Expert Rebuttal Report of Donna L. Hoffman, Ph.D.

Public Redacted Version

SUPERIOR COURT OF THE STATE OF ARIZONA COUNTY OF MARICOPA

STATE OF ARIZONA, <i>ex rel.</i> MARK BRNOVICH, Attorney General	
Plaintiffs,	No. CV2020-006219
V.	Assigned to the Hon. Timothy Thomason
GOOGLE LLC, A Delaware Limited Liability Company	
Defendants	

EXPERT REPORT OF DONNA L. HOFFMAN

June 8, 2022

Table of Contents

I. Introduction	1
A. Assignment	1
B. Qualifications	1
C. Summary of Opinions	5
D. Information Relied Upon	6
II. Background	6
A. Parties	6
1. Plaintiff	6
2. Defendant	7
B. Allegations	7
III. The Gray Report	7
A. Synopsis	7
B. Rebuttal	8
1. "Dark Patterns" Are a Nebulous Construct	8
2. Dr. Gray's Opinions that Google's UI Includes "Dark Patterns" Are Not Based on Scientific Reasoning or Evidence	11
IV. Contextual Considerations	12
A. Business/Organizational Considerations	14
B. Market/Consumer Considerations	18
1. The Rise of Location-Based Services	18
2. Privacy Concerns Are Contextual and Individualized	20
3. Search Has Revolutionized Ready Access to Information	23
C. Technical Considerations	24
V. UI Considerations	27
A. Heterogeneous Users and Human Cognition	27
B. Progressive Disclosure	28
C. Good UI is Evolutionary	34
VI. Responses to Dr. Gray's UI Analysis	39
A. The AP Article Oversimplifies Google's LBS Related Disclosures and Misunderstands Google's LBS Related Technologies	40
1. Dr. Gray Also Oversimplifies Google's LBS Related Disclosures and Features	43
2. Post-AP Article Events	43

B.	Location Related Controls	46
1	. Task Flow Is User-Dependent	46
2	. Progressive Disclosure Is User-Friendly	48
3	. Account-Level Settings	49
4	. Opt-In	53
5	. Popup Screens	54
6	. Google's UI Facilitates User Choice and Control	55
7	. UI Requires Judgment, Particularly for Complex Technologies	55
8	. Device Level Settings	56
9	. Concluding Observations on Google's Location Related Controls	57
C.	Account Setup	57
1	. Progressive Disclosure Is User Friendly	57
2	. UI Design Requires Knowledge About Users, Particularly for Complex Technologies	62
3	. Task Flow Is User Dependent	66
D.	Google's Public WAA and LH Disclosures	72
E.	IP Geo	73
F.	Removing Location from the QS Tile	74
G.	Google Search Footer	75
Н.	Wi-Fi Connectivity and WiFi Scanning	76
I.	Technical Aspects of Location Data Collection and Use	76
1	. Backend Location Sharing	76
2	. "Off Means Coarse"	76
J.	Connecting Google's UI to Its Business Goals	77
VII.	Conclusion	79

I. INTRODUCTION

A. Assignment

 I have been engaged by counsel for Google LLC ("Google") to respond to portions of the reports of Plaintiff's experts Jennifer King, Ph.D. ("King Report") and Colin M. Gray, Ph.D. ("Gray Report") as they relate to user interface ("UI") design and presentation of information to users in the digital context.

B. Qualifications

- My name is Donna L. Hoffman. I am a Full Professor of Marketing at The George Washington University School of Business. I am the holder of the endowed chair, titled the Louis Rosenfeld Distinguished Scholar, at The George Washington University.
- 3. I co-founded and co-direct the Center for the Connected Consumer at The George Washington University School of Business. The Center is supported by university and foundation grants and corporate gifts. Previously, as a professor at Vanderbilt University and the University of California, Riverside, I co-founded and co-directed for ten years the Sloan Center for Internet Retailing, supported by a grant from the Alfred P. Sloan Foundation in New York City, a university grant, and corporate gifts. I have also cofounded and co-directed the first academic center for electronic commerce in the United States, called eLab.¹
- 4. The principal focus of my research over the past two decades has been in the area of the online consumer experience, including online consumer behavior, digital commerce and Internet marketing, the "social" web, and the social and policy implications of the commercialization of the Internet. I am the co-editor of the book *Beyond the Basics: Research-Based Rules for Internet Retailing Advantage.* I am the author of 87 papers, including articles published in leading academic journals such as the *Harvard Business Review, Sloan Management Review, Science, Marketing Science, Management Science, Journal of Marketing Research, Journal of Marketing Research, Journal of Marketing, Journal of Consumer Research, and Journal of Consumer Psychology*, among many others, along with chapters in books.

¹ Vanderbilt University, "Hoffman and Novak named 'Distinguished Graduate Alumni," June 6, 2003, available at https://news.vanderbilt.edu/2003/06/06/hoffman-and-novak-named-145distinguished-graduate-alumni146-59977/.

My publications also include working papers and technical reports as well as a number of articles I have published in the popular press, including *Wired, HotWired, MicroTimes* and *Information Impact Magazine*. In the course of my research, teaching and editorial responsibilities, I have become familiar with the body of research on online consumer behavior, particularly as it relates to online consumer experience, as well as Internet retailing and Internet marketing.

- 5. I have worked with major corporations on the topic of digital marketing strategy and online consumer experience, including Procter & Gamble, Intel, Microsoft, FedEx.com, Land's End/Sears, Walmart.com, and CBS Interactive, among many others. I have also served as an Academic Trustee of the Marketing Science Institute and as a member of the Procter & Gamble Digital Advisory Board.
- 6. My research on online consumer behavior has been funded by the Alfred P. Sloan Foundation, the National Science Foundation, the Marketing Science Institute, Google/WPP, and the University of Pennsylvania Future Of Advertising Center/Wharton Customer Analytics Initiative.
- 7. I have been awarded many of the marketing field's most prestigious research awards, including being named a Fellow of the Society for Consumer Psychology, the Robert B. Clarke Educator of the Year Award from Marketing EDGE (formerly the DMEF), the Sheth Foundation/*Journal of Marketing* Award for long-term contributions to the discipline of marketing, the Stellner Distinguished Scholar Award from the University of Illinois, the William O'Dell/*Journal of Marketing Research* Award for long-term research impact, and the Robert D. Buzzell Marketing Science Institute Best Paper Award Honorable Mention. I am also an MSI "Challenges of Communications and Branding in a Digital Era" research proposal competition winner and was named a finalist for the Paul D. Converse Award for my lasting contributions to the marketing field.
- 8. I have won several other awards in connection with my research. I was voted the top Internet Scientist by over 600 U.S. and European scientists and marketing managers in a survey conducted by the ProfNet Institute for Internet Marketing in Dortmund, Germany. In the past, my research was cited as an "Emerging Research Front" in the entire field of

2

Economics and Business by the ISI Essential Science Indicators, and I was cited by ISI Essential Science Indicators for the highest percentage increase in total citations to my research in the entire field of Economics and Business.

- 9. My research has exceptionally high impact. As of May 10, 2022, my Google Scholar citation count was 35,877 and 40 of my published articles have at least 100 citations. Two of my research articles are among the most cited articles in the journals in which they appear. My 1996 *Journal of Marketing* paper on consumer experience on the Internet is the most widely cited paper in that journal from 1995 to 2007 and the number one most cited paper in the entire marketing discipline between 1990 and 2002.² My 2000 *Marketing Science* paper on customer experience in online environments is one of the of "all time most highly cited articles" and the top article in terms of "all time citations per year" in *Marketing Science*,³ as well as the 14th most cited paper in the entire marketing discipline between 1990-2002.⁴
- 10. I was Editor of the first special issue of *Marketing Science* devoted to "Marketing on the Internet" and the Special Issue Editor, Marketing Section, for the "Electronic Commerce Metrics" issue of *Information Systems Research*. I was also the co-editor of a special issue of the *Journal of Interactive Marketing* on "Social Media" and a co-editor of a special issue of the *Journal of Marketing* on "New Technologies in Marketing." In addition, I serve as a founding member on the editorial boards of the *Journal of Electronic Commerce*, the *Journal of Interactive Marketing*, and have served or am currently serving as a member of the editorial boards of *Marketing Science, Journal of Marketing Research, Journal of Consumer Research*, and *Journal of Consumer Psychology* among other editorial posts. Currently, I am an Associate Editor for the *Journal of Marketing Science* and the *Journal of Marketing*. I served as a Final Judge for *Inc. Magazine's* competition of the best marketing websites.

²Stremersch, S., Verniers, I., and P.C. Verhoef, "The Quest for Citations: Drivers of Article Impact," *Journal of Marketing* 71, 2007, pp. 171-193.

 ³Shugan, S.M., "Editorial: Introduction to the Special Classics Issue," *Marketing Science* 27, No. 1, 2008, pp. 9-11.
⁴Stremersch, S., Verniers, I., and P.C. Verhoef, "The Quest for Citations: Drivers of Article Impact," *Journal of Marketing* 71, 2007, pp. 171-193.

- 11. I received the EDSF Excellence in Education Award for Innovation in Higher Education (sponsored by Xerox) for my work establishing the eLab virtual behavioral laboratory and eLab has received a commendation from the Association to Advance Collegiate Schools of Business (AACSB) for "International Effective Practice." I co-created, co-launched and directed the first formal MBA curricular concentration in the world for the study of electronic commerce at a business school while I was a professor at Vanderbilt University. The *New York Times* called my pioneering effort "one of the premier research centers in the world for the study of electronic commerce pioneer among business schools." I also taught the first MBA course on Internet marketing at a business school. I have created and taught courses in Internet Marketing Strategy, Digital Commerce Strategy, Managing the Customer Chain, AI and Marketing Strategy, and Marketing Strategy Analytics.
- 12. I have received media citations from *Newsweek* (as one of the 50 people who matter most on the Internet), *Advertising Age* (as a Web warrior), *Internet World* (as an Internet Hero), *MicroTimes* (as one of the *MicroTimes* 100), and San Francisco Webgirls (as one of the top 25 women on the Web).
- 13. I hold a Ph.D. from the L.L. Thurstone Psychometric Laboratory of the University of North Carolina at Chapel Hill with a formal minor in marketing. In 2002, the University of North Carolina named me a Distinguished Graduate Alum in honor of their Centennial. Before joining The George Washington University, I was a faculty member at Columbia University, the University of Texas, Vanderbilt University and the University of California. I have also served as a visiting scholar at UCLA, Stanford, USC, and UCSD. A complete list of my professional qualifications, publications, affiliations and expert witness testimony are described in my curriculum vitae, which is attached as **Appendix A**.
- 14. I am being compensated for my work on behalf of Google at the rate of \$950 per hour. Employees of Analysis Group, an economic research and consulting firm, working under my direction, have assisted me in this assignment. No compensation is contingent upon the nature of my findings or on the outcome of this litigation.

4

C. Summary of Opinions

- 15. Based on my professional expertise, experience, and knowledge, and my review of the information available to me in this case, I have developed the following key opinions:
- 16. I understand that "dark patterns" are not alleged in the Complaint and that whether or not Google engaged in "dark patterns" is not at issue in this case. I have nevertheless been asked to opine on Dr. Gray's assessment that Google's user interface contains "dark patterns."⁵
- 17. Dr. Gray's conclusion that Google's user interface and disclosures contain dark patterns is untethered to any scientifically based methodology and should not be relied upon. Dr. Gray's purported analysis of dark patterns is based on a nebulous and subjective construct lacking in reliability and validity, and assumes his conclusions that Google acted deceptively and fraudulently. Dr. Gray further appears to have developed his conclusions based on a cherry-picked collection and mischaracterization or misinterpretation of Google documents.
- 18. In contrast with Dr. Gray's opinions, my analysis of Google's user interface design and related disclosures at issue in this case demonstrates that they are consistent with best practices and do not evidence any intent to deceive or any other "dark pattern" that Dr. Gray discusses. Google is a highly customer-centric business that operates in a technologically complex environment and is supported by a unique organizational structure. In the context of significant market, business, and technical complexity, Google nonetheless employs well founded user interface design principles including progressive disclosure to support user control over navigational choices, continuously responds to customer feedback, and evolves its user interface based on opportunities to improve. Google's flexible user interface provides individuals choices that best support their needs for location-based services and privacy. Google's UI balances the need to avoid overwhelming users informationally while at the same time providing easy access to

⁵ I understand that another expert retained by Google will be opining on whether Dr. Gray has utilized systematic methodologies for identifying so-called "dark patterns," including whether Dr. Gray has utilized methodologies in this case that he has previously used in attempting to identify "dark patterns."

disclosures. Providing its global and diverse users with choices is not indicative of an intent to deceive or manipulate.

19. My own responsive analysis of Dr. Gray's user experience ("UX") analysis shows that in the absence of a scientifically based reliable and valid method, Dr. Gray consistently mischaracterizes or misinterprets Google's actions and intent regarding location-based services and user controls. In stark contrast, my own detailed user interface analysis demonstrates that Google consistently employs best practices and provides users information and choice to control their own location and privacy preferences.

D. Information Relied Upon

20. In undertaking this assignment, I have relied on my extensive research and knowledge of online consumer behavior, user interface design, Internet marketing and Internet retailing, my familiarity with research done by others, and discovery materials in this case including pleadings, depositions, declarations, and affidavits of fact witnesses, internal Google documents, discussions with Google employees, academic research, and other publicly available material. I have also reviewed the expert reports of Drs. King and Gray, particularly the portions that relate to user interface design and presentation of information to users in the digital context. The sources on which I rely are identified in this report or listed in the attached **Appendix B**. My work is ongoing, and I may revise my opinions as I review additional data and information that may become available.

II. BACKGROUND

A. Parties

1. Plaintiff

 The Plaintiff in this case is the State of Arizona, *ex rel.* its Attorney General Mark Brnovich ("Arizona").⁶

⁶ Complaint for Injunctive and Other Relief, State of Arizona v. Google, LLC, Superior Court of the State of Arizona, County of Maricopa, CV-2020-006219, May 27,2020 ("Complaint"), ¶ 13.

2. Defendant

22. The Defendant in this case is Google LLC, a Delaware limited liability company based in Mountain View, California. "Google is a technology company that specializes in Internet-related products and services, which include online advertising technologies, search, cloud computing, and other software and hardware,"⁷ and markets, advertises, and sells those products and services throughout the United States (and worldwide), including in Arizona.⁸

B. Allegations

23. Arizona accuses Google of "widespread and systemic use of deceptive and unfair business practices to obtain information about the location of its users, including its users in Arizona, which Google then exploits to power its lucrative advertising business."⁹ In its Complaint, Arizona likens Google to "a sweeping surveillance apparatus"¹⁰ whose "deceptive and unfair conduct extends well beyond its false Location History disclosure" and that "such acts and practices pervade Google's seemingly relentless drive to (i) collect as much user location information as possible and (ii) make it exceedingly hard for users to understand what is going on with their location information, let alone opt-out of this morass."¹¹

III. THE GRAY REPORT

A. Synopsis

24. In the Summary of Conclusions of his report, Dr. Gray opines that:

Google's Android user interface ("UI"), the UI of other Google services, and Google's disclosures regarding its settings contain specific dark patterns that hide important complexity from end users and are designed in a manner that would lead users to think they are managing the totality of location tracking when they are not.¹²

⁷ Complaint, ¶ 15.

⁸ Complaint, ¶¶ 16, 25.

⁹ Complaint, ¶ 1; *see also* ¶ 22.

¹⁰ Complaint, ¶ 6, citing Zuboff, Shoshana, The Age of Surveillance Capitalism (2019), pp. 8-10.

¹¹ Complaint, ¶ 9.

¹² Gray Report, p. 2.

25. Thereafter, Dr. Gray discusses what some refer to as "dark patterns" ("DPs") of UI and taxonomies developed to classify them, and attempts to map Google's alleged conduct into a "typology [he] created" comprised of the subjective terms "nagging," "obstruction," "sneaking" "interface interference," and "forced action."¹³ While Dr. Gray's report labels Google's setting screens according to his categorization scheme, his scheme simply assumes, rather than tests for or measures, fraudulent intent or effect. He neither identifies nor methodically evaluates the UI he criticizes against any objective criterion for distinguishing good UI design from "dark patterns" or conduct in violation of the consumer statute at issue.

B. Rebuttal

1. "Dark Patterns" Are a Nebulous Construct

26. Dr. Gray does not rigorously define what he means by "dark patterns" in his report. Harry Brignull, the user experience consultant Dr. Gray refers to as having "coined" the term "dark patterns," defines it on his blog as a "kind of bad design pattern, one that's been crafted with great attention to detail, and a solid understanding of human psychology, to trick users into do things they wouldn't otherwise have done."¹⁴ Beyond that, Mr. Brignull explains that "[b]lack-hat UX is different: it's subtle," and has no clearly defined guidelines.¹⁵ Without explicit and commonly accepted guidelines that clearly define "evil design" and how to detect it, whether a particular user interface design is bad or good is left largely in the eye of the beholder.

¹³ Gray Report, p. 6. Before introducing his taxonomy, Dr. Gray cites one paper reporting that 95 percent of 240 common smartphone apps studied contain DPs, with an average of seven each, and another finding that "while users are 'generally aware of the influence that manipulative designs can exert on their online behaviors [sic] ... being aware does not equip users with the ability to oppose such influence." (Gray Report, p. 5, citing De Geronimo (2020) and Bongard-Blanchy et al. (2021).)

¹⁴ Brignull, Harry, "Dark Patterns: dirty tricks designers use to make people do stuff," *Harry Brignull's 90 Percent of Everything*, July 8, 2010, available at https://90percentofeverything.com/2010/07/08/dark-patterns-dirty-tricks-designers-use-to-make-people-do-stuff/index html. Elsewhere, Mr. Brignull describes dark patterns as "dirty tricks designers use to make you do stuff." (Brignull, Harry, "Darkpatterns.org: naming and shaming sites that use black hat, anti-usability design patterns," Harry Brignull's 90 Percent of Everything, August 16, 2010, available at https://90percentofeverything.com/2010/08/16/darkpatterns-org-naming-and-shaming-sites-that-use-black-hat-anti-usability-design-patterns/index html)

¹⁵ Brignull, Harry, "Darkpatterns.org: naming and shaming sites that use black hat, anti-usability design patterns, Harry Brignull's 90 Percent of Everything, August 16, 2010, available at

https://90percentofeverything.com/2010/08/16/darkpatterns-org-naming-and-shaming-sites-that-use-black-hat-anti-usability-design-patterns/index html.

27. Another blog post from Mr. Brignull that Dr. Gray cites, this one on the edited blog *A List Apart*, illustrates a "continuum from honest interfaces to dark patterns" on which extreme dark patterns are, in Mr. Brignull's opinion at least, "unarguably deceptive to users," but "carefully placed on the right side of the law" (*see* figure below).¹⁶ Even an example he considers "at the least honest end of the scale," Mr. Brignull characterizes as "clever," "very subtle," and while "likely to boost [] conversion rates, *it also steers clear of any legal issues*."¹⁷ Again, there appears to be subjectivity rather than clear guidelines around what constitutes a dark pattern.



28. Dr. Gray broadly describes a dark pattern as a design that manipulates consumers to take a certain action. According to Dr. Gray, the use of a dark pattern is intended to manipulate consumers to engage in behaviors at odds with their preferences rather than treat consumers' preferences as paramount. However, research on dark patterns is merely descriptive and the literature is highly fragmented. Interfaces that someone somewhere considers to be less than honest are categorized as some type of dark pattern and given a name, often sensationalistic (e.g. "sneaking"¹⁸), that implies a deliberate intent to deceive. There is no single, consensus definition of what constitutes a dark pattern, no research that illuminates what makes a particular interface a dark pattern, no coherent specification of the cognitive mechanism by which dark patterns operate on users, nor

¹⁶ Brignull, Harry, "Dark Patterns: Deception vs. Honesty in UI Design," A List Apart (blog), November 1, 2011, available at https://alistapart.com/article/dark-patterns-deception-vs-honesty-in-ui-design.

¹⁷ Id. (emphasis added).

¹⁸ Colin M. Gray, Yubo Kou, Bryan Battles, Joseph Hoggatt, and Austin L. Toombs (2018), "The Dark (Patterns) Side of UX Design." In Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems (Montreal QC, Canada) (CHI '18).

standards or norms for identifying problematic dark patterns.¹⁹ Indeed, the "current academic discourse about dark patterns is built on a shaky foundation..."²⁰ Until such time that the current descriptive work on dark patterns can be grounded in scientific methods, attempting to classify a particular UI as a "dark pattern" is neither reliable nor valid.

29. In the case of Dr. Gray's particular classification of user interfaces as "sneaking," "forced action," "interface interference," "obstruction," and "nagging," each of these labels seem intentionally inflammatory. All imply an intent to manipulate or deceive. Dr. Gray's categorization scheme was drawn from Brignull's original twelve type classification of user interface patterns. Dr. Gray then modified those types and invented new labels by classifying examples he obtained from nonrepresentative users from social media sites like Facebook, Twitter, Reddit and other online platforms.²¹ Dr. Gray specifically searched for and recruited examples that someone somewhere on the Internet had deemed to be "dark patterns," "evil," "manipulative," or "unethical." Despite having no definitions for these biased keywords, nor a theoretical framework to guide analysis, Dr. Gray then proceeded to classify the examples into six arbitrary categories. Later, Dr. Gray reclassified his 6 types into his current 5 type scheme. However, there is no consensus in the field concerning how to define dark patterns, the characteristics that comprise dark patterns, how they operate on users, what benefits or harms might result, or even how many dark patterns actually exist. Besides Dr. Gray's 5 types, there are numerous other arbitrary and subjective categorization schemes for dark patterns. These include Brignull's 12 types, Conti and Sobiesk's 9 types, Zagal's 7 types, Greenberg, et.al.'s 8 types, Bosch, et.al.'s 7 types, NCC's 5 types, CNIL's 18 types, Mathur, et.al.'s 6 types, Lacey & Caudwell's 1 type, and Gray, et.al.'s earlier scheme consisting of 6

 ¹⁹ Mathur, Mayer, Kshirsagar (2021), "What Makes a Dark Pattern...Dark?" Design Attributes, Normative Considerations, and Measurement Methods," CHI Conference on Human Factors in Computing Systems (CHI '21).
²⁰ Id.

²¹ Colin M. Gray, Yubo Kou, Bryan Battles, Joseph Hoggatt, and Austin L. Toombs (2018), "The Dark (Patterns) Side of UX Design." In Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems (Montreal QC, Canada) (CHI '18). In Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems (Montreal QC, Canada) (CHI '18). ACM, 534. Colin M. Gray, Shruthi Sai Chivukula, and Ahreum Lee. 2020. "What Kind of Work Do 'Asshole Designers' Create? Describing Properties of Ethical Concern on Reddit." In Proceedings of the 2020 ACM Designing Interactive Systems Conference (Eindhoven, Netherlands) (DIS '20). Association for Computing Machinery, 61–73.

types.²² Despite the provocative labels applied to dark patterns, each of these arbitrary and subjective categorization schemes lacks a reliable and valid foundation. The schemes are not actionable in any way, because there is no way to normatively identify a dark pattern. Therefore, it is not clear how one can apply the categorizations to new examples, let alone determine in a reliable and valid way that an example represents manipulation or deception.

30. As I will discuss in detail in Section VI, even presuming certain actions can be deemed "dark patterns," the use of supposed dark patterns by bad actors can be starkly contrasted with a firm like Google which rigorously designs its interfaces with the consumer in mind.²³ In contrast with dark pattern design, the Google UI explicitly provides consumers with a multitude of choices according to the principle of progressive disclosure – a bedrock of good UI design that puts users in the driver's seat to express their unique preferences, (e.g. clicking on a link to learn more or not), as each sees fit. (ref. Section V.B.). However nebulous a construct Dr. Gray's dark pattern is, my analysis of Google's UI negates Dr. Gray's dark pattern claims.

2. Dr. Gray's Opinions that Google's UI Includes "Dark Patterns" Are Not Based on Scientific Reasoning or Evidence

- 31. I have been informed that the Arizona Consumer Fraud Act ("ACFA") prohibits "the act, use or employment by any person of any deception, deceptive or unfair act or practice, fraud, false pretense, false promise, misrepresentation, or concealment, suppression or omission of any material fact with intent that others rely on such concealment, suppression or omission, in connection with the sale or advertisement of any merchandise whether or not any person has in fact been misled, deceived or damaged thereby, is declared to be an unlawful practice."
- 32. Having reviewed the Complaint, I was unable to locate even a single instance of the term "dark pattern" and I am unaware of the Complaint asserting that Google's UI relating to location constitutes a "dark pattern."

²² See Table 3 in Mathur, Mayer and Kshirsagar (2021).

²³ Discussion with Dr. Gretchen Gelke, Senior Manager User Experience at Google.

- 33. I understand that to offer an expert opinion admissible at trial an expert must offer scientific testimony based upon scientifically valid reasoning that can properly be applied to the facts of the case. Dr. Gray's description of "dark patterns" as applied to this case does not appear to be scientific testimony because, for example, the patterns he describes—"sneaking, forced action, interface interference, obstruction and nagging"— all require (by his own definition), and in this case assume, an intention to deceive or manipulate by Google. Dr. Gray fails to identify any such deception or manipulative intent. Rather, he simply compiles isolated anecdotes of confusion and snippets of examples out of context, which he interprets based on his subjective views.
- 34. To the extent Dr. Gray asserts that attempting to influence a user into action is a "dark pattern," that would imply that any and all consumer advertising or user-facing activity by any business could be construed by someone somewhere as a "dark pattern," as it is the goal of business to influence consumers to buy or consume certain products or services. It is not at all clear where Dr. Gray proposes to draw the line between the legitimate efforts of business to influence consumers (e.g., by recommending items for sale at checkout), and intentional, deceptive efforts to trick consumers into doing things against their wishes. The research on dark patterns is mute on this issue as there are only a handful of empirical efforts that have analyzed user response to dark patterns.
- 35. In contrast to Dr. Gray's descriptive report, in my analysis that follows, I lay out the context in which the disclosures at issue were made and evaluate them relative to established scientific principles of UI and human cognition.

IV. CONTEXTUAL CONSIDERATIONS

36. By means of introduction, a large body of scholarly and industry research in online consumer experience and human-computer interaction supports the idea that positive experiences and successful interactions with computer devices arise from giving users control over their navigational choices.²⁴ Indeed, user control is a key principle of UI

²⁴ Hoffman, Donna L., and Thomas P. Novak. "Marketing in hypermedia computer-mediated environments: Conceptual foundations." *Journal of marketing* 60, no. 3 (1996): 50-68.; Hoffman, Donna L., and Thomas P. Novak. "Flow online: lessons learned and future prospects." *Journal of interactive marketing* 23, no. 1 (2009): 23-34.; Marathe, Sampada, and S. Shyam Sundar. "What drives customization? Control or identity?." In Proceedings of the SIGCHI conference on human factors in computing systems, pp. 781-790. 2011.

design.²⁵ User control means giving users the freedom to decide what navigational choices to make during their interactions with an interface, such as which link to click, what menu to access, and so on, at any point during the interaction.

- 37. Because it is impossible for providers to know exactly what information is likely to be most important to every particular user for whatever reason at every particular step of each interaction, they must organize their user interfaces around solid principles of UI design. Additionally, if every piece of information were made available on every screen, users would suffer from information overload. Customer-oriented providers, with Google being a paramount example, therefore, do their best to apply principles of good UI design. This means that Google broadly organizes large amounts of information in a reasonable and comprehensible manner and then provides its users with numerous options on every screen so that users can be in control of the choices they make during interaction.
- 38. It is important to keep in mind that the industries Google competes in are highly dynamic and subject to a continuously and rapidly changing technology landscape. This means that what constitutes the state of the art in UI design and privacy disclosures are not static, but will necessarily evolve over time, both proactively to address user needs and also in response to changes in user behavior and expectations, industry and legislative standards, and competitive pressures. As my analysis will show, Google's interface design with respect to disclosures at issue in this case is generally user-friendly, especially considering how complex the underlying information is. It gives consumers easy control over the choices they make, the paramount concern in UI, without overwhelming them. It also evolves over time, both proactively and in response to feedback, as relevant technology, consumer expectations and industry norms evolve.
- 39. For example, Google provides a number of ways users can control their information including "activity controls" that let users control seven different User Data Control ("UDC") settings, including Web & App Activity ("WAA") and Location History

²⁵ See, for example Rosala, Maria, "User Control and Freedom (Usability Heuristic #3)," Nielsen Norman Group, November 29, 2020, available at https://www.nngroup.com/articles/user-control-and-freedom/; Marathe, Sampada, and S. Shyam Sundar. "What drives customization? Control or identity?." In Proceedings of the SIGCHI conference on human factors in computing systems, pp. 781-790. 2011.

("LH"), "Google Takeout" where users can download their own data, "My Activity" where users can review what data Google collects about them, and "My Account" which is the entry point for the options above, as well as other info and account settings.²⁶

40. Before evaluating Google's UI design around location data, I first discuss key considerations as they relate to the specific market, UI design, business, and technical contexts of this case.

A. Business/Organizational Considerations

- 41. Google is a highly innovative and extraordinarily successful company. It has grown steadily in a competitive environment by continuously developing and utilizing a range of technologies to deliver a variety of products and services appealing to a massive and diverse customer base. It is constantly trying to improve, create the best possible user experience, and respond to feedback.²⁷
- 42. Google is a customer-centric company. A customer-centric approach means having a "baked in" philosophy across every unit in the company that identifies customer needs as central to the firm's actions. Customer-centricity also implies specific frameworks to extract insights about customer needs and then use these insights to drive business decisions.²⁸ Customer-centric firms understand that "[c]ustomers represent the fundamental unit of analysis for marketing strategy, because each individual customer is an independent, decision-making entity."²⁹
- 43. According to Glass and Callahan (2014, p. 22), "Google is a nearly perfect example of a customer-focused, data-driven company. One of its core tenets is: "Focus on the user and all else will follow."³⁰ Its mission, "to organize the world's information and make it

²⁶ Google also provides an extended support and help network for users who desire even more information than provided through their mobile devices. This includes website help and support pages. In addition, voluminous material is easily searchable on the internet from technical sources other than Google on how to adjust Android settings.

²⁷ Discussions with Dr. Gretchen Gelke, Senior Manager User Experience, and David Monsees, Senior Project Manager responsible for UDC at Google.

²⁸ Fader, Peter. *Customer centricity: Focus on the right customers for strategic advantage*. University of Pennsylvania Press, 2020.

²⁹ Robert W. Palmatier and Shrihari Sridhar (2021), *Marketing Strategy: Based on First Principles and Data Analytics*, Macmillan Education Limited.

³⁰ Russell Glass and Sean Callahan (2014) The Big Data-Driven Business: How to Use Big Data to Win Customers,

universally accessible," is inherently customer-centric.³¹ Google's search product is the paramount example of this focus on ease of use and speed to guarantee highly positive experiences for users. The smartphone UI is similarly designed to generate positive experiences for users through the principle of progressive disclosure discussed above.

- 44. In pursuit of its customer-focused mission, Google employs a unique organizational structure. "Google does not have a traditional organization structure," but rather "maintains a more informal, organic organizational structure of business components and employees that continuously change (in varying degrees) to meet various demands."³² This means there are many decision makers. For example, Google has multiple teams working on the functionality of different settings that comprise User Data Controls.³³ Similarly, Google does not have just a single group focused on privacy, but rather "a distributed team and a series of processes."³⁴ Specifically, Google has Privacy Working Groups (PWGs) that are security and privacy "technical consulting groups made up of privacy subject matter experts."³⁵ The members of each PWG manage the privacy-aspects of product launches and provide targeted, privacy-focused guidance for product teams.³⁶ "Every PWG would review and approve changes to UDC or other product changes that are not trivial."³⁷
- 45. Many teams at Google are involved in implementing location-based features to enhance user experiences. For example, 38 different Google teams use Location History data "for their product or feature implementation in accordance with their user data access request

Beat Competitors, and Boost Profits. John Wiley & Sons, p. 22. *See also* "Google's 'user-centric' brand mission," WARC, August 1, 2018, available at https://www.warc.com/newsandopinion/news/googles-user-centric-brand-mission/en-gb/39839; Miller, Michael J., "Google Cloud's Thomas Kurian Says Customer Success Is Key," PCMag, October 30, 2019, available at https://www.pcmag.com/news/google-clouds-thomas-kurian-says-customer-success-is-key; Gosh, Sudipto, "New Google Analytics Brings in Customer-centric Measurement, YouTube Conversions Reports and Much More, MarTech Series, October 14, 2020, available at

https://martechseries.com/analytics/new-google-analytics-brings -in-customer-centric-measurement/.

