Center for Customer Insight, The Customer Insights Conference, New Haven, CT. May 12-14, 2011. New Product Innovations.

Non-traditional Models of Consumer Preference and Choice, Adaptive Preference and Estimation, Optimizing Product Design and Customer Targeting, Obtaining Information From or About Consumers (Atlanta, GA, 2005, co-chair four sessions)

TIMS International Meeting, Copenhagen, Denmark, June 1984 (two sessions).

TIMS College of Marketing, Houston, Texas, October 1981 (twelve sessions).

TIMS College of Marketing, Milwaukee, Wisconsin, October 1979 (five sessions).

American Marketing Association Educator's Conference, Chicago, Illinois, August 1978, (three sessions).

INFORMS Marketing Science Conference, Atlanta GA, June 2005 (four sessions)

Session Chairman: *INFORMS (Previously named ORSA or TIMS)*

Virtual Customer Initiative (Rotterdam, The Netherlands, 2004)

New Approaches to Mapping (University of Maryland, 2003)

The Virtual Customer (University of Alberta, Canada 2002)

The Virtual Customer (Wiesbaden, Germany 2001)

Building Competitive Advantage Through Product Quality and R&D (Gainesville, FL 1996)

Customer Satisfaction and Its Role in Global Competition (San Francisco, CA 1992)

Competitive R&D (Washington, D.C., April 1988)

Competitive Marketing Strategy, (St. Louis, Michigan, November 1987)

Competition in Multiattributed Spaces (Atlanta, Georgia, November 1985).

Marketing: Consumer Measurement (Copenhagen, Denmark, June 1984)

Marketing: Dynamic Structures (Copenhagen, Denmark, June 1984)

Product Policy (Orlando, Florida, November 1983)

Product Policy (San Diego, California, October 1982)

New Product Introduction and Defense in Competitive Environments, (Detroit, Michigan, April 1982)

New Product and Product Policy Models, (Houston, Texas, October 1981)

New Product Models (Toronto, Ontario, Canada, May 1981)

Models of Consumer Behavior (Colorado Springs, Colorado, November 1980)

New Product Realization and Selection (Los Angeles, California, November 1978).

Session Chairman: *Association of Consumer Research*

Mathematical Theories of Consumer Behavior (St. Louis, Missouri, October 1981)

Committee Memberships

Editor Selection Committee, *Marketing Science*, INFORMS College of Marketing, 2001 (chair), 2004 (chair), 2007.

Editor Selection Committee, *Journal of Marketing Research,* American Marketing Association, 1999.

Conference Steering Committee, Duke Invitational Symposium on Choice Modeling and Behavior, June 1993.

Editor Selection Committee, *Management Science,* TIMS.

Founding Committee for *Marketing Science*, TIMS College of Marketing, (1979 - 1982).

Management Science Roundtable, TIMS, (1982 - 1988)

Marketing Strategy Steering Committee, Marketing Science Institute, (1983 - 1984).

Organizing Committee for Conference on Economics of the Firm, April 1985, Universite de Paris X Nanterre.

Organizing Committee for 1985 Conference in Bielefeld, West Germany, European Marketing Academy.

Publications Committee (1980 - 1982), Operations Society of America.

Scientific Committee for 1986 Conference in Helsinki, Finland.

Student Affairs Committee (1978 - 1979), Operations Society of America.

*Litigation Consulting (on behalf of, *deposition testimony, †court, commission, or arbitration testimony, for public vita, current cases with pending reports are not listed)*

ABC, Inc., American Broadcasting Company, Inc., and Disney Enterprises, Inc., Plaintiffs, v. Dish Network L.L.C. and Dish Network Corp., (Preliminary Injunction)

Alcatel-Lucent USA Inc. v. Amazon.com, Inc. et al. (Patent Infringement)* †

Allergan, Inc. Engagement. (Off-label Prescriptions)

American Express Travel Related Services, Inc. v. Visa USA, Inc., et. al.* (Evaluation of marketing research)

In Re American Express Anti-Steering Rules Antitrust Litigation (II)* (Evaluation of marketing research)

American Multi-Cinema, Inc. v. American Movie Classics Company, Inc., et. al. (Confusion)

Amway v. Procter & Gamble (Damages)*

Apple, Inc. v. Samsung Electronics Company, Ltd, et al.** †† (Patent infringement, two cases, 1846, 630)

Atlantic Recording Corporation, et. al. v. XM Satellite Radio, Inc. (Copyright infringement).

Axcan Scandipharm, Inc. V. Global Pharmaceuticals And Impax Laboratories, Inc. (False Advertising)

Berlex v. Biogen, Inc. (Damages)*

Blue Mountain Arts, Susan Polis Schutz, and Stephen Schutz v. Hallmark Card, Inc. (Trade Dress)

James And Lisa Camenson, et al.; v. Milgard Manufacturing Inc., et. al. (Class action)

CBS Corporation, CBS Broadcasting Inc., CBS Studios Inc., and Survivor Productions, LLC. v. and DISH Network Corporation, DISH Network L.L.C. (damages).

Comm-Tract Corp. v. Northern Telecom, Inc. (Advice only)

Computer Aid, Inc. v. Hewlett Packard (damages)*

Creative Laboratories, Inc. v. Apple Computer, Inc. (Intellectual Property)

CTC Communications Corporation v. Bell Atlantic Corporation (Damages)

Curt Schlesinger and Peter Lore, on behalf themselves and the Certified Class, Plaintiffs, v. Ticketmaster* (Class action, false advertising, confusion)

Dayna Craft, et al. v. Philip Morris Companies, Inc. and Philip Morris Inc. (Class Action).*

Eagle Harbor Holdings LLC, and Mediustech LLC, v. Ford Motor Company (Patent infringement).

EPD v. Curtis (Product Confusion)†

Fox Broadcasting Company, Inc., Twentieth Century Fox Film Corp., and Fox Television Holdings. Inc., Plaintiffs,

v. Dish Network L.L.C. and Dish Network Corp., (Preliminary Injunction, Damages)*

Stephen S. Gallagher, et. al. v. State Farm Mutual Automobile Insurance Company, et al. (Class Action)

Geico v. Google and Overture Services (Yahoo), Inc. (Trademark Infringement)

Gillette v. S. C. Johnson (Patent Infringement)

Gyrodata, Inc. v. Atlantic Inertial Systems Inc ("AIS"), et al. (consulting expert)

Heublein vs. Seagrams and Gallo (Liability)

Hewlett-Packard, Inc. v. Factory Mutual Insurance Company (Insurance Coverage)*

IMS Health Incorporated v. Symphony Health Solutions Corporation, Source Healthcare Analytics, LLC, and ImpactRx, Inc., C.A. No. 1:13-cv-2071-GMS (D. Del.). (Patent infringement, technical expert.)

Intel v. Advanced Micro Devices (Damages)*

J. B. D. L. Corp. d/b/a, Beckett Apothecary v. Wyeth-Ayerst Laboratories, Inc. and American Home Products Corporation, (Class Action)

Jerry Jacobs, et. al. v. Osmose Inc., et. al. (Class Action)*

Jay Kordich, et. al. v. Salton Maxim Housewares, Inc., et. al. (Trademark)†

In RE J.P. Morgan Chase Cash Balance Litigation (Class Action)*

Lending Tree, Inc. v. The Gator Corporation (Intellectual Property)

Lotus v. Borland (Damages)*

Luciano F. Paone v. Microsoft Corporation (Patent Infringement)*.

Louis Vuitton Malletier, S. A. v. Hyundai Motor America (Trademark Infringement)*

Marvin Lumber and Cedar Company v. PPG Industries, Inc., et. al. (Survey Design)

MasterCard International, Inc. v. First National Bank of Omaha (Product Confusion)*

Mayo Foundation v. Mayo Health Facilities (Product Confusion)†

Mead Johnson Nutritionals v. unnamed party (False Advertising)

Merck & Co. (Lanham Act Advice)

Michael Kors (USA), Inc. and Michael Kors, L.L.C. v. Costco Wholesale Corporation, Civil Action No. 13-CV-4832, the United States District Court Southern District of New York. (Damages)*

In Re Microsoft Corporation Antitrust Litigation (Multi-district Litigation)*

Millennium Laboratories, Inc. v. Ameritox, Ltd. (False Advertising)

Pacific Bell Telephone Company in New Regulatory Framework Review of Customer Satisfaction before the California Public Utility Commission†

Pfizer Consumer Healthcare (Lanham Act Advice)

Playtex v. Procter & Gamble (Claims Substantiation)*†

Procter & Gamble v. Amway (Liability and Damages)*†

Procter & Gamble v. Haugan, et. al. (Liability and Damages)†

Putnum Fund Trustees, (Investment Fraud, advice on market research)

Ram Broadcasting, Inc. (Cellular Telephone Filings)

RealPlayer, Inc. v. Microsoft Corporation (Anti-trust)

Roberts et. al. v. Enterprise Rent-a-Car Company of Boston, Inc. (Class Action)

The Republic of Columbia v. Diageo North America, et al. (Anti-trust)

St. Clair Intellectual Property Consultants, Inc. v. Research in Motion, Ltd. and General Imaging Co. (Patent infringement)

Barbara Schwab, et. al. v. Philip Morris, USA (Class Action)*

SoundExhange, Inc. vs. Sirius Satellite Radio, Inc. and XM Satellite Radio, Inc.: In the Matter of Adjustment of Rates and Terms for Preexisting Subscription Services and Satellite Digital Radio Services. 2007*†. 2012†*

State of Colorado, et. al. v. Warner Chilcott Holdings Company III, Ltd., et. al. (Anti-trust)*

State of Florida and Plaintiff States Antitrust Litigation for Disposable Contact Lenses (Survey Analysis)†

Stipic, et. al. v. Behr Process Corporation and Masco International (Class Action)*

Straumann Company v. Lifecore Biomedical, Inc. (Product Confusion)*

Sun Microsystems, Inc. v. Microsoft Corporation (Anti-trust)

Tivo, Inc. v. Echostar Communications Corporation, et. al*

Tropicana Products, Inc. v. Vero Beach Groves, Inc. (Lanham Act)† (Declaration accepted as court testimony.)

Wal-Mart Stores, Inc (and other retailers) v. Mastercard International, Inc. (Liability and Damages, Anti-trust)*

We Media, Inc. v. We: Women's Entertainment, LLC. (Product Confusion)*

Marketing, Marketing Research, and Product Development Consulting

American Home Foods, Inc.; American Airlines; American Hospital Supply Corporation; Analog Devices, Inc; Andersen Consulting, Inc. (Accenture), Applied Marketing Science, Inc.; A.T.&T.; Avon; Barton-Aschmann Associates; Baxter Cardiovascular Group, Booz Allen Hamilton, Inc., Cambridge Systematics, Inc.; Chrysler, LLC; Colgate-Palmolive; Costello Associates, Inc.; Economics' Laboratories, Inc.; Elrick and Lavidge, Inc.; Evanston Hospital; Evanston, Illinois and Schaumburg, Illinois (Transportation Planning); Fiat Chrysler Automobiles, Fidelity Investments; Ford Motor Company; French's Inc., G.D. Searle, Inc.; General Foods, Inc.; General Motors, Inc., Buick Division, Chevrolet Division, Marketing and Product Planning; Gillette; IBM, Inc.; Information Resources, Inc.; Intel, Inc., Johnson & Johnson; Kodak; Macromedia, Inc., Management Decision Systems, Inc.; M/A/R/C, Inc.; Merck, Inc., Navistar International, Inc.; Pacific Gas and Electric Company, Pepsi-Cola, Inc.; Polaroid; Procter & Gamble Company; Product Genesis, Inc.; RAM Broadcasting, Inc.; Regional Transportation Authority; Richardson-Vicks, Inc.; Southern Company Services, Inc.; Time-Life Books; Volunteers in Technical Assistance, and Wyeth-Ayerst Laboratories, Inc. Co-founder, principal, and board member, Applied Marketing Science, Inc., Advisory Board (former), Affinnova, Inc.

M.I.T. or MIT Sloan Committee Work

Associated Faculty Committee to Review the Organizational Learning Center (MIT Sloan), 1995.

Building Committee for the E51 Expansion, MIT Sloan, 1992, Ad Hoc.

Center for Innovation in Product Development

Leader, Virtual Customer Initiative, 2000 - 2006

Research Director, 1997 – 2000

Center for Transportation Studies, 1981 - 1982.

Master of Science in Transportation Committee.

Committee on the Masters in Analytics, 2014-2015.

Committee on the Undergraduate Program, 2003 – 2005.

Committee to Investigate Sloan-Logo Research Notes (MIT Sloan, chair), 2001-2002.

Dean's Consultation Committee (MIT Sloan), 2008-2009.

Dean Search Committee (MIT Sloan), 1993.

Executive Educational Programs Committee (MIT Sloan), 1983 – 1985, 1998-1999, 2007.

Faculty Admissions Committee, 2004-2009.

Faculty Council (MIT Sloan), 1999.

International Center on Research for the Management of Technology (MIT Sloan).

Co-Director, (1993 - 2000).

Joint Steering Committee (1990 - 1993).

Management Science Area, MIT Sloan School of Management.

Area Head, (2005- 2009).

Chairman of Subcommittee on Peer Group Comparisons, (1981 - 1982).

Committee on Management Science Curriculum Redesign, (1982 - 1983).

Marketing Group Head (1986, 1988 – 2003, 2010-2011).

Management of Technology Program Committee (MIT Sloan), (2001- 2003).

Master's Program Committee, MIT Sloan, (1980 – 1987, 2007 – 2014).

Subcommittee on Fellowship Awards (2014-2015)

Ad hoc committee to develop a Marketing, Operations and Strategy Track (2011-2012).

Chairman: Subcommittee On Placement, (1981 - 1982).

Core Curriculum Implementation Committee (1992-1994).

Core Curriculum Reassessment Committee (1991-1992).

Subcommittee on Admissions, Special Consideration, (2007 – 2009).

Subcommittee on Course Ratings (2011).

Subcommittee on Entrepreneurship and Innovation Evaluation (Chair, 2008).

Subcommittee on the Management Science Core, (1982 - 1983).

Subcommittee on Tracks (2008-2009).

Subcommittee on Strategy Curriculum (2009).

MIT Sloan Committee on Educational Technology, 2004 – 2006.

Operations Research Center

Admissions Committee, (1981 - 1982).

Associated Faculty (1980 – 2000).

Operations Research Committee (2001- 2003).

President's Committee (1984).

Organization Committee for the New MIT Sloan Building, E62, (2007- 2009).

Personnel and Policy Committee, MIT Sloan (Executive Committee, 2005 – 2009, 2013-2014).

Chair of ad hoc committees for reappointment, promotion, and tenure (1983 - 2014).

Member of ad hoc committees for reappointment, promotion, and tenure (1981 - 2014).

Sloan Appreciation Awards Committee (2013-2014)

Symposium Director, Marketing Center, MIT Sloan School, M.I.T., (1981 - 1982).

Zannetos Dissertation Award Committee, MIT Sloan, (1981-82, 1996-97, chair 1997-1998).

M.I.T. Subjects Taught (often multiple sections)

15.810, Marketing Management (Core)	Spring 1990, 1991, 1992, 1993, 1994, 1995, 1997, 1998, 1999, 2001, 2004, 2005. 2006. Fall 1999, 2006, 2007, 2008, 2011, 2012, 2013, 2014. (Teaching awards listed on page 2 of vita.)
15.812, Marketing Management (UG)	Fall 1981, 1982, 1984, 1985, 1986. Spring 1981, 1984, 2006.
15.813, Marketing Management in Public Sector	Fall 1980.

15.814, Marketing Mgmt (Mgmt of Technology)	Fall 1988, 1993, 1999, 2001.
15.820, Advanced Marketing Management	Spring 1990
15.828, New Product Development	Spring 1981, 1982, 1989; Fall 1982, 1984; 1985.
15.838, Ph.D. Seminar (Various Topics)	Spring 1986, 1997, 2002, 2006, 2011, 2013, 2014, 2015.
15.839, Marketing and Statistics Workshop	Spring 1982; Fall 1982, 1984.
15.TH4. Thesis Project on Competitive Strategy	Spring 1985, 1986.

Summer Session, ILP, and External Executive

A.T.&T Course on New Product Development, 1986.

European Institute for Business Administration (INSEAD) European Marketing Programme, 1985.

Greater Boston Area Executive Program, 1982, 1983.

M.I.T. Civil Engineering, Demand Theory, 1980, 1981, and 1982.

M.I.T. ILP, Marketing Strategy and Models in the Information age, 1983.

M.I.T., Management of R&D, 1989, 1990, 1991, 1992, 1993, 1994. 1995, 1996, 1997, 1998, 1999.

M.I.T. Marketing Science Symposium, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988.

M.I.T./M.I.P. Executive Program, 1992.

M.I.T. New Product Development, 1997.

Pedagogical Developments.

In 2012, I redesigned the core curriculum in marketing to reflect new developments in marketing analytics, big data, and new media.

In 1990 and 1991, Prof. John D. C. Little and I redesigned the core curriculum in Marketing Management and taught the course to the entire Master's class.

In the 1991-1992 I was part of a committee of six faculty members that redesigned the core curriculum at the Sloan School. I supervised the voice-of-the-customer analyses of students and recruiters and encouraged the committee to design a program that these customers would find exciting. The new core was implemented in the 1993-1994 academic year. Student satisfaction increased significantly.

Teaching Notes

Note on Defensive Marketing Strategy (2005, for 15.810, Marketing Management)

Note on Product Development (213, for 15.810, Marketing Management)

Note on the Voice of the Customer (2013, for 15.810, Marketing Management)

Note on Consumer Behavior (2013, for 15.810, Marketing Management)

Note on Life Cycle Diffusion Models (2005, for 15.810, Marketing Management)

Note on Engineering Product Design (2006, for 15.810, Marketing Management)

Note on Conjoint Analysis (2013, for 15.810, Marketing Management)

M.I.T. Thesis Supervision

(a) *MIT Sloan School of Management, Master's Theses*

Hafiz Adamjee (joint with John Scaife), "The Face of the Customer: The Use of Multimedia in Quality Function Deployment," - (1993). This product was subsequently commercialized and was a finalist for the *New Media* Invision 1994 Multimedia award at COMDEX/Spring '94.

Ramay Akras, "Competitive Strategy in the Marketing of Small DDP Computers: an Analysis of Emerging Price and Product Position Patterns," - (1986).

Frederic Amerson, "Strategic Marketing Simulation: Improvements to the Enterprise Integrating Exercise," - (1989).

Sébastien Andrivet (Sloan Fellows Program), "Customer research, customer-driven design, and business strategy in Massively Multiplayer Online Games," – (2007)

Andrew Anagnos (joint with Karen Van Kirk), "A Framework for Analyzing Quality in the News Media," - (1991)

Allen Aerni, "Measurement of Customer Satisfaction," - (1994).

Joel Berez, "An Investigation of Decision Hierarchies" - (1981).

Harel Beit-on, "Competitive Strategy for Small Business Jet Aircraft," - (1985).

Willy Biberstein (SDM Program), "Framework for Customer Interaction Throughout the Automotive Product Development Process," (February 2002).

Andre Borschberg (joint with Webb Elkins), "Defensive Marketing Strategy: Its Application to a financial Decision Support System" - Reader (1983).

Philippe Bosquet, "European Airline Deregulation: Defining Air France's Strategy for the 1990's," - Reader (1989)

Jill A. Christians, (joint with Cheryl M. Duckworth), "Expectations and Customer Satisfaction: A Market Research Study for Plimoth Plantation," Reader (1994).

Poh-Kian Chua (MOT Program), "R,D&E Metrics: Shaping the Outcomes of Your R,D&E Investment," – (1998).

Leslie K. Cooper, "The Structure of Recruiter Needs at the Sloan School of Management: A Quantitative Assessment," - (1992).

Teruyuki Daino (Sloan Fellows Program), "How a Leading Company Can Overcome a Competitive Challenge: A Case Study of Anheuser-Busch Company." – (1998).

Laura E. Donohue, "Software Product Development: An Application of the Integration of R&D and Marketing via Quality Function Deployment" - (1990)

Cheryl M. Duckworth (joint with Jill A. Christians), "Expectations and Customer Satisfaction: A Market Research Study for Plimoth Plantation," Reader (1994).

Webb Elkins (joint with Andre Borschberg), "Defensive Marketing Strategy: Its Application to a Financial Decision Support System" - Reader (1983).

Rasheed El-Moslimany (LFM Program), "Getting Value from the Value Chain: Comfort Choice," Co-Advisor. (June 2002)

Merve Ergez (Master of Science in Management Studies), Strategic Scent Selection: A Marketing Research Study for Olivita Brand," (June 2014).

Julio Faura (MOT Program), "Contribution to Web-based Conjoint Analysis for Market Research," (2000).

Richard Feldman, "Decision Support Systems for Forecasting Communications in the Home," - Reader (1985).

Anders T. Fornander, "The Continuing Operating System Battle in the Personal Computer Industry," - Reader (1994).

Carl Frank (MOT Program), "Metrics Thermostat for Strategic Priorities in Military System Acquisition Projects," (2000).

Mihaela Fulga, "Competitive Pricing and Positioning Strategies in the Dating Service Market," - (1986).

Steven P. Gaskin, "Defender: Test and Application of a Defensive Marketing Model" - (1986). 1st Place, Brooks Award.

Peter N. Goettler, "A Pre-market Forecasting Model of New Consumer Durables: Development and Application," - Reader (1986).

Patti N. Goldberger, "Competitive Strategy in the Market for Running Shoes," - (1985).

Akhil Gupta, "The Personal Computer Industry: Economic and Market Influences on Product Positioning Strategies," - (1986).

Michael Halloran (joint with Marc Silver), "Defensive Marketing Strategy: Empirical Applications" - (1983).

Carla Heaton, "Competitive Strategy in the Facsimile Market," - (1985).

Judith Hee, "Determining Manufacturer's Coupon Strategies" - Reader (1981).

Jonathan E. Higginson, "Understanding Dependencies in Research and Development at the Charles Stark Draper Laboratory." - (1997).

Scott D. Hill, "Correlation of Core Competencies with Market-Driven or Self-Guided Research," - (1995).

Dan Isaacs, "Competitive Pricing and Positioning Strategies in the Imported Beer Marketing," - (1986).

Francois Jacques, "Marketing Strategies in Innovative Industries: The Case of Package/Document Delivery Services," - Co-Advisor (1985).

Lawrence Kahn, "Competitive Positioning: A Study of Recruiter's and Employer's Perceptions of the Sloan School of Management" - (1982). Honorable mention Brooke's Thesis Prize.

D. Darcy Kay, "Competitive Strategy for Anti-arthritic Drugs" - (1985).

Young Joo Kim (MOT Program), "R&D Management Applications of The Dynamic Metrics Framework" – (1998)

Sidney A. Kriger, "The Effect of Quality Function Deployment on Communications of the New Product Development Teams," - (1989)

Yasuke Kume, "New Marketing Strategy of Telecommunications in Japan" - Reader (1981).

Elvind Lange, "Measuring Market Response to Marketing Mix Variables Using Dynamic Modeling and Its Implications for Brand Strategy" - Reader (1981).

Stephen P. Langhans, "Defensive Marketing Strategy: A Consumer Semi-Durable Case Example" - (1983).

In-Kyu Lee, "Evaluating System for the Upstream Center of R&D for being Market-Oriented in a Consumer Electronics Company," - (1995).

Michael Leslie (joint with Joel Wachtler), "A Methodology for Making International Marketing Mix Decisions," - Reader (1985).

Kit Mee Lim, "Competitive Strategy among Companies Offering Credit Cards," - Reader (1985).

James A. Lutz, "Competitive Marketing Strategy in the CAD Marketplace," - (1985).

Larry D. Lyons, "Forecasting the Impact of Competitive Entries on Sales of a New Consumer Durable" - Reader (1984).

Arpita Majundar (SDM Program), "Strategic Metrics for Product Development at Ford Motor Company," - (2000).

Catherine E. Manion, "A Survey of Customer Satisfaction Incentive Systems for Salespersons," - (1993).

Maureen E. Matamoros, "Information Overload," – Reader (1986).

Meghan McArdle (LFM Program), "Internet-based Rapid Customer Feedback for Design Feature Tradeoff Analysis," – co-Advisor (2000)

Fernando Motta, "Competitive Strategy Among Panamanian Banks," - (1985).

Neil Novich, "Price and Promotion Analysis Using Scanner Data" - Reader (1981).

Kenji Nozaki, "Marketing and Technology Strategy for the Japanese Architectural Design Company," - (1989).

Seiji Nozawa, “Voice of the Customer Analysis in the Japanese Beer Market.” - (1997).

Minho Park (MOT Program), “R&D Matrix at LG Electronics.” - (1997)

Stephen Pearse, "Production and Sales Forecasting: A Case Study and Analysis" - Reader (1982).

Ning P. Peng, "An Exploration of the Impact and Success of Customer Satisfaction Programs," - (1994).

Homer Pien (MOT Program), “Competitive Advantage through Successful Management of R&D.” - (1997)

Susan B. Poulin, "Defensive Strategy in the Automatic Test Equipment Industry" (1984).

Jill W. Roberts, "MBA Recruiters' Needs: Voice of the Customer Analysis," - (1992).

Lisa Gayle Ross, "A Voice of the Customer Analysis of M.B.A. Schools: The Student Segment," - (1992). Lisa was a runner-up for the George Hay Brown Marketing Scholar of the Year in 1992.

Tamaki Sano, “Strategy for Kirin as a Global Brand” – (2009) Sloan Fellow.

John Scaife (joint with Hafiz Adamjee), "The Face of the Customer: The Use of Multimedia in Quality Function Deployment," - (1993). See award listed under Adamjee.