³¹ Alphabet, Inc., Form 10-K, filed December 31, 2021, p. 4, https://abc.xyz/investor/static/pdf/20220202_alphabet_10K.pdf?cache=fc81690

³² Google's Response to CIDs 3, Demand for Information ("DFI") Nos. 19, 20, 21 pp. 87, 89. 90-91, citing to examination under oath of David Monsees, July 12, 2019.

³³ Affidavit of David Monsees, October 1, 2020, ¶ 34.

³⁴ Deposition of David Monsees, August 20, 2021 ("Monsees Deposition"), p. 163.

³⁵ GOOG-GLAZ-00317867 at -873.

³⁶ GOOG-GLAZ-00317867 at -873.

³⁷ Deposition of David Monsees, August 20, 2021 ("Monsees Deposition"), p. 163.

and Google's policies."³⁸ On the user side, the LH feature can be used to recommend places of interest and transit points to travelers, provide last known location to emergency responders, enable parental controls and location sharing among friends, and furnish personalized recommendations and localized search results.³⁹

- 46. Likewise, at least nine different teams have approved access to Web & App Activity data "to improve Google users' experiences across Google products and services."⁴⁰ Depending on how the user configures it, WAA saves information about user searches (e.g. chrome browsing history, maps) and activities from other Google services (e.g. ad clicks) in order to enhance user experiences. WAA data is used "to get location for a user at the time of a user's interaction with a Google product or service in order to deliver a more relevant and personalized experience."⁴¹ "Web & App Activity data is specifically used to help Google give users more personalized experiences across Google services. This includes things like faster searches, better recommendations, and useful ads, both on and off Google."⁴² For example, a user interested in local restaurants could search for "restaurant" using Google Search or Google Maps. WAA, if enabled, would use the "search term as well as information about that activity, including IP address and location information" to show the user nearby restaurants.
- 47. Similarly, Google's Geo product area, which includes Google Maps and other location products, is comprised of 11 or more different (sub)teams, including IPGeo.⁴³ IP Geo is a system "used to take an IP address and infer location from that … adding personalized features to various of our products based on location … for example, the ability to tailor search results and make them more relevant based on the user's current location."⁴⁴
- 48. Within each team, there are multiple stakeholders and decision makers. For example, the LH and WAA teams each have their own product managers, technical personnel, and organizational reporting structures. Marlo McGriff, Product Manager for Location

³⁸ Google's Response to CID 3, DFI Nos. 4 and 5, pp. 65-68.

³⁹ Google's Response to CID 3, DFI No. 5, pp. 66-68.

⁴⁰ Google's Response to CID 3, DFI Nos. 7 and 8, pp. 70-73.

⁴¹ Google's Response to CID 3, DFI No. 8, p. 72.

⁴² Google's Response to CID 3, DFI No. 7, p. 71.

⁴³ Google's Response to CID 3, DFI No. 19, pp. 87-88; RFP No. 3, p. 37.

⁴⁴ Deposition of Jennifer Fitzpatrick, March 3, 2022, p. 50.

History, reports to **Construction** (Senior Director, Product Management Geo), who in turn reports to Dane Glasgow (Vice President of Geo Product Experience), who in turn reports to senior management.⁴⁵ Similarly, Mr. Monsees, Product Manager for Web & App Activity, reports to Bryan Horling (Software Engineer). Mr. Horling reports to

(Vice President of Engineering), and Mr. reports to senior management.

- 49. Each team also engages with one or more Privacy Working Groups. Privacy at Google is a cross-functional management effort. The PWGs are Security & Privacy technical consulting groups made up of privacy subject matter experts.⁴⁶ Among other things, "PWGs manage the Privacy launch review process and provided targeted guidance for product teams. Most PWGs are embedded in the product area or function."⁴⁷ Beyond the PWGs, there are numerous other individuals and groups that work together to achieve Google's commitments regarding privacy.⁴⁸ For example, there is also a Privacy Advisory Council ("PAC"), and group of Vice Presidents and Senior Vice Presidents that sit above the PAC and act as further escalation points on privacy issues.⁴⁹
- 50. Google's innovative, customer-focused, data-driven ethos thrives on feedback. Combined with its organizational structure featuring multiple product teams, issue-specific working

⁴⁹ GOOG-GLAZ-00317867 (Privacy Policies, Structure and Review.pdf, at GOOG-GLAZ-00317873.)

(Basic

⁴⁵ Google's Response to CID 1, Response to Request for Production ("RFP") No. 2, p. 32.

⁴⁶ "The term 'PWG' (Privacy Working Group) refers to a collective of privacy and technical personnel that review launches, answer questions, and offer advice on privacy and data protection requirements for a particular product area. Each PWG is comprised of privacy experts from multiple functions. PWGs are cross-functional groups, not standalone organizational units. (Google's Response to CID 4, DFI 11, p. 14.)

⁴⁷ GOOG-GLAZ-00317867 (Privacy Policies, Structure and Review.pdf, at GOOG-GLAZ-00317873.) A "launch" at Google is "[a]ny new development, modification, deprecation, or termination of a product, service, or study at an Alphabet company that: presents a new user experience; and/or changes public facing representations; and/or impacts how we collect, use, store, retain, or share User Data or Workforce Data internally or externally," (GOOG-GLAZ-00317867, at GOOG-GLAZ-00317879.) Each launch at Google requires a Privacy Design Document ("PDD") which "summarizes the privacy-relevant details of a product or service and is a living document that changes as the product does." (GOOG-GLAZ-00317867, at GOOG-GLAZ-00317880.)

⁴⁸ "[T]here are many people who are likely to encounter privacy and user expectations around privacy as part of the research across Google that are embedded in teams all across Google." (Deposition of Gretchen Gelke, September 3, 2021, p. 23.) The Privacy and Security UX Research Team, Android UX Research Team, and GO teams also conduct research and experimental studies on privacy and security topics, including related to user location data specifically. (Deposition of Gretchen Gelke, September 3, 2021, pp. 20-25.)

Internet Privacy Policy at GOOG-GLAZ-00317862; In-Product Notice and Consent User Experience Policy.pdf, at GOOG-GLAZ-00317845.)

groups, and cross-functional management teams, working together on complex issues can lead to vigorous debate, potentially conflicting viewpoints, differing knowledge about various other working groups, and sometimes quite deliberative decision-making processes. It is my understanding that all substantive UI design and related disclosure change proposals for any Google surface are vetted by at least five to a dozen reviewers including representatives from product, privacy, legal teams between their initial collaborative development and actual launch.⁵⁰ It is important to keep this unique organizational and business context in mind when evaluating Google's actions and output, let alone its intent.

B. Market/Consumer Considerations

1. The Rise of Location-Based Services

- 51. Over the past decade, the rise of the smartphone has transformed the mobile industry and reshaped consumers' expectations and relationships with their mobile devices. Consumer demand for location-based services ("LBS") has closely tracked the rapid growth of the smartphone market. Between 2011 and 2021, the percentage of U.S. adults who report smartphone ownership grew from 35% to 85%.⁵¹ Concurrently, the percentage of Americans reporting use of location-based services grew from 28% in 2011 to 74% in 2013 and 90% in 2015.⁵²
- 52. Today, virtually all smartphone users, which now comprise the vast majority of adults in the U.S., access location-based services on their smartphones and consider location-based services an essential component of their mobile experience. LBS underpin key functionalities for many of the most popular applications in mapping and navigation, local search and information, social networking, fitness, ride sharing, entertainment, and

 $^{^{50}}$ Discussion with David Monsees, Senior Project Manager responsible for UDC Product Manager for Web & App Activity

⁵¹ Pew Research Center, "Mobile Fact Sheet," April 7, 2021, available at https://www.pewresearch.org/internet/fact-sheet/mobile/.

⁵² Pew Research Center, "28% of American adults use mobile and social location-based services," September 6, 2011, available at https://www.pewresearch.org/internet/2011/09/06/28-of-american-adults-use-mobile-and-social-location-based-services/; Pew Research Center, "Location-Based Services," September 12, 2013, available at https://www.pewresearch.org/internet/2013/09/12/location-based-services/; Pew Research Center, "More Americans using smartphones for getting directions, streaming TV," January 29, 2016, available at https://www.pewresearch.org/fact-tank/2016/01/29/us-smartphone-use/.

gaming.⁵³ By 2015, 83% of smartphone users identified location services as "crucial" to their mobile experience.⁵⁴

- 53. One of the most important LBS apps is navigation. Most smartphone owners use navigational apps, with Google Maps being the most popular navigational app by far.⁵⁵ In January 2022, Google Maps had the fourth largest reach among smartphone apps in the U.S., reaching 56% of all smartphone users (behind YouTube with 73%, Facebook with 63%, and Gmail with 57%).⁵⁶
- 54. Many of the most-used apps on Android rely significantly on LBS for their functionality, from Pokemon Go to Tinder, which generated \$320 million and \$306 million in gross revenue in 2021, respectively.⁵⁷ Many of Google's own apps also use location to provide enhanced services to users, such as up-to-date local weather conditions, geotagged photos, and real-time traffic information and turn-by-turn directions.
- 55. The value of location data to consumers can also be seen by the increasing number of marketers who use location-based marketing strategies to better serve their customers. Marketers use information about a consumer's location to provide them personalized and more relevant offers, products, and services. The location-based marketing sector is predicted to grow significantly over the next five years.⁵⁸ A majority of smartphone marketers report significant benefits from incorporating location into their marketing and advertising efforts. Location-based marketing increases sales, grows the number of

⁵⁵Panko, Riley, "The Popularity of Google Maps: Trends in Navigation Apps in 2018," The Manifest, July 10, 2018, available at <u>https://themanifest.com/app-development/trends-navigation-apps;</u> Statista, "Leading mapping apps in the United States in 2021, by downloads," May 11, 2022, available at

https://www.statista.com/statistics/865413/most-popular-us-mapping-apps-ranked-by-audience/.

⁵⁶ Statista, "Mobile audience reach of leading smartphone apps in the United States in January 2022," March 7, 2022, available at https://www.statista.com/statistics/281605/reach-of-leading-us-smartphone-apps/.

⁵³ Business News Daily, "Location-Based Services: Definition and Examples," May 4, 2022, available at https://www.businessnewsdaily.com/5386-location-based-services.html.

⁵⁴ GeoMarketing, "Consumers Deem Location Services 'Crucial' For Apps — But Only Half of Them Leave Geo Signals On," October 20, 2015, available at https://geomarketing.com/consumers-deem-location-services-crucial-for-apps-but-only-half-of-them-leave-geo-signals-on.

⁵⁷ BusinessofApps, "Top Grossing Apps (2022)," May 4, 2022, available at https://www.businessofapps.com/data/top-grossing-apps/.

⁵⁸ GlobeNewsWire, "Global Location Based Advertising (LBA) Market Report 2021: Market to Reach \$133 Billion by the Year 2026, from \$63.9 Billion in 2020," February 10, 2022, available at

https://www.globenewswire.com/news-release/2022/02/10/2382926/28124/en/Global-Location-Based-Advertising-LBA-Market-Report-2021-Market-to-Reach-133-Billion-by-the-Year-2026-from-63-9-Billion-in-2020.html.

customers for the application, increases customer engagement, and provides greater insights into customers' needs.⁵⁹ As discussed further below, consumers also appreciate and benefit from location-relevant content, including advertising.

2. Privacy Concerns Are Contextual and Individualized

- 56. Privacy is not a monolithic construct that is automatically violated whenever information is collected. Rather, the level of perceived privacy threat depends to a large extent on both the context and the individual. The high level of variance among individuals with respect to privacy reinforces the importance of industry norms and market context, leading Nissenbaum (2009) to conclude that "only data collection practices that violate context-specific informational norms are problematic."⁶⁰
- 57. There is a robust literature on the role of privacy concerns in consumers' decision-making processes in the context of engaging with LBS. Of specific interest is whether consumers engage in a "privacy trade-off" when balancing the value that the service provides with any costs to privacy. Wottrich et al. (2018) demonstrate that consumers do engage in a privacy trade-off, and are willing to trade privacy in exchange for mobile app services. When apps provide a high level of value, consumers are increasingly willing to discount privacy.⁶¹ Other studies have shown that while privacy concerns are an important determinant of engagement with LBS, "users tend to trade-off their privacy for the benefits obtained."⁶² Research also shows that consumers "like" or find value in (*i.e.*, click through) location-based advertising, especially if the advertising is motive-congruent (meaning that it aligns with their needs).⁶³

 ⁵⁹ Statista, "Mobile audience reach of leading smartphone apps in the United States in January 2022," March 7, 2022, available at https://www.statista.com/statistics/1040830/location-based-marketing-leading-benefits-us/.
⁶⁰ Helen Nissenbaum, Privacy in Context: Technology, Policy, and the Integrity of Social Life, Stanford University Press, 2009.

⁶¹ Wottrich et al, "The privacy trade-off for mobile app downloads: The roles of app value, intrusiveness, and privacy concerns," *Decision Support Systems*, 2018, p. 50 ("The robust findings of our study show that although consumers do engage in a privacy trade-off, they still do not seem to be sufficiently equipped to make well-considered, self-regulated privacy decisions when downloading apps, because app value seems to overrule the influence of app intrusiveness and privacy concerns in the decision-making process.")

⁶² Gutierrez, Anabel, et al. "Using privacy calculus theory to explore entrepreneurial directions in mobile locationbased advertising: Identifying intrusiveness as the critical risk factor." *Computers in Human Behavior* 95 (2019): 295-306. The authors posit that this may be the case because users are progressively accepting that privacy/security concerns are better managed than before.

⁶³ Hühn et al., "Does location congruence matter? A field study on the effects of location-based advertising on

- 58. The literature also makes it clear that there is no "representative" user; rather users have diverse "mental models" and expectations. Multiple studies have shown that the perception of privacy threats is highly individualized. Differences among users on measures of age,⁶⁴ personality,⁶⁵ psychosocial characteristics,⁶⁶ and privacy fatigue⁶⁷ can significantly affect consumer decisions about privacy. A recent study used 34 distinct factors to construct a privacy calculus index, reinforcing the idea that individual privacy decisions are multifaceted and diverse.⁶⁸
- 59. Google, being a customer-centric provider, is well aware that privacy concerns are highly contextual and individualized, and designs its UI accordingly.⁶⁹
- 60. According to David Warren, the Technical Writer responsible for updating Google's Privacy Policy, starting in 2018, Google's privacy policy was treated more like a UX product, with UX writers (rather than only lawyers) preparing and improving upon this user-facing document that aimed to convey the policies in a way that every user could easily digest and appreciate. Google utilized a "writers room" where writers would gather weekly and discuss how to best convey the policy to users. That included making judgments about what users would care most about regarding a specific setting or feature. Google intentionally added buttons, large visuals, videos, and recurring patterns so users

perceived ad intrusiveness, relevance & value" *Computers in Human Behavior*, 2017, p. 667 ("The results of our real world investigation show that location congruency has a positive effect on the perceived relevance and value of the mobile ad. In contrast, against our expectation, we did not see a significant effect of location-congruency on perceived ad intrusiveness.").

⁶⁴ Wottrich et al., p. 50.

⁶⁵ Junglas, Iris A., Norman A. Johnson, and Christiane Spitzmüller. "Personality traits and concern for privacy: an empirical study in the context of location-based services." *European Journal of Information Systems* 17.4 (2008); 387-402.

⁶⁶ Lee, Jin-Myong, and Jong-Youn Rha, "Personalization–privacy paradox and consumer conflict with the use of location-based mobile commerce," Computers in Human Behavior 63 (2016): 453-462.

⁶⁷ Choi, Hanbyul, Jonghwa Park, and Yoonhyuk Jung, "The role of privacy fatigue in online privacy behavior." *Computers in Human Behavior* 81 (2018): 42-51.

⁶⁸ Beke, Frank T., et al. "Consumers' privacy calculus: The PRICAL index development and validation," International Journal of Research in Marketing 39.1 (2022): 20-41.

⁶⁹ "There are various matters that Google takes into account in designing the processes by which UDC settings can be accessed and changed by users. A very large and diverse population of users use Google's products. They have different characteristics in terms of age, education, reading level and familiarity with technology. They also may have quite distinct interests and concerns when accessing UDC settings. In designing the processes and screens by which users will access UDC settings, Google needs to account for this diversity of users and diversity of needs. On a mobile device, Google also needs to account for the small screen space." (Affidavit of David Monsees, October 1, 2020.) *See also* GOOG-GLAZ-00216028 - "Coarse Location Data: Comfort with Different Levels of Location Precision," Q4 2018.

could recognize and make sense of the material. Concerted effort was made to make legal concepts comprehensible to users. Google attempted to minimize jargon, use common English, break up long sentences to improve the readability of the policy, and provide examples. Google rewrote the policy to cater to and educate three audiences it identified: skippers, skimmers and readers. At the time, Google's approach to user privacy policy was highly innovative.⁷⁰

- 61. According to Google, "skippers" are people who land on long text and will barely stop on it, so Google uses bold text in the hope that the most important portions of the text will be absorbed. Google's aim is to catch their attention so "skippers" will at least be exposed to the most important concepts in the text and then choose whether to spend more time skimming and reviewing the information. For "skimmers," Google is trying to create a narrative through the headlines so that "skimmers" can have a sense of the information quickly and will then read as much as possible. For "readers" Google seeks to provide detailed and progressive disclosure so that users who may want access to more information have more and more opportunities to learn more about a particular feature or setting.
- 62. According to Google, important to all of these audiences is the concept of progressive disclosure, which is a core tenet of UX writing and design. Google does not believe audiences need five sentences when a simple term will do, but wants to ensure that supplementary information is accessible through progressive disclosure for those who want it (e.g. pop-outs, internal and outbound links). In general, Google's goal is to provide a "well lit path,"⁷¹ that facilitates top level awareness of privacy and terms with easily accessible links to pictures, videos, or additional text that provide information in different ways to reach as many users as possible.
- 63. Based on my discussion with Mr. Warren, it appears that the privacy policy and subsequent legal disclosures are drafted with the explicit goal of getting as many users as possible to engage with the content so that skippers become skimmers and skimmers

⁷⁰ Discussion with David Warren, Technical Writer.

⁷¹ Discussion with David Warren, Technical Writer.

become readers. In this way, users will be more likely to read and understand the disclosures.

3. Search Has Revolutionized Ready Access to Information

- 64. The number of Google searches per day has increased significantly in recent years, from around 3.5 billion in 2012 to 5.6 billion in 2021.⁷² Today, the average person submits a Google search an estimated three or four times a day.⁷³ This is not surprising as Google Search delivers results. One study of user behavior found that only 15 percent of users modified their initial search term, indicating that the remaining 85 percent succeeded in finding relevant results on the first try.⁷⁴
- 65. Smartphone users have also come to rely on Google search as a key resource. Mobile devices account for more than 50 percent of all web traffic, and 63 percent of all Google searches originate from mobile devices. These percentages are expected to continue growing as smartphones enjoy faster and faster internet connections.⁷⁵
- 66. Owing to the success of Google's search engine, smartphone users understand that they can quickly and easily find reliable information simply by searching for it. This information includes online support guides that help users navigate and fully understand LBS-related technology features.⁷⁶ Indeed, search has become a critical tool to enhance user experience in navigation.

⁷² *Internet Live Stats,* "Google Search Statistics," available at https://www.internetlivestats.com/google-search-statistics/; Prater, Meg, "25 Google Search Statistics to Bookmark ASAP," *HubSpot*, June 9, 2021, available at https://blog hubspot.com/marketing/google-search-statistics.

⁷³ Prater, Meg, "25 Google Search Statistics to Bookmark ASAP," *HubSpot*, June 9, 2021, available at https://blog hubspot.com/marketing/google-search-statistics.

⁷⁴ Dean, Brian, "How People Use Google Search (New User Behavior Study)," *Backlinko*, August 20, 2020, available at https://backlinko.com/google-user-behavior.

⁷⁵ Georgiev, Deyan, "111+ Google Statistics and Facts That Reveal Everything About the Tech Giant," *Review42*, May 12, 2022, available at https://review42.com/resources/google-statistics-and-facts/; Lin, Ying, "10 Mobile Usage Statistics Every Marketer Should Know in 2021 [Infographic]," *Oberlo*, June 20, 2021, available at https://www.oberlo.com/blog/mobile-usage-statistics.

⁷⁶ See, e.g., Jansen, Mark and Parrish, Kevin, "How to use gesture navigation in Android 11, or how to turn it off," *digitaltrends*, March 26, 2021, available at https://www.digitaltrends.com/mobile/how-to-use-gesture-navigation-inandroid-10/. See also, Raphael, JR, "10 hidden tricks for making the most of Android gestures," *Computerworld*, February 25, 2022, available at https://www.computerworld.com/article/3439060/android-gestures html.

C. Technical Considerations

- 67. Google relies on a variety of geolocation-related technologies in delivering products and services that consumers want. While I am not a technical expert, I briefly describe here some of these technologies, which will be referenced below in my UI analysis.⁷⁷
 - <u>GPS</u> "GPS is a radio navigation system that is relatively precise. It works by using radio waves between satellites and a receiver inside a device to geolocate the device. The device's GPS receiver uses data from the satellite signals to triangulate where the device is and what time it is."⁷⁸
 - <u>Device sensors</u> "Built-in sensors on devices measure motion, orientation, and various environmental conditions. The Android OS [operating system] supports a number of these different sensor types, which vary from device to device. ... Android OS application developers, including Google, can use accelerometers, gravity sensors, gyroscopes, rotational vector sensors, barometers, orientation sensors, and magnetometers to more precisely determine a device's location."⁷⁹
 - c. <u>Cellular network information</u> "Depending on the type of network to which the device is connected, Google may collect the tower-broadcasted latitude and longitude of the cell tower from which the device is receiving service."⁸⁰
 - <u>WiFi and Bluetooth scanning</u> "These settings (on a user's device) allow apps and services to scan for publicly available information from nearby devices (for example, Wi-Fi access points or Bluetooth beacons). These settings allow the user's device to scan for nearby networks or other devices, even when Wi-Fi or Bluetooth connectivity settings are disabled on a user's device."⁸¹
 - e. <u>IP address</u> "IP addresses are required for devices to be able to connect to the Internet and are necessary for online services to function. Because IP addresses are usually assigned in geographic blocks, they may be used to provide an estimate of

⁷⁷ I understand from counsel that various aspects of these technologies will be discussed more fully in a concurrently filed expert report by Dr. Georgios Zervas.

⁷⁸ Google's Response to CID 1, Response to DFI No. 2, p. 5.

⁷⁹ Google's Response to CID 1, Response to DFI No. 2, p. 5.

⁸⁰ Google's Response to CID 1, Response to DFI No. 2, p. 5.

⁸¹ Google's Response to CID 1, Response to DFI No. 2, p. 6.

the location from which a device is connecting to the Internet. ... Google may need to roughly estimate a user's location by using an IP address, even when a particular device and Google Account settings affecting other user location information are disabled," for regulatory compliance or fraud detection, for example.⁸²

- 68. To enable products and services that rely on this suite of technologies while providing each member of their diverse customer base their own choices of how to use them, Google provides users with a combination of account, device, and application-level settings.⁸³ Here again, while I am not a technical expert, I briefly describe these types of settings, which will be referenced below in my UI analysis.⁸⁴
 - a. <u>Account level settings</u> apply to a user's account/profile across all their devices associated with that account. "[Google Account Settings] ... are the settings that control aspects of the Google Account across all Google products and services where the user is signed in, and across all devices that the user uses to access those products and services."⁸⁵ They enable users to control their profile information (*e.g.*, name, age); general preferences (*e.g.*, language and region settings); security settings (*e.g.*, passwords and verification methods); how their data are saved (or not), which in turn affects product and service personalization; and account storage (*e.g.*, for email and photos).⁸⁶ Users can access and change their Google Account settings at any time and in a variety of ways, including over the internet with any browser, regardless of device, and if a user is logged into their Google Account, they can also access their Google Account settings from within apps and using the Chrome browser on a desktop computer.⁸⁷ Both LH and WAA are account level settings.⁸⁸ As explained in Google's Privacy Policy, neither LH nor WAA "affect or control device settings,"

⁸² Google's Response to CID 1, Response to DFI No. 2, p. 6.

⁸³ These various settings accommodate users engaging with Google products and services through many different means, e.g., iPhones, Androids, desktop and laptop Macs and PCs.

⁸⁴ I understand from counsel that various technical aspects of these settings may be discussed more fully in a concurrently filed expert report by Dr. Zervas.

⁸⁵ Affidavit of David Monsees, October 1, 2020, ¶ 25.

⁸⁶ Affidavit of David Monsees, October 1, 2020, ¶ 24.

⁸⁷ Affidavit of David Monsees, October 1, 2020, ¶ 28.

⁸⁸ Google's Motion for Summary Judgment, July 23, 2021, p. 11, footnote 2.

which vary based on the specific device and which Google does not create or control."89

b. <u>Device level settings</u> apply only to the device on which they are set. On the Pixel and many other Android devices, "[w]hen the device's location setting [Device Location Setting] is on, apps with the user's permission can access the device's location," and when it is off, "no apps can access the device's location."⁹⁰ Users can change this setting at any time in the 'Security & location' panel of their Pixel [and presumably many other Android devices]."⁹¹ Even when a device's location setting is turned off, however, "apps or websites connecting to the Internet may continue to use other signals like IP address, or other information the user provides, to infer information about the user's location."⁹² "As a general matter, … IP addresses are required for devices to be able to connect to the Internet and are necessary for online services to function … IP address information is transmitted, even when location settings are disabled."⁹³ Other device location settings (besides primary Device Location Setting described above) include Google Location Accuracy ("GLA"), previously called Google Location Services ("GLS"); User Location Reporting ("ULR"); and Usage and Diagnostics.⁹⁴

⁸⁹ Google's Response to CID 1, DFI No. 12, p. 22.

⁹⁰ Google's Response to CID 1, DFI No. 7, p. 18.

⁹¹ Google's Response to CID 1, DFI No. 7, p. 18.

⁹² Google's Response to CID 1, DFI No. 7, p. 18.

⁹³ Google's Response to CID 1, DFI No. 12, p. 22; see also Google's Privacy Policy and Terms of Service circa January 2017 (GOOG-GLAZ-00299381-394.)

⁹⁴ Google's Motion for Summary Judgment, July 23, 2021, p. 11, footnote 2 (citing the Amended Complaint); Google's Response to CID 1, DFI No. 2, p. 7.

 [&]quot;GLA is a network-based location service that collects data to improve location accuracy and provide certain location information to the apps and services with the requisite permissions." (Google's Response to CID 1, DFI No. 7, p. 18.) "Q. So if the user turns Google Location Accuracy [GLA] on, what is he or she enabling? A. For Google to provide additional -- to use additional signals to provide a more accurate location on the device for apps and services that have the requisite permission. Q. What are those additional signals comprised of? A. They include WiFi, cell, gyro, magnetometer, accelerometer and barometer." (Examination Under Oath of Jennifer Chai ("Chai EUO"), September 25, 2019, p. 57; see also Google's Response to CID 3, DFI No. 1, p. 61.

collects information from the device sensors and the scans as well as the location calculated by the scans " to Location " to Location " to Location " to Location information itself (Google's Response to CID 3, DFI No. 1, p. 60, emphasis added.) and does not collect location information itself (Google's Response to CID 1, DFI No. 2, p. 7), but "can provide estimated location received from " [now <u>GLA</u> (described above)]" or "estimated location based on the device's GPS

- c. <u>Application-level settings</u> apply to the apps in which they are set.⁹⁵ The app-level permissions control whether a particular app may obtain the device's location from the device location services Application Programming Interfaces (API).⁹⁶ The device can derive location from sensor data and information about things near a user's device, such as WiFi access points and cell towers, and is provided to the Google products and services via APIs.⁹⁷
- 69. The rapid evolution and capabilities of geolocation related technologies, and the efforts Google exerts to provide its individual users with control over these technologies are important considerations to keep in mind when evaluating the UI at issue, particularly with respect to allegedly malicious intent.

V. UI CONSIDERATIONS

A. Heterogeneous Users and Human Cognition

70. As discussed above, individual users have differing preferences for privacy, with those preferences varying depending on characteristics of the user and the context. As such, a key challenge that UI designers grapple with is balancing functionality (power) with usability (simplicity). Good UI design enables enhanced functionality while at the same

 ⁹⁵ Android Help, "Change app permissions on your Android phone," available at https://support.google.com/android/answer/9431959?hl=en#zippy=%2Ctypes-of-permissions.
⁹⁶ Coogle's Supplemental Barranse to Interpretation No. 11, p. 20 ("

⁹⁶ Google's Supplemental Response to Interrogatory No. 11, p. 20 ("

chipset." (Google's Response to CID 3, DFI No. 1, pp. 61-62.) "For Google-licensed Android devices, Fused Location Provider is an API that provides location to apps and services with the requisite user permissions." (Google's Response to CID 3, DFI No. 6, p. 70.)

 [&]quot;The optional <u>Usage & Diagnostics</u> setting helps Google improve Android OS based on information about how devices are used and work. When this setting is enabled, Google collects IP addresses. When the Usage & Diagnostic setting is disabled, Google may still collect user location information via other relevant settings." (Google's Response to CID 1, DFI No. 7, p. 18.)

⁹⁷ Google's Response to CID 3, DFI No. 6, p. 68. "Android OS application developers, including Google, can use accelerometers, gravity sensors, gyroscopes, rotational vector sensors, barometers, orientation sensors, and magnetometers to more precisely determine a device's location." (Google's Response to CID 1, DFI No. 2, p. 5.) "Google Mobile Services (GMS) is a collection of Google applications and APIs that help support functionality across devices." (Google's Response to CID 3, DFI No. 16, p. 85.) "GMS products collect, store, transmit, use, delete, and disclose [share] location information." (Google's Response to CID 3, DFI No. 10, p. 74.) GMS products include Google, Chrome Browser, Gmail, Google Maps, YouTube, Google Play Store, Drive, Google Play Music, Google Play Movies, Duo, and Google Photos. (Google's Response to CID 3, DFI No. 10, p. 82.) "They [LocationManager API within Android and FLP API within Google Play Services] provide [location data to] apps that have the required permission. As long as the location toggle is on for the device, they will provide location data to apps and services, yes." (Chai EUO p. 65)

time allowing for an interface that is easy to use for the largest number of users, does not overwhelm users, and takes into account the many different types of users. As enhanced functionality necessarily increases complexity, this may require users to invest more and more time just learning how to navigate the interface. If users cannot successfully navigate the UI to meet their needs, their experiences could be significantly degraded. For this reason, good UI design strives to provide this complexity of information in an easy to use way that is "aesthetic and minimalist."⁹⁸

71. Users themselves, however, present a challenging UI design paradox. This is because from a cognitive science perspective, users have tendencies to both "focus on end products at the expense of prerequisite learning," and "apply prior knowledge even when it does not apply."⁹⁹ In light of these challenges, creative solutions are required to facilitate learning without degrading user experience. A key solution that has emerged as an industry standard is progressive disclosure.

B. Progressive Disclosure

72. *Progressive disclosure* is a long-standing approach to interface design that reconciles functionality and content with usability.¹⁰⁰ First called the "Training-Wheels System," the process, rooted in understanding of human cognition, has been known to improve

⁹⁸ ("Interfaces should not contain information which is irrelevant or rarely needed. Every extra unit of information in an interface competes with the relevant units of information and diminishes their relative visibility... it's about making sure you're keeping the content and visual design focused on the essentials."). Nielson, Jakob, "10 Usability Heuristics for User Interface Design," *Nielsen Norman Group*, April 24, 1994, available at

www nngroup.com/articles/ten-usability-heuristics/; ("Apple's iOS environment initially focused on informing users about applications requesting their location, enabling them to selectively decide which app they were willing to grant access to their location and also giving them some real-time visibility into whether their location was being accessed or had been accessed over the past 24 hours. With the introduction of iOS6, this approach was extended to encompass the ability to dynamically review and revise permissions to access one's location, calendar, reminders, photos, contacts list and more. While this approach provides more control to users, it overwhelms them with options they cannot realistically be expected to manage. This situation reflects a fundamental tension between usability and privacy, with greater privacy arguing for users being given a greater number of controls or settings, and usability arguing for keeping a tractable number of decisions for users to make."). Liu, Bin, Jialiu Lin, and Norman Sadeh, "Reconciling Mobile App Privacy and Usability on Smartphones: Could User Privacy Profiles Help?" *Proceedings of the 23rd International World Wide Web Conference*, December 2013, p. 201.

⁹⁹ Rosson, Carroll J., and J. M. Carroll. "The Paradox of the Active User," Interfacing thought: Cognitive aspects of human-computer interaction (1987): 26-28.