Paul E. Schoidtz, "Advertising, Price, and Positioning Equilibria," - (1986).

Hongmei Shang, "A Simulation Analysis of Optimal Task Assignment for Growing Managers from R&D Labs," – (February 2000).

Rosemarie Shield, "Competitive Pricing and Positioning Strategies in the Chromatographic Instruments Market," - , (1986).

Jon Silver (joint with John C. Thompson, Jr.), "Beta-binomial Analysis of Customer Needs -- Channels for Personal Computers," - (1991). 1st Prize, Brooks Award.

Marc Silver (joint with Michael Halloran), "Defensive Marketing Strategy: Empirical Applications" - (1983).

Lisa Silverman, "An Application of New Product Growth Modeling to Automobile Introductions" - (1982).

Sheryl Sligh, "An Assessment of the Analog Modem Market," - (1991).

Jamie Smith, "Industrial Buying Process of Pension Funds for Real Estate," - (1982).

Yoshihito Takahashi (MOT), "Analysis of Strategy in an Ethical Drug Industry," – Reader (2000).

Genevieve Tchang, "A Methodology for Planning and Evaluating External Relations at Business Schools" - Reader (1982).

John C. Thompson, Jr. (joint with Jon Silver), "Beta-binomial Analysis of Customer Needs -- Channels for Personal Computers," - (1991). 1st Place, Brooks Award.

V. Mullin Traynor, "The Dissemination and Adoption of New Technology: Control Data's Computer-Based Training System, Plato, and the Electric Utilities" - (1982).

Karen Van Kirk (joint with Andrew Anagnos), "A Framework for Analyzing Quality in the News Media," - (1991)

Joel Wachtler (joint with Michael Leslie), "A Methodology for Making International Marketing Mix Decisions," - Reader (1985).

Tamao Watanabe, "Customer Analysis of the U.S. Cardiovascular Drug Market: Focusing on Physician's Drug Choice" - (1991)

Stephen L. Weise, "Expert Decision Support Systems for Marketing Management," – Reader (1986).

Nancy Werner, "Competitive Price and Positioning in the Integrated Office Automation Systems Market" - (1986).

Julie Wherry, “Pre-Test Marketing: Its Current State in the Consumer Goods Industry and Its Effect on Determining a Networked Good.” - (2006).

Ali Yalcin, "The Potentials and Limitations of Customer Satisfaction Indices in Captive Customer-Supplier Environments," - (1995)

Sandra Yie, "The Core Curriculum at Sloan: Establishing a Hierarchy of Needs," - (1992).

Judy Young, "Responsive Marketing Strategy at AT&T" - (1982).

(b) *Aeronautics S.M. Theses*

Keith Russell (LSI), "Reengineering Metrics Systems for Aircraft Sustainment Teams: A Metrics Thermostat for Use in Strategic Priority Management," (February 2001).

(c) *Electrical Engineering, S.B. and M.Eng. Theses*

Chan, Christine W. Y. (M. Eng), "Measuring Non-Monetary Incentives Using Conjoint Analysis," Co-Advisor (1999).

Emily Hui (M.Eng.), "Application of Polyhedral Conjoint Analysis to the Design of Sloan's Executive Education Programs." June 2003.

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(d) *Mechanical Engineering, Master's Theses*

Burt D. LaFountain, "An Empirical Exploration of Metrics for Product Development Teams" – (1999)

Tina Savage, "The Virtual Customer: A Distributed Methodology for Linking Product Design and Customer Preferences." Co-Advisor (1998).

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Jeffrey Moffit (ORC), " Applying the Metrics Thermostat to Naval Acquisitions for Improving the Total Ownership Cost – Effectiveness of New Systems," (2001)

Olivier Toubia (ORC), "Interior-point Methods Applied to Internet Conjoint Analysis," (February 2001), Co-Advisor.

(f) *Urban Studies, Master's Theses*

Marijoan Bull, "Affirmative Fair Housing Marketing" - Committee Member (1982).

Barry Cosgrove, "Marketing Analysis for the Brockton Area Transportation Authority" – Committee Member (1981).

(g) *Sloan School of Management, Ph.D. Theses*

Makoto Abe, "A Marketing Mix Model Developed from Single Source Data: A Semiparametric Approach." Committee member (August 1991). Abe is on the faculty at the University of Tokyo.

Daria Dzyabura, "Essays on Machine Learning in Marketing (tentative title)," Chairman (June 2012). Dzyabura is now on the faculty at New York University.

Peter Fader, "Effective Strategies in Oligopolies," Chairman (February 1987). Sloan School of Management, Zannetos Prize, 1st Place. Fader is on the faculty at the University of Pennsylvania.

Fred Feinberg, "Pulsing Policies for Aggregate Advertising Models" Committee Member (August 1988). Feinberg is on the faculty of the University of Michigan.

Dave Godes, " Friend or Foe?: The Relationship Between Learning and Incentives and two additional essays in marketing," (June 2000), Committee Member. Primary advisor on listed essay. Zannetos Prize, 1st Place. Godes is on the faculty of the University of Maryland.

Abbie Griffin, "Functionally Integrated New Product Development: Improving the Product Development Process Through Linking Marketing and Technology Development," Chairman. (June 1989). Griffin is on the faculty at the University of Utah and was editor of *Journal of Product Innovation Management* from 1997-2003 Frank Bass Dissertation Award (INFORMS).

Gurumurthy Kalyanaram, "Empirical Modeling of the Dynamics of the Order of Entry Effect on Market Share, Trial Penetration and Repeat Purchases for Frequently Purchased Consumer Goods," Committee Member (March 1989). G. K. was on the faculty at the University of Texas, Dallas.

Eriko Kitazawa, "Customer Satisfaction at Japanese Utility Franchises," Committee Member (1996).

Eleanor (Nell) Putnam-Farr, "The Effects of Framing on Enrollment and Participation – Field Experiments Using Different Recruitment Language." expected June 2015. Putnam-Farr will begin a post doc at Yale in July 2015.

John H. Roberts, "A Multiattributed Utility Diffusion Model: Theory and Application to the Prelaunch Forecasting of Autos". Committee Member (February 1984). Roberts is on the faculty at the London Business School.

Matt Selove, "The Strategic Importance of Accuracy in Conjoint Design," Committee Member (June 2010). Selove is on the faculty at the University of Southern California. John Howard Dissertation Award (AMA), 2010.

Duncan I. Simester, "Analytical Essays on Marketing," Committee Member, (June 1993). Sloan School of Management, Zannetos Prize, Honorable Mention. Simester is on the faculty of M.I.T.

Olivier Toubia, "New Approaches to Idea Generation and Consumer Input in the Product Development Process," (June 2004). Toubia is on the faculty of Columbia University. Frank M. Bass Dissertation Award (INFORMS), 2005, John Howard Dissertation Award (AMA), 2005.

Miguel Villas-Boas, "On Promotions and Advertising Policies: A Strategic Approach." Committee member (February 1991). Villas-Boas is on the faculty at the University of California, Berkeley.

Bruce Weinberg, "An Information-Acceleration-Based Methodology for Developing Preproduction Forecasts for Durable Goods: Design, Development, and Initial Validation." Committee Member. (August 1992). Weinberg was on the faculty at Boston University.

Florian Zettelmeyer, "Three Essays on Strategic and Organizational Uses of Information in Marketing." Committee Member. Zettelmeyer is on the faculty of Northwestern University.

(h) *Civil Engineering, Ph.D. Thesis*

Karla Karash (Ph.D.), "An Application of the Lens Model in Measuring Retail Attractiveness and the Effects of Transportation Programs" - Committee Member (August 1983). Karash was at the MBTA.

(i) *Electrical Engineering and Computer Science, Ph.D. Thesis*

Atwi, Aliaa, "Exploration vs. Exploitation in Rapid Coupon Personalization." PhD in Electrical Engineering and Computer Science, Chair, (expected June 2016)..

(j) *Mechanical Engineering, Ph.D. Thesis*

Javier Gonzalez-Zugasti (Mechanical Engineering, Ph.D.), "Models for Product Family Design and Selection," (June 2000), Committee Member.

(k) Operations Research Center, Ph.D. Thesis

Yee, Michael (Operations Research, Ph.D.), “Inferring Non-Compensatory Choice Heuristics,” (June 2006), Co-Advisor. Yee is at MIT’s Lincoln Laboratories.

Northwestern University Ph.D. Thesis Supervision (1975 - 1980 Academic Years)

Steven M. Shugan, "A Descriptive Stochastic Preference Theory and Dynamic Optimization: Applications Toward Predicting Consumer Choice' Chairman (September 1977). Shugan is on the faculty at the University of Florida and was editor of *Marketing Science* for six years.

Patricia Simmie, "Product Realization: Theory, Models, and Application" - Chairman (June 1979), American Marketing Association Dissertation Prize, Honorable Mention. Simmie was at York University.

Ken J. Wisniewski, "A Semi-Markov Theory of Consumer Response: New Theoretical Properties, Simulation Testing, and Empirical Application" Chairman (June 1981). American Marketing Association Dissertation Prize, First Place. Wisniewski was on the University of Chicago.

APPENDIX B
EXPERT TESTIMONY

John R. Hauser
Expert Testimony

Fox Broadcasting Company, Inc. v. Dish Network LLC, Civil Action No. 12-04536-DMB-SHx, United States District Court for the Central District of California. Deposition testimony, December 15, 2014.

Michael Kors, Inc. v. Costco Wholesale Corporation, Civil Action No. 13-CV-4832, United States District Court for the Southern District of New York. Deposition testimony, June 9, 2014.

Apple Inc. v. Samsung Electronics Co. Ltd. et al., Case No. 12-CV-00630, United States District Court for the Northern District of California San Jose Division. Deposition testimony, September 27, 2013. Trial Testimony, April 8, 2014.

In Re American Express Anti-Steering Rules Antitrust Litigation (II), United States District Court for the Eastern District of New York, Master File No. 11-MD-02221 (NGG)(RER). Deposition testimony, August 12, 2013.

Apple Inc. v. Samsung Electronics Co. Ltd. et al., Case No. 11-CV-01846-LHK, United States District Court Northern District of California San Jose Division. Deposition testimony, April 27, 2012. Trial Testimony, August 10, 2012. Deposition Testimony, November 29, 2012. Trial Testimony, November 14, 2013.

In the Matter of Determination of Rates and Terms for Preexisting Subscriptions and Satellite Digital Audio Radio Services, Docket No. 2011-1 CRB PSS/Satellite II, Before the Copyright Royalty Judges, Library of Congress. Deposition testimony, March 2, 2012. Trial testimony June 12, 2012.

Alcatel Lucent, Inc. v. Amazon.Com, Inc. et al., Civil Docket No. 6:09-CV-422. United States District Court for the Eastern District of Texas Tyler Division, Deposition testimony, June 3, 2011, Trial testimony, October 13, 2011.

Luciano F. Paone v. Microsoft Corporation, Case No. CV-07-2973, United States District Court for the Eastern District of New York. Deposition Testimony, September 23, 2011.

Louis Vuitton Malletier v. Hyundai Motor America, Case Number 10-CIV-1611-PKC, United States District Court for the Southern District of New York. Deposition testimony, May 6, 2011.

Curt Schlesinger, et al. v. Ticketmaster, Case No. BC30456, Superior Court of the State of California for the County of Los Angeles. Deposition testimony, November 19, 2010.

St. Claire Intellectual Property Consultants, Inc. v. Research In Motion LTD., et al., Research In Motion Corporation, Civil Action No. 08-371-JJF-LPS, United States District Court for the District of Delaware. Deposition testimony, February 26, 2010.

Dayna Craft, et al. v. Philip Morris Companies, Inc. and Philip Morris Inc., Case No. 002-00406-02, Division No. 6, Missouri Circuit Court, Twenty-Second Judicial Circuit (City of St. Louis). Deposition testimony, November 11-12, 2009.

Playtex Products, Inc. v. The Procter & Gamble Company, Case No. 08 Civ. 1532 (WHP). Deposition testimony, February 25, 2009. Trial testimony, March 19, 2009.

In Re J.P. Morgan Chase Cash Balance Litigation, Master File No. 06. Div. 0732 (HB), United States District Court for the Southern District of New York. Deposition testimony, December 10, 2008.

APPENDIX C
MATERIALS RELIED UPON

Court Documents

"Introductory Memorandum to the Written Direct Statement of SoundExchange, Inc.," *In Re: Determination of Royalty Rates and Terms for Ephemeral Recording and Digital Performance of Sound Recordings (Web IV)* Before the United States Copyright Royalty Judges, Library of Congress, Washington, D.C., Docket No. 14-CRB-0001-WR, October 7, 2014.

Testimony of Daniel L. McFadden, *In Re: Determination of Rates and Terms for Digital Performance in Sound Recordings and Ephemeral Recordings (WEB IV)* Before the Copyright Royalty Judges, Library of Congress, Washington D.C., Docket No. 14-CRB-0001-WR, October 6, 2014 and Backup Documents.

Testimony of Daniel L. Rubinfeld, *In Re: Determination of Rates and Terms for Ephemeral Recording and Digital Performance of Sound Recordings (WEB IV)* Before the United States Copyright Royalty Judges, Library of Congress, Washington D.C., Docket No. 14-CRB-0001-WR, October 6, 2014.

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Ding, Min, John R. Hauser, Songting Dong, Daria Dzyabura, Zhilin Yang, Chenting Su, and Steven P. Gaskin, "Unstructured Direct Elicitation of Decision Rules," *Journal of Marketing Research*, 48(1) February 2011, pp. 116-127.

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"Pandora Unveils Billboard Advertising Unit Featuring Lexus," *Pandora.com*, October 20, 2011, http://investor.pandora.com/phoenix.zhtml?c=227956&p=irolnewsArticle&ID=1619467, visited February 16, 2015.

"Parlin Award 2010," *American Marketing Association*, 2015, https://www.ama.org/AboutAMA/Pages/Parlin-Award.aspx, visited February 16, 2015.

"The Paul D. Converse Awards," *American Marketing Association*, 2014, https://archive.ama.org/Archive/ Community/ARC/Pages/Career/Awards/Converse.aspx, visited February 15, 2015.

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AppliedMarketingScience_409BO15-Music_Jan14th-2pm-Donna.avi

AppliedMarketingScience_409BO15-Music_Jan14th-2pm-Linda.avi

AppliedMarketingScience_409BO15-Music_Jan14th-3pm-Steven.avi

AppliedMarketingScience_409BO15-Music_Jan14th-3pm-Toni.avi

AppliedMarketingScience_409BO15-Music_Jan14th-5pm-Giana.avi

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AppliedMarketingScience_409BO15-Music_Jan14th-10am-Ariana.avi

AppliedMarketingScience_409BO15-Music_Jan14th-10am-Edward.avi

AppliedMarketingScience_409BO15-Music_Jan14th-11am-Alexandra.avi

AppliedMarketingScience_409BO15-Music_Jan14th-11am-Leanne.avi

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AppliedMarketingScience_409BO15-Music_Jan14th-Hackeem.avi

AppliedMarketingScience_409BO15-Music_Jan15th-1pm-Brian.avi

AppliedMarketingScience_409BO15-Music_Jan15th-1pm-Zora.avi

AppliedMarketingScience_409BO15-Music_Jan15th-2pm-Christopher.avi

AppliedMarketingScience_409BO15-Music_Jan15th-2pm-Rebecca.avi

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AppliedMarketingScience_409BO15-Music_Jan15th-9am-Juliana.avi

AppliedMarketingScience_409BO15-Music_Jan15th-9am-Kevin.avi

AppliedMarketingScience_409BO15-Music_Jan15th-10am-Nancy.avi

AppliedMarketingScience_409BO15-Music_Jan15th-10am-Thomas.avi

AppliedMarketingScience_409BO15-Music_Jan15th-11am-Kelly.avi

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Fieldwork-Network_529de15_AliciaR-11am-1-15-15.avi

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Fieldwork-Network_529de15_CelineA-3pm-1-14-15.avi

Fieldwork-Network_529de15_ChadV-10am-1-14-15.avi

Fieldwork-Network_529de15_DeliaP-5pm-1-15-15.avi

Fieldwork-Network_529de15_DrewH-10am-1-14-15.avi

Fieldwork-Network_529de15_EricR-3pm-1-14-15.avi

Fieldwork-Network_529de15_frankB-2pm-1-14-14.avi

Fieldwork-Network_529de15_Hannahc-2pm-1-14-15.avi

Fieldwork-Network_529de15_HaydenC-3pm-1-15-15.avi

Fieldwork-Network_529de15_HelenS-2pm-1-15-15.avi

Fieldwork-Network_529de15_ImanD-11am-1-14-15.avi

Fieldwork-Network_529de15_JacobK-4pm-1-15-15.avi

Fieldwork-Network_529de15_JamesH-9am-1-15-15.avi

Fieldwork-Network_529de15_JordanP-2pm-1-15-15.avi

Fieldwork-Network_529de15_LidiaS-4pm-1-14-15.avi

Fieldwork-Network_529de15_ManuelR-1pm-1-14-15.avi

Fieldwork-Network_529de15_MollyS-10am-1-15-15.avi

Fieldwork-Network_529de15_NicoleM-11am-1-14-15.avi

Fieldwork-Network_529de15_SelenaM-4pm-1-14-15.avi

Fieldwork-Network_529de15_SherryM-9am-1-14-15.avi

Fieldwork-Network_529de15_Stevens-5pm-1-14-15.avi

Fieldwork-Network_529de15_TanyaR-1pm-1-14-15.avi

APPENDIX D
QUALITATIVE STUDY QUESTIONNAIRE

QUALITATIVE STUDY QUESTIONNAIRE FOR "PART 2 SURVEY"

Quota: n=50 who have qualified for Phase II of the Music Streaming Survey

Section 1: Introduction to Interview

[Note to moderator: The respondent will review the material on a single page of the web survey and fill-in any required responses. Allow the respondent to click "NEXT" when s/he is ready. After the respondent clicks on the "NEXT" button to move on to the next page of the web survey, you will ask the respondent a series of follow-up questions. Direct the respondent to face you so that you can talk face-to-face. During the discussion, the respondent is allowed to go back to the web survey to review or look up information. This action should not be encouraged or discouraged. It should happen at the discretion of the respondent as if the respondent were taking the survey on his or her own. Once the discussion is completed, instruct the respondent to continue with the web survey.]

[Below are examples of general probing questions that can be asked throughout the discussion in the case that the respondent hesitates or indicates confusion through statements, body language, or facial expressions.

What did you mean by that? ***[or]*** Why did you say that?

Why? ***[or]*** Anything else? ***[or]*** What else?

I noticed you hesitated before you answered – what were you thinking about?*]*

Techniques to avoid:
Please do not lead respondents via confirmatory remarks such as "Got it," "Clearly!," "Right," etc.

[Moderator to read out loud:]

Today we would like you to provide us comments on a survey about streaming music.

Thank you for your willingness to participate in our study. Your answers will be kept confidential. The results of this study will not be used to try to sell you anything.

This interview should take about 30 minutes to 1 hour to complete. You will use this computer to take the survey. After you answer questions on the computer screen, click the "NEXT" button to move to the next screen. At this point, I may ask you a few follow-up questions. During this time, you can ask me questions or make comments. It is helpful for us to understand what you are thinking when you are answering the survey questions. Feel free to "think out loud." The responses you give to these questions are very important to us. When you are ready to get started, please turn to your screen and begin.

Section 2: Introduction Section of the Survey

Introduction (Incentive alignment)

Please read the following screen and let me know when you are done.

[Instruct the respondent to click the "NEXT" button on the screen whenever (s)he feels ready to continue to the next screen of the web survey.]

Q.1. Could you tell me in your own words what the survey is asking you to do? How would you say it yourself? *[If respondent indicates confusion over a particular word or phrase, do not try to explain. Simply respond]* Thank you, we will note that.

Q.2. With respect to the music streaming service gift mentioned on the prior screen, in your own words, could you tell me what the particular gift comprises?

Q.3. *[ONLY if respondent does not describe the particular gift that [s]he expects, ask:]* In your words, what do you expect your personal gift to include?

Q.4. *[ONLY if respondent indicates confusion over a particular word or phrase, or if respondent indicates that there was not enough information, ask:]* Is there any additional information or different words or phrases that would help you better understand the instructions?

Feature descriptions table

Please read the following screen and click the "NEXT" button when you are ready.

Q.5. *[ONLY if respondent indicates confusion over a particular word or phrase while thinking aloud or directly asks for clarification, or if respondent indicates that there was not enough information, ask:]* What is your understanding of the word…?

a. Is there any additional information or different words or phrases that would help you understand the instructions better?

Section 3: Conjoint Choice Screens

Introduction screen to conjoint task including mentions of brand (first of three screens throughout the choice exercise)

Please read the following screen.

Q.6. *[ONLY if respondent indicates confusion over a particular word or phrase while thinking aloud or directly asks for clarification, or if respondent indicates that there was not enough information, ask:]* What is your understanding of the word…?

a. Is there any additional information or different words or phrases that would help you understand the instructions better?

Conjoint (Card 1)

Please read the following screen and then proceed based on the instructions that are provided to you on this screen.

[After respondent clicks "NEXT", ask]

Q.7. Did you or did you not understand the instructions on the screen? *[If respondent indicates confusion over a particular word or phrase, do not try to explain. Simply respond]* Thank you, we will note that.

Q.8. Could you tell me in your own words what the survey is asking you to do?

a. *(Optional if respondent indicates confusion.)* If you were providing these instructions, how would you say this?

Q.9. Please describe why you chose the option that you chose.

Q.10. How easy or difficult did you find this exercise to answer? Why do you say that?

Q.11. Do you think or do you not think that the question below the table relates to the gift mentioned earlier in the survey?

a. *[If respondent indicates it does, probe:]* How does this question relate to the gift mentioned earlier in the survey?

b. *[If respondent does not mention the compensation payment to reach $30, probe:]* How does this question relate to your total compensation for taking this survey?

Conjoint (Cards 2 to 5)

Please read the screen and follow the instructions.

[After respondent completes card 5, ask]

Q.12. How did you go about making your choices on the prior screens?

Q.13. Is there or isn't there a brand to which your last five choices relate?

a. *[If "yes, there is a brand", ask:]* Did the brand associated with these plans matter or did it not matter when you made your choices?

Q.14. How easy or difficult did you find this exercise to answer? Why do you say that?

Now that you have made some choices, we would like to learn how you interpreted the various options.

Available Library Size

Q.15. Could you tell me in your own words what the term **Available Library Size** means to you? *[Probe.]*

a. Could you tell me in your own words what it means when the **Available Library Size** is 20 million songs? *[Probe for explanation of this feature]*

Mobile Device Streaming

Q.16. Could you tell me in your own words what the term **Mobile Device Streaming** means to you? *[Probe.]*

a. Could you tell me in your own words what it means when **Mobile Device Streaming** offers **Playlists generated by the service** and **Album, artist, and song selection on demand**? *[Probe for explanation of these features]*

Playlist Method

Q.17. Could you tell me in your own words what the term **Playlist Method** means to you? *Probe.*

Q.18. Could you tell me in your own words what it means when the playlist is **Curated by music tastemakers**? *[Probe for explanation of this feature]*

a. Could you tell me in your own words what the term to curate means to you? *[Probe for explanation of this term]*

b. Could you tell me in your own words what the term Tastemaker means to you? *[Probe for explanation of this term]*

Q.19. Could you tell me in your own words what the term **Generated by a computer algorithm customized by your own preferences** means to you? *[Probe for explanation of this term]*

a. Could you explain in your own words what the term computer algorithm means to you?

b. Could you tell me in your own words what the term customized means to you?

c. Could you tell me whether or not the service that you have tested during the last few days

   i. Uses computer algorithms?

   ii. Uses customizations?

   iii. Accounts for your preferences?

Conjoint Intro 2 (after Card 5)

Please read the screen and follow the instructions.

[After respondent completes Conjoint Intro 2, ask]

Q.20. *[ONLY if respondent indicates confusion over a particular word or phrase while thinking aloud or directly asks for clarification, or if respondent indicates that there was not enough information, ask:]* What is your understanding of the word…?

a. Is there any additional information or different words or phrases that would help you understand the instructions better?

Conjoint (Cards 6 to 10)

Please read the screen and follow the instructions.

[After respondent completes card 10, ask]

Q.21. How did you go about making your choices on the prior screens?

Q.22. Is there or isn't there a brand to which your last five choices relate?

a. *[If "yes, there is a brand", ask:]* Did the brand associated with these plans matter or did it not matter when you made your choices?

Q.23. How easy or difficult did you find this exercise to answer? Why do you say that?

Now that you have made some more choices, we would like to learn how you interpreted the various options.

Advertising

Q.24. Could you tell me in your own words what the term **Advertising** means to you? *Probe.*

a. Could you tell me in your own words what it means when there are **1.5 to 3 minutes of ads per hour**? *[Probe for explanation of this feature]*

b. Could you tell me in your own words how many commercial breaks you expect these **1.5 to 3 minutes of ads per hour** to occur in?

c. How many blocks of advertisements did you assume to be played when you read **1.5 to 3 minutes of ads per hour?**

d. Could you tell me whether or not it matters to you that these **1.5 to 3 minutes of ads per hour** occurred in one block or several shorter blocks per hour? *[Offer Yes, No, Not sure, probe Why?]*

Skip Limits

Q.25. Could you tell me in your own words what the term **Skip Limits** means to you? *Probe.*

a. Could you tell me in your own words what it means when there is a **Limit of 6 skips per hour?** *[Probe for explanation of this feature]*

b. Could you tell me whether or not **skipping** as mentioned in the survey allows you to skip over advertisements?

c. Could you tell me whether or not it matters to you to be able to skip advertisements? *[Offer Yes, No, Not sure, probe Why?]*

Conjoint Intro 3 (after Card 10)

Please read the screen and follow the instructions.