¹⁰⁰ Nielsen, Jakob, "Progressive Disclosure," *Nielsen Norman Group*, December 3, 2006, available at www nngroup.com/articles/progressive-disclosure/; Interaction Design Foundation, "Progressive Disclosure," available at https://www.interaction-design.org/literature/topics/progressive-disclosure.

efficiency and usability since the 1980s.¹⁰¹ Fundamentally, progressive disclosure involves simply presenting only commonly-used features first and deferring more sophisticated options to secondary screens.¹⁰² Progressive disclosure aims to simplify the basic experience for users by prioritizing the most important features, and letting users control what additional features or details they want or need to see next.

- 73. Thus, progressive disclosure puts control in the hands and minds of individual users so that they are free to exercise choice over their navigation decisions by deciding for themselves what information they want to consider, in what order, when interacting with an interface. This design flexibly accommodates the variability in different users' needs and behaviors, benefiting, for example, both novices and experienced users, or skippers, skimmers, and readers, by allowing for both choice and control.¹⁰³
- 74. Information underlying LBS and related technology disclosures is by necessity complex. It is therefore critical to maintain a user-friendly interface that is accessible to all members of the diverse population of users. This is understandably challenging as users represent most adults in the U.S. Therefore, the goal is to provide the easiest and most intuitive UI that will satisfy the needs of many different types of users who wish to learn more about their location privacy. A UI based on progressive disclosure offers users the most effective way to access the information they want when they want it without information overload.¹⁰⁴

¹⁰³ Nielsen, Jakob, "Progressive Disclosure," *Nielsen Norman Group*, December 3, 2006, available at www nngroup.com/articles/progressive-disclosure/. Progressive disclosure stands in opposition to those who would argue that instead of offering users options about what to do next in an interaction, users should instead be overloaded with every single piece of information on every screen, regardless of its relevance to every user in every context in every interaction.

¹⁰¹ Galitz, Wilbert O. The essential guide to user interface design: an introduction to GUI design principles and techniques, John Wiley & Sons, 2007, pp. 56-57.

¹⁰² Carroll, John M. and Carrithers, Caroline. "Training Wheels in a User Interface," *Communications of the ACM* 27.8 (1984): 800; Babich, Nick, "Progressive Disclosure: Simplifying the Complexity," Shopify Partners, available at www.shopify.com/partners/blog/progressive-disclosure.

¹⁰⁴ Google's own search help pages offer informative steps for customers to control their data, including their Location History and Web & App Activity. See Google Account Help, "Manage your Location History," available at https://support.google.com/accounts/answer/3118687?hl=en; Google Account Help, "Find & control your Web & App Activity," available at

https://support.google.com/websearch/answer/54068?hl=en&co=GENIE.Platform%3DAndroid.

- 75. Rapidly evolving mobile/LBS market spaces and related consumer cognitive limitations are also important contextual considerations to keep in mind when evaluating the UI at issue as well. With so much demand for LBS, and such great diversity among users, it makes sense to offer users control over the many choices they face when learning about and adjusting their settings. Progressive disclosure provides users with that control, enabling them to tailor their interactions to their own preferences.
- 76. Given that there are hundreds if not thousands of combinations of potential user actions available in a mobile operating system, and providers are unable to intuit exactly what will be important to each user in every situation, judgments must be made on how best to group options that address the needs of diverse users while at the same time providing for control. A variety of different menus and icons serve as aids to provide user control over navigation. These menus and icons allow users to navigate to the features, setting options and information that are most relevant to them.
- 77. Menu and icon navigational tools are necessary because it is not possible to put the details of every single potentially relevant disclosure on every single screen. In mobile OS and app design, in which both users' time and screen space, i.e., "real estate," are at a premium, using progressive disclosure tools like these is critically important.¹⁰⁵
- 78. Navigational tools are a key element of progressive disclosure that helps users control the interaction, determining what information to access, where to click next, and so on, at any particular point in time. A good UI should be designed so that information desired by the broadest possible array of users can be quickly and easily accessed in the most flexible way possible for those users.
- 79. As my UI analysis below will show, Google's practice of designing menus according to the principle of progressive disclosure to give users a "good overview," "organize items intuitively," and "make settings easy to find" reflects effective execution of UI design

¹⁰⁵ Nielsen, Jakob, "Defer Secondary Content When Writing for Mobile Users," Nielsen Norman Group, July 31, 2011, available at www.nngroup.com/articles/defer-secondary-content-for-mobile/.

principles and enable the consumer, as opposed to Google, to decide what action to take depending on the context.¹⁰⁶

80. One example of progressive disclosure from the Android setup process is below (circa January 2017).¹⁰⁷ This screen gives users additional setup options, available by simply tapping the tile with the desired option. If users do not wish to set up these additional options, they can simply tap "NO, THANKS" and be returned to the home screen.



81. Google also makes good use of hyperlinks to let users drill down on terms used and topics arising in the context of its service descriptions and related disclosures. As I

¹⁰⁶ Android Source, "Android Settings Design Guidelines," available at https://source.android.com/devices/tech/settings/settings-guidelines.

¹⁰⁷ GOOG-GLAZ-00299238.

discussed previously, the Privacy and Terms summary users see when setting up their devices include such links to the full Terms of Service and Privacy Policy disclosures, as shown below (circa January 2017 - April 2018).¹⁰⁸



82. If users want to learn more about the Privacy Policy, they can click through to the full policy, which includes more information and additional links as shown below. The first screen of the Privacy Policy page (also circa January 2017) includes a link to "key term," for users "not familiar with terms like cookies, IP addresses, pixel tabs, and browsers," which provides disclosures regarding smartphone technologies that enable location determination.¹⁰⁹

¹⁰⁸ GOOG-GLAZ-00299213.

¹⁰⁹ GOOG-GLAZ-00299381. The explanations of key terms in the Privacy Policy includes, among other defined terms, the following: i) "and other sensors' Your device may have sensors that provide information to assist in a better understanding of your location. For example, an accelerometer can be used to determine things like speed, or a gyroscope to figure out direction of travel. Learn more [hyperlink]" (GOOG-GLAZ-00299390); and ii) "Wi-Fi
PRIVACY POLICY

There are many different ways you can use our services – to search for and share information, to communicate with other people or to create new content. When you share information with us, for example by creating a Google Account, we can make those services even better – to show you more relevant search results and ads, to help you connect with people or to make sharing with others quicker and easier. As you use our services, we want you to be clear how we're using information and the ways in which you can protect your privacy.

Our Privacy Policy explains:

- What information we collect and why we collect it.
- How we use that information.
- The choices we offer, including how to access and update information.

We've tried to keep it as simple as possible, but if you're not familiar with terms like cookies. IP addresses, pixel tags and browsers, then read about these key terms first. Your privacy matters to Google so whether you are new to Google or a longtime user, please do take the time to get to know our practices – and if you have any questions contact us.

Information we collect

We collect information to provide better services to all of our users – from figuring out basic stuff like which language you speak, to more complex things like which ads you'll find most useful, the people who matter most to you online, or which YouTube videos you might like.

We collect information in the following ways:

- Information you give us. For example, many of our services require you to sign up for a Google Account.
 When you do, we'll ask for personal information, like your name, email address, telephone number or credit card to store with your account. If you want to take full advantage of the sharing features we offer, we might also ask you to create a publicly visible Google Profile, which may include your name and photo.
- Information we get from your use of our services. We collect information about the services that you use and how you use them, like when you watch a video on YouTube, visit a website that uses our advertising services, or view and interact with our ads and content. This information includes:
- 83. The second screen of this same Privacy Policy page (circa January 2017) clearly states that "[Google] may collect and process information about your actual location" using

access points and cell towers' For example, Google can approximate your device's location based on the known location of nearby cell towers" (GOOG-GLAZ-00299393.)

various technologies including IP address, GPS, and "other sensors [as defined in 'key terms']."¹¹⁰

	Device information
	We collect device-specific information (such as your hardware model, operating system version, unique device identifiers, and mobile network information including phone number). Google may associate your device identifiers or phone number with your Google Account.
•	Log information
	When you use our services or view content provided by Google, we automatically collect and store certain information in server logs. This includes:
	 details of how you used our service, such as your search queries.
	 telephony log information like your phone number, calling-party number, forwarding numbers, time and date of calls, duration of calls, SMS routing information and types of calls.
	 Internet protocol address.
	 device event information such as crashes, system activity, hardware settings, browser type, browser language, the date and time of your request and referral URL.
	 cookies that may uniquely identify your browser or your Google Account.
•	Location information
	When you use Google services, we may collect and process information about your actual location. We use various technologies to determine location, including IP address, GPS, and other sensors that may, for example, provide Google with information on nearby devices, Wi-Fi access points and cell towers.

84. This navigation flow is another example of the effective use of progressive disclosure.

C. Good UI is Evolutionary

85. Even good UI can often be improved upon, especially as technology and user preferences change. For example, Google added to the deeper layers of its location related disclosures

¹¹⁰ GOOG-GLAZ-00299382.

in May 2018. The "Location Information" portion of the Privacy Policy evolved from that shown immediately above, to that shown immediately below, the latter of which uses bullets highlighting the list of location related technologies employed, provides an illustrative example of how such information is used, and additional detail regarding how "[t]he types of location data [Google] collect[s] depend[s] in part on your device and account settings."¹¹¹ Hyperlinks to defined terms within the "Your location information" portion of the May 2018 Privacy Policy highlighted above also included additional information, including about how "[a]n IP address can often be used to identify the location from which a device is connecting to the Internet,"¹¹² and how "[i]f you use Google's Location services on Android, …your device sends information to Google about its location, sensors (like accelerometer), and nearby cell towers and Wi-Fi access points (like MAC address and signal strength) … to determine your location."¹¹³

¹¹¹ GOOG-GLAZ-00299397.

¹¹² GOOG-GLAZ-00299415.

¹¹³ GOOG-GLAZ-00299409.

- Purchase activity
- · People with whom you communicate or share content
- Activity on third-party sites and apps that use our services
- Chrome browsing history you've synced with your Google Account

If you use our services to make and receive calls or send and receive messages, we may collect telephony log information like your phone number, calling-party number, receiving-party number, forwarding numbers, time and date of calls and messages, duration of calls, routing information, and types of calls.

You can visit your Google Account to find and manage activity information that's saved in your account.

Go to Google Account

Your location information

We collect information about your location when you use our services, which helps us offer features like driving directions for your weekend getaway or showtimes for movies playing near you.

Your location can be determined with varying degrees of accuracy by:

- · GPS
- IP address
- Sensor data from your device
- Information about things near your device, such as Wi-Fi access points, cell towers, and Bluetooth-enabled devices

The types of location data we collect depend in part on your device and account settings. For example, you can turn your Android device's location on or off using the device's settings app. You can also turn on Location History if you want to save and manage your location information in your account.

In some circumstances, Google also collects information about you from publicly accessible sources. For example, if your name appears in your local newspaper, Google's Search engine may index that article and display it to other people if they search for your name. We may also collect information about you from trusted partners, including marketing partners who provide us with information about potential customers of our business services, and security partners who provide us with information to protect against abuse. We also receive information from advertisers to provide advertising and research services on their behalf.

86. Users are quite familiar with nested navigation menu systems as a mechanism for implementing the principles of progressive disclosure. Though such menu systems have evolved since the introduction of smartphones, the basic concepts of navigation, e.g.,

drilling down, are largely unchanged. These types of menus are the dominant style of operating system menus, appearing on iPhones, Android phones, and web browsers and many types of software. Below is an example of this type of menu, used to navigate Android settings (circa January 2017).¹¹⁴ Users interested in accessing the options related to "Security & Location" would tap the setting and access a screen with options related to device security and privacy. Additional options, for example, those related to location, could be toggled or tapped for even more nested options related to location.



87. Because of the dynamic nature of the technological environment, users have learned that smartphone updates are likely to introduce changes, sometimes dramatically so, to the

¹¹⁴ GOOG-GLAZ-00299282.

operating system.¹¹⁵ Thus, smartphone navigation evolves, owing to competitive pressures, changing consumer demand for features, and a continual desire by providers for improvement.

88. While applying principles such as progressive disclosure can improve usability, it is widely recognized that designing a UI requires extensive user testing and iteration, oftentimes even after the initial release of a product or application.¹¹⁶ As usability expert Jakob Nielsen states, "[I]t is virtually impossible to design a user interface that has no usability problems from the start."¹¹⁷ In addition, industry trends and consumers' expectations are constantly evolving. Consider, for example, the rise in popularity of "dark mode." Dark mode is a display setting in which light text is shown against a dark screen—as opposed to the default, dark text shown against a light screen—and which uses less energy. The advantages of dark mode are that it extends battery life, decreases users' exposure to blue light, and can reduce eye strain.¹¹⁸ In 2018, Apple popularized dark mode by way of its operating system update, Mojave, and Amazon, Google, and many others followed suit.¹¹⁹ The localization of content to create a personal user experience is another such trend.¹²⁰ The UIs of many early web pages were built by and catered to Americans, and non-U.S. users accepted, for instance, American-English spellings and left-to-right interfaces.¹²¹ Over time, however, users have come to expect their online-cultural norms to be followed.¹²²

¹¹⁵ For example, beginning with Android 10, users have the option to employ gesture navigation. Gesture navigation (swiping to get around) is an example of a dramatic change to the user interface. Gesture navigation provides more screen "real estate" for apps and offers users a more immersive experience compared to clicking buttons, and is a more natural and intentional way to navigate on the device. (Li, Abner, "Google explains and defends Android Q gesture navigation," August 8, 2019, available at https://9to5google.com/2019/08/08/android-q-gesture-navigation-explained/.)

¹¹⁶ Nielsen, Jakob, "Iterative User Interface Design," *Nielsen Norman Group*, November 1, 1993, available at https://www.nngroup.com/articles/iterative-design/.

¹¹⁷ Id.

¹¹⁸ Lunn, Emma, "What Is Dark Mode – And Should You Be Using It?" *Forbes*, March 24, 2022, available at www forbes.com/uk/advisor/mobile-phones/what-is-dark-mode-and-should-you-be-using-it/.

¹¹⁹ "UI and UX Design Trends that Dominate 2022 and Beyond," *Studio*, available at www.uxpin.com/studio/blog/ui-ux-design-trends/.

¹²⁰ Id.

¹²¹ Id.

¹²² Id.; Discussion with Dr. Gretchen Gelke, Senior Manager User Experience at Google.

VI. RESPONSES TO DR. GRAY'S UI ANALYSIS¹²³

- 89. Having presented principles of UI design and key considerations related to the market, business, and technical contexts, I now apply those principles to the allegations and facts at issue. In the paragraphs below, I present a re-analysis of Dr. Gray's UX discussions that—contrary to what Dr. Gray opines—demonstrates that Google built a UI that followed industry best practices. Google also engaged in continuous improvement of their UI over time as a result of responses to the contextual factors I discussed above.
- 90. I organize my analysis in the same manner that Dr. Gray did for ease of comparison. That said, it is important to recognize that Dr. Gray approached the analysis in narrow modular fashion, i.e., treating each area of Google's UI he takes exception to in isolation, and within each area, making it seem as if the one particular navigation path he considers is the only way all users would choose to navigate. Dr. Gray's approach was contrived and not representative of actual user behavior. Google's well-designed UI offers extensive choice to users regarding navigation and disclosure. Real users would not be likely to interact with the UI in the artificial manner Dr. Gray presents. As such, in my opinion, the Gray Report is highly misleading and unnecessarily confusing.
- 91. In my responsive UI analysis I mitigate this confusion. Before presenting my analysis, I provide a high-level roadmap of how my analysis is organized.
- 92. First, I discuss the AP article that appears to be a catalyst for the allegations in this case and a predicate of Dr. Gray's opinions.
- 93. Second, I analyze Google's location-related UI design, explaining the variety of information and control over choices it offers users right from their smartphones or other devices, both during setup and continuously thereafter via settings. In sum, users are provided with ample, clear information regarding Google's location data collection and related services, and many easy ways in a flexible interface to access as much of that information as they may like to make informed decisions regarding which services and settings to enable or not.

¹²³ Gray Report at 17-38.

- 94. Third, I address a loose collection of derivative topics that Dr. Gray chooses to address separately, and somewhat redundantly, but are in fact all part of the technology and UI designed to deliver users direct control over their choices among a powerful array of location-based and related services.
- 95. Finally, I discuss the connections between Google's location-related UI design and its business goals. In my opinion, it is abundantly clear from Google's LBS offerings, as well as the individualized navigation of related settings and disclosures afforded by its thoughtful UI design that "Google relies upon user location data ... as a key part of its service delivery and advertising strategy."¹²⁴ As part of this strategy, Google "want[s] to increase users' perceived value from location, and through positive experiences increase their comfort," while "reducing risk caused by any lack of comfort, lack of understanding around location."¹²⁵

A. The AP Article Oversimplifies Google's LBS Related Disclosures and Misunderstands Google's LBS Related Technologies

- 96. After prefacing its investigation with the admission that "[f]or the most part, Google is upfront about asking permission to use your location information," the AP article summarized its primary point by saying that "Google's support page on the subject [of the Location History setting] states: 'You can turn off Location History at any time. With Location History off, the places you go are no longer stored,'" but that "[t]hat isn't true. Even with Location History paused, some Google apps automatically store time-stamped location data without asking."¹²⁶
- 97. What the article's punchline apparently fails to appreciate is how complex LBS-enabling technologies are, and thus the customer-centric thought Google has put into its LBS and related UI design by designing disclosures specific to certain features and services addressing how that feature/service utilizes users' information. Google's UI is designed to provide each of its users with the information they need to control their own

¹²⁴ Gray Report, p. 36.

¹²⁵ GOOG-GLAZ-00246795, at GOOG-GLAZ-00246798 and GOOG-GLAZ-00246803.

¹²⁶ Nakashima, Ryan, "AP Exclusive: Google tracks your movements, like it or not," AP News, August 13, 2018.

individualized, informed decisions regarding the location data used (or not) to provide the LBS services they do (or do not) want.

- 98. As I understand it, the Location History toggle is an opt-in account-level feature service, not a location master setting for the device, and that is what the language on the Google support page featured in the AP article was intended to convey.¹²⁷ This is consistent with i) the contemporaneous disclosures in Google's Privacy and Terms discussed and illustrated above, ii) the language at the top of (i.e., higher up on) the support page at issue that described Location History as a feature that "helps you get better results and recommendations on Google products" rather than any sort of device-level location kill switch, and iii) the fact that there was a link at the bottom of that same page to "Turn location on or off for your device" through another means.¹²⁸
- 99. According to Mr. Monsees, Product Manager for Web & App Activity at Google, the AP article was factually incorrect in some respects. For example, "the AP article describes the collection of location information by the Web & App Activity setting as '*background location tracking*', and suggests that Google '*continuously record[s]*' location information '*even when users disable Location History*."¹²⁹ The AP article got it wrong "because the Web & App Activity setting does not collect any location information in the 'background' and does not 'continuously record' location information."¹³⁰
- 100. Specifically, "the Web & App Activity setting allows Google to save information about a Google Account Holder's past activity on Google products and services, which is generated only when users use those products and services [not continuously],"¹³¹ and

¹²⁷ Examination Under Oath ("EUO") of Marlo McGriff, July 11, 2019, p. 77; discussion with Marlo McGriff, Product Manager for Location History at Google; see also Copy of web_3118687_version_256_2017-08-29_14_01_27.html.pdf.

¹²⁸Copy of web_3118687_version_256_2017-08-29_14_01_27.html.pdf.

¹²⁹ Affidavit of David Monsees, November 19, 2020, ¶ 51, emphasis original.

¹³⁰ Affidavit of David Monsees, November 19, 2020, ¶ 51.

¹³¹ Affidavit of David Monsees, November 19, 2020, ¶ 52.a. As Mr. Monsees had previously explained, "The only information about a user's location that is saved as a result of WAA being 'on' is that obtained by Google from the user's use of Google's apps and services like Search and Maps." (Affidavit of David Monsees, October 1, 2020, ¶48.) As he also previously explained, "WAA controls when Google retains and uses that information with the user's Google Account [to improve users Google searches for example]; but does not control whether Google obtains the information in the first place. The language of the WAA settings screens in the Screenshot Bundle reflects this in that it speaks in terms of the user's activity being 'stored' or 'saved' (for example, pages 59, 63, 78-79, 110-111, 161, 164 of the Screenshot Bundle." (Affidavit of David Monsees, October 1, 2020, ¶46.) This

"the Web & App Activity setting is different to the Location History setting, because the Location History setting does store location data generated by the user's mobile device 'in the background'."¹³²

- 101. As I understand it, Google did not originally as prominently disclose that WAA relates in part to location data (and named it as it did) because that is not its primary purpose or function.¹³³ WAA is primarily about enhancing other features (e.g., search) by logging certain historical activity to improve future services for that user, not location per se. Where location is used for logging certain online activity for the user, WAA provides users with information about which activity was associated with a particular location.¹³⁴
- 102. Taking a step back, Google is primarily focused on the entire user experience, which is not as narrowly centered on location as Dr. Gray suggests. Google's philosophy is not to hide things from users, or make decisions for them, but rather puts what it considers important information where consumers can see it, flags it concisely to avoid overwhelming users, and uses progressive disclosure to enable users to make informed choices based on the amount of information they desire.¹³⁵

testimony is consistent with various Google disclosures, including for example in its Privacy and Terms (e.g., GOOG-GLAZ-00299308, GOOG-GLAZ-00299257, Copy of web_3118687_version_256_2017-08-

²⁹_14_01_27.html.pdf), pop up messages (e.g., GOOG-GLAZ-00299310), and help pages and articles (e.g., Copy of web_3118687_version_256_2017-08-29_14_01_27 html.pdf, GOOG-GLAZ-000299455-456, GOOG-GLAZ-000299461-462).

¹³² Affidavit of David Monsees, November 19, 2020, ¶ 52c. As Mr. Monsees had previously explained, "Unlike WAA ... LH stores location data that is generated by the user's mobile device 'in the background.' ... LH does not depend on how a user's device is being actively used, including whether they are using a Google product or service." (Affidavit of David Monsees, October 1, 2020, ¶51.) As he also previously explained, benefits of LH include personalization and use of data in an "aggregated and anonymized way to create better experiences for all users and improve Google's products and services, consistent with the terms of the Terms of Use and Privacy Policy." (Affidavit of David Monsees, October 1, 2020, ¶56.)

¹³³ Discussions David Monsees, Senior Project Manager responsible for UDC at Google.

¹³⁴ Discussions David Monsees, Senior Project Manager responsible for UDC at Google. As will be discussed in greater detail later in this report, Google clearly discloses during the device setup process, including in its Privacy Policy which is summarized and linked to during that process, that it collects and uses user location data in the provision of its services, including internet and app usage. *See for example*, GOOG-GLAZ-00299213-214, GOOG-GLAZ-00299220-235, and GOOG-GLAZ-00299381-382.

¹³⁵ Discussions with Dr. Gretchen Gelke, Senior Manager User Experience, and David Monsees, Senior Project Manager responsible for UDC at Google.

- 103. Google's UI, with different locations and controls for WAA and LH, facilitates these distinctions and gives users more choices and finer control of how their data are collected and used across these different services.
- 104. A few things that are not different about WAA and LH, however, is users' ability to access each of these features multiple ways, as well as review and delete their information associated with each of those features separately.¹³⁶

1. Dr. Gray Also Oversimplifies Google's LBS Related Disclosures and Features

105. Dr. Gray repeats the AP article's oversimplification of Google's disclosures (and technology) at issue, beginning his discussion of the AP article by reiterating the sensational headline, while ignoring the details. He begins the relevant section of his report much like the AP article, stating that:

Prior to the publication of the AP Article, Google's Location History Help Center Page read, 'With Location History off, the places you go are no longer stored.' ... However, this recitation was not true, since Google calculated user's location based on other signals, including WAA and IP addresses.¹³⁷

106. And similar to the AP article, Dr. Gray fails to consider this particular disclosure in light of the relevant contexts I explained earlier (ref. Sec. V. Contextual Considerations) and fails to mention the highly relevant facts laid out in my discussion of the AP article immediately above.

2. Post-AP Article Events

107. Dr. Gray's portrayal of the AP article regarding Google's context and response contains important mischaracterizations. As discussed above, Google is an effective, but complex, proactive organization dedicated to customer-focused evolution. As noted above, at the time the AP article was released, Google's Location History Help Center Page (which a user could navigate to through related progressive disclosures or the standalone page in order to obtain assistance about how to use Location History) was

¹³⁶ Affidavit of David Monsees, October 1, 2020, ¶ 28, 49, 52, 54.

¹³⁷ Gray Report, p. 17.

intended to apply specifically to the Location History feature itself rather than be interpreted more broadly with respect to user location in its entirety.¹³⁸

108. I understand that Google is continuously evaluating and improving upon its user controls and disclosures, in part based on user feedback,¹³⁹ and that as part of this process, Google was already in the process of testing and developing new versions of the LH disclosure to improve ease of use and understanding of this feature.¹⁴⁰

Manage or delete your Location History

Your Location History helps you get better results and recommendations on Google products. For example, you can see recommendations based on places you've visited with signed-in devices, or traffic predictions for your daily commute.

You control what's saved in your Location History, and you can delete your history at any time.

Learn what applies in Android 4.1 through 4.3 or for iPhone and iPad.

Turn Location History on or off

You can turn off Location History at the account level at any time.

This setting does not affect other location services on your device, like Google Location Services and Find My Device. Some location data may be saved as part of your activity on other services, like Search and Maps. When you turn off Location History for your Google Account, it's off for all devices associated with that Google Account.

You can also turn off Location services for a device. Learn how.

109. In fact, rather than simply removing the allegedly confusing language from the LH help page at issue, as Dr. Gray seems to suggest was "notabl[y]" Google's only response,¹⁴¹ Google also revised the LH help page as shown in part below. Not only had it removed the allegedly confusing language, but it added the very explicit clarifying language shown below (circa August 16, 2018).¹⁴²

¹³⁸ EUO of Marlo McGriff, July 11, 2019, pp. 114-118.

¹³⁹ Discussions with Dr. Gretchen Gelke, Senior Manager User Experience, and David Monsees, Senior Project Manager responsible for UDC at Google.

 ¹⁴⁰ EUO of Marlo McGriff, July 11, 2019, pp. 140-145; discussion with Marlo McGriff, Product Manager for Location History at Google, and David Monsees, Senior Project Manager responsible for UDC at Google.
 ¹⁴¹ Gray Report, p. 18.

¹⁴² Copy of web_3118687_version_256_2017-08-29__14_01_27.html.pdf.

- 110. Dr. Gray then goes on to criticize how LH and WAA disclosures are in different places and say different things, demonstrating his apparent misunderstanding of their different user-facing functionality. From a UI perspective, different disclosures for different functionalities are actually appropriate and reasonable. For example, some users are likely to want different settings for LH versus WAA, as they provide different functionalities.
- 111. As for the so-called "Oh shit" meeting that Dr. Gray apparently attaches so much significance to, my understanding is that it was a regularly scheduled weekly meeting about press events and other communications-related items that continues to date.¹⁴³ I understand the meeting was called the "Weekly PR Sync: Cross Google Stories." Such meetings are consistent with Google's customer-centric culture of innovation and constructive use of feedback.¹⁴⁴ I have seen no evidence indicating that Google intended to mislead, as Dr. Gray's characterization of events subsequent to the article seem to suggest and is a presumptive underpinning of Dr. Gray's entire dark pattern claim.
- 112. For example, Dr Gray says that:



113. As the source that Dr. Gray cites notes in its first page summary, the absolute number of visitors to pages where they could adjust or monitor their privacy settings was fairly small.¹⁴⁶ In absolute terms, approximately **adjusted on the set of Google accounts** turned LH off in each of the three days following the AP article, and over

¹⁴³ Email from Argemira Flórez to Michael Eshagian and others, subject "AZ v. Google - August 13, 2018 Meeting, sent December 6, 2021.

¹⁴⁴ Discussion with Marlo McGriff, Product Manager for Location History; see also GOOG-GLAZ-00001523.

¹⁴⁵ Gray Report p. 19.

¹⁴⁶ GOOG-GLAZ-00001458 at 459.

more accounts turned LH on than off in August. With respect to WAA, only approximately **accounts** or less Google accounts turned WAA off in each of the three days following the AP article, and over **accounts** more accounts turned WAA on than off that month.¹⁴⁷ The source Dr. Gray cites also noted a "[s]trong increase in queries related to 'Google location history,"¹⁴⁸ which is consistent with my discussion above regarding how search has revolutionized ready access to information.

B. Location Related Controls

1. Task Flow Is User-Dependent

- 114. Dr. Gray claims he has identified "key task flows" that "provide context in how a user might locate (or try to locate) a relevant setting or information across multiple screens in the UI (Appendices 3-9)."¹⁴⁹ Dr. Gray does not explain how these task flows were identified as "key" or take into account, for example: individual differences in users (e.g. naïve vs technologically sophisticated users, younger vs older users, first-time Android smartphone owners vs experienced Android users, and so on) and user motivation for determining whether a setting or information screen in the UI is relevant (e.g. first-time phone setup, modifying a particular setting in response to a change in user preference, specific privacy preferences relative to specific benefits sought). For example, Dr. Gray gives no consideration to how many users, if any, may find the lack of disclosure regarding changes in the precision of the location data Google uses in its LBS provision that he criticizes relevant rather than superfluous to their decision making process.¹⁵⁰
- 115. Dr. Gray does not provide any relevant context for his analyses. He does not reveal the assumptions he made regarding the users in terms of their individual differences, motivations, and preferences for accessing and/or modifying settings. This renders it difficult to interpret his analysis and for him to reliably draw any conclusions. Since where technology is concerned there is no such thing as a single monolithic user,

¹⁴⁷ State of Arizona v. Google, Case No. CV 2020-006219 Rule 30(b)(6) Written Questions & Responses HIGHLY CONFIDENTIAL—ATTORNEYS' EYES ONLY SUBJECT TO PROTECTIVE ORDER, pp. 2, 13, and 24. ¹⁴⁸ GOOG-GLAZ-00001458 at 475.

¹⁴⁹ Gray Report p. 21.

¹⁵⁰ Gray Report, p. 20.

but rather segments of users based on individual differences and varying needs and benefits sought, his analysis cannot be relied upon to determine whether the UI is deceptive.

- 116. Dr. Gray specifically claims that LH and WAA (and other location-related controls) are indistinct and misleading.¹⁵¹ This claim is demonstrably false. The bulk of Dr. Gray's critique in this section focuses on the screenshots in Appendix 3 that represent "the task flow" Android users might potentially follow if that user's goal was to navigate to the WAA settings from one specific path taken from the Google Account settings panel (shown in Appendix 6 of Dr. Gray's report). It is important to point out that Dr. Gray's "task flow" analysis assumes that there is no variation among users, that there is a single task flow for this hypothetical user that can be applied to all users, and that this task flow is confined to the single specific path to the WAA page he diagrams in Appendix 3. However, users vary both in terms of their individual differences and their needs and preferences and their particular navigational goals at any one point in time. These variations among independent users mean that different users will approach the settings screen from many different perspectives. I understand that Google regularly conducts interviews and usability studies with different types of users (e.g., different levels of technical savvy, and different privacy-related sensitivities) to better understand how various users perceive and interact with Google's services, controls, and disclosures.152
- 117. Dr. Gray's analysis fails to consider not only the additional contexts, beyond initial setup, from which a user might wish to access the WAA settings screen, but also the numerous possible different navigational paths to get there, as well as the numerous disclosures a user might choose to access along the way before reaching the WAA screen and even choose to access on the WAA screen itself. Thus, Dr. Gray completely ignores the multitude of other situations that could lead a user to that screen, and thus fails to consider what information a user would be bringing to that context, motivating them to seek that path and the disclosures they would see along the way. Based on my own

¹⁵¹ Gray Report, p. 19.

¹⁵² Discussion with Dr. Gretchen Gelke, Senior Manager User Experience, and David Monsees, Senior Project Manager responsible for UDC at Google.

analysis of and interactions with Google's UI, as well as discussion with Google personnel involved in designing, maintaining, and improving it,¹⁵³ it is obvious that there are many entry points and paths by which any given user can access information to make informed decisions regarding how much information they are willing to share with Google for what purposes. These access points include not only the account setup process and through account, device, and app level settings continuously thereafter, but also via pop ups during usage, push notifications via email, and reminders on the Google search page and search results page footers, as well as multiple Google and third party online help pages.¹⁵⁴

118. Setting aside the single starting point from the Google Account settings panel for the moment, let us consider the single specific path Dr. Gray leads us down in his Appendix 3. Before even embarking, Dr. Gray asserts there will be "confusing terminology"¹⁵⁵ but fails to identify any.