[After respondent completes Conjoint Intro 3, ask]

Q.26. *[ONLY if respondent indicates confusion over a particular word or phrase while thinking aloud or directly asks for clarification, or if respondent indicates that there was not enough information, ask:]* What is your understanding of the word…?

a. Is there any additional information or different words or phrases that would help you understand the instructions better?

Conjoint (Cards 11 to 15)

[After respondent completes card 15, ask]

Q.27. How did you go about making your choices on the prior screens?

Q.28. Is there or isn't there a brand to which your last five choices relate?

a. *[If "yes, there is a brand", ask:]* Did the brand associated with these plans matter or did it not matter when you made your choices?

Q.29. How easy or difficult did you find this exercise to answer? Why do you say that?

Now that you have made some more choices, we would like to learn how you interpreted the various options.

Offline Listening

Q.30. Could you tell me in your own words what the term Offline Listening means to you? *Probe*.

a. Could you tell me in your own words how you use the **Offline Listening** feature?

i. Could you tell me in your own words to how many **albums** you can listen offline? *[Probe wether or not the survey mentioned a number]*

ii. Could you tell me in your own words to how many **artists** you can listen offline? *[Probe wether or not the survey mentioned a number]*

iii. Could you tell me in your own words to how many **songs** you can listen offline? *[Probe wether or not the survey mentioned a number]*

b. While making your choices in this survey, how many **songs** did you assume **Offline Listening** would include?

c. Could you tell me whether or not it matters to you to have a certain amount of **songs** available for offline listening? *[Offer Yes, No, Not sure, probe Why?]*

i. *[If yes, ask:]* How many songs would you like to have available for offline listening?

On Demand Track Selection

Q.31. Could you tell me in your own words what the term On Demand Track Selection means to you? *Probe*.

a. Could you tell me in your own words what it means when there is a **Playlists generated by the service – Album, artist, and song selection on demand?** *[Probe for explanation of this feature]*

b. Could you tell me in your own words whether or not you believe that **Playlists generated by the service** are based on an analysis of music to which you listened in the past using this service?

c. Could you tell me whether or not it matters to you to be able to influence playlists through music to which you listened in the past using this service? *[Offer Yes, No, Not sure, probe Why?]*

d. Could you tell me in your own words whether or not you assumed that **Album, artist, and song selection on demand** are restricted to the offered playlists or whether they can be chosen from the service's complete library? *[Probe for explanation of this feature]*

e. Could you tell me whether or not it matters to you to be able to select **Album, artist, and song selection on demand** from the service's complete library? *[Offer Yes, No, Not sure, probe Why?]*

Conjoint Card 15

[After respondent has provided feedback on the features, ask] I have only a few more questions on this section:

Q.32. How did you feel about the information presented in the 15 choice questions you just completed?

a. Was it too little, just right, or too much information?

b. Why do you say that?

Q.33. Did your decision-making process change or not change while answering all 15 choice questions? *[Offer Yes, No, Not sure, probe Why?]*

Q.34. If you were presented with these options and had to spend your own money, would you choose the same options?

Q.35. Thinking about the choices that you just made, assume that you had a fourth option of **not choosing** any of the three plans presented to you. Would you or would you not have chosen the "no plan" option in any of the 15 sets of three plans each?

Section 4: Close out

Proceed through the final question block in the web survey: Can you please continue with the survey.

Close Out Discussion Questions:

Thank you for completing the survey on the screen. I have a few more follow-up questions before we wrap up.

Q.36. How easy or difficult did you find the survey? Why do you say that?

Q.37. Did you or did not understand the explanations of features in the survey? Why do you say that?

Q.38. Were you or were you not able to navigate the survey? Why do you say that?

Q.39. Was there or wasn't there anything in the survey that made you think that you should answer one way or the other? Why do you say that?

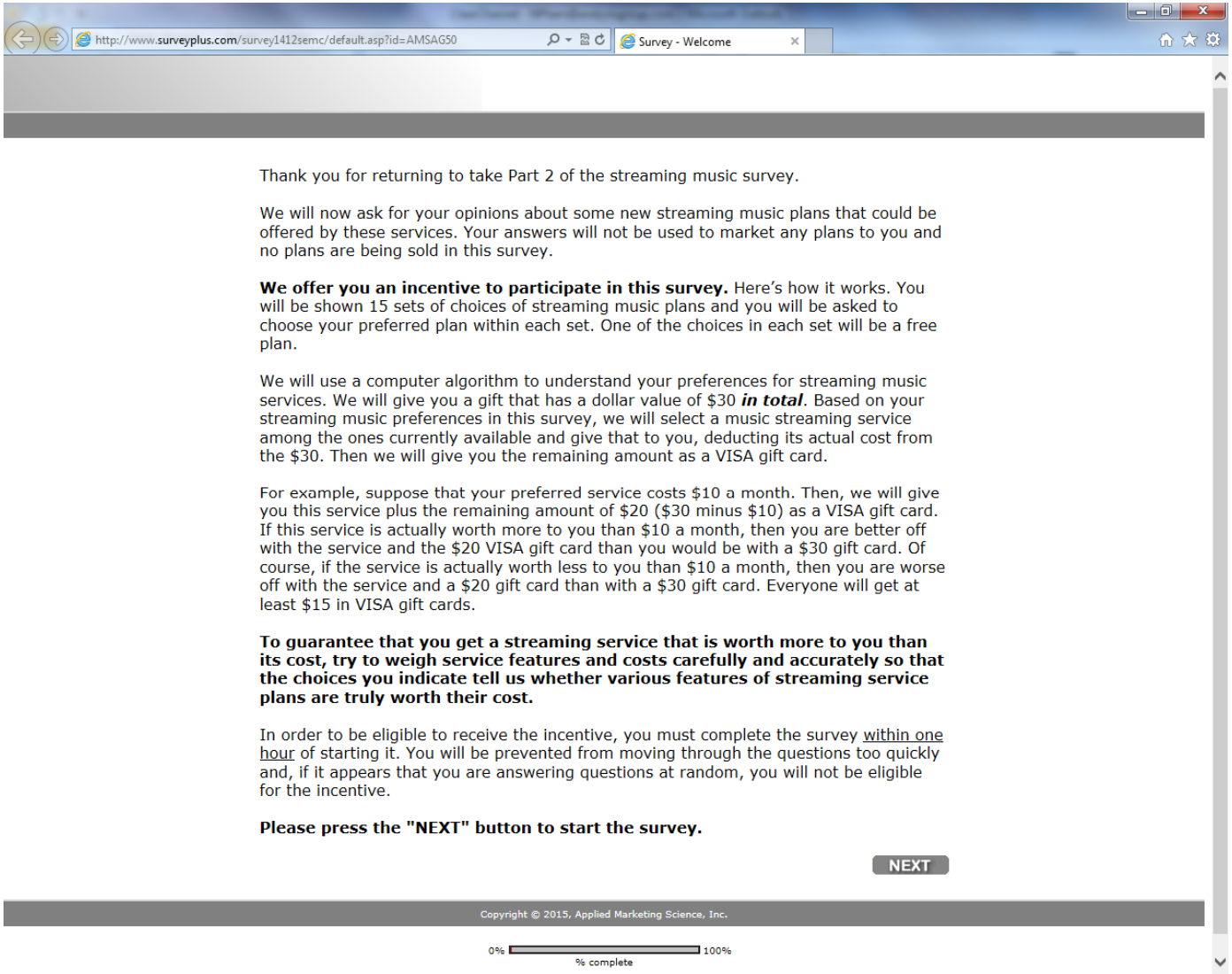
Q.40. Did you or did you not think the plan options shown in each choice question were realistic? Why do you say that?

Q.41. What do you think is the purpose of this study?

Q.42. Is there anything else you would like to add?

Thank you for your time and sharing your thoughts with us today.

APPENDIX E
REPLICATION SURVEY


http://www.surveyplus.com/survey1412semc/default.asp?id=AMSAG50
Survey - Welcome
Thank you for returning to take Part 2 of the streaming music survey.
We will now ask for your opinions about some new streaming music plans that could be offered by these services. Your answers will not be used to market any plans to you and no plans are being sold in this survey.
We offer you an incentive to participate in this survey. Here's how it works. You will be shown 15 sets of choices of streaming music plans and you will be asked to choose your preferred plan within each set. One of the choices in each set will be a free plan.
We will use a computer algorithm to understand your preferences for streaming music services. We will give you a gift that has a dollar value of $30 in total. Based on your streaming music preferences in this survey, we will select a music streaming service among the ones currently available and give that to you, deducting its actual cost from the $30. Then we will give you the remaining amount as a VISA gift card.
For example, suppose that your preferred service costs $10 a month. Then, we will give you this service plus the remaining amount of $20 ($30 minus $10) as a VISA gift card. If this service is actually worth more to you than $10 a month, then you are better off with the service and the $20 VISA gift card than you would be with a $30 gift card. Of course, if the service is actually worth less to you than $10 a month, then you are worse off with the service and a $20 gift card than with a $30 gift card. Everyone will get at least $15 in VISA gift cards.
To guarantee that you get a streaming service that is worth more to you than its cost, try to weigh service features and costs carefully and accurately so that the choices you indicate tell us whether various features of streaming service plans are truly worth their cost.
In order to be eligible to receive the incentive, you must complete the survey within one hour of starting it. You will be prevented from moving through the questions too quickly and, if it appears that you are answering questions at random, you will not be eligible for the incentive.
Please press the "NEXT" button to start the survey.
NEXT
Copyright © 2015, Applied Marketing Science, Inc.
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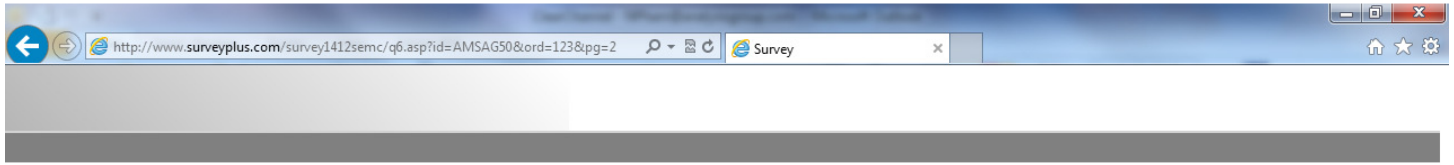

Assume that a streaming music provider is currently offering the 3 plans shown below.

Feature	Plan A	Plan B	Plan C
On-demand track selection *definition*	Playlists generated by the service Album, artist, and song selection on demand	Playlists generated by the service Album, artist, and song selection on demand	Playlists generated by the service Album, artist, and song selection on demand
Available library size *definition*	1 million songs	1 million songs	1 million songs
Advertising *definition*	1.5 to 3 minutes of ads per hour	No ads	No ads
Mobile device streaming *definition*	Not available	Playlists generated by the service Albums and artists chosen by you, but tracks are played in a random order	Playlists generated by the service Albums and artists chosen by you, but tracks are played in a random order
Skip limits *definition*	Limit of 6 skips per hour	Limit of 6 skips per hour	Limit of 6 skips per hour
Offline listening *definition*	Not available	Yes	Yes
Playlist Method *definition*	Curated by music tastemakers	Curated by music tastemakers	Curated by music tastemakers Generated by a computer algorithm customized by your preferences
Price *definition*	Free	$5.99 per month	$10.99 per month
Feature	**Plan A**	**Plan B**	**Plan C**

Among the 3 plans shown, which plan do you most prefer?

(Select one only)

- ○ Plan A
- ○ Plan B
- ○ Plan C

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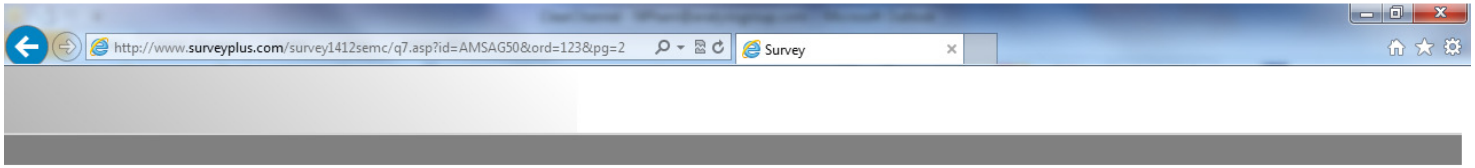

Assume that a streaming music provider is currently offering the 3 plans shown below.

Feature	Plan A	Plan B	Plan C
On-demand track selection *definition*	Playlists generated by the service Album, artist, and song selection on demand	Playlists generated by the service Album, artist, and song selection on demand	Playlists generated by the service Album, artist, and song selection on demand
Available library size *definition*	1 million songs	1 million songs	1 million songs
Advertising *definition*	1.5 to 3 minutes of ads per hour	No ads	No ads
Mobile device streaming *definition*	Not available	Playlists generated by the service Album, artist, and song selection on demand	Playlists generated by the service Album, artist, and song selection on demand
Skip limits *definition*	Limit of 6 skips per hour	Limit of 6 skips per hour	Limit of 6 skips per hour
Offline listening *definition*	Not available	Not available	Yes
Playlist Method *definition*	Curated by music tastemakers	Curated by music tastemakers Generated by a computer algorithm customized by your preferences	Curated by music tastemakers Generated by a computer algorithm customized by your preferences
Price *definition*	Free	$9.99 per month	$12.99 per month
Feature	**Plan A**	**Plan B**	**Plan C**

Among the 3 plans shown, which plan do you most prefer?

(Select one only)

- ○ Plan A
- ○ Plan B
- ○ Plan C

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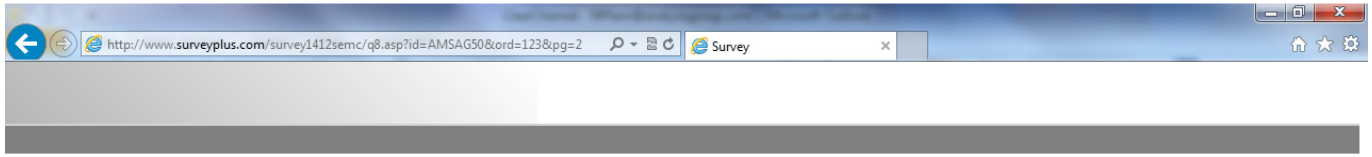

Assume that a streaming music provider is currently offering the 3 plans shown below.

Feature	Plan A	Plan B	Plan C
On-demand track selection *definition*	Playlists generated by the service Album, artist, and song selection on demand	Playlists generated by the service Album, artist, and song selection on demand	Playlists generated by the service Album, artist, and song selection on demand
Available library size *definition*	1 million songs	1 million songs	1 million songs
Advertising *definition*	1.5 to 3 minutes of ads per hour	No ads	No ads
Mobile device streaming *definition*	Not available	Playlists generated by the service Album, artist, and song selection on demand	Playlists generated by the service Album, artist, and song selection on demand
Skip limits *definition*	Limit of 6 skips per hour	Unlimited ability to skip tracks	Unlimited ability to skip tracks
Offline listening *definition*	Not available	Not available	Yes
Playlist Method *definition*	Curated by music tastemakers	Generated by a computer algorithm customized by your preferences	Generated by a computer algorithm customized by your preferences
Price *definition*	Free	$3.99 per month	$9.99 per month
Feature	**Plan A**	**Plan B**	**Plan C**

Among the 3 plans shown, which plan do you most prefer?

(Select one only)

- ○ Plan A
- ○ Plan B
- ○ Plan C

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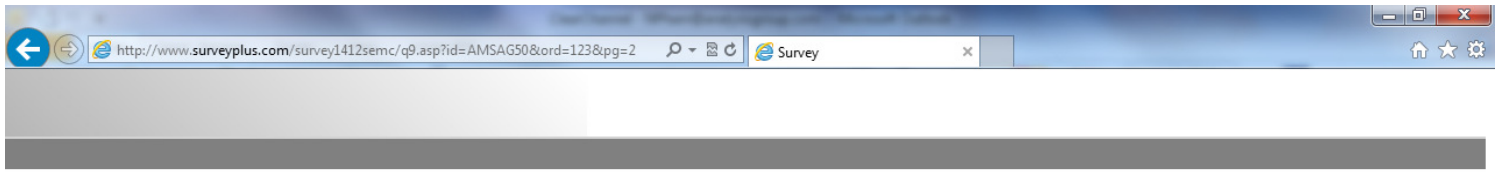

Assume that a streaming music provider is currently offering the 3 plans shown below.

Feature	Plan A	Plan B	Plan C
On-demand track selection *definition*	Playlists generated by the service Album, artist, and song selection on demand	Playlists generated by the service Album, artist, and song selection on demand	Playlists generated by the service Album, artist, and song selection on demand
Available library size *definition*	1 million songs	1 million songs	1 million songs
Advertising *definition*	1.5 to 3 minutes of ads per hour	1.5 to 3 minutes of ads per hour	No ads
Mobile device streaming *definition*	Not available	Playlists generated by the service Album, artist, and song selection on demand	Playlists generated by the service Album, artist, and song selection on demand
Skip limits *definition*	Limit of 6 skips per hour	Unlimited ability to skip tracks	Unlimited ability to skip tracks
Offline listening *definition*	Not available	Yes	Yes
Playlist Method *definition*	Generated by a computer algorithm customized by your preferences	Curated by music tastemakers Generated by a computer algorithm customized by your preferences	Curated by music tastemakers Generated by a computer algorithm customized by your preferences
Price *definition*	Free	$2.99 per month	$10.99 per month
Feature	**Plan A**	**Plan B**	**Plan C**

Among the 3 plans shown, which plan do you most prefer?

(Select one only)

- ○ Plan A
- ○ Plan B
- ○ Plan C

NEXT

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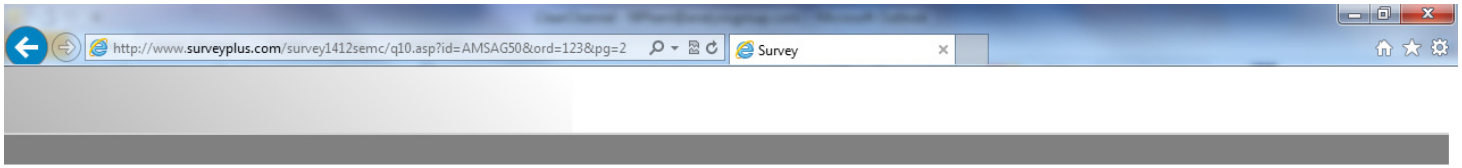

Assume that a streaming music provider is currently offering the 3 plans shown below.

Feature	Plan A	Plan B	Plan C
On-demand track selection *definition*	Playlists generated by the service Album, artist, and song selection on demand	Playlists generated by the service Album, artist, and song selection on demand	Playlists generated by the service Album, artist, and song selection on demand
Available library size *definition*	1 million songs	1 million songs	1 million songs
Advertising *definition*	1.5 to 3 minutes of ads per hour	No ads	No ads
Mobile device streaming *definition*	Playlists generated by the service	Playlists generated by the service Albums and artists chosen by you, but tracks are played in a random order	Playlists generated by the service Albums and artists chosen by you, but tracks are played in a random order
Skip limits *definition*	Limit of 6 skips per hour	Limit of 6 skips per hour	Limit of 6 skips per hour
Offline listening *definition*	Not available	Yes	Yes
Playlist Method *definition*	Curated by music tastemakers	Generated by a computer algorithm customized by your preferences	Curated by music tastemakers Generated by a computer algorithm customized by your preferences
Price *definition*	Free	$6.99 per month	$9.99 per month
Feature	**Plan A**	**Plan B**	**Plan C**

Among the 3 plans shown, which plan do you most prefer?

(Select one only)

- ○ Plan A
- ○ Plan B
- ○ Plan C

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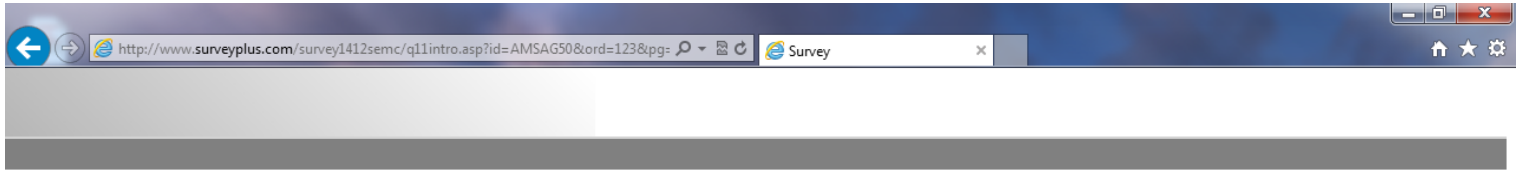

Assume that one or more new services is currently offering the plans on the following screens. Please review these plans and answer the questions that follow.

If you currently have a plan with one or more new services, all of your playlists, radio station, ratings and other settings will be preserved if you switch to a different plan.

Assume that any features that are not described are the same for all plans.

NEXT

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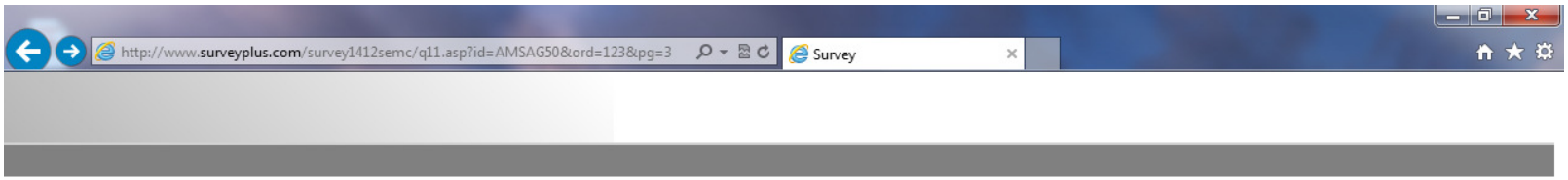

Assume that a streaming music provider is currently offering the 3 plans shown below.

Feature	Plan A	Plan B	Plan C
On-demand track selection *definition*	Playlists generated by the service	Playlists generated by the service Album, artist, and song selection on demand	Playlists generated by the service Album, artist, and song selection on demand
Available library size *definition*	20 million songs	20 million songs	20 million songs
Advertising *definition*	1.5 to 3 minutes of ads per hour	No ads	No ads
Mobile device streaming *definition*	Not available	Playlists generated by the service	Playlists generated by the service
Skip limits *definition*	Limit of 6 skips per hour	Unlimited ability to skip tracks	Unlimited ability to skip tracks
Offline listening *definition*	Not available	Yes	Yes
Playlist Method *definition*	Generated by a computer algorithm customized by your preferences	Generated by a computer algorithm customized by your preferences	Curated by music tastemakers Generated by a computer algorithm customized by your preferences
Price *definition*	Free	$7.99 per month	$9.99 per month
Feature	**Plan A**	**Plan B**	**Plan C**

Among the 3 plans shown, which plan do you most prefer?

(Select one only)

- ○ Plan A
- ○ Plan B
- ○ Plan C

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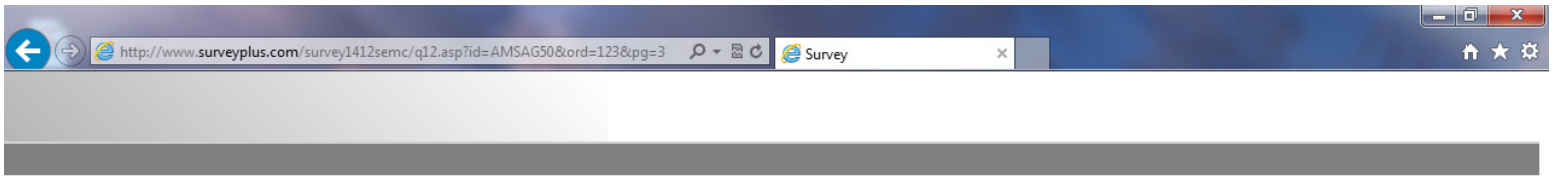

Assume that a streaming music provider is currently offering the 3 plans shown below.

Feature	Plan A	Plan B	Plan C
On-demand track selection *definition*	Playlists generated by the service Album, artist, and song selection on demand	Playlists generated by the service Album, artist, and song selection on demand	Playlists generated by the service Album, artist, and song selection on demand
Available library size *definition*	20 million songs	20 million songs	20 million songs
Advertising *definition*	1.5 to 3 minutes of ads per hour	No ads	No ads
Mobile device streaming *definition*	Playlists generated by the service	Playlists generated by the service	Playlists generated by the service Albums and artists chosen by you, but tracks are played in a random order
Skip limits *definition*	Limit of 6 skips per hour	Unlimited ability to skip tracks	Unlimited ability to skip tracks
Offline listening *definition*	Not available	Not available	Not available
Playlist Method *definition*	Generated by a computer algorithm customized by your preferences	Curated by music tastemakers Generated by a computer algorithm customized by your preferences	Curated by music tastemakers Generated by a computer algorithm customized by your preferences
Price *definition*	Free	$5.99 per month	$11.99 per month
Feature	**Plan A**	**Plan B**	**Plan C**

Among the 3 plans shown, which plan do you most prefer?