2. Progressive Disclosure Is User-Friendly

119. Once on his way down his path to WAA settings, Dr. Gray fails to fairly evaluate how the setting screens facilitate progressive disclosure, ignoring, for example, the numerous branching points that offer users control over the choices they may wish to make. For example, he makes no mention of the fact that the first screen of Appendix 3 is boldly labeled "Personal info & Privacy" and prominently features at the top the option for a "Privacy Checkup."¹⁵⁶ This option is prominently designed with a relatively large shield icon and accompanied by an invitation to "review and adjust important privacy settings." Should users wish to take this checkup, all they would need to do is click the "GET STARTED" link below the shield, which would allow them to review and learn about their location-related and other relevant settings. Dr. Gray ignores this prominent explicit privacy disclosure option, and fails to analyze where it might lead and what disclosures it may reveal along the way. The text at the top of the screen indicating

¹⁵³ Discussions with David Monsees, Senior Project Manager responsible for UDC at Google.

¹⁵⁴ David Monsees, Senior Project Manager responsible for UDC at Google. *See*, for example, safety.google.com, which features information about Google privacy related tools, controls, and policies.

¹⁵⁵ Gray Report, p. 21.

¹⁵⁶ GOOG-GLAZ-00299305-306.

"Personal info & privacy," the privacy shield icon, the text beside the icon indicating "Privacy Checkup," and the call to action text below the icon instructing users to "[t]ake this quick checkup to review and adjust important privacy settings," along with the link in all capital letters and bright blue lettering to "GET STARTED," all explicitly and directly signals to users that this screen concerns settings related to user privacy.

- 120. Going back to Dr. Gray's "task flow" in his Appendix 3, he apparently assumed all users would click "Activity controls" upon reaching this screen, as opposed to the numerous other options on this privacy screen. The "Activity controls" screen contains links to different types of activity, information, and history.¹⁵⁷ Again, it is a reasonable assumption that the links on the "Activity controls" screen, any of which can be freely clicked depending on the users' interests at that moment, explicitly and directly signal to users that this screen concerns settings related to controlling the information related to different elements of their navigational behavior.
- 121. For unknown reasons, Dr. Gray then assumed that every single user who landed on the "Activity controls" screen would click on the first link "Web & App Activity." If any users were inclined to do so, they would land at the "Web and App Activity" screen, at GOOG-GLAZ-00299308. Dr. Gray opines that this WAA settings screen "included no reference to location tracking even when it was paused and re-enabled."¹⁵⁸ However, the primary function of WAA is for search optimization, not location, and users were made aware that location-based activity was a part of WAA.

3. Account-Level Settings

122. I have reproduced the "Web & App Activity" screen below and boxed in red the second paragraph of text on this screen.¹⁵⁹ The text in the box informs the user that WAA "[s]aves your activity on Google sites and apps to give you faster searches, better recommendations, and more personalized experiences in Maps, Search and other Google Services."¹⁶⁰ This language, and the examples it includes, notably "better

¹⁵⁷ GOOG-GLAZ-00299307.

¹⁵⁸ Gray Report, p. 22.

¹⁵⁹ GOOG-GLAZ-00299308.

¹⁶⁰ GOOG-GLAZ-00299308.

recommendations... in Maps, Search," signals that WAA utilizes the user's location data to provide these "more personalized experiences." Below this text is a "Learn more" link which users can click to access a "Help Article"¹⁶¹ containing additional information about their search and Web & App activity settings. This "Help Article" further alerts users that "[s]ome browsers and devices may have more settings that affect how this activity is saved."



123. Outside the red box on the "Web & App Activity" screen, there is a clear checkbox option to include "Chrome history and activity from sites, apps, and devices that use Google services." Users of Google Map, for example, will understand that this

¹⁶¹ GOOG-GLAZ-00299422.

can refer to location data.¹⁶² Location data can help users understand where they are, where they may want to go, and what they might want to see or do along the way and when they get there.

124. Dr. Gray opines that this "Web & App Activity" page "includes no indication in the name or setting description that this automatically opted-in setting tracks location data."¹⁶³ However, he fails to note the "Learn more" link and checkbox discussed and shown above, as well as the overflow menu on the top right, a toggle to switch WAA from On to Off, and a clear and highly visible link to "MANAGE ACTIVITY." Clicking the "MANAGE ACTIVITY" link takes users to a website where they can view and delete their activity (including location information in cases where it is logged) and access additional information about controlling their account activity.¹⁶⁴. Clicking "Details" for any item logged in a user's "My Activity" list leads to additional information about that particular activity, including any location associated with that particular activity, as well as a note that the activity "was saved to [the user's] Google Account because [their] Web & App Activity setting was on while using [Maps/Chrome/etc]" (*see* figure below, circa June 2022¹⁶⁵).¹⁶⁶ This further informed users that certain location information was used by WAA, when enabled and available.

¹⁶² Google Maps is extremely popular in the United States, with over 154 million monthly users. (Galov, Nick, "17+ Google Maps Statistics to Survey in 2022," Web tribunal, April 6, 2022, available at

https://webtribunal net/blog/google-map-statistics/#gref.; Wise, Jason, "How Many People Use Google Maps in 2022?", June 4, 2022, available at https://earthweb.com/how-many-people-use-google-maps/). It is reasonable to expect that many users, simply by virtue of using an online map, understand at some level that location data are being transmitted and used.

¹⁶³ Gray Report, p. 22.

¹⁶⁴ GOOG-GLAZ-0299320; discussion with David Monsees, Senior Project Manager responsible for UDC at Google.

¹⁶⁵ <u>https://myactivity.google.com/product/search?hl=en</u> and <u>https://myactivity.google.com/product/search?hl=en</u> (from an actual account; replicable in form using any personal account after using search and maps with WAA activated). See also GOOG-GLAZ-0299321, emphasis in original; discussion with David Monsees.

¹⁶⁶ Deposition of David Monsees, August 20, 2021, pp. 55, 59.

	n details	:	×
0	Maps		
Vie	wed area around San Francisco		
Det	tails		
	Today at 10:28 PM		
Ш	Maps		
Wh This was Mar	y this activity? activity was saved to your Google Account because your Web & App Activity on while using Maps. hage	setting	
0	If you use a shared device or sign in with multiple accounts, activity from an account may appear here. Learn more	nother	
lter	n details	:	×
G	Search		•
000	rched for sf giants		
Det	rched for sf giants ails		-
Det	rched for sf giants ails Today at 10:25 PM		-
Det	rched for sf giants ails Today at 10:25 PM Search		
Det	rched for sf giants ails Today at 10:25 PM Search Unknown Device		-
Det	rched for sf giants ails Today at 10:25 PM Search Unknown Device From your places [2] (Home)		
Det	rched for sf giants ails Today at 10:25 PM Search Unknown Device From your places (2) (Home) Hide general area A	data ©202	2 Googl
Det	rched for sf giants ails Today at 10:25 PM Search Unknown Device From your places (2) (Home) Hide general area Hide general ar	data ©2022	2. Googi
Det	rched for sf giants ails Today at 10:25 PM Search Unknown Device From your places ((Home) Hide general area Hide general area Hide general area y this activity? activity was saved to your Google Account because your Web & App Activity on while using Search.	data ©2022	2 Googi
Det	rched for sf giants alls Today at 10:25 PM Search Unknown Device From your places ((Home) Hide general area Hide general area Sunser DISTRICT TWIN Peaks Unkreshore Sone Francisco Zoo Unit San Francisco Z	data ©2022 y setting	2 Googi

- 125. It is also important to note the overflow menu (three vertical dots) in the "My Activity" banner highlighted on the screen on the left above. This menu gives users options to i) Delete activity by" various parameters (e.g. date(s)), ii) view their "Other Google Activity," including a map and timeline of where they have been, and iii) access additional "Help" on how to "[v]iew & control activity on [their] account" saved while using Google services, including via Web & App Activity."¹⁶⁷
- 126. It is important to point out that many of these screens can themselves be accessed from multiple different navigational points.

4. Opt-In

127. Dr. Gray also claims that "... the use of opt-in by default for WAA automatically tracks users' location data, possibly without their knowledge. Because there is no action required here, the user is likely to preserve a default and pre-selected setting." ¹⁶⁸ I see no basis for Dr. Gray's assertion that users are likely to (inadvertently) preserve the default here. On the contrary, the very fact that some users turned this setting off (Gray footnote 19) demonstrates that this is easy to do if one is so inclined. ¹⁶⁹ Contrary to Dr. Gray's claim, what action any particular user is likely to take with respect to the toggle, or any other action, on this screen, depends on the unique characteristics of that user and the particular benefits they are seeking at that point in time as they land on that screen. WAA is not primarily a location service; it is a search optimization service. It is entirely reasonable that users would desire optimizing their activities for better search results, considering the importance and value of search, on the first try, as I discuss above in section IV.B.3.

¹⁶⁷ GOOG-GLAZ-00299425-429.

¹⁶⁸Gray Report, p. 22. "This pre-selection is an example of the dark pattern strategy '*forced action*' ('requiring the user to perform a certain action to access (or continue to access) certain functionality"; Gray, 2018), which could also be the dark pattern strategy *sneaking*, if the user is only later made aware that WAA control includes location tracking when the setting is paused and then re-enabled (GOOG-GLAZ-00299199 at 309 to 310)." (Gray Report, p. 22, emphasis original.)

¹⁶⁹ Dr. Gray noted what he characterized as "a large spike in the number of users who turned off WAA" within days of publication of the AP article. While this demonstrates users' ability to find and change settings as they choose, as I noted earlier, the largest daily spike was only approximately **Determined** of Google account holders.

5. Popup Screens

128. Furthermore, if a user chose to toggle Web & App Activity from On to Pause, they would access the popup I reproduce below.¹⁷⁰ Users would reasonably and easily access this screen, even if they were just considering whether to opt out of WAA. Out of curiosity, users might toggle this setting just to see what happens, including what additional information might be revealed about the feature. The language on this popup makes clear that when WAA is toggled "on" it applies user information, including location, to personalize a wide variety of content. This is because many suggestions (e.g., restaurants and entertainment) and updates (e.g., weather, heavy traffic, better leave early) require location in order to be personalized. Additionally, the popup informs users that they can view, edit, and delete their WAA data "whenever you like."



¹⁷⁰ GOOG-GLAZ-00299310.

6. Google's UI Facilitates User Choice and Control

- 129. Dr. Gray argues that on the WAA screen, Google modified the "choice architecture" by manipulating the "decision space through a restrictive and covert approach" that eliminates choice.¹⁷¹ In fact, the opposite is true. Google gives each independent user control over the choices they make to define their own unique navigational path based on their particular setting preferences at that moment.
- 130. For all the reasons discussed above, I think users are given clear indication of the types of data WAA involves when they are presented with the opt in/out option on the WAA settings page pictured above. Should a user feel that they need more information, there are multiple paths to additional screens that contain that information.

7. UI Requires Judgment, Particularly for Complex Technologies

131. Next Dr. Gray opines that "... there is also indistinction regarding the number of location settings that are distributed across account, device, and app-specific contexts."¹⁷² What he seemingly fails to consider is that location services involve a complicated and interdependent set of geolocation technologies that are relevant in particular contexts, offer different features/benefits and combinations of settings, and may be differentially set at the account, device, and app-specific levels to accommodate how users approach Google-related services and devices. In light of this complexity, UI designers are faced with difficult decisions about how best to organize such settings. This is the reason that principles like progressive disclosure can be effective as a guiding framework for practice, particularly where there is complex technology involved and different users will have different preferences with respect to which and how much information they are interested in considering in different contexts.¹⁷³

¹⁷¹ Gray Report, p. 22.

¹⁷² Gray Report, p. 22. "This absence of all comprehensive location-related controls on this page constitutes an example of the dark pattern strategies *obstruction* and *sneaking*, since they make it more difficult to control all instances of location (and may lead to the user concluding that all relevant location settings are on a settings page marked "Location") and may result in the use of user location data in ways that are only realized through other means (see "Off means coarse" section below)." Gray Report, pp. 22-23.

¹⁷³ Ref. Section V.B, which discusses an array of geolocation technologies and related controls (account, device, and app level) that may be used in different contexts (i.e., in different combinations for different features/functionality).

- 132. Dr. Gray then states that the "[t]he WAA setting included no reference to location tracking."¹⁷⁴ I disagree with this opinion for reasons discussed above.
- 133. Dr. Gray also argues that "... the LH setting does not reference that Location History is not the only place to control location tracking. The LH settings can be accessed through at least three different parts of the UI, including the initial account set-up process (Appendix 4), Google account related settings (Appendix 3), and device settings (Appendix 7)."¹⁷⁵ He suggests this is a negative, but in actuality, providing the user with multiple access points is customer-centric considering the wide variation that exists in user preferences, as I discussed above.

8. Device Level Settings

134. Next, Dr. Gray suddenly pivots to device level settings when he states:

The 'Location' setting screen of an Android device is shown in Appendix 7. ... On this page, the device location switch is present alongside controls that impact the level of accuracy (Mode), Location History, Scanning, and App-level permissions ... Importantly, WAA controls are not present on this screen, which would lead a reasonable user (especially the least sophisticated user) to conclude that WAA does not relate in any way to location tracking.¹⁷⁶

135. I disagree with Dr. Gray's opinion here for several reasons.

136. First, as I discussed in Section VI.A, as I understand it, the primary purpose or function of WAA is to enhance other features (e.g., search) by logging certain historical activity to improve future services for that user, not location per se.¹⁷⁷ As such, grouping WAA controls with other primarily "Activity controls" (as shown in Dr. Gray's Appendix 3) rather than with primarily "Location" controls makes a lot of sense from a UI design perspective, where like things are often grouped together to make navigation more intuitive. Also, as discussed above in Section IV.C, particularly when designing UI

¹⁷⁴ Gray Report, p. 22.

¹⁷⁵ Gray Report, p. 22.

¹⁷⁶ Gray Report, p. 22.

¹⁷⁷ Discussion with David Monsees, Senior Project Manager responsible for UDC at Google.

for complex technologies, judgments such as these must be made and they do not reflect an intent to deceive anyone.

- 137. Second, as I discussed in Section VI.B.2, the fact that "Activity controls," including for WAA, are directly linked to a screen boldly labeled "Personal info & Privacy" and prominently featuring a "Privacy Checkup"¹⁷⁸ option, a relatively large shield icon, and an invitation to "review and adjust important privacy settings," should send fairly explicit signals to users that settings navigated to from such a screen may have privacy implications.
- 138. Third, as I discuss in Section VI.C.1 below, Google's account setup disclosures, including those referenced in Dr. Gray's Appendix 4, are examples of progressive disclosure, including around by what means and for what purposes Google gathers, processes, and uses user location data.

9. Concluding Observations on Google's Location Related Controls

139. In summary, based on my analysis, I observe no confusing, indistinct, misleading, manipulative, or deceptive elements in the way these screens were organized. On the contrary, the screens offer users control over the choices they may wish to make as they navigate through numerous settings options. The UI provides as much flexibility in consumer choice as possible while limiting complexity or confusion. Google's UI is based on the principle of progressive disclosure and represents good design. The screens are uncluttered, clean and easy to read, and provide numerous options to drill down if that is what the user desires. There is no evidence for the "dark patterns," e.g. "sneaking" or "forced action," that Dr. Gray purports to find in his contrived analysis of Google's UI.

C. Account Setup

1. Progressive Disclosure Is User Friendly

140. Dr. Gray observes that "[i]n the initial account setup (Appendix 4), options to change WAA and LH settings are only shown if the user clicks on 'More Options' and scrolls down to view the first entry: "Web & App Activity (the setting text does not

¹⁷⁸ GOOG-GLAZ-00299305-306.

indicate that WAA is related to location tracking unless they click on the "Learn More" text underneath the setting.")¹⁷⁹ However, rather than being a negative aspect of UI, this is a good example of progressive disclosure which allows the user to be in control of how much they choose to learn about a particular setting.

141. When a user sets up an account, they are required to agree to Google's Privacy and Terms. In order to click "I agree," users must scroll down through a relatively high level summary of Google's Privacy Policy and Terms of Service designed to meet the needs of users who are likely to want the big picture, without the fine print. This "big picture" includes four bullets at the top of the first screen as shown below.¹⁸⁰

¹⁷⁹ Gray Report, p. 23.

¹⁸⁰ GOOG-GLAZ-00299254.



142. These "above the fold" bullets disclose that setting up a Google account and using Google services means that Google "store[s] information you give us," "we store the information that you create," "process information about ... activity," and "process…information…when you use apps or sites that use Google services…." The third bullet at the top of the screen specifies that "information" includes location. This language at the very top of the Privacy and Terms screen that users must scroll through and agree to in the process of setting up a Google account makes it clear to users that

Google will collect and use data about them, including location, in a variety of ways. In the context of this broad disclosure at the top of the Privacy and Terms screen, I believe it is reasonable for Google to not unduly overload the user with more extensive detail regarding precisely which features and settings enable such data collection, particularly considering that much more specific and detailed disclosures about those features and settings are available just by clicking the appropriate link on this page (*see* below).

- 143. Further down the summary of Privacy and Terms (below what is shown above), users are informed that Google may "process [their] data" to "deliver more useful, customized content such as more relevant search results," "[d]eliver personalized ads," "[i]mprove security," and "[c]onduct analytics and measurement to understand how our services are used." ¹⁸¹
- 144. For users who want to know even more, there are links to Google's full Privacy Policy and Terms of Service right at the top of the summary of Privacy and Terms discussed and excerpted above.¹⁸² There is also a "More Options" link at the bottom of this Privacy and Terms summary¹⁸³ that enables users to "[c]ustomize [their] Google experience by confirming [their] personalization settings and the data stored with [their] account" (*see* below).¹⁸⁴

¹⁸¹ GOOG-GLAZ-00299255.

¹⁸² GOOG-GLAZ-00299254. "Google's Privacy Policy and user instructional videos describe the information that Google collects, why it collects that information, and how Google keeps that information secure. The Privacy Policy specifically explains to users how Google uses location information in a section entitled, 'Information Google collects,' with a subsection titled, 'Your location information.' Under Google's Terms of Service and Privacy Policy, users agree that Google can collect information about location. As Google's Privacy Policy states, we 'collect information about your location when you use our services, which helps us offer features like driving directions for your weekend getaway or showtimes for movies playing near you.'" (Google's Response to CID 1, DFI No. 5, p. 13.)

¹⁸³ GOOG-GLAZ-00299256.

¹⁸⁴ GOOG-GLAZ-00299257.

MOR	EOPTIC	ONS A
Custo your with y	omise y persona your ac	our Google experience by confirming alisation settings and the data stored count.
/ou d adjus Goog	an alw t them, le Acco	ays learn more about these options, and review your activity in your ount (account.google.com).
Ð	Web	& App Activity
	Save histo that u bette perso	s your searches, Chrome browsing ry, and activity from sites and apps use Google services to give you r search results, suggestions, and onalization across Google services
	۲	Save my Web & App Activity to my Google Account
	0	Don't save my Web & App Activity

- 145. These additional settings give users additional control over their "Web & App Activity," "Ads Personalization," "YouTube Search History," "YouTube Watch History," "Location History," and "Voice and Audio Activity" settings. Most of these individual settings have their own "Learn more" options (like seen above under the Web & App Activity setting).¹⁸⁵
- 146. Back at the top of the "More Options" page users are advised that "[they] can always learn more about these options, adjust them, and review [their] activity in [their]

¹⁸⁵ GOOG-GLAZ-00299257-560.

Google Account. (account.google.com)."¹⁸⁶ And right under that, users are reminded that WAA "[s]aves your searches, Chrome browsing history, and activity from sites and apps that use Google services to give you better search results, suggestions, and personalization across Google services."¹⁸⁷

147. Dr. Gray notes that "until early or mid-2018, the account creation disclosures completely omitted any reference to the fact that WAA collects and stores location data."¹⁸⁸ As discussed earlier in this section, however, the language at the top of the Privacy and Terms page that users must scroll through and agree to in the process of setting up a Google account makes it clear to users that Google will collect and use data about them, including location, in a variety of ways. In the context of this broad disclosure at the top of the Privacy and Terms screen, this progressive disclosure is reasonable and appropriate as it leaves the control over what information is to be accessed and when to the user. Furthermore, and as discussed in the prior section, users are given reasonable indication of the types of data collection and use WAA involves when they are presented with the opt in/out option on the WAA settings page.

2. UI Design Requires Knowledge About Users, Particularly for Complex Technologies

148. Dr. Gray states that there "is no implied or actual connection in this consent flow to the fact that both WAA and LH control location; the user would only become aware if they clicked on the Learn More text for WAA and carefully read the description."¹⁸⁹ As I discussed above,¹⁹⁰ different geolocation technologies are used in different contexts, i.e. for different functionalities and setting combinations, and settings are account, device,

¹⁸⁶ GOOG-GLAZ-00299257. When logged in to their account at myaccount.google.com, users are given a variety of options to "[m]anage [their] info, privacy, and security to make Google work better for [them]," including, among others, links to "[m]anage [their] data & privacy," where users can pause collection of, review, download, edit and delete their activity data (including location) by LH, WAA, LH and YouTube; a Privacy Checkup where users can review and adjust other privacy related settings; and a place to turn ad personalization on and off. ¹⁸⁷ GOOG-GLAZ-00299257.

¹⁸⁸ Gray Report, p. 23, citing July 12, 2019 Monsees EUO Tr. at 273:18-274.

¹⁸⁹ Gray Report, pp. 23-24.

¹⁹⁰ Ref. Section V.D.

and app-specific.¹⁹¹ This means that this information is complicated and represents a judgment call on how this information should be organized.

149. Because WAA and LH are different account-level settings, it is logical that they would have separate consent flows.¹⁹² First, as discussed briefly earlier, Web & App Activity "is a Google Account setting that stores a user's Google activity data to My Activity (https://myactivity.google.com) in their Google Account. The user location information that is saved as a result of Web & App Activity (which users can review and delete in My Activity at any time) is collected and stored in a user's Google Account when the user is engaging with a Google product and has Web & App Activity enabled. For example, when a user uses Google Search or Google Maps to search for "restaurant," Google collects the search term as well as information about that activity, including IP address and location information, so that the search results returned to the user will show nearby restaurant options."¹⁹³ Clearly, it is reasonable for users to understand that WAA relies on location information.

150. Also as discussed briefly earlier, recall that **Location History** is distinct from WAA. LH is a Google Account setting "that saves a private map (that is not accessible to or shared with third parties) of where the user goes with his or her signed-in devices, even when the user is not using a Google service. Location History is disabled by default and users must opt in to enable it. Opting in to Location History allows Google to build a user's Timeline (which users can review and delete at any time at https://maps.google.com/timeline) of the places the user's devices have been and to

¹⁹¹ The user location information that Google may collect depends on a number of factors. As Google explains in its Privacy Policy (available at https://policies.google.com/privacy#infocollect), user location information includes information from inputs such as search queries and other information the user chooses to provide to Google (e.g., destination address for driving directions), users' IP addresses, device sensors (as explained further below in Response to DFI No. 2), and device signals including GPS, information cellular networks provided to a device, information from nearby Wi-Fi networks, and information from nearby Bluetooth devices. Location information can be used to provide a range of functionality, including ensuring that Google products and services use the correct default language based on a user's location, providing search results that relate to a relevant place, or providing optional account features, such as current traffic predictions. (Google's Response to CID 1, DFI No. 1, p. 4.) "[T]he user location information that Google collects and stores depends on a number of factors, including the product or service being used and an individual user's settings. (Google's Response to CID 1, DFI No. 11, p. 21.)

¹⁹³ Google's Response to CID 1, DFI No. 7, pp 18-19.

provide more personalized features across Google products and services, such as traffic predictions for their daily commute."¹⁹⁴ This description of LH makes clear that it is distinct from WAA.

- 151. As noted previously, the language at the top of the Privacy and Terms page that users must scroll through and agree to in the process of setting up a Google account makes it reasonably obvious to users that Google is going to be collecting and using data about them, including location, in a variety of ways. In this context of such broad disclosure at the top of the Privacy and Terms screen, this progressive disclosure is reasonable and appropriate as it leaves the control over what information to be accessed and when to the user.
- 152. Furthermore, as discussed in the prior section, users are given reasonable indication of the types of data collection and use WAA involves when they are presented with the opt in/out choice on the WAA settings page.
- 153. Here again, this multiplicity of access points and use of progressive disclosure is consumer-centric, especially considering consumer heterogeneity (as discussed earlier in my report).
- 154. Next, discussing pre-2018 UI, Dr. Gray states the following:

Notably the screens shown in Appendix 5 would not be seen by users unless they first disabled WAA and then re-enabled the setting. ... This lack of visible disclosure during setup exemplifies the dark pattern strategy of *sneaking*, since the user would not have access to information regarding the setting's relationship to location tracking unless they first located the setting and then disabled and reenabled it. Additionally, the fact that WAA that defaulted to on—with a disclosure only appearing after the setting is changed twice (first off and then on again)—constitutes an example of the dark pattern strategy *interface interference*, due to its reliance on pre-selection and lack of visual indication of a disclosure—or disclosure as potential part of feedforward—that is only triggered through multiple changes to the setting."¹⁹⁵

¹⁹⁴ Google's Response to CID 1, DFI No. 7, pp. 17-18.

¹⁹⁵ Gray Report, p. 24.

- 155. As I have explained earlier, there are multiple other ways that users could have and would have been reasonably informed of Google's location data collection and use generally, and in connection with WAA specifically, without—and before—their having "first located the setting and then disabled and reenabled it," as Dr. Gray says.¹⁹⁶
- 156. Also as explained earlier, having WAA on by default is reasonable and appropriate given user preferences and all the related disclosures discussed above.
- 157. Dr. Gray states that "[i]n the Google account-related settings on an Android device (Appendix 6), the location-related controls are buried within a long chain of screens."¹⁹⁷ But in fact, from a usability perspective, these screens are well laid out, applying principles of the widely adopted progressive disclosure approach, and provide users with control over their choices for settings, particularly given the complexity that is being managed. On the first screen it is clear there is 1) a link to "Google Account" which intuitively leads to account-level settings, and 2) below that are links to device-level settings, which users could reasonably intuit from the facts that a) these links are under a separate heading than the Google Account link, b) the user is in the settings app on their device, and c) at least a few of the links could reasonably be understood to be device-level settings based on their names, one of which is "Location."
- 158. As I have discussed throughout this section of my report, it is clear that Google settings maximize user control. In contrast, it is not clear what Dr. Gray means when he says that the UI "makes it more difficult than it needs to be" for users to tailor their settings to their unique contexts. There are multiple device and account-level settings, and these two types of settings are distinct and accommodate different users that interact with Google services in many different ways (i.e., some Google users do not use a Google smartphone but do use certain Google Apps, just as some Google users use Google search through a web browser but not Google Apps). It is appropriate that a customer-centric company like Google provides a UI that is flexible enough to meet the

¹⁹⁶ Gray Report, p. 24.

¹⁹⁷ Gray Report, p. 24. "This task flow does not indicate any control over location settings until the user has navigated four screens deep into the Google account settings interface, representing the dark pattern strategy *interface interference* ('manipulation of the user interface that privileges certain actions over others;" Gray, 2018)." (Gray Report, p. 25.)

needs of many different types of users across many different usage contexts. Providing this type of control over the choices users wish to make is preferable to a UI that forces users to follow specific navigational paths whether they wish to pursue those paths or not. It is also preferable to a UI that unnecessarily burdens users on every screen with so much information that they become overloaded and are unable to process the information. Google's UI makes it easier for users, not more difficult.

3. Task Flow Is User Dependent

- 159. I have noted that it is not possible to define a single optimal task flow for all users, owing to differences among users. Google has done a good job providing its users with control over their location preference choices. For example, Dr. Gray's Appendix 6 evaluates GOOG-GLAZ-00299199.pdf starting at '282/'283 (Settings) and proceeding to '286/'287 (Google, offering a menu of account and service settings), and from there to either a) '292 (Location, where the account level Location services toggle is), or b) '304 (My Account, where there is a menu of security, personalization and privacy, and account preference settings) then '305/306 (Personal info & privacy, offering progressively more personalisation settings, including Privacy Checkup). Though Dr. Gray presents Appendix 6 as if it represents the only task flow users may use to navigate among Google account location related settings, there are actually a number of others.
- 160. For example, a user starting at '282/'283 (Settings) could also navigate to '292 (Location, where the account level Location services toggle is) by tapping the "Security and Location" menu option on '282 that links to a page of that name, shown immediately below,¹⁹⁸ and then selecting "Location" from the menu presented there.

¹⁹⁸ GOOG-GLAZ-000299290.



161. Additionally, once at '292, users are presented with multiple choices to learn more—choices Dr. Gray failed to show, discuss, or perhaps even to consider. Specifically, if a user wants more information before deciding whether to set Location services on or off, they could click the blue "?" icon at the top of the '292 Location screen shown above to arrive at the following Help screen ('293) not shown or discussed by Dr. Gray.¹⁹⁹

¹⁹⁹ GOOG-GLAZ-000299293.



162. From this '293 Help screen, users have multiple choices. One is to click the Location setting icon on that page, which leads to a pop-up window with the Location services switch on it— this time with additional information, as shown below (but again not by Dr. Gray).²⁰⁰

²⁰⁰ GOOG-GLAZ-000299294.


163. Another choice from the '293 Help screen above is to choose from a menu of links to various articles with further information about settings choices—including a first link labeled "Manage your Pixel phone's location settings,²⁰¹ which takes users to an article titled "Turn location on or off for your device," shown immediately below (circa January 2017).²⁰²

²⁰¹ GOOG-GLAZ-000299293.

²⁰² GOOG-GLAZ-000299455-456.

(i) Turn location on or off for your device

You can turn location mode on or off completely for your device. You can also change only your device's location accuracy mode. Each mode uses different sources to estimate your device's location.

When location is turned on for your device, Google can use your Location History to get useful information – like automatic commute predictions or better search results – based on the places that you've been with your Android device.

Change your location mode

Choose your location mode based on:

- How accurate you want the location estimate to be
- How long it takes to determine your location
- How much battery power location services uses

If you turn off location completely for your device, then no apps (neither Google nor non-Google apps) can use your device location. Many useful features will be turned off.

Turn location on or off for your device

- 1. Open your phone's Settings app.
- 2. Under "Personal", tap Location.
- 3. At the top, tap the On/Off switch.

Off

Your device location isn't shared with any apps.

On

Choose your mode:

High accuracy

High accuracy mode uses GPS, Wi-Fi, cellular networks, and other sensors to get the highestaccuracy location for your device. It uses Google's location service to help estimate your location faster and more accurately.

(ii)

Battery saving

Battery saving mode estimates your location using low batteryintensive location sources, like Wi-Fi and cellular networks. It uses Google's location service to help estimate your location faster and more accurately.

Device only

Device only mode estimates your location using GPS only. It doesn't use Google's location service to provide location information. This mode may use more battery power and take longer to determine your location.

When an app is using your device's precise location, the top of your screen shows Location. This icon doesn't necessarily mean that there's GPS activity. Rather, it means that a mode using more power to determine your location is turned on.

Tip: Location is a Quick Setting.

Related links

- Manage location settings for apps
- Manage & delete your Location History
- Find & improve your location's accuracy in Google Maps

164. This article is rich with relevant information. Even so, it was refined over time. By October 5, 2018 it read as appears below, including additional disclosure regarding the use of location information when location is turned off.²⁰³

Manage your Android device's location settings

When you have location turned on for your Android device, you can get info based on its location, like commute predictions, nearby restaurants, and local search results.

When an app is using your device's location via GPS, the top of your screen shows Location.

Tip: When you turn off location for your device, apps and services will not be able to get your device's location, but you could still get local results and ads based on your IP address.

Understand the location settings available on your device

Google has a number of location-based services, including:

 Location Accuracy for your Android device (a.k.a. Google Location Services)

To get a more accurate location for your device, <u>learn how to turn on Location</u> <u>Accuracy</u>.

Location History for your Google Account

To see and manage the places your device has been, learn how to turn on Location History.

Location Sharing for Google Maps

To let others see where your device is, learn how to share your real-time location via Google Maps.

Note: Apps have their own settings ...

Turn location on or off for your device

- 1. Open your device's Settings app.
- 2. Tap Security & location.
 - If you don't see "Security & location," follow the steps for older Android versions.
 - If you have a work profile, tap Advanced.
- 3. Tap Location.
- 4. Turn Use location on or off.

 TIp: You can also turn your device's location on or off with Quick Settings. <u>Learn how</u>.