(Select one only)

- ○ Plan A
- ○ Plan B
- ○ Plan C

NEXT

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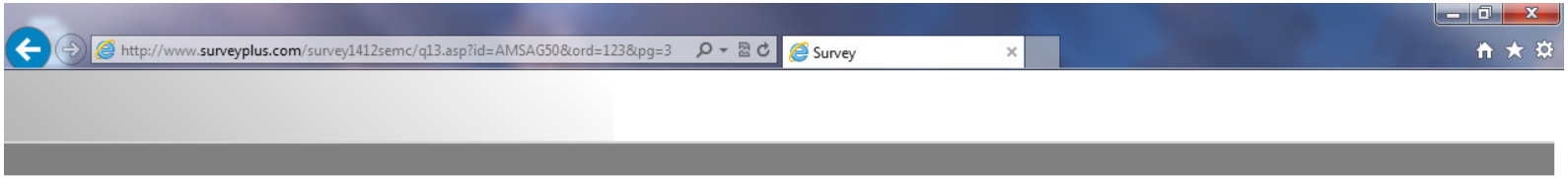

Assume that a streaming music provider is currently offering the 3 plans shown below.

Feature	Plan A	Plan B	Plan C
On-demand track selection *definition*	Playlists generated by the service Album, artist, and song selection on demand	Playlists generated by the service Album, artist, and song selection on demand	Playlists generated by the service Album, artist, and song selection on demand
Available library size *definition*	20 million songs	20 million songs	20 million songs
Advertising *definition*	1.5 to 3 minutes of ads per hour	No ads	No ads
Mobile device streaming *definition*	Not available	Not available	Playlists generated by the service Albums and artists chosen by you, but tracks are played in a random order
Skip limits *definition*	Limit of 6 skips per hour	Limit of 6 skips per hour	Limit of 6 skips per hour
Offline listening *definition*	Not available	Not available	Not available
Playlist Method *definition*	Generated by a computer algorithm customized by your preferences	Curated by music tastemakers Generated by a computer algorithm customized by your preferences	Curated by music tastemakers Generated by a computer algorithm customized by your preferences
Price *definition*	Free	$2.99 per month	$12.99 per month
Feature	**Plan A**	**Plan B**	**Plan C**

Among the 3 plans shown, which plan do you most prefer?

(Select one only)

- ○ Plan A
- ○ Plan B
- ○ Plan C

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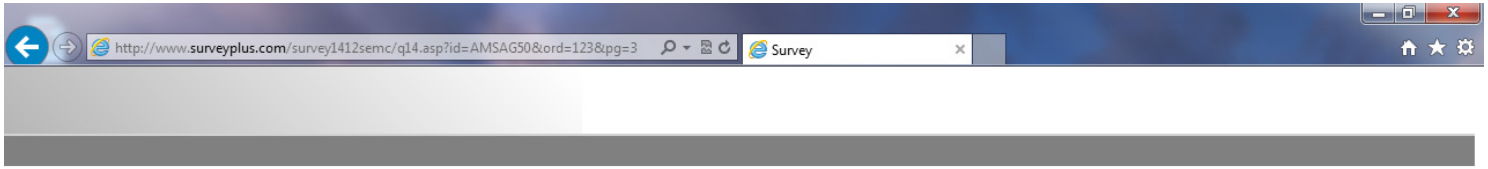

Assume that a streaming music provider is currently offering the 3 plans shown below.

Feature	Plan A	Plan B	Plan C
On-demand track selection *definition*	Playlists generated by the service Album, artist, and song selection on demand	Playlists generated by the service Album, artist, and song selection on demand	Playlists generated by the service Album, artist, and song selection on demand
Available library size *definition*	20 million songs	20 million songs	20 million songs
Advertising *definition*	1.5 to 3 minutes of ads per hour	No ads	No ads
Mobile device streaming *definition*	Not available	Playlists generated by the service	Playlists generated by the service Albums and artists chosen by you, but tracks are played in a random order
Skip limits *definition*	Limit of 6 skips per hour	Limit of 6 skips per hour	Unlimited ability to skip tracks
Offline listening *definition*	Not available	Not available	Not available
Playlist Method *definition*	Curated by music tastemakers	Curated by music tastemakers Generated by a computer algorithm customized by your preferences	Curated by music tastemakers Generated by a computer algorithm customized by your preferences
Price *definition*	Free	$4.99 per month	$12.99 per month
Feature	**Plan A**	**Plan B**	**Plan C**

Among the 3 plans shown, which plan do you most prefer?

(Select one only)

- ○ Plan A
- ○ Plan B
- ○ Plan C

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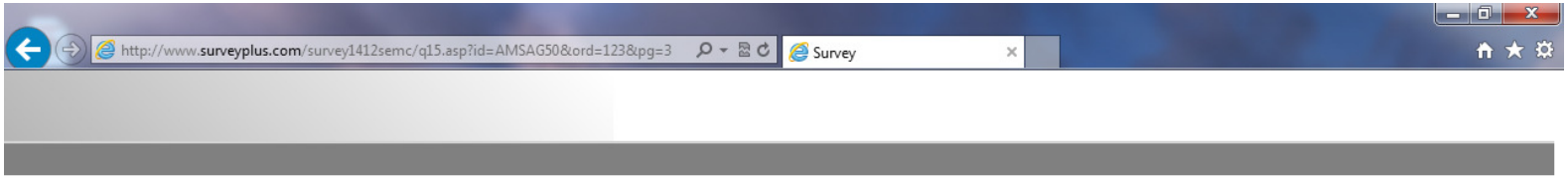

Assume that a streaming music provider is currently offering the 3 plans shown below.

Feature	Plan A	Plan B	Plan C
On-demand track selection *definition*	Playlists generated by the service Album, artist, and song selection on demand	Playlists generated by the service Album, artist, and song selection on demand	Playlists generated by the service Album, artist, and song selection on demand
Available library size *definition*	20 million songs	20 million songs	20 million songs
Advertising *definition*	1.5 to 3 minutes of ads per hour	1.5 to 3 minutes of ads per hour	No ads
Mobile device streaming *definition*	Playlists generated by the service	Playlists generated by the service Album, artist, and song selection on demand	Playlists generated by the service Album, artist, and song selection on demand
Skip limits *definition*	Limit of 6 skips per hour	Unlimited ability to skip tracks	Unlimited ability to skip tracks
Offline listening *definition*	Not available	Not available	Not available
Playlist Method *definition*	Generated by a computer algorithm customized by your preferences	Generated by a computer algorithm customized by your preferences	Generated by a computer algorithm customized by your preferences
Price *definition*	Free	$1.99 per month	$9.99 per month
Feature	**Plan A**	**Plan B**	**Plan C**

Among the 3 plans shown, which plan do you most prefer?

(Select one only)

- ○ Plan A
- ○ Plan B
- ○ Plan C

NEXT

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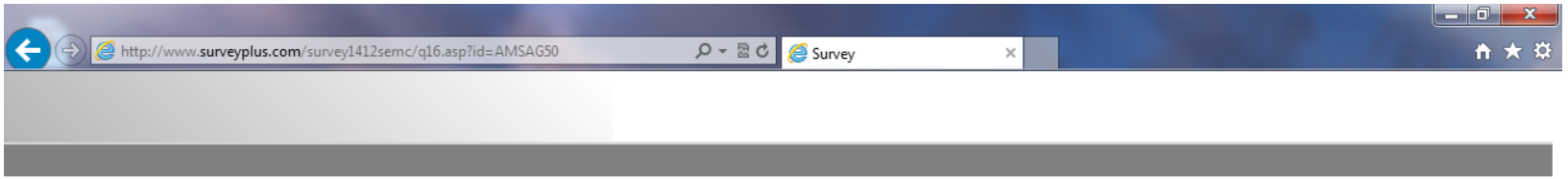

During the past two days, how much (if at all) did you listen to music on Pandora?

(Select one only)

- ○ I listened to music on Pandora for more than one hour
- ○ I listened to music on Pandora for between 30 minutes and an hour
- ○ I listened to music on Pandora for less than 30 minutes
- ○ I didn't have time to listen to music on Pandora
- ○ I tried to listen to music on Pandora, but could not get it to work
- ○ I didn't try to listen to music on Pandora

NEXT

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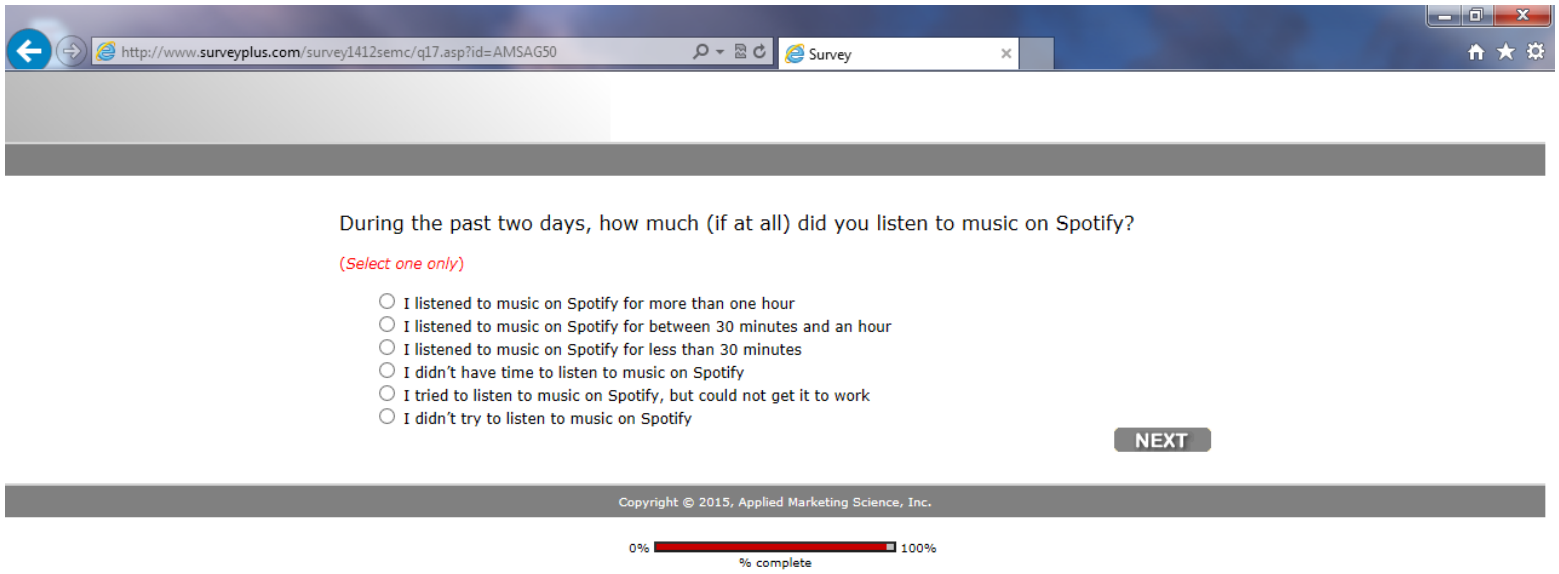
http://www.surveyplus.com/survey1412semc/q17.asp?id=AMSAG50
Survey
During the past two days, how much (if at all) did you listen to music on Spotify?
(Select one only)
I listened to music on Spotify for more than one hour
I listened to music on Spotify for between 30 minutes and an hour
I listened to music on Spotify for less than 30 minutes
I didn't have time to listen to music on Spotify
I tried to listen to music on Spotify, but could not get it to work
I didn't try to listen to music on Spotify
NEXT
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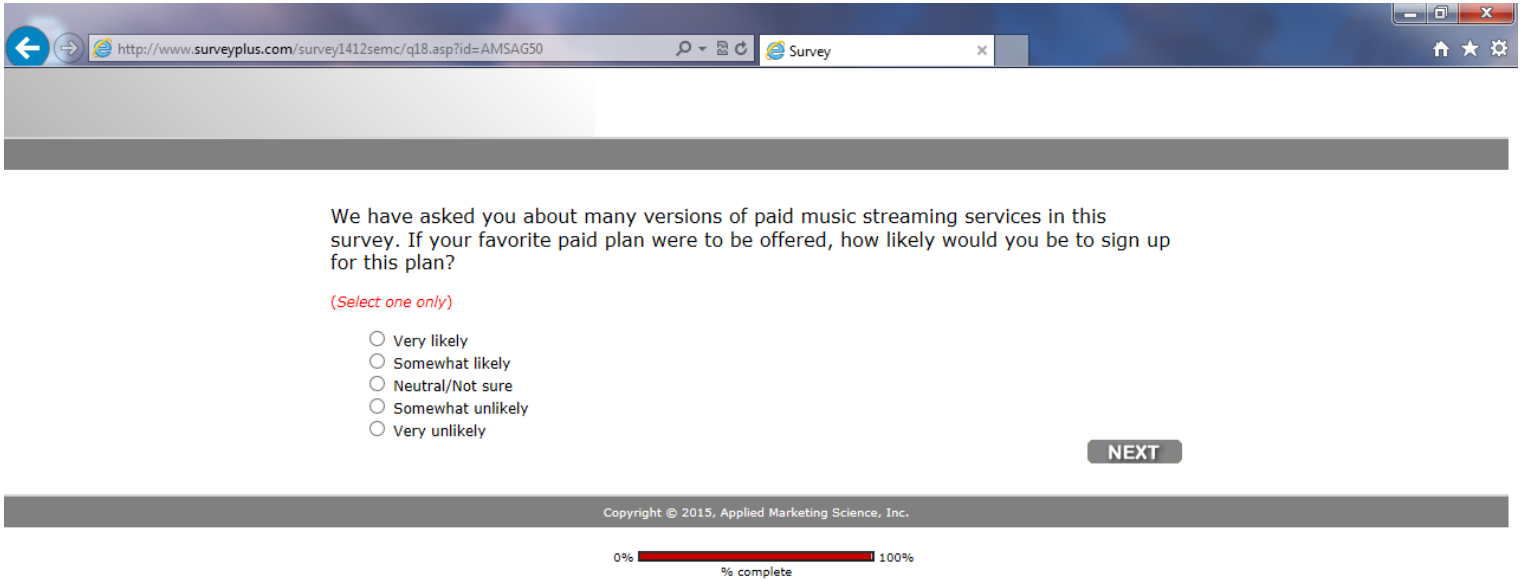
http://www.surveyplus.com/survey1412semc/q18.asp?id=AMSAG50
Survey
We have asked you about many versions of paid music streaming services in this survey. If your favorite paid plan were to be offered, how likely would you be to sign up for this plan?
(Select one only)
Very likely
Somewhat likely
Neutral/Not sure
Somewhat unlikely
Very unlikely
NEXT
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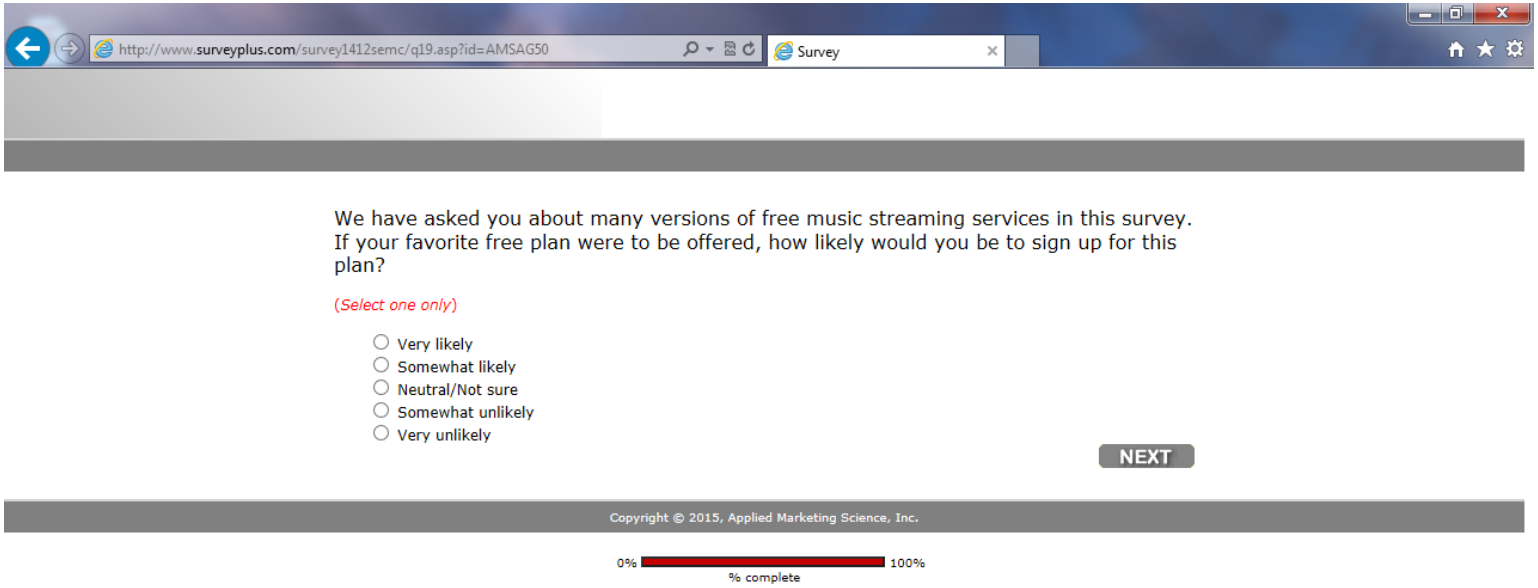
http://www.surveyplus.com/survey1412semc/q19.asp?id=AMSAG50
Survey
We have asked you about many versions of free music streaming services in this survey. If your favorite free plan were to be offered, how likely would you be to sign up for this plan?
(Select one only)
Very likely
Somewhat likely
Neutral/Not sure
Somewhat unlikely
Very unlikely
NEXT
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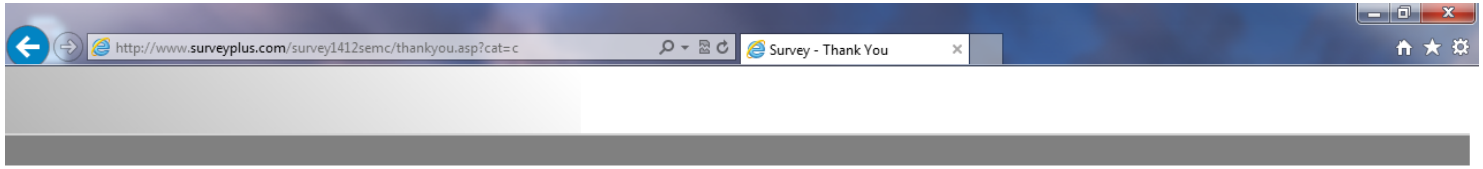

Thank You

Thank you for taking the time to complete this survey today.

APPENDIX F
GUIDE FOR BLIND-TO-THE-PURPOSE CODERS

Guide to coding videos

You are being asked to be a coder of video footage related to market research that was conducted in different locations in the US. In your role as a coder, we are asking you to review carefully 52 videos that display 53 different respondents while they take a survey on a computer.[1] Each of the 53 survey respondents was interviewed while taking the survey.

The person who led each interview is also visible in the video. This interviewer asked a series of questions based on a script. The script will also be provided to you before you start watching any of the videos. We would like you to follow the script and "keep up" with the interviewer. If you need time, feel free to hit "pause" or repeat sections of the video until you feel confident enough to judge it. Note that not all questions in the questionnaire will be asked in all interviews, but the interview should follow the script as closely as is reasonable.

For each video you review, we ask you to judge the respondent's understanding of various aspects of the survey based on the following five-point scale:

- Understands
- Probably understands or somewhat understands
- Unsure/unclear
- Probably does not understand or does not completely understand
- Does not understand

Section 1: Introduction and Incentive

At the beginning of the survey, the interviewer assesses the respondent's understanding of the payout that was described on the first screen of the survey. When judging this section, consider the following:

1. The incentive to truthfully answer the survey can be described correctly as *a compensation of $30 in total, where the total amount consists of a one-month payment for the respondent's ideal music streaming service (determined by the respondent's answers to the survey) plus whatever amount is needed to reach a total of $30.*
2. Aside from the incentive to answer truthfully, respondents received a compensation of $100 in cash for showing up and taking the survey. If respondents exclusively talk about the $100, do not assume that they don't understand the incentive to answer the survey truthfully. Instead, code them as "Unsure."
3. If you do not understand these two points, please ask and we will explain.

[1] Each video lasts approximately one hour.

A. Given what you have seen in the video, are you under the impression that the respondent does or does not understand how her/his incentive to answer the survey truthfully is described in the screen (Questions 1-4 in interview script)?

- Understands
- Probably understands or somewhat understands
- Unsure/unclear
- Probably does not understand or does not completely understand
- Does not understand

Section 2: Conjoint Choice Task 1

The interviewer now takes the respondent through a series of tasks where they can choose among music streaming services, based on different sets of features. You are asked to review the video and determine whether the respondent understands or does not understand these features. Please ensure that you understand the features, in order to determine this. If you don't understand the features, ask and we will explain.

The features are defined as follows:

Playlist generation method
Playlists offered to a user can either be curated by music tastemakers (such as Beyoncé or Rolling Stone Magazine) or generated by a computer algorithm customized by the user's preferences or feedback (often provided by "like" or "dislike" votes).

Features available for streaming to a computer
Using desktop software or a web interface from a computer, users may be able to access playlists generated by the streaming service and/or play specific tracks "on demand." With "on demand" features, users can listen to particular tracks (songs) or an entire album on request and users can create their own playlists.

Ability to listen offline
Users can download and listen to a selection of the service's music when internet access is unavailable.

Features available for streaming to mobile devices
Users may be able to use the music streaming service on mobile devices, such as phones and tablets. The music streaming service may limit the features that are available on mobile devices. Users may be able to access playlists generated by the streaming service, pick the artist or album but hear tracks in a random order, and/or play specific tracks "on demand." With "on demand" features, users can listen to particular tracks (songs) or an entire album on request and users can create their own play lists.

Ability to skip songs
Users can skip tracks (songs) that they do not want to hear and continue to the next track.

Library size
The number of tracks (songs) available in the service's database

Advertising
Plans may be ad-free or may have advertising breaks in between tracks

B. Given what you have seen in the video, are you under the impression that the respondent does or does not understand the survey instructions (Questions 7-10 in interview script)?

- Understands
- Probably understands or somewhat understands
- Unsure/unclear
- Probably does not understand or does not completely understand
- Does not understand

Section 3: Conjoint Choice Tasks 2-5

C. Given what you have seen in the video, are you under the impression that the respondent does or does not understand the feature "Available Library Size" (Question 15 in interview script)?

- Understands
- Probably understands or somewhat understands
- Unsure/unclear
- Probably does not understand or does not completely understand
- Does not understand

D. Given what you have seen in the video, are you under the impression that the respondent does or does not understand the feature "Mobile Device Streaming" (Question 16 in interview script)?

- Understands
- Probably understands or somewhat understands
- Unsure/unclear
- Probably does not understand or does not completely understand
- Does not understand

E. Given what you have seen in the video, are you under the impression that the respondent does or does not understand the feature "Playlist Method" (Question 17 in interview script)?

- Understands
- Probably understands or somewhat understands
- Unsure/unclear
- Probably does not understand or does not completely understand
- Does not understand

F. Given what you have seen in the video, are you under the impression that the respondent does or does not understand the feature "curated by music tastemakers" (Question 18 in interview script)?

- Understands
- Probably understands or somewhat understands
- Unsure/unclear
- Probably does not understand or does not completely understand
- Does not understand

G. Given what you have seen in the video, are you under the impression that the respondent does or does not understand the feature "generated by a computer algorithm customized by your own preferences" (Question 19 in interview script)?

- Understands
- Probably understands or somewhat understands
- Unsure/unclear
- Probably does not understand or does not completely understand
- Does not understand

Section 4: Conjoint Choice Tasks 6-10

H. Given what you have seen in the video, are you under the impression that the respondent does or does not understand the feature "advertising" (Question 24 in interview script)?

- Understands
- Probably understands or somewhat understands
- Unsure/unclear
- Probably does not understand or does not completely understand
- Does not understand

I. Given what you have seen in the video, are you under the impression that the respondent does or does not understand the feature "skip limits" (Question 25 in interview script)?

- Understands
- Probably understands or somewhat understands
- Unsure/unclear
- Probably does not understand or does not completely understand
- Does not understand

Section 5: Conjoint Choice Tasks 11-15

J. Given what you have seen in the video, are you under the impression that the respondent does or does not understand the feature "offline listening" (Question 30 in interview script)?

- Understands
- Probably understands or somewhat understands
- Unsure/unclear
- Probably does not understand or does not completely understand
- Does not understand

K. Given what you have seen in the video, are you under the impression that the respondent does or does not understand the feature "on demand track selection" (Question 31 in interview script)?

- Understands
- Probably understands or somewhat understands
- Unsure/unclear
- Probably does not understand or does not completely understand
- Does not understand

Section 6: Conclusion

In this section, we will use a different scale and include more factual questions.

Given what you have seen in the video,

L. How did the respondent answer Question 34 ("If you were presented with these options and had to spend your own money, would you choose the same options?")? Please provide your best characterization of her/his answer.

- Yes, I would have chosen the same options.
- No, I would not have chosen the same options.
- Unsure/unclear

M. How did the respondent answer Question 35 ("Thinking about the choices that you just made, assume that you had a fourth option of not choosing any of the three plans presented to you. Would you or would you not have chosen the "no plan" option in any of the 15 sets of three plans each?") Please provide your best characterization of her/his answer.

- Yes, I would have chosen the "no plan" answer at least once.
- No, I would not have chosen the "no plan" answer.
- Unsure/unclear

N. How did the respondent answer Question 36 ("How easy or difficult did you find the survey?"). Please provide your best characterization of her/his answer.

- Very difficult
- Somewhat difficult
- Neutral
- Easy
- Very easy

O. How did the respondent answer Question 37 ("Did you or did you not understand the explanations of features in the survey?")

- Understands
- Probably understands or somewhat understands
- Unsure/unclear
- Probably does not understand or does not completely understand
- Does not understand