When Location is on v

- Apps can get your device's location to give you location-based info or services. Learn how to change app location settings.
- Google Location Services can collect data to improve location-based services.
- You can get search results and ads based on your device's location.
- You can see where your device is if you lose it. Learn about Find My Device.
- You can share your device's location with others. Learn about <u>Location Sharing with</u> <u>Google Maps</u> and <u>sending location in</u> <u>emergencies</u>.
- If you have Location History turned on, the places your device goes will be saved. You can see and manage them later. <u>Learn</u> <u>about Location History</u>.

When Location is off

- Your device's location isn't shared with any apps. Features that use location may not work properly.
- Google Location Services won't collect data to improve location-based services.
- You can get search results and ads based on your IP address.
- You can't see where your device is if you lose it. <u>Learn about Find My Device</u>.
- You can't share your device's location with anyone via Google Maps. You can still send it to first responders in an emergency. Learn about Location Sharing with Google Maps and sending location in emergencies.
- Even if you have Location History turned on, the places your device goes won't be saved. Learn about Location History.

²⁰³ GOOG-GLAZ-000299461-462.

165. Thus, far from an interface that manipulates users by forcing them to take one set of actions over another, Google's UI provides users with flexibility in how they might wish to configure their account and device settings in a simple, well understood, easy to navigate series of menus and icons. Information and menu options are organized so as to provide users with control over what information to access and when at different points during their navigational experiences without information overload.

D. Google's Public WAA and LH Disclosures

- 166. Dr. Gray states that on Google's Help Center Page, Google disclosed WAA's collection of user location data in an "obscure" page titled "See & control your Web & App Activity." Dr. Gray claimed that the disclosure requires a user to locate the relevant page (that the user would have no reason to search for in the first place), then scroll to and click on an "Info about your searches & more" link.²⁰⁴
- 167. Dr. Gray's analysis shows a significant misunderstanding of user behavior. First, based on my discussion above of search behavior, it would be nonsensical to argue that a page can be "obscure" when it could be served in a fraction of a second with a search. Second, Dr. Gray has no way of knowing the intent of every user at every point in time. His claim that "the user" would have no reason to look for this information in the first place does not make sense when the fact is that "the [monolithic] user" does not exist. Instead, there are many independent users, each with their own unique needs and preferences. A search on 5-24-2022 for "web and app activity" without the quotes produced over 2.8 million results, suggesting that information on this topic is readily available to interested users through public sources, in addition to the specific WAA disclosures discussed above Google also makes available.²⁰⁵

²⁰⁴ Gray Report, pp. 25-26.

²⁰⁵ One such page is https://policies.google.com/technologies/location-data?hl=en-US. This page contains extensive information on how Google uses location information, as well as several links to additional information. On this page, Google clearly states (among many other things, that "[a]n IP address (also called Internet address) is assigned to your device by your Internet Service Provider, and is a requirement to use the internet. IP addresses are used to make the connection between your device and the websites and services you use. IP addresses are roughly based on geography. This means that any website you use, including google.com, may get some information about your general area. Like many other internet services, Google can use information about the general area that you're in to provide some basic services. Estimating the general area that you're in means for instance that Google can give you relevant results, and keep your account safe by detecting unusual activity, such as signing in from a new city."

E. IP Geo

168. Google's IPGeo "map[s] IP addresses to certain geographic blocks."²⁰⁶ That IP addresses are required to connect to the Internet and can be used to identify the location from which a device is connected to the Internet is at least generally known among a fairly broad cross section of internet and smartphone users. Nevertheless, all Google smartphone users, including those without such prior general knowledge before using a Google smartphone, would be shown such information in the process of setting up a Google smartphone. As discussed in Section VI.C above, the first and second screens of Google's Privacy and Terms early in the Android device setup process clearly disclose that Google gathers and processes user data, including IP address and location, for a variety of reasons including to help its "services deliver more useful, customized content such as more relevant search results," such as "[w]hen you search for a restaurant on Google Maps."²⁰⁷ If a user is interested in learning more about anything in those conveniently abridged Privacy and Terms disclosures, they can click directly through to Google's full Privacy Policy and Terms of Service. Once there, an interested reader would see, among other things, the disclosure below (circa January 2017).²⁰⁸

Location information

When you use Google services, we may collect and process information about your actual location. We use various technologies to determine location, including IP address, GPS, and other sensors that may, for example, provide Google with information on nearby devices, Wi-Fi access points and cell towers.

169. I understand that most technological aspects of enabling geolocation from IP addresses are publicly accessible or available through third parties. I also understand that Google's IPGeo utilizes substantial proprietary technology as well. As such, I do not find Dr. Gray's contention that "Google keeps IPGeo and from the public eye and has attempted to seal (many times successfully) the names of the products and their

²⁰⁶ Google's Response to CID 1, DFI No. 5, p. 67.

²⁰⁷ GOOG-GLAZ-00299213-214.

²⁰⁸ GOOG-GLAZ-00299382.

functionalities throughout this case" surprising or problematic²⁰⁹ That level of disclosure may threaten the security of Google (and possibly other firms') intellectual property, and is certainly beyond the level of detail required by smartphone users to be aware of, and make informed decisions regarding location related settings on their smartphones.

F. Removing Location from the QS Tile

- 170. The QuickSettings ("QS") feature on Android devices is designed to give users quick access to a few of the settings they use most. Users can access it any time by swiping down from the top of the screen of a smartphone running an Android operating system. As explained in a 2013 Android user guide, QS is "[t]he fastest way to adjust system settings that you access frequently, such as Wi-Fi or brightness."²¹⁰
- 171. As Dr. Gray points out, the device location setting was removed from QuickSettings in mid-2016.²¹¹ By that time LBS had become a critical part of smartphone users' experience, enabling many of the features they used most. As noted earlier, by 2015, 90% of Americans reported using LBS on their smartphones,²¹² and 83% of smartphone users identified location services as "crucial" to their mobile experience.²¹³ While Dr. Gray may have a point that "the QS location toggle was the easiest, most accessible way for a user to disable their device location,"²¹⁴ removing the device's location setting from QS in mid-2016 made sense from a UI design perspective given how integral a part of smartphones users' experience it had become by that time.
- 172. Google, being a customer-centric company well attuned to feedback, would know that to many users, disabling all their phone's location-enabled capabilities would rob them of much of the functionality they found most useful. Google's rationale for making the change was that "by putting Location front and center, we have inadvertently started

²⁰⁹ Gray Report, p. 27.

²¹⁰ Android Quickstart Guide, Android Mobile Technology Platform, 4.4 KitKat, 2013, p. 46.

²¹¹ Gray Report, p. 29.

²¹² Pew Research Center, "More Americans using smartphones for getting directions, streaming TV," January 29, 2016, available at: https://www.pewresearch.org/fact-tank/2016/01/29/us-smartphone-use/.

²¹³ GeoMarketing, "Consumers Deem Location Services 'Crucial' For Apps — But Only Half Of Them Leave Geo Signals On," October 20, 2015, available at https://geomarketing.com/consumers-deem-location-services-crucial-for-apps-but-only-half-of-them-leave-geo-signals-on.

²¹⁴ Gray Report. p. 29.

encouraging users to toggle this setting to save battery. As a result, users get into a bad state where they are trying to use navigation in Maps or do a local search and are unable to do so because location is disabled."²¹⁵ Google knew that "[1]ocation is critical forsearch," specifically because it "[s]ignificantly improves search quality,"²¹⁶ and was on a "[m]ission" to "[p]rovide the most accurate user location available and use this location to improve the user experience."²¹⁷ Their plans to help users avoid "get[ting] into a bad state"²¹⁸ (in which they had unnecessarily turned off location to save battery life) included providing "contextual prompts"²¹⁹ in apps like Maps, and "warn[ing] users who disabled location about the implications."²²⁰ This is all good user-centric, evolutionary UI design.

G. Google Search Footer

- 173. Contrary to Dr. Gray's opinion that footers have "extremely low engagement rate[s]," and therefore represent a manipulative design element,²²¹ footers are actually considered an important element of UI design.²²² UX experts argue that footers are "highly visible" because studies of scroll depth show that "no page is too tall, no footer too far."²²³ Undoubtedly, users looking for content have learned that scrolling down is where content that cannot be located anywhere else might be found.
- 174. Footers are used to provide secondary content. They can help structure content in a way so as to minimize clutter that might otherwise distract users from their main objectives. Depending on the application, footers might contain a firm's privacy policy

²¹⁵ GOOG-GLAZ-00026360. Internal Google documents show that user privacy concerns were taken into account in making the decision to remove location from QS. A document memorializing the decision noted that "[a]lthough the majority of users toggle the location switch to save battery, **use** this toggle because they concerned about privacy **use** ." (GOOG-GLAZ-00026360, at 361). Other Google research had at the time indicated that "[o]nly **use** of users who turn off device location do it for privacy. Most of the other are concerned about battery." (GOOG-GLAZ-00027187, at 196.)

²¹⁶ GOOG-GLAZ-00026768, at 770.

²¹⁷ GOOG-GLAZ-00027187, at 188.

²¹⁸ GOOG-GLAZ-00026360, at 360.

²¹⁹ GOOG-GLAZ-00026768, at 782.

²²⁰ Id.

²²¹ Gray Report, p. 32.

 ²²² Crestodina, Andy, "Website Footer Design Best Practices: 27 Things to Put at the Bottom," Orbit Media Studios, available at https://www.orbitmedia.com/blog/website-footer-design-best-practices/.
 ²²³ Id.

(the second most common piece of information in a footer²²⁴), terms of use, links to related content, and the like. Users expect to scroll down to a footer when looking for content that they are otherwise unable to locate. One UX designer considers footers a "safety net," as they provide that "last chance to capture the user before they give up and take their clicks elsewhere."²²⁵ Google clearly uses footers as a crucial element of the UI that supplements all the other disclosures it provides on its screens.

H. Wi-Fi Connectivity and WiFi Scanning

175. Similar to how and why Google handled WAA related disclosures the way it did, it was logical for its WiFi connectivity related disclosures to focus on that as its primary purpose, rather than its supporting role in location determination in some circumstances. As Dr. Gray himself admits, Google's public disclosures indicate that WiFi Scanning relates to the collection of user location data, and that the WiFi Scanning setting is aptly located within a device's location settings [whereas WIFi connectivity is not].²²⁶ Grouping settings in a logical manner (e.g., according to their primary functionality) and telling users what is most relevant in specific contexts so as to avoid overwhelming them with superfluous detail, as Google did here, are consistent with good UI design principles. Taking a step back, Google is primarily focused on the whole user experience—not everything is as narrowly about location as Dr. Gray suggests.

I. Technical Aspects of Location Data Collection and Use

1. Backend Location Sharing

176. I understand that Dr. Gray is misinformed regarding the alleged "loophole," and that this topic is being addressed by a technical expert.

2. "Off Means Coarse"

177. Since the introduction of smartphones, users have become aware that smartphones are equipped with technology that can be used to determine users' locations. As I discussed above, users consider location capabilities to be one of the smartphone's most

²²⁴ Id.

²²⁵ McGowan, Sean, "UX Design Tips To Put Your Best Footer Forward," UsabilityGeek, available at https://usabilitygeek.com/ux-design-tips-best-footer/.

²²⁶ Gray Report, p. 33.

important functions. Academic research and real world behavior show that consumers are not only willing to trade location data for location-based services in the context of smartphone usage, but that the vast majority of U.S. users do so regularly. As I have discussed above from several perspectives, Google makes effective use of good UI design principles and practices to provide users with the information they need to make informed decisions regarding which, if any, location data for LBS tradeoffs they are willing to make in different situations, along with the granular setting options to make them. Users are informed in the privacy policy that Google can collect location data from sources other than device location such as IP address. The "off means coarse" policy meant that Google would only use coarsened data to target ads when device location was off, even if it could have derived a more precise location. This decision meant that Google was restricting its use of data while also providing users with the benefits derived from coarse location information.²²⁷

J. Connecting Google's UI to Its Business Goals

- 178. Dr. Gray begins his concluding remarks by claiming that "Google used multiple strategies that reduced user awareness and control over location by manipulating the user's choice architecture."²²⁸ The analyses I have presented in this report demonstrate that the opposite is true. Google's UI design involves progressive disclosure which expands, rather than reduces, user control over location and other settings. As opposed to manipulating the user's choice architecture, Google's UI has been designed to put control over choices in the hands of users, rather than Google.
- 179. In my opinion, collecting user location data is in the interests of serving customers and Google's well-subscribed LBS attest to this. Google is focused on understanding user location so that it "can understand what users are looking for and fetch helpful results," for example, by understanding that when a user searches for, say, "pizza near me," the user wants results for pizza in their current physical location (to the extent possible via

²²⁷ GOOG-GLAZ-00242126.

²²⁸ Gray Report, p. 36.

available signals) and in relation to their preferences.²²⁹ Google's intent in understanding user location is to improve user experience.²³⁰

- 180. Google understands that user expectations change over time and puts a continual emphasis on helping users understand the benefits that can be derived from location data.²³¹ Rather than "the aggregation of so many dark patterns ...[that] makes it practically impossible for consumers to avoid,"²³² Google's efforts reflect a customer-centric strategy to deliver positive user experiences. Google has determined that location-based services are valued and thus offers them to users with multiple opportunities to adjust settings based on their comfort levels.
- 181. Dr. Gray claims that settings "potentially confuse users," that navigating settings is a "herculean task," and that users are somehow "unwilling."²³³ Yet, he provides no empirical evidence of confusion, task difficulty, or unwillingness to provide location data. He argues that "the "aggregation of so many dark patterns"²³⁴ makes them so pervasive that consumers are unavoidably trapped. But Dr. Gray never explains how many of the "so many" dark patterns it takes to create an inescapable trap. For example, Dr. Gray provides no method for how the alleged dark patterns should be weighted, summed, or aggregated in any way that would lead to a replicable or reliable conclusion.
- 182. Collecting user location data is in the interests of serving customers. Users desire experiences that take into account their location, and marketers and advertisers rely on location data to deliver those experiences. My analysis above shows that personalization (e.g., via location) is a successful marketing strategy because it meets the needs of both marketers and consumers. In my opinion, users would find their smartphone and online experiences severely degraded if they actually did choose to turn off every location setting, as Dr. Gray implicitly suggests users may want to do.²³⁵

²²⁹ GOOG-GLAZ-00246795 at 795.

²³⁰ Id.

²³¹ GOOG-GLAZ-00246795 at 796, 797, 798, 799, 800.

²³² Gray Report, pp. 37-38.

²³³ Gray Report, pp. 37-38.

²³⁴ Gray Report, p. 37.

²³⁵ Gray Report, p. 38.

183. When one carefully considers the evolution of Google's UI and disclosures at issue in their full context, it is my opinion that they are consistent with efforts to give users the information they need to make informed decisions based on their individual preferences for location-based services. The fact that "Google relies upon user location data ... as a key part of its service delivery and advertising strategy,"²³⁶ is not evidence of manipulation, but instead reflects a customer-centric strategy focused on delivering superior user experiences.

VII. CONCLUSION

- 184. Based on my professional expertise, experience, and knowledge, and my review of the information available to me in this case, I have developed the following key opinions:
- 185. Dr. Gray's conclusion that Google's user interface and disclosures contain dark patterns should not be relied upon because it is based on an arbitrary and subjective construct lacking in reliability and validity. Further, his conclusions assume that Google acted deceptively and fraudulently.
- 186. Dr. Gray's opinions also fail to consider key principles of effective user interface design. As I explain above, Google's user interface design and related disclosures are consistent with industry best practices. Google is a customer-centric business that operates in a technologically complex environment and is supported by a unique organizational structure. In the context of significant market, business, and technical complexity, Google nonetheless employs well founded user interface design principles including progressive disclosure to support user control over navigational choices, continuously responds to customer feedback, and evolves its user interface based on opportunities to improve. Google's flexible user interface provides individuals choices that best support their needs for location-based services and privacy. Google's UI balances the need to avoid overwhelming users informationally while at the same time

²³⁶ Gray Report, p. 36.

providing easy access to disclosures. Providing users with choices is not indicative of an intent to deceive or manipulate.

- 187. Dr. Gray consistently mischaracterizes or misinterprets Google's actions and intent regarding location-based services and user controls. Based upon Google's adherence to objective principles of user interface design, I conclude that Google consistently employs best practices and provides users information and choice to control their own location and privacy preferences.
- 188. In the event additional information is provided, I reserve the right to update these opinions as appropriate.

* * *

Signed on the 8th day of June, 2022 in Encinitas, CA.

MA L HAMMAN

Donna L. Hoffman

APPENDIX A

DONNA L. HOFFMAN

George Washington University School of Business 2201 G St NW #304 Washington, DC 20052 email: dlhoffman@gwu.edu web: http://postsocial.gwu.edu voice: 202-994-3137

Education

Ph.D., L.L. Thurstone Psychometric Laboratory, University of North Carolina, Chapel Hill, NC, 1984. (Quantitative Psychology with Formal Minor in Marketing from Graduate School of Business Administration.)

M.A., L.L. Thurstone Psychometric Laboratory, University of North Carolina, Chapel Hill, NC, 1980. (Quantitative Psychology.)

A.B., University of California, Davis, California, 1978. (Psychology.)

Academic Appointments

The George Washington University, July 1, 2013-present Louis Rosenfeld Distinguished Scholar and Professor of Marketing Co-Director, Center for the Connected Consumer

University of California, Riverside, 2006-2013 Albert O. Steffey Chair of Marketing (2011-2013); Chancellor's Chair (2006-2011) Co-Director, UCR Sloan Center for Internet Retailing Department Chair, Management and Marketing (2006-2011) Cooperating Faculty, Department of Psychology (2007-2013)

Vanderbilt University

Professor of Marketing, 2000-2006. Co-Director, Vanderbilt University Sloan Center for Internet Retailing, 2003-2006 Co-Founder & Co-Director, *eLab* Research Laboratory, 1994-2006. Director, Electronic Commerce Concentration 1999-2006. Marketing Area Head, 2002-2003, 2005-2006 Associate Professor of Marketing, 1993-2000. Founder & Director, Electronic Commerce Emphasis at Owen, 1995-1999. (Emphasis converted to formal concentration in 1999).

University of Texas (Dallas) Associate Professor, 1991-1993.

Page 2 June 2022

Columbia University Associate Professor, Graduate School of Business, 1987-1990. Assistant Professor, 1984-1987. Associate in Business, 1983-1984.

Visiting Scholar Appointments

University of Hong Kong (HKU), January 12-29, 2019 Visiting Scholar, Faculty of Business and Economics, Department of Marketing

University of California, San Diego, Fall 2013, Spring 2018 Visiting Scholar, Rady School of Management

University of Southern California, Fall 2010 Visiting Scholar, Marshall School of Business

Stanford University

Visiting Scholar, Center for Electronic Business and Commerce (Summer 2000) Visiting Scholar, Department of Marketing (Summer 1997)

UCLA

Visiting Associate Professor, Anderson Graduate School of Management (Summer 1989)

Professional Experience

Interval Research Corporation, Palo Alto, CA, 1995-1999 Visiting Scholar (summer)

Research Triangle Institute, N.C., 1980-1981 Social Science Analyst

Special Appointments

President's Information Technology Advisory Committee (PITAC), Socio-Economic and Workforce Panel, 1998.

Page 3 June 2022

Academic Honors and Awards

- 2021 GWSB Dean's Awards for Excellence: Senior Faculty Research Award
- 2021 Best Article Award, *Journal of Consumer Research*. Awarded for Hoffman and Novak (2018), "Consumer and Object Experience in the Internet of Things: An Assemblage Theory Approach," (Volume 44) April 2018.
- 2020 Finalist for Academy of Marketing Science Best JAMS Article Award Published in 2019
- 2019 Winner of the Lazaridis Prize for the Best Paper on the Practice of Marketing as it relates to Innovation, Technology and Interactivity, awarded by the American Marketing Association (AMA) TechSIG
- 2019 Journal of Consumer Research Best Reviewer Award
- 2019 Society for Consumer Psychology Fellow
- 2012 University of Pennsylvania Future of Advertising Center/Wharton Customer Analytics Initiative "Innovative Approaches to Measuring Advertising Effectiveness" Winner for proposal "Crowdsourcing Ad Effectiveness: Can Emergent Segments Produce the Most Effective Online Ads? (\$7,500)
- 2012 MSI Ideas Challenge Winner for proposal "Idea Wars: Developing a Collaborative Research Agenda for the Gamification of Marketing" (\$10,000)
- 2012 Finalist, Paul. D. Converse Award for Outstanding Contributions to the Science of Marketing
- 2011 National Science Foundation Grant # IIS-1114828, "Motivations, Expectations and Goal Pursuit in Social Media," PI (\$413,756 for two years)
- 2011 Robert B. Clarke Outstanding Educator of the Year Award (Direct Marketing Educational Foundation)
- 2011 Marketing Science Institute "Challenges of Communications and Branding in a Digital Era" research proposal competition winner (\$8,750)
- 2011 Robert D. Buzzell MSI Best Paper Award Honorable Mention for "The 'Right' Consumers for the Best Concepts: Identifying and Using Emergent Consumers in Developing New Products" (Hoffman, Kopalle and Novak)
- 2009 Thomson Reuters' Essential Science Indicators cited Professors Donna Hoffman and Tom Novak's *Journal of Interactive Marketing* (2009) article as a "Fast Breaking Paper" (one of the most cited in the past two years) in the entire field of Economics and Business, November 2009.
- 2009 Google/WPP Marketing Research Award (First Round Inaugural Year), "Are Brand Attitudes Contagious?" \$55,000, with Tom Novak
- 2008 Marketing Science Institute Research Grant Award, The "Right" Consumers for the Best Concepts: A Methodology for Identifying Emergent Consumers for New Product Development, \$6,750, with Tom Novak and Praveen Kopalle.
- 2008 National Science Foundation, Global Environment for Network Innovations (GENI) End-User Opt-In Initiative

Vita	
Donna L. Hoffman	

- 2007 Alfred P. Sloan Foundation Research Networking Workshop Grant Award (\$15,000)
- 2007 National Retail Federation Ray M. Greenly Shop.org Scholarship (\$2500) to the UCR Sloan Center for Internet Retailing – awarded to Hector Rosales, UCR undergraduate
- 2005 Sheth Foundation/Journal of Marketing Award for long-term contributions to marketing for the article "Marketing in Hypermedia Computer-Mediated Environments: Conceptual Foundations, published in the *Journal of Marketing* (1996).
- 2005 Stellner Distinguished Scholar for 2005-2006, University of Illinois at Urbana-Champaign.
- 2004 Member of marketing department ranked #2 in research impact per faculty member (based on median citation rates) among the top 46 business schools in the United States.
- 2003 ISI Essential Science Indicators cited Professors Donna Hoffman and Tom Novak's *Marketing Science* (2000) article as "Emerging Research Front" in the entire field of Economics and Business, December 2003.
- 2003 ISI Essential Science Indicators cited Professors Donna Hoffman and Tom Novak for the highest percentage increase in total citations in the entire field of Economics and Business, July 2003.
- 2003 AACSB International Effective Practice: eLab
- 2002 University of North Carolina Distinguished Graduate Alumni http://gradschool.unc.edu/centennial/distinguished_graduate.html
- 1999 With Professor Tom Novak, voted as one of the top two Internet scientists by over 600 U.S. and European scientists and marketing managers in a survey conducted by the ProfNet Institute for Internet Marketing in Dortmund, Germany.
- 1999 EDSF Excellence in Education Award for Innovation in Higher Education (sponsored by Xerox).
- 1997 EFF (Electronic Frontier Foundation) Honorary Fellow.
- 1996 TLA/SIRS Freedom of Information Award.
- 1991 William O'Dell Award for "Correspondence Analysis: The Graphical Representation of Categorical Data in Marketing Research," *Journal of Marketing Research*, 1986.
- 1991 American Marketing Association Second Annual Advanced Research Techniques Forum Best Paper Award and Best Presentation Award for "Asymmetric Residual Maps for Market Structure Analysis."

Research Interests

- Consumer and smart object experience of AI using assemblage theory and objectoriented ontology perspectives
- Computational approaches (machine learning and NLP methods) for understanding consumer-smart object experience from IoT interaction data
- Self-extension and self-expansion theories of consumers' relationships with objects

Page 5 June 2022

• Online consumer behavior and digital marketing strategy

Research Impact

36,091 citations in Google Scholar (as of June 2022): Google Scholar Page: <u>https://scholar.google.com/citations?user=FY9GUJgAAAAJ&hl=en</u>

- 8 articles with 1000+ citations
- 15 articles with 500+ citations
- 31 articles with 150+ citations
- h-index=49 (at least 49 articles cited at least 49 times)
- i10index=86 (86 papers with 10 or more citations)
- 10,219 citations in the past five years

The 1996 *Journal of Marketing* article on marketing in computer-mediated environments is the most widely cited *Journal of Marketing* article from 1995-2007 and the #1 most cited paper in the entire marketing discipline between 1990-2002 (Stremersch, Verniers and Verhoef 2007).

The 2000 *Marketing Science* article on online customer experience is one of the "all time most highly cited articles" and the top article in terms of "all time citations per year" in *Marketing Science* (Shugan 2008), as well as the 14th most cited paper in the entire marketing discipline between 1990-2002 (Stremersch, Verniers and Verhoef 2007)

Journal Publications

- 1. Novak, T.P. and D.L. Hoffman, "Automation Assemblages in the Internet of Things: Discovering Qualitative Practices at the Boundaries of Quantitative Change," accepted, *Journal of Consumer Research*.
- 2. Hildebrand, C., F. Efthymiou, B. Francesc, W.H. Hampton, D.L. Hoffman and T.P. Novak (2020), "Voice Analytics in Business Research: Conceptual Foundations, Acoustic Feature Extraction, and Applications," *Journal of Business Research*, 121 (December), 364-374.
- MacInnis, Deborah J., Vicki G. Mortwitz, Simona Botti, Donna L. Hoffman, Robert V. Kozinets, Donald R. Lehmann, John G. Lynch, Jr., Cornelia Pechmann (2020), "Creating Boundary-Breaking Marketing-Relevant Consumer Research," *Journal of Marketing*, 84(2), 1-23.

Page 6 June 2022

 Novak, T.P. and D.L. Hoffman, (2019), "Relationship Journeys in the Internet of Things: A New Framework for Understanding Interactions Between Consumers and Smart Objects," *Journal of the Academy of Marketing Science*, special issue on Consumer Journeys: Developing Consumer-Based Strategy, 47(2), 216-237.

Finalist for Academy of Marketing Science Best JAMS Article Award published in 2019

- 5. Hoffman, D.L. and T.P. Novak (2018), "The Path of Emergence Experience in the Consumer IoT: From Early Adoption to Radical Changes in Consumers' Lives," *Marketing Intelligence Review: IoT Experiences*, 10(2), 10-17.
- 6. Hoffman, D.L. and T.P. Novak (2018), "Consumer and Object Experience in the Internet of Things: An Assemblage Theory Approach," *Journal of Consumer Research*, 44(6), April, 1178-1204. Lead article.

Winner of the 2021 Journal of Consumer Research Best Article Award.

Winner of the 2019 Lazaridis Prize for the Best Paper on the Practice of Marketing as it relates to Innovation, Technology and Interactivity, awarded by the American Marketing Association (AMA) TechSIG.

- Verhoef, P., Stephen, A., Kannan, P.K., Luo, X., Abhishek, V., Andrews, M., Bart, Y., Datta, H., Fong, N., Hoffman, D., Hu, M., Novak, T., Rand, W., and Zhang, Y. (2017), "Consumer Connectivity in a Complex, Technology-Enabled, and Mobile-Oriented World with Smart Products," *Journal of Interactive Marketing*, 40 (November), 1-8.
- 8. Hoffman, D.L., T.P. Novak and H. Kang, (2017), "Let's Get Closer: How Regulatory Fit Drives Feelings of Connectedness in Social Media," *Journal of the Association for Consumer Research*, issue on "The Consumer in a Connected World," 2(2).
- 9. White, T., T. P, Novak and D. L. Hoffman (2014), "No Strings Attached: When Giving It Away Versus Making Them Pay Leads to Negative Net Benefit Perceptions in Consumer-Retailer Exchanges," *Journal of Interactive Marketing*, 28 (August), 184-195.
- Yadav, Manjit S, Kristine De Valck, Thorsten Hennig-Thurau, D.L. Hoffman and Martin Spann (2013), "Social Commerce: A Contingency Framework for Assessing Marketing Potential," *Journal of Interactive Marketing*, 27 (November), 311-323.
- Hoffman, D.L. and T.P. Novak (2012), "Toward a Deeper Understanding of Social Media," Journal of Interactive Marketing. (Editorial, Co-Editor, Special Issue on "Social Media"), 26(May), 69-70.

Page 7 June 2022

- 12. Hoffman, D. L. (2011), "Web 2.0 for B2Bs: Strategic Brief," *European Business Review*, November-December, 72-73.
- Hoffman, D.L. and Novak. T.P (2011), "Marketing Communication in a Digital Era," Marketing Management, Fall, 20(3), 37-42, American Marketing Association. Cover article. (Invited article to commemorate the 50th Anniversary of the Marketing Science Institute.)
- 14. Hoffman, D.L. and M. Fodor (2010), "Can You Measure the ROI of Your Social Media Marketing?" *Sloan Management Review*, 52(1), Fall, 41-49.
- 15. Hoffman, D., Kopalle, P., Novak, T. (2010) The "Right" Consumers for Better Concepts: Identifying Consumers High in Emergent Nature to Develop New Product Concepts," *Journal of Marketing Research*, 47 (October).

Honorable Mention: 2011 Robert D. Buzzell MSI Best Paper Award for significant contribution to marketing practice and thought.

- 16. Hoffman, D.L. (2009), "Managing Beyond Web 2.0," McKinsey Quarterly, July.
- Hoffman, D.L., Novak, T.P. (2009), "Flow Online: Lessons Learned and Future Prospects," Journal of Interactive Marketing, 23(1), February, Anniversary Issue, 23-34.
 Most cited article during the period 2007-2011.
- 18. Novak, T.P., Hoffman, D.L. (2009), "The Fit of Thinking Style and Situation: New Measures of Situation-Specific Experiential and Rational Cognition," *Journal of Consumer Research*, 36(1), December, 56-72.
- 19. Neslin, S., Novak, T., Baker, K., Hoffman, D. (2009), "An Optimal Contact Model for Maximizing Online Panel Response Rates," *Management Science*, 55(5), May, 727-737.
- 20. Hoffman, Donna L., Thomas P. Novak, and Alladi Venkatesh (2004), "Has the Internet Become Indispensable?" *Communications of the ACM*, 47(7), July, 37-42.
- 21. Hoffman, Donna and Thomas P. Novak (2005), "A Conceptual Framework for Considering Web-Based Business Models and Potential Revenue Streams" *International Journal of Marketing Education*, 1(1).
- 22. Chatterjee, P., D.L. Hoffman and T.P. Novak (2003), "Modeling the Clickstream: Implications for Web-Based Advertising Efforts," *Marketing Science*, 22(4), 520-541.

Page 8 June 2022

- 23. Hoffman, Donna L., Thomas P. Novak and Ann Schlosser (2003), "Consumer Attitudes Toward Software Filters and Online Content Ratings: A Policy Analysis," *Journal of Public Policy and Marketing*, 22(1), 41-57.
- 24. Novak, Thomas P., Donna L. Hoffman, and Adam Duhachek (2003) "The Influence of Goal-Directed and Experiential Activities on Online Flow Activities," *Journal of Consumer Psychology*, 13(1&2), 3-16. Lead article.
- 25. Straub, Detmar, Donna L. Hoffman, Bruce Weber and Charles Steinfield (2002), "Toward New Metrics for Net-Enhanced Organizations," *Information Systems Research*, 13(3), September. (Editorial)
- 26. Straub, Detmar, Donna L. Hoffman, Bruce Weber, and Charles Steinfield (2002),
 "Measuring e-Commerce in Net-Enabled Organizations," *Information Systems Research*.
 13 (2), June. (Editorial)
- 27. Hoffman, D. L. (2000), "The Revolution Will Not Be Televised," Editorial, *Marketing Science*, Winter, 19(1), 1-3. (Editorial)
- 28. Hoffman, D.L. and T.P. Novak (2000), "How to Acquire Customers on the Web," May/June, *Harvard Business Review*, 179-188.
- 29. Hoffman, D.L., T.P. Novak and A. Schlosser (2000), "The Evolution of the Digital Divide: How Gaps in Internet Access May Impact Electronic Commerce," *Journal of Computer-Mediated Communication, 5(3),* <u>http://www.ascusc.org/jcmc/vol5/issue3/hoffman.html</u>. Reprinted in: Hoffman, D.L., T.P. Novak and A. Schlosser (2003), "The Evolution of the Digital Divide: How Gaps in Internet Access May Impact Electronic Commerce," *New Directions in Research on E-Commerce,* Charles Steinfield, Editor, 245-292, Purdue University Press.
- 30. Novak, T.P., D.L. Hoffman, and Y.F. Yung (2000), "Measuring the Customer Experience in Online Environments: A Structural Modeling Approach," *Marketing Science*, Winter, 19(1), 22-44.
- 31. Hoffman, D.L., T.P. Novak, and M.A. Peralta (1999), "Building Consumer Trust Online," April, *Communications of the ACM*, Volume 42, Number 4, April, 80-85.

- 32. Hoffman, D.L, T.P. Novak, and M.A. Peralta (1999), "Information Privacy in the Marketspace: Implications for the Commercial Uses of Anonymity on the Web," The *Information Society*, Volume 15, Number 2, April-June, 129-140.
- *33.* Hoffman, D.L. and T.P. Novak (1998), "Division on the Internet?" *Science, 281 (August 14), 919d* (response to letters regarding "Bridging the Racial Divide on the Internet").
- 34. Hoffman, D.L. and T.P. Novak (1998), "Bridging the Racial Divide on the Internet," Science, Volume 280, 390-391, April 17.
- Novak, T.P. and D.L. Hoffman (1997), "New Metrics for New Media: Toward the Development of Web Measurement Standards," *World Wide Web Journal*, Winter, 2(1), 213-246. Russian translation reprinted as a chapter in *Research on the Internet*, *Humanitarian and Social Aspects*, A. Voiskounsky, ed.
- Hoffman, D.L. and T.P. Novak (1997), "A New Marketing Paradigm for Electronic Commerce," *The Information Society,* Special Issue on Electronic Commerce, 13 (Jan-Mar.), 43-54. German translation reprinted in *THEXIS*, special issue on "Online Marketing," (1997), Jan., 39-43.
- 37. Hoffman, D.L., W.D. Kalsbeek and T.P. Novak (1996), "Internet and Web Use in the United States: Baselines for Commercial Development," Special Section on "Internet in the Home," *Communications of the ACM, 39 (December)*, 36-46.
- 38. Hoffman, D.L. and T.P. Novak (1996), "Perspectives: The Future of Interactive Marketing," *Harvard Business Review*, 74 (November-December), 161.
- Hoffman, D.L. and T.P. Novak (1996), "Marketing in Hypermedia Computer-Mediated Environments: Conceptual Foundations," *Journal of Marketing*, 60 (July), 50-68.
 Reprinted in: *Marketing Communication Classics*, (2000), Maureen FitzGerald and David Arnott, eds. London: Business Press, pp. 261-290.

Winner of the 2005 AMA Sheth Foundation/Journal of Marketing Award for long-term contributions to the marketing discipline.

 Hoffman, D.L., T.P. Novak, and P. Chatterjee. (1995), "Commercial Scenarios for the Web: Opportunities and Challenges," *Journal of Computer-Mediated Communication*, Special Issue on Electronic Commerce, 1(3). Lead article. Reprinted in: *Electronic Commerce: Profiting from Business On-line*, (1996) Layna Fischer, ed., Lighthouse Point FL: Future Strategies Inc., Book Division, pp. 107-136. Reprinted in: *Readings in Electronic Commerce* (1996), Ravi Kalakota and Andrew Whinston, eds., Reading, MA: Addison-Wesley, pp. 29-53. Reprinted in: *Web Marketing Insider* (1996). [www.ideacentral.com/wmi/hoffman1.html]

- Hoffman, D.L. & Holbrook, M.J. (1993) The Intellectual Structure of Consumer Research: A Bibliometric Study of Author Co-Citations in the First 15 Years of JCR. Journal of Consumer Research, 19(4), March, 505-517.
- 42. Hoffman, D.L. & de Leeuw, J. (1992) Interpreting Multiple Correspondence Analysis as an MDS Method. *Marketing Letters, 3(3).*
- 43. Kopalle, P. & Hoffman, D.L. (1992) Generalizing the Sensitivity Conditions in an Overall Index of Product Quality. *Journal of Consumer Research*, 18 (4), March, 530-535.
- 44. Hoffman, D.L. & Batra, R. (1991) Viewer Response to Programs: Dimensionality and Concurrent Behavior. *Journal of Advertising Research*, (August-September), 31(4), 46-56.
- 45. Novak, T.P & Hoffman, D.L. (1990). Residual scaling: An alternative to correspondence analysis for the graphical representation of residuals from log-linear models. *Multivariate Behavioral Research*, 25(July), 351-370.
- 46. Hoffman, D.L. & Novak, T.P. (1988). A short SAS macro for performing the basic equations of correspondence analysis. *TRAC*, 7(3), *Computer Corner*, 93-94.
- DeSarbo, W. & Hoffman, D.L. (1987). Constructing MDS Joint Spaces from Binary Choice Data: A New Multidimensional Unfolding Model for Marketing Research. *Journal of Marketing Research*, 24 (February), 40-54.

Hoffman, D.L. & Franke, G. (1986). Correspondence Analysis: The Graphical Representation of Categorical Data in Marketing Research. *Journal of Marketing Research*, 23 (August), 213-227. Reprinted in *Multidimensional Scaling: Concepts and Applications*, P. Green, F. Carmone and S. Smith (Eds.), Allyn and Bacon, Inc. (1993)

Winner of the 1991 William O'Dell Award for long-run contributions to marketing.

48. DeSarbo, W. & Hoffman, D.L. (1986). Simple and Weighted Multidimensional Unfolding Threshold Models for the Spatial Representation of Binary Choice Data. *Applied Psychological Measurement*, 10(3), 247-264.

49. Hoffman, D.L. (1985). An argument for qualitative ratings. *Television Quarterly*, 21(4), 39-44.

Papers Under Review and in Preparation for Submission

- 50. Hildebrand, C., D.L. Hoffman and T.P. Novak, "Dehumanization in the IoT: Experiential Consequences of Syntactically Constricted Human-Machine Interaction with Digital Voice Assistants," studies completed, target: *Management Science* special issue on The Human-Algorithm Connection.
- *51.* Hoffman, D.L. and T.P. Novak, "Human-Centric versus Object-Oriented Perspectives on Perceptions of AI," three studies completed, target: *Journal of Consumer Research.*
- 52. Novak, T.P. and D.L. Hoffman, "Enabling and Constraining Experiences: Theory, Measurement, and Application," two studies completed, target: Journal of Consumer Research.

Working Papers and Monographs

- Hoffman, D.L. and T.P. Novak (2016), "How to Market the Smart Home: Focus on Emergent Experience, Not Use Cases," January 15. Working paper available at: <u>https://ssrn.com/abstract=2840976</u>.
- Hoffman, D.L. and T.P. Novak, (2015), "Emergent Experience and the Connected Consumer in the Smart Home Assemblage and the Internet of Things," August 20. Monograph. 152 pages. Available at SSRN: http://ssrn.com/abstract=2648786
- Hoffman, D.L. and T.P. Novak (2014), "Online Experience in Social Media: Two Paths to Feeling Close and Connected," working paper available at: <u>https://ssrn.com/abstract=1990005</u>.
- Hoffman, D.L. and T.P. Novak (2012), "Why Do People Use Social Media? Empirical Findings and a New Theoretical Framework for Social Media Goal Pursuit," working paper available at: <u>https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1989586</u>

Edited Books

Hoffman, D.L. And T.P. Novak, Eds. (2005), *Beyond the Basics: Research-Based Rules for Internet Retailing Advantage.* eLab Press, Vanderbilt University.

Page 12 June 2022

Refereed Chapters in Books

- Hoffman, D.L., T.P. Novak, and Y. Li (2015), "Online Consumer Behavior," In Mansell, R. and Ang, P-H (Eds), *The International Encyclopedia of Digital Communication and Society*, Wiley-Blackwell-ICA Encyclopedias of Communication. Malden and Oxford: Wiley.
- Hoffman, D. L., T.P. Novak and R. Stein (2013), "The Digital Consumer," chapter in The Routledge Companion to Digital Consumption, Eds., Russell Belk and Rosa Llamas, Routledge, Taylor And Francis Group.
- Hoffman, D.L. and T.P. Novak (2012), "Social Media Strategy," in *Handbook on Marketing Strategy*, eds., Venkatesh Shankar and Gregory S. Carpenter, Edward Elgar Publishing, Ltd., 198-216.
- 4. Hoffman, D.L. (2012), "Internet Indispensability, Online Social Capital, and Consumer Well-Being," Chapter to appear in *Transformative Consumer Research for Personal and Collective Well Being* in the section "Technological Fronts," eds., David Glen Mick, Simone Pettigrew, Cornelia Pechmann, and Julie L. Ozanne, New York: Routledge.
- 5. Hoffman, D.L. and T.P. Novak (2003), 'A Detailed Analysis of the Conceptual, Logical and Methodological Flaws in the Article: "Marketing Pornography on the Information Superhighway," in *Cyberspace Crime*, D.S. Wall, ed., Ashgate Publishing Limited.
- 6. Hoffman, D.L. and T.P. Novak (2000), "The Growing Digital Divide: Implications for an Open Research Agenda," in "Understanding the Digital Economy: Data, Tools and Research," B. Kahin and E. Brynjolffson, eds. Cambridge: MIT Press. (editorial review)
- 7. Novak, T.P. and D.L. Hoffman (2000) "Advertising and Pricing Models for the Web," in *Internet Publishing and Beyond: The Economics of Digital Information and Intellectual Property*, Brian Kahin and Hal Varian, eds. Cambridge: MIT Press. (editorial review)
- 8. Novak, T.P., D.L. Hoffman, and A. Venkatesh (1998), "Diversity On The Internet: The Relationship Of Race To Access And Usage," In *Investing in Diversity: Advancing Opportunities for Minorities and the Media,* Amy Garmer, Ed. Washington, D.C., The Aspen Institute.
- Hoffman, D.L. & Steenkamp, J.B. (1994). "Marketing and Quality," chapter 31 (Noel Capon, ed. Marketing Section). In AMA Management Handbook, Third Edition, Rod Willis (Ed.) American Marketing Association.

- Steenkamp, J.B.E.M. & Hoffman, D. (1994). "Price and Advertising as Market Signals for Service Quality." In Service Quality: New Directions in Theory and Practice, Roland T. Rust and Richard L. Oliver (Eds.), Sage Publications.
- 11. Hoffman, D.L., de Leeuw, J., & Arjunji, R.V. (1994). "Multiple Correspondence Analysis," In Advanced Methods of Marketing Research, Richard P. Bagozzi (Ed.), Blackwell.
- 12. Hoffman, D.L. & Perreault, W.D., Jr. (1987). The Multidimensional Analysis of Consumer Preference and Perception Data. In *Multidimensional Scaling: History, Theory, and Applications,* F.W. Young and R. M. Hamer (Eds.), Lawrence Erlbaum Associates, Inc.
- Young, F.W., Null, C., Sarle, W., & Hoffman, D.L. (1982). Interactively Ordering the Similarities Among a Large Set of Stimuli. In *Proximity and Preference: Problems in the Multidimensional Analysis of Large Data Sets,* R.D. Golledge and S.N. Rayner (Eds.), University of Minnesota Press.

Letters, Comments and Reviews

- Hoffman, D.L. and T.P. Novak (2013), "How the Digital Future Killed Advertising," Wharton Future of Advertising Project.
- Hoffman, D.L. (2012), "CB As I See It," feature in *Consumer Behavior: Buying, Having, and Being* by Michael Solomon. Tenth Edition, Prentice Hall.
- Hoffman, D.L. and T.P. Novak (2010), "Retweet: A Digital Meditation on the Power of Twitter." Video Essay.
- Hoffman, D.L., Novak, T.P. and M. Peralta (1999), "Con Game?" Information Impact Magazine, April.
- Hoffman, D.L. & Novak, T.P. (1998), "TrustBuilders vs. Trustbusters," The *Industry Standard*, May 11.

Hoffman, D.L. & Novak, T.P. (1997), "Pushing Passive Eyeballs," Wired, 5.3, March.

- Hoffman, D.L. (1996), "Cyberspace to Congress: The Net is Mainstream and It Votes!" *MicroTimes*, 148, March 4.
- Hoffman, D.L. & Novak, T.P. (1995), "Panning for Business Models in a Digital Gold Rush," *HotWired*, Intelligent Agent Section, April 22.

Hoffman, D.L. & Novak, T.P. (1994), "The Challenges of Electronic Commerce," *HotWired* (Intelligent Agent Section), December 29.

Hoffman, D.L. & Novak, T.P. (1994), "Wanted: Net.census," Wired, 2.11, November.

Hoffman, D.L. & Novak, T.P. (1994), "How Big is the Internet, HotWired, Aug. 18.

- Hoffman, D.L. & Novak, T.P, (1994), "Commercializing the Information Super Highway: Are We In for a Smooth Ride?" *The Owen Manager*, 15(2), 2-7.
- Hoffman, D.L. (1991). Review of Four Correspondence Analysis Programs for the IBM PC. *American Statistician*, 45 (4), November, 305-311.
- Hoffman, D.L. (1987). Review of Multivariate Descriptive Statistical Analysis: Correspondence Analysis and Related Techniques for Large Data Matrices (1984) by Lebart, L., Morineau, A. & Warwick, K. Psychometrika, 52(2), 308-309.

Proceeding Publications (Refereed)

- Hoffman, D.L. and T.P. Novak (2010), "Retweet: A Digital Meditation On The Power Of Twitter", in Advances in Consumer Research Volume 38, eds. Darren Dahl and Gita V. Johar and Stijn van Osselaer, Duluth, MN : Association for Consumer Research, Pages: .
- Hoffman, D.L. (2010), "Navigating the Networked Rivers Of The Social Web: Emerging Themes For Consumer Behavior Research On Web 2.X", in Advances in Consumer Research Volume 37, eds. Margaret C. Campbell and Jeff Inman and Rik Pieters, Duluth, MN: Association for Consumer Research, Pages
- Donna Hoffman, Praveen Kopalle, Thomas Novak (2009), "The "Right" Consumers For The Best Concepts: A Methodology For Identifying Emergent Consumers For New Product Development", in Advances in Consumer Research Volume 36, eds. Ann L. McGill and Sharon Shavitt, Duluth, MN : Association for Consumer Research, Pages: 571-572.
- Thomas P. Novak, Donna L. Hoffman (2007), "New Measures Of Task-Specific Experiential And Rational Cognition", in Advances in Consumer Research Volume 34, eds. Gavan Fitzsimons and Vicki Morwitz, Duluth, MN : Association for Consumer Research, Pages: 657-660.
- Hoffman, D.L. & Young, F.W. (1982). Quantitative Analysis of Qualitative Data: Applications in Food Preference Research. Food Research and Data Analysis Symposium Proceedings, Oslo, Norway, September.

Page 15 June 2022

Hoffman, D.L. & van der Heijden, P.G.M. (1994). Asymmetric Residual Maps for Market Structure Analysis. Proceedings of the Second Annual AMA Advanced Research Techniques Forum, Beaver Creek, Colorado, June 1991.

Unpublished Working Papers

- Hoffman, D.L. (1984). Program impact: The key measure of audience response. Columbia Business School Center for Telecommunications and Information Studies Research Working Paper.
- Hoffman, D.L. & Franke. G. (1985). Correspondence analysis: Graphical representation of categorical data in marketing research (contains technical appendix). Columbia Business School Research Working Paper.
- Novak, T.P. & Hoffman, D.L. (1987). Residual scaling using the singular value decomposition: Graphical representation of log-linear models. Columbia Business School Research Working Paper, No. 87-1.
- Hanssens, D.M. & Hoffman, D.L. (1989). Diagnostic Maps for Product Line Monitoring. The Avis Rent a Car System, Inc. Working Paper Series in Marketing Research Working Paper No. 89-AV-10.
- Hoffman, D.L. & de Leeuw, J. (1990). Geometrical Aspects of Multiple Correspondence Analysis: Implications for the Coordinate Scaling Debate. UCLA Statistics Series, No. 49.
- Hoffman, D.L. & van der Heijden, P.G.M. (1990) Asymmetric Residual Maps for Market Structure Analysis. Columbia Business School Research Working Paper.
- Kopalle, P. & Hoffman, D.L. (1990) Generalizing the Sensitivity Conditions in an Overall Index of Product Quality. Columbia Business School Research Working Paper.
- Hoffman, D.L. & de Leeuw, J. (1993) "A New Two-Stage Procedure for Analyzing a Brand Switching Matrix: One Approach to the Analysis of a Contingency Table," in Analyzing *Brand Switching Matrices,* Richard Colombo (Ed.). MSI Working Paper Series.
- Hoffman, D.L. and T.P. Novak (1995), "A Detailed Critique of the *TIME* Article: "On a Screen Near You: Cyberporn (DeWitt, 7/3/95)," July 1.

Page 16 June 2022

- Hoffman, D.L. and T.P. Novak (1995), 'A Detailed Analysis of the Conceptual, Logical and Methodological Flaws in the Article: "Marketing Pornography on the Information Superhighway," July 2.
 Reprinted in International Library of Criminology, Criminal Justice and Penology, General Editors, David Nelken and Gerald Mars. Volume on *Cyberspace Crime*, edited by D.S. Wall (in press). Ashgate Publishing Limited.
- Hoffman, D.L. and T.P. Novak (1995), "The CommerceNet/Nielsen Internet Demographics Survey: Is It Representative?" December 12.
- Hoffman, D.L., W.D Kalsbeek, and T.P. Novak (1996), "Internet Use in the United States: 1995 Baseline Estimates and Preliminary Market Segments, April 12.

Research Conference Presentations

- Hildebrand, C.A., D.L. Hoffman, and T.P Novak (2021), "Detrimental Dehumanization in the IoT: Phonetic & Experiential Consequences of Restricted Human-Machine Interaction," Keynote presentation at the Conference on Artificial Intelligence, Machine Learning, and Business Analytics, Temple University, Fox School of Business (online conference), December 2-3.
- Hildebrand, C.A, D.L. Hoffman, and T.P. Novak (2021), "Dehumanizing Voice Technology: Phonetic & Experiential Consequences of Restricted Human-Machine Interaction," Paper Presented at the AAAI Artificial Intelligence for Human-Robot Interaction Virtual Symposium (online conference), November 4-6. <u>https://arxiv.org/abs/2111.01934</u>
- 3. Hoffman, D.L. and T.P. Novak (2020), "Object-Oriented Metaphorism as a Mechanism for Understanding AI," paper presented in the Symposium, "Resisting Artificial Intelligence: When Do Decision Makers Avoid or Use Algorithmic Input," Academy of Management Conference, August 10 (online conference).
- 4. Hoffman, D.L. and T.P. Novak (2020), "Object-Oriented Metaphorism as a Mechanism for Understanding AI," paper presented in the Special Session, "Consumers and Their Smart Devices: Perspectives on Anthropomorphism," Association for Consumer Research Conference, October 1-4 (online conference).
- Novak, T.P. and D.L. Hoffman (2020), "Quantifying Assemblage Theory to Reify the Possibility Space of Personal Automation Practices," paper presented at the First Virtual ISMS Marketing Science Conference, Session TB10 – Internet of Things, June 11.

- Hoffman, D.L. and T.P. Novak (2020), "Object-Oriented Metaphorism as a Mechanism for Understanding AI," paper presented at the First Virtual ISMS Marketing Science Conference, Session SC06 – Artificial Intelligence 1, June 13.
- 7. Hoffman, D.L. and T.P. Novak (2020), "Object Oriented Metaphorism as a Mechanism for Understanding AI," paper presented at the Winter AMA Academic Conference, San Diego, CA, February 13-16.
- 8. Novak, T.P. and D.L. Hoffman (2020), "Reifying the Possibility Space of IoT Automation Practices: A Machine Learning Approach," Keynote Address presented at the Affective Content Analysis (AffCon) Workshop, AAAI-20, New York City, February 7.
- Hoffman, D.L. and T.P. Novak (2019), "Object-Oriented Metaphorism as a Mechanism for Understanding AI," Paper presented at the Psychology of Technology Institute "New Directions in Research on the Psychology of Technology" Conference, UVA Darden Sands Family Grounds, November 8-9.
- 10. Hildebrand, Christian, D.L. Hoffman, and T.P. Novak (2019), "Dehumanization in the IoT: Experiential Consequences of Human Interaction with Digital Voice Assistants," paper presented in the Special Session, "The Modern Consumer: How New Technologies are Changing Consumer Behavior and Interactions," ACR Fiftieth Anniversary Conference, Atlanta, Georgia, October 17-20.
- 11. Hoffman, D.L. and T.P. Novak (2019), "Object-Oriented Anthropomorphism as a Mechanism for Understanding AI," paper presented in the Special Session, "Rethinking Anthropomorphism: The Antecedents, Unexpected Consequences, and Potential Remedy for Perceiving Machines as Humanlike," ACR Fiftieth Anniversary Conference, Atlanta, Georgia, October 17-20.
- 12. Novak, Thomas and D.L. Hoffman (2019), "Reifying the Possibility Space of IoT Automation Practices: A Machine Learning Approach," paper presented in the Special Session, "Extracting Behavioral Insights from Big Data: Novel AI and NLP Approaches," ACR Fiftieth Anniversary Conference, Atlanta, Georgia, October 17-20.
- 13. Hoffman, D.L. and T.P. Novak (2019), "Object-Oriented Metaphorism as a Mechanism for Understanding AI," paper presented in the Symposium, "Rethinking Anthropomorphism: The Antecedents, Unexpected Consequences, and Potential Remedy for Perceiving Machines as Humanlike," the American Psychological Association Technology, Mind, and Society Conference, Washington, DC, October 3-5.

Page 18 June 2022

- Novak, T.P. and D.L. Hoffman (2019), "Reifying the Possibility Space of IoT Automation Practices: A Machine Learning Approach," paper presented at the 11th Triennial Invitational Choice Symposium, Cambridge, Maryland, May 30 – June 1.
- Hoffman, D.L. and Novak, T.P. (2019), "Impact of AI on Consumer Experience," paper presented at the 11th Triennial Invitational Choice Symposium, Cambridge, Maryland, May 30 – June 1.
- 16. Hoffman, D.L. and Novak, T.P. (2019), "AI: Beyond Friend or Foe," paper presented at the Theory + Practice in Marketing (TPM) Conference, Columbia, May 16-18.
- 17. Hoffman, D.L. (2019), "Marketing Strategy Panel," Lehmann Fest Research Conference in Honor of Don Lehmann's 50th Anniversary Columbia University, May 10-11.
- Novak, T.P. and D.L. Hoffman (2019), "Reifying the Possibility Space of IoT Automation Practices: A Machine Learning Approach," paper presented at the GWSB Inaugural Conference on the Intelligence of Things, April 5.
- Hoffman, D.L. (2019), "Managing Institutional and Cultural Complexity in the Contemporary Digital Marketplace," Discussant, Special Session, Winter AMA, Austin, TX, February 22-24.
- Hoffman, D.L. (2019), "Opportunities and Challenges in Using Computational Methods to Study the Impact of AI on Consumer Behavior," paper presented in Special Session on Machine Learning for Consumer Behavior Research, Winter AMA, Austin, TX, February 22-24.
- 21. Hoffman, D.L. (2019), "The Future of Omni-Social Marketing," Invited Panel Session, Winter AMA, Austin, TX, February 22-24.
- 22. Hoffman, D.L. (2018), "Studying the Effects of New Tech: Methodological Challenges and Solutions," presentation in the Roundtable Special Session, "Trust in the Age of AI," Association for Consumer Research, Dallas, TX, October 11-14.
- 23. Novak, T.P. and D.L. Hoffman (2018), "A Computational Social Science Framework for Visualizing the Possibility Space of Consumer-Object Assemblages from IoT Interaction Data," paper presented in the Special Session, "The Technological Consumer in an Interconnected World," Association for Consumer Research, Dallas, TX, October 11-14.

- 24. Hoffman, D.L. and T.P. Novak (2018), "Object-Oriented Anthropomorphism as a Mechanism for Understanding AI," paper presented in the Special Session, Association for Consumer Research, Dallas, TX, October 11-14.
- 25. Novak, T.P. and D.L. Hoffman (2018), "A Computational Social Science Framework for Visualizing Emergent Consumer Experience from IoT Interaction Data," paper presented at SCECR 2018, Rotterdam, June 18-19.
- 26. Novak, T.P. and D.L. Hoffman (2018), "A Computational Social Science Framework for Visualizing Emergent Consumer Experience from IoT Interaction Data," paper presented at Theory + Practice in Marketing, UCLA, May 16-18.
- 27. Hoffman, D.L. and T.P. Novak (2018)," Mining the Secret Life of Objects: An Object-Oriented Approach to Constructing Representations of Object Experience," accepted for presentation at the 2018 Society for Consumer Psychology Conference, Dallas, TX, February 15-17.
- 28. Hoffman, D.L. and T.P. Novak (2018), "The Changing Relationship Between Consumers and Objects in the IoT," presentation in the invited special session "Doing Observational Research," presentation at the 2018 Winter American Marketing Association Conference, New Orleans, LA, February 23-25.
- 29. Hoffman, D.L. and T. P. Novak (2017), "Understanding Object Experience," paper presented at the 2017 Association for Consumer Research Conference, San Diego, CA, October 26-29.
- 30. Novak, T.P. and D.L. Hoffman (2017), "Send 'Her' My Love: A Circumplex Model for Understanding Relationship Journeys in Consumer-Smart Object Assemblages," paper presented at the 2017 Association for Consumer Research Conference Special Session: Human-Object Relationships: How Consumers Interact with Analog and Digital Things in Analog and Digital Worlds, October 26-29.
- 31. Hoffman, D.L. and T.P. Novak (2017), "Consumer-Object Relationship Styles in the Internet of Things, paper presented at the Consumer Culture Theory Conference, Anaheim, CA, July 10-12.
- 32. Hoffman, D.L. (2017), "What Do You Mean She Doesn't Work There Anymore? Challenges and Rewards of Research and Data Collaborations with Industry Sponsors," Paper presented at the AMA Doctoral Consortium, Research Frontiers 2: Managing Collaborations, University of Iowa, June 14-17.

- 33. Novak, T.P. and D.L. Hoffman (2017), "Visualizing Emergent Identity of Assemblages in the Internet of Things: A Topological Data Analysis Approach, paper presented at EMAC, Groningen, Netherlands, May 23-26.
- 34. Hoffman, D.L. and T.P. Novak (2017), "Consumer-Object Relationship Journeys in the Internet of Things," paper presented at the Thought Leaders in Consumer-Based Strategy Conference, Amsterdam, May 19-21.
- 35. Hoffman, D.L. and T.P. Novak (2017), "How to Market the Consumer IoT: Focus on Experience," MSI Webinar, March 1.
- 36. Hoffman, D.L. (2017), "Consumer-Object Relationship Journeys," paper presented at the Invited Special Session, Winter AMA, Orlando, FL, February 17.
- 37. Hoffman, D.L. (2017), "The Impact of Marketer-Consumer Collaborations in the IoT," paper presented in Special Session, Winter AMA, Orlando, FL, February 18.
- Hoffman, D.L. and T.P. Novak (2016), "When Dumb Objects Become Smart, Do Smart Consumers Become Dumb?," presented at the Invited Perspectives Session, ACR Annual Conference, Berlin, Germany, October 27-30.
- 39. Hoffman, D.L., T.P. Novak, and H. Kang (2016), "Anthropomorphism from Self-Extension and Self-Expansion: An Assemblage Theory Approach to Interactions Between Consumers and Smart Devices," presented at the ACR Annual Conference, Berlin, Germany, October 27-30.
- 40. Novak, T.P. and D.L. Hoffman (2016), "Visualizing Emergent Identity of Assemblages in the Internet of Things: A Topological Data Analysis Approach," presented at the ACR Annual Conference, Berlin, Germany, October 27-30.
- 41. Hoffman, D.L. (2016), "Object Experiences and Object Consumers," presented at the ACR 2016 Doctoral Consortium, Berlin, Germany, October 27.
- 42. Hoffman, D.L. and T.P. Novak (2016), "How to Market the Consumer IoT: Focus on Experience," presented at the MSI Conference on Marketing in the Consumer Internet of Things, September 30, Washington, DC.

Page 21 June 2022

- 43. Hoffman, D.L. and T.P. Novak (2016), "A Machine Learning and Data-Driven Visualization Framework for Studying Emergent Experience in the Consumer IoT," Paper presented at the Mobile + Social: Marketing Big Data Analytics Workshop 10th Triennial Invitational Choice symposium, Lake Louise, Canada, (University of Alberta) May 14-17.
- 44. Hoffman, D.L., Novak, T.P. and Kang, H. (2016), "Anthropomorphism from Self-Extension and Self-Expansion Processes: An Assemblage Theory Approach to Interactions between Consumers and Smart Devices," paper presented at the Society for Consumer Psychology Winter Conference, St. Pete Beach, FL, Feb 25-27.
- 45. Novak, T.P. and D.L. Hoffman (2015), "Using Topological Data Analysis to Explore Emergent Consumer Experience from Digital Interactions," keynote presentation at the Center for Complexity in Business Annual Conference, Washington, DC, November 12-13.
- 46. Hoffman, D.L. (2015), "Consumer Experience in the Internet of Things," presented at the MSI Board of Trustees Meeting Finding Growth in Disruption, Phoenix, AZ, November 5-6.
- 47. Novak, T.P. and D.L. Hoffman (2015), "Using Topological Data Analysis to Explore Emergent Consumer Experience from Digital Interactions," presented at the NYU Conference on Digital Big Data, Smart Life and Mobile Marketing Analytics, New York, NY, October 23.
- 48. Hoffman, D. L. and T.P. Novak (2015), "Consumer Experience in the Connected World: How Emerging Technologies are Poised to Revolutionize Consumer Behavior Research," presentation in the roundtable (Hoffman and Novak co-chairs), 2015 Association for Consumer Research, New Orleans, October 1-3.
- 49. Hoffman, D.L. and T.P. Novak (2015)," Consumer Experience in the Internet of Things: Conceptual Foundations," paper presented in the invited plenary session "Future Consumer Worlds: How The Internet Of Things, Avatars, Robots, Cyborgs, And Human Enhancement Technologies May Change The Face Of Consumer Psychology- And Our Concept Of What It Means To Be "Human".," 2015 Society for Consumer Psychology 2nd International Conference, June, Vienna, Austria.

- 50. Hoffman, D.L., T.P. Novak and H. Kang (2015), "Let's Get Closer: How Regulatory Fit Drives Feelings of Connectedness in Social Media," paper presented in the symposium, "Social Media Experience: Implications for Well-Being, Word-of-Mouth and Brand Consumption," 2015 Society for Consumer Psychology Conference, February, Ritz-Carlton, Phoenix, AZ.
- 51. Hoffman, D.L. (2014), "Marketing in the Internet of Things," MSI Immersion Conference, Boston, MA, September 18-19.
- 52. Hoffman, D. L. & T.P. Novak (2014), "The Gamification of Smart Devices: Some Preliminary Thoughts on Concepts and Constructs," Winter AMA Pre-Conference Event on Games, Gaming and Gamification, Orlando, FL, February 21.
- 53. Hoffman, D.L., T.P. Novak (2013), "The Social Life of Content: How Negative Motivations Can Lead to Positive Feelings in Social Media," MSI Conference on Social Media and Social Networks: What Are They Good For, Boston, MA, December 3-4.
- 54. Hoffman, D.L., T.P. Novak (2013), "Two Paths to Feeling Close and Connected in Social Media," Advertising and Consumer Psychology Conference, San Diego, CA, June 13-15.
- 55. Mintz, O. and D.L. Hoffman (2012), "The Impact of Strategic, Market, and Metric Orientation on Social Media Metric Use and Social Media Marketing Performance," Direct/Interactive Marketing Research Summit, Las Vegas, NV, October 13-14.
- 56. Novak, T.P. and D.L. Hoffman (2012), "Online Experience in Social Media: Two Paths to Connectedness," Association for Consumer Research, Vancouver, BC, October 4-7.
- 57. D.L. Hoffman, T.P. Novak and R. Stein (2012), "Predicting Identification with Social Media Groups: Flourishing Independents or Languishing Interdependents," Behavioral Decision Research in Management Conference, Boulder, CO, June 27-29.
- 58. D.L. Hoffman, T.P. Novak and R. Stein (2012), "Predicting Identification with Social Media Groups: Flourishing Independents or Languishing Interdependents," ISMS Marketing Science Conference, Boston, MA, June 7-9.
- 59. T.P. Novak and D.L. Hoffman (2012), "Relatedness Need Satisfaction During Social Media Goal Pursuit: The Influence of Online Social Identity and Motivations," Conference of the International Communication Association, Phoenix, AZ, May 24-28.

- 60. D.L. Hoffman and T.P Novak (2012), "Need Satisfaction from Interacting with People Versus Content: The Roles of Motivational Orientation and Identification with Social Media Groups," Society for Consumer Psychology Annual Conference, Las Vegas, NV, Feb 16-18.
- D.L. Hoffman, T.P. Novak, and R. Stein (2012), "The Determinants of Online Social Identity," Society for Consumer Psychology Annual Conference, Las Vegas, NV, Feb 16-18.
- 62. D.L. Hoffman and T.P. Novak (2012), "Need Satisfaction During Social Media Goal Pursuit: The Role of Motivational Orientation and Identification with Online Social Groups," Annual Meeting of the Society for Personality and Social Psychology, San Diego, CA, January 26-28.
- D. L. Hoffman (2011), "MSI 50th Anniversary Special Session in Support of Consumer Behavior Research," Association for Consumer Research North American Conference, St. Louis, MO, October 13-16, 2011.
- 64. D.L. Hoffman and T.P. Novak (2011)," Beyond Facebook: Emerging Trends for a Post-Social Media World," MSI Conference on Marketing in the Digital Age," October 5, Berkeley.
- 65. D.L. Hoffman and T.P. Novak (2011), "Why People Use Social Media," INFORMS Marketing Science Conference 2011, Rice University, June 9-11.
- 66. D. L. Hoffman and T.P. Novak (2010), ", "Retweet: A Digital Meditation on The Power of Twitter," original film, Association for Consumer Research North American Conference, Jacksonville, FL, October 7-10.
- 67. D.L. Hoffman and T.P. Novak (2010), "Roles and Goals: Consumer Motivations to Use the Social Web," INFORMS Marketing Science Conference 2010, Cologne, Germany, June 16-19.
- 68. D.L. Hoffman and T.P. Novak (2010), "Are Brand Attitudes Contagious? Consumer Response to Organic Search Trends," INFORMS Marketing Science Conference 2010, Cologne, Germany, June 16-19.
- 69. D.L. Hoffman, T.P. Novak and J. Silva-Risso (2010), "Validating Brand Tracking Data Against Organic Brand Search Trends," INFORMS Marketing Science Conference 2010, Cologne, Germany, June 16-19.

- 70. Hoffman, D.L. (2010), "Social Metrics for Social Media," Internet Metrics Session, MSI Pre-Conference Workshop on Marketing Spending, March 1.
- 71. Hoffman, D.L (2010), "Session One: Allocating Across the Media Mix," panelist, MSI Conference on Effective Marketing Spending, UCLA, March 2-3.
- 72. D.L. Hoffman and T.P. Novak (2009), "Are Brand Attitudes Contagious? Consumer Response to Organic Search Trends," Google and WPP Marketing Research Awards Conference 09, New York City, November 3.
- 73. Hoffman, D.L. (2009), "Navigating the Networked Rivers of the Social Web: Emerging Themes for Consumer Behavior Research on Web 2.X," ACR Roundtable, Association for Consumer Research Annual Conference, Pittsburgh, PA, October 22-25.
- 74. Hoffman, D.L. (2009), "The "Right" Consumers for the Best Concepts: Identifying and Using Emergent Consumers in Developing Innovations," MSI Customer Insights for Innovation Conference, University of Miami School of Business, Coral Gables, FL, June 18-19.
- 75. Hoffman, D.L. (2009), "Decomposing Morris: A Curious Correspondence Analysis," "Morrisfest" Symposium, Graduate School of Business, Columbia University, May 8, (Invited)
- 76. Hoffman, D.L. P. Kopalle, and T.P. Novak (2008), "The "Right" Consumers for the Best Concepts: A Methodology for Identifying Emergent Consumers for New Product Development," ACR North American Conference, Hyatt Regency Hotel, San Francisco, CA, October 23-26. (presenter)
- 77. Hoffman, D.L. (2008), "Generating Customer Insights from the "Social Web:" Are Marketers Ready to Give Up Control?," Direct Marketers Educational Foundation (DMEF) Direct/Interactive Marketing Research Summit, Las Vegas Hilton, Las Vegas, NV, October 11-12. (Invited)
- 78. Hoffman, D.L. (2008), "Generating Customer Insights from the 'Social Web': Are You Ready to Give Up Control?," MSI Board of Trustees Meeting and Conference on New Insights on Customer Behavior, Langham Hotel, Boston, MA, April 10-11.
- 79. Hoffman, D.L., P. Kopalle, and T.P. Novak (2008), "The 'Right' Consumers for Concept Development: Development and Validation of a Scale to Measure Emergent Nature," UC/USC Marketing Colloquium, University of California, Irvine, April 4. (presenter)
- 80. Hoffman, D.L. (2008), "The Evolution of Customer Experience: 10 Trends You Can't Afford to Miss," (presentation and panel moderator) MSI/Sloan Conference on Leveraging Online Media and Online Marketing, UCR Palm Desert Campus and Hotel Miramonte Resort, February 6-8.
- 81. Hoffman, D.L. (2008), "User Generated Content," MSI/Sloan Conference on Leveraging Online Media and Online Marketing, UCR Palm Desert Campus and Hotel Miramonte Resort, February 6-8.
- Hoffman, D.L. (2007), "Cognitive Augmentation: Can the Internet Make You Smarter and More Creative?" Sloan Center for Internet Retailing Networking Workshop, Riverside, CA, May 3-4.
- 83. Hoffman, D.L. and Novak, T.P. (2006), "Subject Recruitment and Panel Management: Experience and Observations Based on our Work Creating eLab and eLab 2.0," ACR Roundtable on Doing Better Web-Based Research, ACR North American Conference, Orlando, FL, September 28-October 1. (presenter)
- 84. Hoffman, D.L. (2006), "Perspectives on Marketing in the Electronic Marketplace: Challenges and New Directions for Research and Instruction," Technology and Innovation SIG Special Session, AMA Summer Marketing Educator's Conference, Sheraton Chicago Hotel and Towers, Chicago, IL, August 4-7, 2006.
- 85. Hoffman, D.L. (2005), "A Decade of Empirical Research Regarding the Internet," ACR Doctoral Symposium, San Antonio, TX, September 29."
- 86. Novak, T.P and D.L. Hoffman (2005), "The Impact of Consumer Thinking Style on Performance: Measure of Task-Specific Experiential and Rational Cognition," Marketing Science Conference, Emory University, Atlanta, GA, June 17.
- 87. White, T., D.L. Hoffman, and T.P Novak (2005), "Forgotten Favors: Biased Account Keeping in Information-Driven Consumer-Seller Relationships," Society for Consumer Psychology Winter Conference, St. Petersburg, Florida, Feb 24-28.
- Hoffman, D. L., P. Kopalle, and T. P. Novak (2004), "Identifying and Using Emergent Consumers in Developing Radical Innovations," ACR North American Conference, Portland, October 7-10.
- 89. Hoffman, D.L. "A Brief Overview of eLab Research," Inaugural Partner Conference, Vanderbilt University Sloan Center for Internet Retailing, November 7, 2003.

- Hoffman, D.L., T.P. Novak and F. Wan (2003), "The Impact of Online Product Review Characteristics on Consumer Preferences," ACR North American Conference, Toronto, October 9-12.
- 91. Hoffman, D.L., T.P. Novak and F. Wan (2003), "The Impact of Online Product Review Characteristics on Consumer Preferences," UCLA CIBER/CMIE Conference, Managing in the Global Information Economy, Anderson Graduate School of Management, UCLA, September 12-13, 2003.
- 92. Hoffman, D.L., Novak, T.P. and Kumar, P. (2002), "How Processing Modes Influence Consumers' Cognitive Representations of Product Perceptions Formed from Similarity Judgments," Association for Consumer Research, Atlanta, October 16-20.
- 93. Hoffman, D.L. (2001), "Consequences of the Web for Customers and Firms: Developing A Research Agenda for Internet Marketing," Presentation at the CMIE Conference: Research Directions in the Management of the Information Economy, Anderson Graduate School of Management, UCLA, February 9.
- 94. Hoffman, D.L., Novak, and Schlosser (2001), "Consumer Control in Online Environments," Society for Consumer Psychology Winter Conference, Scottsdale, Arizona, February 15-17.
- 95. Hoffman, D.L. (2000), "An Integrative Framework for Internet Commerce," Marketing Science Institute Board of Trustees Meeting, "Marketing Knowledge in the Age of E-Commerce," Loews Coronado Bay Resort, San Diego, CA, November 2.
- 96. Hoffman, D.L. Novak, T.P. and Schlosser, A. (2000), "Consumer Control in Online Environments," Association for Consumer Research, October 19-22.
- 97. Novak, T.P., Hoffman, D.L., and Yung, Y.F. (1999), "Modeling the Structure of the Flow Experience Among Web Users: A Structural Modeling Approach," Paper presented at the Association for Consumer Research Conference, September 30 October 3, Columbus, Ohio.
- 98. Hoffman, D.L. (1999), "The State of the Field: Internet Marketing" panel moderated at the 1999 American Marketing Association Summer Educator's Conference, San Francisco, CA, August 7-10.

Page 27 June 2022

- 99. Hoffman, D.L. and T.P. Novak (1997), "New Metrics for New Media: Toward the Development of Web Measurement Standards," paper presented at the Special Session: Marketing on the Internet, 1997 INFORMS Marketing Science Conference, Berkeley, CA. March 21-24.
- 100. Hoffman, D.L. and T.P. Novak (1997), "Web Server Log File Analysis: Scanner Data for the New Millennium," paper presented at the Special Session: Web Server Log File Analysis, 1997 INFORMS Marketing Science Conference, Berkeley, CA. March 21-24.
- 101. Hoffman, D.L. (1996), "Communication Models and Media Measurement in Computer-Mediated Environments: Research Issues and Challenges" INFORMS Spring Conference on Information Systems and Technology, Panel on Web and IS Research, May 7.
- 102. Hoffman, D.L. (1996), "Commerce in Cyberspace: What Role for Marketing Scientists?" Panel Discussion presented at the 1996 INFORMS Marketing Science Conference, Gainesville, March 7-10.
- 103. Chatterjee, P., D.L. Hoffman, and T.P. Novak (1996), "Modeling Consumer Response on the World Wide Web: Implications for Advertising," paper presented at the 1996 INFORMS Marketing Science Conference, The University of Florida, Gainesville, March 7-10.
- 104. Hoffman, D.L. and Novak, T.P. (1995), "Measuring the Internet," Sixth Conference on Organization Computing, Coordination and Collaboration International Conference on Electronic Commerce, University of Texas at Austin IC2 Institute, October 29-31, 1995.
- 105. Novak, T.P. and D.L. Hoffman (1995), "Consumer Behavior in Computer-Mediated Environments: Conceptual Foundations," poster presented at the Association for Consumer Research Conference, Minneapolis, MN, October 19-21.
- 106. Novak, T.P. and D.L. Hoffman (1995), "Marketing in Hypermedia Computer-Mediated Environments: Propositions," paper presented at the 1NFORMS Spring 1995 National Meeting, Los Angeles, April 24-26.
- 107. Hoffman, D.L. (1994), "Implications of Commercializing the Internet for Marketing Theory and Practice" The Marketing Information Revolution. AMA Summer Marketing Educators' Conference, San Francisco, August 6-9; and the AMA/Vanderbilt Frontiers in Services Conference, October.

- 108. Hoffman, D.L. and de Leeuw, J. (1993). Benefit Segmentation and Structuring in Service Business Markets. Paper presented at the TIMS Marketing Science Conference, Washington University, March 11-14.
- 109. Hoffman, D.L. and Lilien, G. (1992). Assessing the Direction and Magnitude of Perceptual Bias in Relative Influence Judgments. Paper presented at the ORSA/TIMS Joint National Meeting, San Francisco, CA, November 2-4.
- 110. Hoffman, D.L. (1992). Measuring Customer Perceptions of Service Quality. Invited paper presented at the AMA/Vanderbilt Services Marketing Conference.
- 111. Hoffman, D.L. and de Leeuw, J. (1992). A Two-Stage Procedure for Analyzing Automobile Switching: The Car Challenge. Invited paper presented at the TIMS Marketing Science Conference, London Business School, July 12-15.
- 112. Hoffman, D.L. and de Leeuw, J. (1992). Using Optimal Scaling to Improve Model Estimates from LISREL. Paper presented at the TIMS Marketing Science Conference, London Business School, July 12-15.
- 113. Hoffman, D.L. and de Leeuw, J. (1991). Linearizing Nonlinear Association with Optimal Scaling: Reducing Bias and Improving Stability in Multivaliate Linear Models. Paper presented at the ORSA/TIMS Joint National Meeting, Anaheim, CA, November 3-6.
- 114. Steenkamp, J.-B. and Hoffman, D.L. (1991). Quantifying Brand Equity Maps. Paper presented at the Annual Conference of the Deutsche Gesellschaft für Operations Research, Stuttgart, Germany, September 4-6.
- 115. Hoffman, D.L. & Steenkamp, J.-B. (1991). A Judgmental Approach to the Measurement of Brand Equity. Paper presented at ORSA/TIMS Marketing Science Conference, University of Delaware and DuPont Company, March 21-23.
- 116. Hoffman, D.L. & Lilien, G.L. (1990). Relative Influence in Husband-Wife Decision Making: Threats to Validity in the Key Informant Problem. Paper presented at ORSA/TIMS Marketing Science Conference, University of Illinois, March 22-25.
- 117. Hanssens, D.M. & Hoffman, D.L. (1989). Strategic Maps for Product Portfolio Management. Paper presented at ORSA/TIMS Joint National Meeting, New York, October 16-18.

- 118. Hanssens, D.M. & Hoffman, D.L. (1989). Monitoring the effectiveness of marketing strategy for a product line. Paper presented at ORSA/TIMS Marketing Science Conference, Duke University, March 17-19.
- Hoffman, D.L. (1988). A methodology for analyzing asymmetric structure in transition matrices. Paper presented at ORSA/TIMS Joint National Meeting, Denver, October 23-26.
- 120. Novak, T.P. & Hoffman, D.L. (1987). Graphically representing nested log-linear models through decomposition of deviance residuals. Paper presented at Psychometric Society Annual Meeting, Montreal, June 17-19.
- 121. Hoffman, D.L. & Novak, T.P. (1986). Analyzing square data tables with residual scaling. Paper presented at ORSA/TIMS Joint National Meeting, Miami, October 27-29.
- 122. Hoffman, D.L. & DeSarbo, W. (1986). Constructing joint space maps from "pick-any/n" data: An illustration of a new stochastic unfolding model. Paper presented at TIMS XXVII International Meeting, Gold Coast City, Australia, July 21-23.
- 123. Hoffman, D.L. & DeSarbo, W. (1985). An unfolding choice model for binary data. Paper presented at ORSA/TIMS Joint National Meeting, Atlanta, November 4-6.
- 124. Hoffman, D.L. & Batra, R. (1985). Contingent effects of program environment on advertising effectiveness. Paper presented at Annual Association for Consumer Research Conference, Las Vegas, October 17-20.
- 125. DeSarbo, W. & Hoffman, D.L. (1985). Simple and weighted unfolding threshold models for the spatial representation of binary choice data. Paper presented at the ORSA/TIMS Marketing Science Conference, Vanderbilt University, March 6-9.
- 126. Hoffman, D.L. (1984), A Marketing Application of Correspondence Analysis. Paper presented at ORSA/TIMS Marketing Science Conference, University of Chicago, March 12-14.

Invited University Research Seminars

"Object-Oriented Metaphorism as a Mechanism for Understanding AI," Baruch College, Zicklin School of Business, New York City, November 1, 2019; Boston University Zoom Behavior Lab, July 29 (online seminar); Department of Marketing Fall Seminar Series, Schulich School of Business, York University, October 22, 2020 (online seminar).

Page 30 June 2022

"Quantifying Assemblage Theory: A Conceptual Empirical, and Data-Driven Approach to Guide Discovery," Wharton School/York University Language Lab, August 20, 2020 (online seminar).

"Reifying the Possibility Space of IoT Automation Practices: A Machine Learning Approach," Keynote, Voya Financial Colloquium: Innovation and Technology in Marketing, University of Connecticut, September 27, 2019; Baruch College, Zicklin School of Business, New York City, November 1, 2019.

"A Computational Consumer Culture Approach to Visualizing the Possibility Space of Automation Assemblages," Ivey Business School, Western University, Canada, November 2, 2018; University of Hong Kong (HKU), January 17, 2019; Boston University Marketing Department Seminar Series, February 12, 2019; Southern California Consumer Culture Community, Annenberg School, University of Southern California, March 8, 2019; John Hopkins University Carey Business School Marketing Department Seminar Series, March 20, 2019. "An Assemblage Theory Approach to Consumer Experience and Consumer-Object Relationships," Marketing Ph.D. Student Workshop, University of Hong Kong (HKU), January 22, 2019.

"Mining the Secret Life of Objects," University of Hong Kong (HKU), Visiting Scholar Presentation, January 17, 2019.

"A Computational Social Science Framework for Visualizing Emergent Consumer Experience from IoT Interaction Data," Stanford Graduate School of Business Marketing Department Seminar Series, February 13, 2018; Temple University Data Science Institute Seminar Series, April 10, 2018; University of California Berkeley Haas School of Business Marketing Department Seminar Series, April 23, 2018; UCSD Rady School Marketing Department Brown Bag Seminar Series , May 9, 2018; UCI Marketing Department Seminar Series, June 8, 2018; University of Geneva, School of Economics and Management, June 21, 2018.

"Send 'Her' My Love: A Circumplex Model for Understanding Relationship Journeys in Consumer-Smart Object Assemblages," York University, September 29, 2017.

"Consumer and Object Experience in the IoT: An Assemblage Theory Perspective," Georgetown University Marketing Department Research Seminar Series, November 4, 2016; UCSD Rady School of Management Marketing Department Research Seminar Series, March 16, 2017; University of Maryland Marketing Department Research Seminar Series, March 29, 2017; Virginia Tech Northern Virginia Center Marketing Department Research Seminar Series, April 21, 2017.

Page 31 June 2022

"Emergence from Interaction in the Consumer Internet of Things: An Assemblage Theory Approach," Marketing Research Symposium, Lazaridis School of Business and Economics, Wilfrid Laurier University, April 21, 2016.

"Online Experience in Social Media: Two Paths to Connectedness," Department of Marketing, Goethe-University in Frankfurt/Main, September 14, 2012.

"Beyond Facebook: Friendly Devices" Stanford SIEPR Policy Forum, Social Media and the Connected Economy, Stanford University, November 18, 2011.

"Augment Me: Marketing Strategies for a Post-Social Media World" Baker Speaker Series, Wharton School, University of Pennsylvania, September 29, 2011.

"Why People Use Social Media: How Online Social Identity and Motivations Influence the Experience of Being Connected," University of Miami School of Business Department of Marketing Seminar, October 5, 2010; University of Pittsburgh Katz School of Business Department of Marketing Seminar, July 8, 2011; Wharton School, University of Pennsylvania, September 30, 2011.

"Are Brand Attitudes Contagious: Consumer Response to Organic Search Trends," University of Notre Dame Mendoza College of Business Marketing Department Seminar, December 4, 2009; University of Washington Marketing Foster School of Business Marketing Seminar Series, February 12, 2010; University of Miami School of Business Department of Marketing Seminar, October 5, 2010; University of Southern California Marshall School of Business Marketing Seminar Series, September 17, 2010.

"Consumer Thinking Style, Task Congruence, and Performance: New Measures of Task-Specific Experiential and Rational Cognition," Distinguished Speaker Series, College of Management, Georgia Institute of Technology, Atlanta, GA, October 20, 2005; Stellner Scholar Distinguished Guest Lecture presented at the College of Business, University of Illinois, Champaign Illinois, November 18, 2005; Invited Seminar, University of California, Riverside, December 8, 2005.

"Identifying and Using Emergent Consumers in Developing Radical Innovations," Distinguished Speaker Series, College of Management, Georgia Institute of Technology, Atlanta, GA, October 20; Stellner Scholar Distinguished Guest Lecture presented at the College of Business, University of Illinois, Champaign Illinois, November 18; Invited Seminar, University of California, Riverside, December 8; 2005; Sloan Industry Studies Centers' Annual Conference, Georgia Institute of Technology, April 19-21, 2004; Tuck Marketing Seminar Series, Dartmouth University, March 19, 2004.

Page 32 June 2022

"The Impact of Online Product Review Characteristics on Consumer Preferences," Graduate School of Management, University of California, Irvine, July 8, 2003.

"Research Directions for E-Commerce," Anderson Graduate School of Management, UCLA, February 2001.

"The Internet is a New Marketing Paradigm" Graduate School of Business, Stanford University, July 12, 2000; Haas School of Business, Berkeley, July 25, 2000 (with T.P. Novak)

"Integrating the Internet into Scholarly Research Paradigms," Marketing Seminar, Stern School of Business, New York University, March 4-5, 1999 (with T.P. Novak)

"Modeling the Structure of the Flow Experience Among Web Users," Information Systems/Marketing Seminar, Stern School of Business, New York University, March 4-5, 1999. (with T.P. Novak) "Measuring the Flow Experience Among Web Users" Stanford Marketing Camp, July 17-20,

"Measuring the Flow Experience Among Web Users" Stanford Marketing Camp, July 17-20 1997. (with T.P. Novak)

"Marketing In Computer-Mediated Environments: Research Issues and Challenges," CRITO, University of California at Irvine, May 3, 1996 (with T.P. Novak)

"Marketing in Hypermedia Computer-Mediated Environments: Implications for Commercialization of the World Wide Web" Interval Research Corporation, October 1994; Stanford University Marketing Seminar, August 3, 1995. (with T.P. Novak)

"Graphical Models of Consumer Perception and Preference" University of North Carolina, November 1992.

"Maximizing Customer Satisfaction Through Market-Driven Quality," University of Texas at Dallas, March 1992; Vanderbilt 1992

"Asymmetric Residual Maps for Market Structure Analysis" Marketing Modeler's Group NY, March 1987; University of Washington, December 1988; Fourth Annual Texas Universities' Marketing Faculty Research Colloquium, Texas A&M University, April 4-5, 1991; Second Annual AMA ART Forum, Beaver Creek, Colorado, June 1991; University of Utah, March 1992;Carnegie Mellon University, April 1992; University of Groningen, May 1992.

"Dyadic Disagreement: An Exploratory Analysis of Household Purchase Influence and Reporting Bias," Pennsylvania State University, November 1990.

Page 33 June 2022

"Diagnostic Maps for Product Line Monitoring" UCLA July 1989; Columbia Summer Workshop June 1989; University of Iowa, February 1990; University of Texas at Dallas, February 1990. "Correspondence Analysis and Related Methods" UCLA (Psychology) April 1987; University of Washington, December 1988.

"Residual scaling and the Analysis of Asymmetric Market Structure" Sixth Annual Columbia/Wharton Joint Seminar, January 30, 1987.

Invited Industry and Government Seminars and Conferences

- Hoffman, D.L. (2019), "AI and the Future of Marketing: From Efficiency to Experience," Marketing Edge Board of Trustees Meeting, George Washington University School of Business, October 10.
- Hoffman, D.L. (2019), "AI and the Future of Retailing: From Efficiency to Experience," New Insights on Retail Evolution from Top Universities, ShopTalk 2019, March 3.
- Hoffman, D.L. (2018), "The IoT: Opportunities and Challenges," Presentation to the StarTech.com Marketing Roundtable, Ivey Spencer Leadership Centre, Ivey Business School, Western University, Canada, November 1.
- Novak, T.P. and D.L. Hoffman (2018), "A Computational Social Science Framework for Representing Emergent Consumer Experience," Presented at Ayasdi, Inc., Menlo Park, CA, May 22.
- Novak, T.P. and D.L. Hoffman (2018), "A Computational Framework for Visualizing the Possibility Space of Emergent Consumer Experience," Presented at IFTTT, San Francisco, CA, April 24.
- Hoffman, D.L. (2017), "The Impact of the Internet of Things on Consumers and Business," Keynote presentation at the EFMI Vision on Food Congres 2017, Theme: "Food for Thought," Kasteel De Vanenburg, Putten, Netherlands, May 23.
- Novak, T.P. and D.L. Hoffman (2016), "Using Topological Data Analysis (TDA) to Visualize Interaction Events from IFTTT Recipes and Smart Home Sensors," Presented at Ayasdi, Inc., Menlo Park, CA March 10.
- Hoffman, D.L. and T.P. Novak (2016), "How to Market the Smart Home: Focus on Emergent Experience, Not Uses Cases," Presented at CBS Interactive, San Francisco, CA, March 11.

Page 34 June 2022

Hoffman, D.L. (2016), "How to Market the Smart Home: Focus on Emergent Experience, Not Use Cases," Presented at Brite '16, Columbia University, NY, NY, March 7.

Novak, T.P. and D.L. Hoffman (2015), "Exploring Emergent Consumer Experience: A Topological Data Analysis Approach," Presented at IFTTT, San Francisco, CA, November 25. "The Digital Customer," Discussion, 2012 SAP CEO Event, March 16, 2012.

"Are Brand Attitudes Contagious: Consumer Response to Organic Search Trends," Paper presented at the Google/WPP Marketing Research Awards, November 3, 2009.

"What is Web 2.0?" Business Leaders Roundtable, UCR Palm Desert Graduate Center, March 12, 2009.

"Emergent Consumers Can Help Develop Successful Future Ideas," Discussion Paper presented at the NSF GENI Opt-In Workshop, Charles Hotel, July 20-21, 2008 (Presenter. Co-authored with T.P. Novak)

"Examining How the "Social Web" is Creating New Opportunities – And Possible Threats," eTail 2008, JW Marriott Desert Springs, Palm Desert, CA, February 11-14, 2008.

"The Evolution of Customer Experience: 10 Trends You Can't Afford to Miss," Shop.org Annual Summit, Mandalay Bay Resort, Las Vegas, NV, September 17-19, 2007.

"The Evolution of Customer Experience: 10 Trends You Can't Afford to Miss," MarketLive E-Commerce Summit, Fairmont Sonoma Mission Inn, Sonoma, CA, June 18-20, 2007.

"How to "Lock in" Your Customers ... and Lure Them Away from Competitors," Panel Presentation at the 2005 Shop.org Annual Summit, Las Vegas, NV, Sept 12-14, 2005. "Managing the Customer Chain: From Theory to Practice," Presentation to the Nashville Technology Council, Tech Roundtable, October 2, 2003.

"Do You Really Understand Your Customers," Panel Presentation at the 2003 Shop.org Annual Summit, New York City, Sept 24-26, 2003.

"The Consumer Experience: A Research Agenda Going Forward," FTC Public Workshop 1: Technologies for Protecting Personal Information: The Consumer Experience. Panel: "Understanding How Consumers Interface with Technologies Designed to Protect Consumer Information," May 14, 2003 "eLab: A Model for Online Consumer Behavior," Keynote address, American Marketing Association EXPLOR Forum, Chicago, Nov 21-22, 2002.

"Internet Advertising: From CPMs to Results," United States Securities and Exchange Commission Portals Roundtable: Relationships Between Broker-Dealers and Web Sites, May 23, 2001.

"An Integrated Framework for Internet Commerce," Presentation at the CMIE Conference Accelerating Change in the Information Economy Anderson Graduate School of Management, UCLA, February 7-8, 2001.

"An Integrated Framework for Internet Commerce," DaimlerChrysler, Stuttgart, Germany, January 2001.

"Today's Web Consumer," Presentation to the Round Table Group E-Commerce Bootcamp, Gleacher Center, Chicago, June 26, 2000.

"Internet Commerce in Action," Presentation at the Sterling Commerce Secrets of the E-Business Masters E-Business Strategies Conference, May 8-11, 2000.

"The Internet Revolution and Consumer Privacy: Can They Coexist?" Keynote presented at the Skadden, Arps, 2000 Women's Retreat, Four Seasons Resort, Palm Beach, May 19-21, 2000. "The Evolution of the Digital Divide: Implications for a Research Agenda," Invited presentation at the Digital Divide Seminar, Markle Foundation, February 14, 2000.

"A Model of Stickiness," Invited paper presented at the *Industry Standard* Internet Summit 99, Ritz-Carlton Laguna Niquel, July 18-20, 1999.

"The Digital Divide: Issues for the Diffusion of Electronic Commerce," Invited paper presented at "The Digital Economy: New Research, Data, and Tools," White House Conference sponsored by NSF, the Department of Commerce and the OECD, May 25-26, 1999 (with T.P. Novak) "Internet Commerce in Action," Mini-Keynote presentation at the Sterling Commerce Worldwide Conference, *EC Strategies*, Chicago, May 13, 1999.

"Issues of Equity, Privacy, and Commercialism," Invited paper and moderated session presented at The Internet and the Family Conference, Annenberg Public Policy Center National Press Club, Washington, DC, May 4, 1999.

"Linking Internet Marketing with Business Practice: The State of the Field," Invited paper presented at the MSI 1998 Fall Board of Trustees Meeting: From Here to '00: Putting Our Priorities to Work, Phoenix AZ, November 5-6, 1998 (with T.P. Novak)

Page 36 June 2022

"Are Women Different?: Gender differences in Web Shopping Behaviors and Their Implications for Internet Business Strategy" Special Seminar, Tools for Building Relationships with the Millennium Woman, iVillage.com and Fast Company. September 24, 1998.

"The Internet Opportunity," Keynote address with Tom Novak at the Future Media Research Programme, London Business School, June 4, 1998.

"Internet Commerce: The Ever Changing Landscape," Sterling Commerce Executive Symposium in partnership with FORTUNE Conference Division "Building the Next Generation Enterprise: Reshaping Your Business with Electronic Commerce" Royal York Hotel, Toronto, Canada, May 12-14, 1998.

"The State of the Industry," Opening Keynote at the 1998 CMA Music Industry & New Technologies (MINT) Conference May 13, 1998.

"Integrating the Internet into Your Electronic Commerce Strategies," AHMA, Marcos Island, Florida, January 25-27, 1998.

"Information Privacy in the Marketspace: Implications for the Commercial Uses of Anonymity on the Web," American Association for the Advancement of Science conference, "Anonymous Communications on the Internet: Uses and Abuses," November 21-23, University of California, Irvine, 1997.

"Measuring the Audience: Where Top Researchers Agree and Diverge" Online News Summit, New York Hilton Hotel, New York City, September 11-12, 1997.

"Privacy and Electronic Commerce," EFF/Silicon Valley Industry Briefing with Ira Magaziner on "Global Electronic Commerce and Personal Privacy Protection." August 5, 1997.

"Segmenting the Online Consumer Market: Preliminary Findings," Interval Research Corporation, Palo Alto, CA, July 31, 1997

"Measuring the Flow Experience Among Web Users" Stanford Marketing Camp, July 17-20; Interval Research Corporation, Palo Alto, CA, July 31, 1997

"Integrating the Internet into Your Electronic Commerce Strategy" Sterling Commerce Executive Symposium, Hotel Inter-Continental, Miami May 12-13, 1997.

Page 37 June 2022

"New Metrics for New Media: Toward the Development of Web Measurement Standards" Keynote Address, IQPC Performance Measurements for Web Sites, Hotel Nikko, San Francisco, February 24-26, 1997.

"Advertising Pricing Models for New Media," Internet Publishing and Beyond: The Economics of Digital Information and Intellectual Property, Kennedy School of Government, Harvard University, Jan 23 - Jan 25, 1997.

"Getting a Grip on Your Technology Strategy" *Fortune* 500 CEO Forum, November 14-16, 1996.

"Commerce on the Internet: Emerging Models" Future of Interactive Marketing Conference, Harvard Business School, May 22-24, 1996; Intel Corporation, Santa Clara, CA, August 12, 1996; Interdisciplinary Aspects of the Electronic Superhighway Seminar, George Washington University, School of Engineering and Applied Science, October 15, 1996. "Envisioning the Future of Internet Marketing: Understanding the Consumer and Market Response," MIT Sloan School, September 18-19, 1996. "Internet Research Methodology Workshop" Microsoft Corporation, September 5, 1996.

"Workshop on Flow Measurement Methodology" Interval Research Corporation, August 1, 1996

"Going with the Flow: Tapping Consumer Experience on the Net" Spotlight Executive Conference Directing the Future of Interactive Media, July 28-30, 1996.

"New Metrics for New Media" Netscape Communications Corporation, July 18, 1996.

"Who Is On the Net?: Implications for Commercial Development," Interval Friday Forum, Interval Research Corporation, Dec. 15 1995; Netscape Communications Corporation, April 18 1996; Stanford Breakfast Briefing Series, July 11, 1996; University of Santa Clara, July 15, 1996.

"Consumer Data and Demographics" Wharton Forum on Electronic Commerce, May 9-10, 1996.

"Leveling the Playing Field: Mass Communication vs. Mass Media," presentation at the Sixth Conference on Computers, Freedom, & Privacy, March 27-30, 1996.

"Commercial Scenarios for the Web: Opportunities and Challenges" Interval Internet Symposium, Interval Research Corporation, February 23 1995; Harvard Business School Colloquium, Multimedia and the Boundaryless World, November 15-17, 1995.

Page 38 June 2022

"What Is the Internet and How Can It Help Your Business?" CABLE, Loews Vanderbilt Plaza, October 11, 1995.

"Understanding the Internet Audience "Keynote Address, Net Profits: Doing Business on the Internet, Sheraton Palace, San Francisco, August 1-2, 1995. [ranked in top 3 of speakers, with Ted Leonsis, President, AOL and Scott Cook, Chairman, Intuit]

"Business Models that Work on the Net," Net Profits: Doing Business on the Internet, August 1-2, 1995; InterAct '96.

"Measurement Implications of the Internet," Bellcore Measurements Research Symposium, May 18, 1995.

"Correspondence Analysis and Related Methods" 192nd American Chemical Society Meetings, September 1986; First Annual AMA ART Forum, Incline Village, Nevada, June 1992.

"Program Impact: The Key Measure of Audience Response" Beyond Ratings Conference, Columbia University, October 19, 1984.

George Washington University Research Seminars and Events

"How the Internet of Things is Going to Change Everything," George Talks Business, February 25, 2019. <u>https://business.gwu.edu/george-talks-business</u>

"How to Market the Consumer IoT: Focus on Experience," GWSB Board of Advisors Presentation, September 23, 2016.

"The Center for the Connected Consumer," GWSB Faculty Meeting Presentation, January 23, 2015.

"Consumer Experience in the Smart Home: An Assemblage Theory Perspective," GWSB Marketing Department Brownbag, February 20, 2015.

"The Social Life of Content: How Introjected Motivation Leads to Feeling Close and Connected in Social Media," GWSB Research Brownbag, Dec 12, 2013.

Page 39 June 2022

UC Riverside Research Seminars and Events

"Sloan Center Overview," Sunstar Delegation Visit to AGSM, Alumni Center, April 16, 2008. "The Evolution of Customer Experience: 10 Trends You Can't Afford to Miss," Back to Class, UC Riverside Homecoming 08, February 23, 2008.

"The Search for Significance: Emergent Nature and Concept Development," MAMA, November 13, 2007.

"How to "Lock in" Your Customers and Lure Them Away From Competitors," CUC Alumni Breakfast, February 28, 2007.

"The Sloan Center for Internet Retailing and eLab 2.0," AMA Student Club Meeting, UC Riverside, November 1, 2006.

"eLab 2.0 Online Research," MAMA, Department of Psychology, October 30, 2006.

Vanderbilt University Events

"Can We Live Without the Internet? Pondering the Implications of Internet Indispensability," VU Commencement Faculty Seminar, May 12, 2005.

"Privacy on the Internet: Key Ethical Issues and Challenges," Cal turner Program for Moral Leadership in the Professions, Student Discussion Series: Professions and Privacy, Feb 18, 2005. "E-Commerce at the Owen School," Faculty Presentation at Diversity Weekend, December 1, 2001.

Owen Strategic Planning On-Site Retreat, Owen Corporate Council, November 8, 2001.

"Electronic Commerce at Owen and the Vanderbilt eLab Initiative," Invited presentation to the IBM Industry Solutions Lab, May 24, 2000.

"Electronic Commerce at the Owen School," Presentation to the Owen Graduate School of Management, Alumni Association Board of Directors, April 28, 2000.

"Owen's Electronic Commerce Advantage," Invited paper presented at the First Annual Scholar's Weekend, Owen Graduate School of Management, Vanderbilt University, March 25-28, 1999.

"Who's Making Money on the Internet? (Hint: It's Not Who You Think!)," Owen 7:29 Breakfast Group, Ingram Industries, March 25, 1998.

Page 40 June 2022

"The Revolution Will Not Be Televised" Vanderbilt Alumni Reception, Capital City Club, February 1995; Nashville Forum, Stadium Club, September 7, 1995.

TEACHING

Post-Doctoral Supervision

Hyunjin Kang (Communications, Pennsylvania State University, Ph.D. 2013) First placement: Assistant Professor of Communication, Wee Kim Wee School of Communication and Information, Nanyang Technological University, Singapore

Randy Stein (Psychology, Yale University, Ph.D. 2011). First placement: Assistant Professor of Marketing, Cal Poly Pomona.

Terry Daugherty (Communications, Michigan State University, Ph.D. 2001). First placement: Assistant Professor of Advertising, University of Texas at Austin.

Fang Wan (Communications, University of Minnesota, Ph.D. 2002). First placement: Assistant Professor of Marketing, University of Manitoba.

Doctoral Dissertation Committees

- Nadia Daniente (Marketing, Gies College of Business, University of Illinois, Ph.D. Expected 2021). Member. Dissertation topic : "Me, Myself, and AI: The Impact of Artificial Intelligence on Marketing and the Self."
- Abishek Borah (Marketing, Marshall School of Business, USC, Ph.D. 2013. First placement : University of Washington, Seattle). Member. Dissertation topic : "Essays in Consumer Conversations in Social Media."
- Jean-François Guertin (Marketing, HEC Montreal, Ph.D. 2011. First placement : University of Sherbrooke). Member. Dissertation topic : "Three Essays on the Development, Validiation and Confirmation of the Flow Construct to Investigate Navigational Web Site Experience"
- Ofer Mintz (Marketing, UC Irvine, Ph.D. 2012. First placement: LSU). Member. Dissertation topic: "What Drives Managerial Use of Marketing vs. Financial Metrics and Does it Impact Performance?"

Page 41 June 2022

- Patrali Chatterjee (Marketing, Vanderbilt University, Ph.D.1998. First placement: Assistant Professor, Rutgers University). Co-Chair. Dissertation topic: "Modeling Consumer Response in World Wide Web Sites - Implications for Advertising."
- Anand Narasimhan (Organizational Theory, Vanderbilt University.1997. First placement: Assistant Professor, London School of Business) Co-Chair. Dissertation topic: "Interpretive Stance in Inchoate Industries"

Scott Eggebeen, Ph.D. Measurement, Evaluation and Statistics 1988 (Columbia).

Richard Columbo, Ph.D. Marketing 1987 (Columbia).

Doctoral Qualifying Committees

Brynn Nodarse, UCR Psychology 2007 orals Abishek Borah, USC Marshall School of Business, 2011 orals

Doctoral Consortia

Co-Chair, ACR Doctoral Symposium, 2018 Faculty, AMA Doctoral Consortium, 2017 Faculty, SCP Doctoral Consortium, 2015 Faculty, ACR Doctoral Consortium, 2010 Resident Faculty, AMA Doctoral Consortium, New York University, July 29 - August 2, 1987

Courses

Undergraduate: AI and Marketing Strategy; Marketing Strategy: Based on First Principles and Data Analytics; Integrated Marketing Communication

MBA Program: AI and Marketing Strategy; Marketing Strategy: Based on First Principles and Data Analytics; Integrated Marketing Communication; Marketing Strategy and Planning; Digital Commerce Strategy; Strategic Brand Management; New Product Development; Product Management; Internet Marketing Strategy; Managing the Internet Retailing Customer Chain

EMBA Program: Marketing Management (Core); Marketing Planning (Marketing II)

Doctoral Seminars: Marketing in Computer-Mediated Environments; Online Consumer Behavior; Nonlinear Multivariate Analysis of Marketing Data

Page 42 June 2022

Executive Teaching

Stanford University Professional Education Executive Programs Market Strategy for Technology-Based Companies Faculty, Marketing on the Web I & II, 1996: April 17-19; October 23-25; 1997: April 23-25; October 29-31; 1998: March 18-20.

Columbia Business School Executive Programs, Arden House Case Discussion Leader, Marketing Management Program 1985-1989 Faculty, Marketing Research Program 1985 Assistant Director, Marketing Management Program 1984-1986

Columbia Business School Executive Programs, Special Programs Division Faculty, Marketing Management Program, Equitable, Inc., Morristown & Tarrytown, 1988-1989 Faculty, Marketing Management Program, Homequity, Inc., Connecticut, 1985

SERVICE

Editorial Activities

Editor

Journal of Marketing, Special Issue Co-Editor, "New Technologies and Marketing," 2019-2021 Marketing Intelligence Review: IoT Experiences, Co-Editor, 2018 Journal of Interactive Marketing, Special Issue Editor, "Social Media," 2011 Information Systems Research (Marketing area), Special Issue Editor, 2000-2001 Marketing Science, Special Issue Editor, "Marketing Science and the Internet," 1999-2000

Departmental Editor

Electronic Commerce Research (Marketing Department)

Associate Editor Journal of Marketing, summer 2018-present Journal of Consumer Research, Dec 2020-present Journal of Marketing Research, Guest AE on multiple manuscripts

Page 43 June 2022

Editorial Boards

Journal of Marketing -through 2018 Journal of Consumer Research, - Dec 2020 Journal of Marketing Research (2012-) Journal of Consumer Psychology, (-present) Journal of Interactive Marketing, Editorial Board founding member 1996-present International Journal of Electronic Commerce, 1995-present Social Science Research Network, 2002-present (Advisory Board) International Journal of Marketing Education, 2002-present

Advisory Panels

Society for Consumer Psychology, 2012-2015

Past Memberships

Journal of Electronic Commerce (Founding Member), Marketing Letters (member of Academic Advisory Board and former member of Editorial Board), Marketing Science (off in 2002), EC World (Founding Member), Managerial Marketing Abstracts, Marketing Research Network

Ad Hoc Reviewing

Journal of Consumer Research, Academy of Management Review, Management Science, Marketing Science, Communications of the ACM, Journal of Computer-Mediated Communication, Journal of Marketing, Journal of Marketing Research, Psychometrika, International Journal of Research in Marketing, Applied Psychological Measurement

Conference Reviewing

2022, Society for Consumer Psychology 2021, ACR Annual Conference 2020 ACR Annual Conference, Associate Editor 2015 Society for Consumer Psychology International Conference 2009 ACR Asia-Pacific Conference (reviewed in 2008) Society for Consumer Psychology 2008, 2009, 2010, 2011 ACR Annual Conference 1991, 1992, 1999, 2000, 2002, 2003, 2004, 2005, 2008, 2010 AMA Summer Educator's Conference, 1989, 1990, 1991, 1992 AMA Winter Educator's Conference, 1991, 1992, 1993, 1994, 1995

Page 44 June 2022

Other Significant Reviewing

Grants National Science Foundation (various programs)

Research Competitions

John A. Howard American Marketing Association Dissertation Competition, Blue Ribbon Panel, 2015 John A. Howard American Marketing Association Dissertation Competition, numerous yearspresent Marketing Science Institute Alden Clayton Doctoral Dissertation Competition, numerous years, 2006-present MSI - Journal of Marketing Research competition on "Practitioner-Academic Collaborative Research SCP Doctoral Dissertation Competition, numerous years, 2006, 2007, 2008

Research Reports

National Research Council Computer Science and Telecommunications Board ETS Scholastic Achievement Test, Irwin

Conference Organization

Conference Chair

GWSB Inaugural Conference on the Intelligence of Things: Year 1: Research Opportunities and Challenges, April 5, 2019 (Co-Chair)

Association for Consumer Research Doctoral Symposium, Dallas, TX. October 11, 2018 (Co-Chair)

MSI Conference on Marketing in the Consumer Internet of Things, Washington, DC, September 30, 2016 (Co-Chair)

Direct/Interactive Marketing Research Summit, Las Vegas, NV, October 13-14, 2012 (Co-Chair)

Marketing Science Institute/Sloan Center for Internet Retailing Leveraging Online Media and Online Marketing, UC Riverside Palm Desert Campus and Hotel Miramonte Resort, February 6-8, 2008 (Co-Chair)

Association for Consumer Research Pre-Conference Consumers Online: Ten Years Later, October 25, 2007 (co-chair)

UCR Sloan Center for Internet Retailing Research Networking Workshop, May 3-4, 2007 AGSM Deliberative Dialogue Conference Featuring Duke University Professor Richard Staelin, April 6, 2007

Inaugural Partner Conference, Vanderbilt Sloan Center for Internet Retailing, 2003 (co-chair)

First INFORMS Marketing Science and the Internet Conference, Co-Chair, 1998

Second Annual Columbia Summer Marketing Workshop: Arden Homestead 1989

Sixth Annual Columbia/Wharton Joint Seminar: Columbia University, 1987

Columbia Center for Telecommunications and Information Studies, "Beyond Ratings: New Directions in Audience Measurement Research": Columbia University, 1984.

Session/Track Chair

ACR North America (special session organizer); San Diego, CA 2017 Winter AMA (special session organizer); Orlando, FL, 2017 SCP (symposium organizer); St. Pete Beach, 2016 ACR North America (special session/roundtable organizer); New Orleans 2015 SCP (special session organizer); Phoenix, 2015 INFORMS Marketing Science Conference (track co-organizer); Atlanta 2014 INFORMS Marketing Science Conference (track co-organizer); Istanbul, 2013 INFORMS Marketing Science Conference (track co-organizer); Boston, 2012 ACR North America (MSI Special Session organizer, with Punam Anand Keller), St. Louis, 2011. ACR North America (roundtable organizer), Pittsburgh, 2009. ACR North America Conference (special session organizer), Portland, 2004. ACR North American Conference (special session organizer); Toronto, 2003. AMA Summer Educator's Conference (panel organizer); San Francisco, 1999 INFORMS Marketing Science Conference (panel organizer); Berkeley, 1997 INFORMS Marketing Science Conference (panel organizer); Gainesville, 1996 INFORMS Spring National Meeting (session chair); Los Angeles, 1995 TIMS XXX-Sobrapo XXIII Joint Intsernational Meeting (track chair): Rio de Janeiro 1991 ORSA/TIMS Marketing Science Conference (session chair): Berkeley 1997; Gainesville 1996; Tucson 1994; Seattle 1988; Dallas 1986; Nashville 1985

Page 46 June 2022

ORSA/TIMS Joint National Meeting (session chair): Denver 1988; Miami 1986; Anaheim 1991 Los Angeles 1995 ACR Annual Conference (special session chair): Las Vegas 1985

External Administrative Service

Chair, External Review Committee, Five-year Review, Center for Research on Information Technology and Organizations (CRITO), University of California, Irvine, 2004

Professional Affiliations and Memberships

Association for Consumer Research, American Marketing Association, INFORMS (member, Society for Marketing Science), Industry Studies Association (Founding member, 2009-present), Society for Consumer Psychology

Past memberships: Association for Computing Machinery, Classification Society of North America, CommerceNet, Psychometric Society

Membership in Professional Organizations

Elected Positions

2021-2022	AMA CB Sig, Past Chair
2020-2021	AMA CB Sig, Chair
2019-2020	AMA CB Sig, Chair-Elect
2018-2019	Journal of the Association for Consumer Research, Policy Board Chair
2017-2020	Perspectives Director (Industry) Association for Consumer Research Board of
	Directors
1998-1999	Past-President, INFORMS Section on Marketing (former name)
1996-1997	President, INFORMS Section on Marketing
1994-1995	President-Elect, TIMS College on Marketing
1992-1993	Secretary-Treasurer, TIMS College on Marketing
1992-1993	Editor, TIMS College on Marketing Newsletter (published quarterly)
1992-1999	Council Member, TIMS College on Marketing Advisory Council
1995	Program Chair, American Statistical Association, Section on Marketing
1994	Program Chair-Elect, American Statistical Association, Section on Marketing

Page 47 June 2022

Program Committees

ACM Conference on Electronic Commerce EC'08 2008 Association for Consumer Research (ACR) Annual Conference, multiple years 1992-present Computers, Freedom, & Privacy Annual Conference 1996, 1997, 1998 Society for Consumer Psychology (SCP) Annual Conference, multiple years-present

Boards and Committees

Marketing Edge, Board of Trustees, Member, 2019-2022 Procter & Gamble Digital Advisory Board February 2009-2013 Marketing Science Institute, Academic Trustee 2008-2014 Web Analytics Association, Advisory Board 2005-present Marketing Science Institute "Blue Ribbon" Committee, Web Survey Research Project 2004-2006 Inc. Magazine Web Awards 2001 EFF Pioneer Awards Judge 2001, 2002, 2003, 2004, 2005 Prize for Promise (nominator) 2002 **Qbiquity, Advisory Board 2001 Internet Policy Institute 2000** eConception, Director 1999-2000 Credible.org, Advisory Board 1999 Standard for Internet Commerce, Founding Member 1999 GII Awards, Final ("Blue Ribbon") Judge, Business Category 1996-1999 AAAS Project (NSF) on Anonymous Communications on the Internet, Advisory Committee 1996-1997 Associate Member, CommerceNet; member, Marketing Working Group 1994-2000

Professional Experience

Summer Visiting Scholar, Interval Research Corporation, 1995-1999 Research Associate, Columbia Business School Institute for Tele-Information, 1984-1985 Social Science Analyst, Research Triangle Institute, Research Triangle Park, North Carolina, 1980-1981

Page 48 June 2022

Strategic Consulting

Bellcore, Bell Northern Research/Northern Telecom, Cohen, Klingenstein & Marks Inc., Daimler-Benz, Federal Reserve Board Electronic Payments System Panel, Hewlett-Packard, HotWired, Impact Planning Group, Intel Corporation, Interval Research Corporation, Kantar Futures Practice, Microsoft Corporation, Nashville Chamber of Commerce, Netscape Communications Corporation, Nielsen Media Research, Ogilvy & Mather, Procter & Gamble, (r)evolution partners, Reinault-Thomas, SBC, Starwave, Stratford Associates, Television Audience Assessment, Inc.

Expert Witness

• Written Affidavit and Deposition for the plaintiff, Spring 2019, The Reinalt-Thomas Corporation d/b/a Discount Tire, vs Mavis Tire Supply LLC, Case 1:18-cv-05877-TCB

Page 49 June 2022

UNIVERSITY AND PRIVATE FOUNDATION GRANTS & CORPORATE GIFTS

Co-Founder and Co-Director, Sloan Center for Internet Retailing (2003-present) and eLab (1994present.). Professor Tom Novak and I founded eLab/Project 2000 in 1994 to conduct scholarly research in Internet marketing and e-commerce. In March 2003, the Alfred P. Sloan Foundation awarded a grant establishing the Vanderbilt University Sloan Center for Internet Retailing. The Center moved to the University of California, Riverside, in July 2006.

From 1994-2006, we raised over \$3 million in Sloan Center and eLab funding from the sources below:

Corporate Funding (\$932,000 Project 2000/eLab; \$450,000) Sloan Center for Internet Retailing):

CDnow, Daimler-Chrysler, FedEx, the Freedom Forum, Digeo, Financial Services Technology Consortium, First Horizon, Focalink, Gaylord Entertainment, HotWired Ventures LLC, Hewlett-Packard, Ingram Entertainment, Interval Research Corporation, iVillage, J.C. Bradford, Land's End/Sears, NCR Knowledge labs, Neomodal, Netscape, Nielsen Media Research, O'Reilly & Associates, Pitney Bowes, Roche-Diagnostics, Rouse Company, SBC, Shop at Home, Shop.org, Sprint, Sterling Commerce, Sun Microsystems, Vulcan Ventures, VF Corporation, Walmart.com, Yankelovich Partners.

Foundation and Government Grants (\$565,000):

Alfred P. Sloan Foundation, American Association for Advancement of Science, The Aspen Institute, The Freedom Forum First Amendment Center, Marketing Science Institute, John and Mary R. Markle Foundation, National Science Foundation

University Grants (\$1,075,000):

Vanderbilt University Central Administration, Vanderbilt University Research Council, Vanderbilt University Medical Center

Page 50 June 2022

The Sloan Center for Internet Retailing moved to UC Riverside in July 2006.

Corporate Gifts

Newsfutures 04/2007	In-kind
GSI Commerce 12/2007	\$5 <i>,</i> 500
Organize.com 12/2007	\$5 <i>,</i> 000
Procter & Gamble 09/2008	\$5 <i>,</i> 000
Miller Coors 09/2008	\$10,000
Hershey 09/2009	\$ 5,000

UC Riverside Academic Senate Omnibus Grant

2012\$11502011\$14002010\$6302009\$10002008\$15002007\$1607

George Washington University Administrative Service

University

GW University Honors Program Advisory Committee, member, Fall 2014-2017

GWSB

SWAPT, Member Fall 2021-present Dean's Covid 19 Response Advisory Task Force Spring 2020 MBA Curriculum Taskforce, 2019 Research Committee, Spring 2017, 2018-2020 SWAPT, Member Fall 2015-Spring 2017 Strategic Planning Committee, Cross-Disciplinary Taskforce Spring 2015

Marketing Department

Department Chair, 2017 APT Chair, Spring 2014-Spring 2016

UC Riverside Administrative Service Department

AGSM Department of Management and Marketing Department Chair, 07/1/2006-6/30/2011 Marketing Area Recruiting Search Committee, Chair, 2006-2007 Management Area Recruiting Search Committee, Ex-Officio Member, 2006-2007

Page 51 June 2022

Marketing Area Recruiting Search Committee, Ex-Officio Member, 2007-2008 Management Area Recruiting Search Committee, Ex-Officio Member, 2007-2008 Management Area Recruiting Search Committee, Chair, 2008-2009 Marketing Area Recruiting Search Committee, Ex-Officio, 2008-2009 First Annual AGSM Marketing Camp, May 9, 2008

College

Soba Faculty Mentor to Student American Marketing Association Club, 2012-present AGSM Strategic Planning Committee, 2008-2009 AGSM Senior Leadership Team, 9/2007-present AGSM Graduate Committee, 07/2006-06/2007 AGSM BASD Committee, 07/2007-2009

Campus

UCR Online Strategic Planning Committee, 2013-present UCR Faculty Welfare Committee, 2012-present UCR Strategic Planning Committee, Academic Excellence Subcommittee, 2009-2010 UCR AGSM Dean Search Committee, 2006-2007 UCR Senior Marketing Council, 2006-2008 UCR School of Medicine Dean Search Committee, 2007 UCR School of Communications Task Force Co-Chair, 2008-present

Vanderbilt University Administrative Service

Faculty Senate, 1996-1999, 2004-2006 Technology Literacy Arc Seminar, sponsored by the Center for Teaching and the Associate Provost for Innovation through Technology, 2002 Owen Executive Committee 2004-2006 Dean Search Committee 2004-2005 Faculty Development Committee, 2003-2005 Marketing Recruiting Committee, 1997, 2003-2006 Owen Strategic Planning Committee, 2001-2002 Marketing Area Head, 2002-2003, 2005-2006 Chair, Marketing Recruiting Committee, 1994 (co-chair), 1999, 2001, 2002, 2004, 2005 Coordinator, Marketing Area Ph.D. Program, 1994-2001 Member, Owen Ph.D. Committee, 1993-2003 Chair, Computing/Telecommunications Strategic Planning Committee, 1993-1996 Promotion Committee, Ray Friedman, 2003

Page 52 June 2022

Renewal Committee, Neta Moye, 2002 Human Resources/Organizational Studies Search Committee, 1994 Director, Electronic Commerce Program, 2000-2005 Faculty Sponsor, eBusiness and Technology Club, 2000-2005 Director & Founder, Electronic Commerce Emphasis, 1996-2000 Faculty Advisor (Marketing area), Business Projects Group, 1994-2000 EMBA Curriculum Committee 2002-2003 Committee on Instruction, 1997-2000

UT Dallas Administrative Service

School of Management Executive Education Committee, 1991-1992 School of Management Teaching Committee, 1991-1993 University Committee on Faculty Standing and Conduct, 1991-1993

Columbia Business School Administrative Service

Marketing Faculty Recruiting Coordinator, 1988 Marketing Faculty Search Committee, 1988; 1986 Faculty Research Review Committee (Chair, 1989), 1987-1990 Committee on Computer Use (Chair, 1987-1989), 1987-1990

Selected Media Recognition

Business Week "Mover & Shaker," San Francisco Webgrrls Top 25 Women on the Web, *Microtimes* 100, Advertising Age "Web Warrior," *c/net* "Visionary," *Internet World* "Internet Hero," *Newsweek* "The Net 50 People Who Matter Most on the Internet"

ATTORNEYS' EYES ONLY - SUBJECT TO PROTECTIVE ORDER

Appendix B Documents Considered

Legal Documents
Affidavit of David Monsees, November 19, 2020, and exhibits thereto
Affidavit of David Monsees, October 1, 2020, and exhibits thereto
Complaint for Injunctive and Other Relief, State of Arizona v. Google, LLC, Superior Court of the State of Arizona, County of Maricopa, CV-2020-006219, May 27, 2020
Declaration of Benedict Y. Hur in Support of Google LLC's Motion for Summary Judgment, July 23, 2021
Declaration of Benedict Y. Hur in Support of Google LLC's Response in Opposition to Plaintiff's Motion for Partial Summary Judgment, November 4, 2020
Declaration of Seth Nielson, November 16, 2021
Defendant Google LLC's Motion for Summary Judgment, July 23, 2021
Examination Under Oath of David Monsees, July 12, 2019
Examination Under Oath of Jennifer Chai, September 25, 2019
Examination Under Oath of Marlo J. McGriff II, July 11, 2019
Google LLC's Answer to the Complaint for Injunctive and Other Relief, October 26, 2020
Google LLC's Motion to Dismiss, July 15, 2020
Google LLC's Reply in Support of Motion to Dismiss, September 8, 2020
Google LLC's Separate Statement of Fact in Support of its Motion for Summary Judgment, July 23, 2021
Google's Response to the Fourth Civil Investigative Demands
Google's Responses to the First, Second, and Third Civil Investigative Demands
Google's Supplemental Response to Interrogatory No. 11
Plaintiff's Requests for Production of Documents to Defendant, Set One, December 4, 2020
Plaintiff's Requests for Production of Documents to Defendant, Set Three, February 3, 2021
Plaintiff's Requests for Production of Documents to Defendant, Set Two, December 30, 2020
State of Arizona v. Google, Case No. CV 2020-006219 Rule 30(b)(6) Written Questions & Responses HIGHLY CONFIDENTIAL—ATTORNEYS' EYES ONLY SUBJECT TO PROTECTIVE ORDER
State's Motion for Partial Summary Judgment, August 25, 2020
State's Separate Statement of Facts in Support of Motion for Partial Summary Judgment, August 25, 2020
The State's Separate Statement of Facts in Support of the State's Response to Google's Motion for Summary Judgment, November 16, 2021

Expert Reports

Expert Report of Colin M. Gray, Ph.D., May 4, 2022 Expert Report of Jennifer King, Ph.D., May 4, 2022

Depositions

Deposition of David Monsees, August 20, 2021, and exhibits thereto Deposition of Gregor Rothfuss, May 8, 2020, and exhibits thereto Deposition of Gretchen Gelke, September 3, 2021, and exhibits thereto Deposition of Ingemar Eriksson, October 5, 2021, and exhibits thereto Deposition of Ingemar Eriksson, September 13, 2021, and exhibits thereto Deposition of Jack Menzel, March 6, 2020, and exhibits thereto Deposition of Jennifer Chai, September 25, 2019, and exhibits thereto Deposition of Jennifer Fitzpatrick, March 3, 2022, and exhibits thereto Deposition of Karen Hennessy, May 21, 2020, and exhibits thereto Deposition of Karen Hennessy, May 21, 2020, and exhibits thereto Deposition of Kevin Berlin, February 27, 2020, and exhibits thereto Deposition of Marlo J. McGriff II, July 11, 2019, and exhibits thereto

ATTORNEYS' EYES ONLY – SUBJECT TO PROTECTIVE ORDER

Bates-Stamped Documents (Bates #s of first page of document in .pdf of same name)

AUSTRALIA-000072
AZAG-0000001
AZAGKoernerPRR000045
GOOG-GLAZ-00000001
GOOG-GLAZ-00000018
GOOG-GLAZ-00000054
GOOG-GLAZ-00000058
GOOG-GLAZ-00000130
GOOG-GLAZ-00000150
GOOG-GLAZ-00000174
GOOG-GLAZ-00000381
GOOG-GLAZ-00000415
GOOG-GLAZ-00000424
GOOG-GLAZ-00000491
GOOG-GLAZ-00000494
GOOG-GLAZ-00000512
GOOG-GLAZ-00000530
GOOG-GLAZ-00000548
GOOG-GLAZ-00000566
GOOG-GLAZ-00000585
GOOG-GLAZ-00000603
GOOG-GLAZ-00000621
GOOG-GLAZ-00000632
GOOG-GLAZ-00000658
GOOG-GLAZ-00000661
GOOG-GLAZ-00000688
GOOG-GLAZ-00000718
GOOG-GLAZ-00000771
GOOG-GLAZ-00000871
GOOG-GLAZ-00000876
GOOG-GLAZ-00000885
GOOG-GLAZ-00000927
GOOG-GLAZ-00000942
GOOG-GLAZ-00000947
GOOG-GLAZ-00001059
GOOG-GLAZ-00001105
GOOG-GLAZ-00001111
GOOG-GLAZ-00001113
GOOG-GLAZ-00001114
GOOG-GLAZ-00001216
GOOG-GLAZ-00001229
GOOG-GLAZ-00001253
GOOG-GLAZ-00001266
GOOG-GLAZ-00001288
GOOG-GLAZ-00001321
GOOG-GLAZ-00001340
GOOG-GLAZ-00001366
GOOG-GLAZ-00001371
COOC OL 17 00001374
GOOG-GLAZ-000013/4

GOOG-GLAZ-00001422
GOOG-GLAZ-00001446
GOOG-GLAZ-00001457
GOOG-GLAZ-00001458
GOOG-GLAZ-00001521
GOOG-GLAZ-00001528
GOOG-GLAZ-00001541
GOOG-GLAZ-00001916
GOOG-GLAZ-00002914
GOOG-GLAZ-00005425
GOOG-GLAZ-00005829
GOOG-GLAZ-00013236
GOOG-GLAZ-00016196
GOOG-GLAZ-00016588
GOOG-GLAZ-00016950
GOOG-GLAZ-00017790
GOOG-GLAZ-00017797
GOOG-GLAZ-00018362
GOOG-GLAZ-00019292
GOOG-GLAZ-00026360
GOOG-GLAZ-00026480
GOOG-GLAZ-00026768
GOOG-GLAZ-00026843
GOOG-GLAZ-00027187
GOOG-GLAZ-00027379
GOOG-GLAZ-00027501
GOOG-GLAZ-00027518
GOOG-GLAZ-00027688
GOOG-GLAZ-00027697
GOOG-GLAZ-00027712
GOOG-GLAZ-00027795
GOOG-GLAZ-00028014
GOOG-GLAZ-00028327
GOOG-GLAZ-00029585
GOOG-GLAZ-00031017
GOOG-GLAZ-00031143
GOOG-GLAZ-00031207
GOOG-GLAZ-00031207
GOOG-GLAZ-00032447
GOOG-GLAZ-00032539
GOOG-GLAZ-00032771
GOOG-GLAZ-000355771
GOOG-GLAZ-00035555
GOOG-GLAZ-00037536
GOOG-GLAZ-00037593
GOOG-GLAZ-00037333
GOOG-GLAZ-00040907
GOOG-GLAZ-00048610
GOOG-GLAZ-00048010
COOC CLAZ-00049400
UUUU-ULAL-VVVJJ4J2

GOOG-GLAZ-00055552
GOOG-GLAZ-00055829
GOOG-GLAZ-00057237
GOOG-GLAZ-00057339
GOOG-GLAZ-00057477
GOOG-GLAZ-00057861
GOOG-GLAZ-00057940
GOOG-GLAZ-00058103
GOOG-GLAZ-00060013
GOOG-GLAZ-00065293
GOOG-GLAZ-00065786
GOOG-GLAZ-00069965
GOOG-GLAZ-00070491
GOOG-GLAZ-00073037
GOOG-GLAZ-00073869
GOOG-GLAZ-00076994
GOOG-GLAZ-00077046
GOOG-GLAZ-00077083
GOOG-GLAZ-00077112
GOOG-GLAZ-00077413
GOOG-GLAZ-00077687
GOOG-GLAZ-00077898
GOOG-GLAZ-00078007
GOOG-GLAZ-00078009
GOOG-GLAZ-00078652
GOOG-GLAZ-00078761
GOOG-GLAZ-00078989
GOOG-GLAZ-00081787
GOOG-GLAZ-00084080
GOOG-GLAZ-00085882
GOOG-GLAZ-00085941
GOOG-GLAZ-00086932
GOOG-GLAZ-00087309
GOOG-GLAZ-00091249
GOOG-GLAZ-00097091
GOOG-GLAZ-00099239
GOOG-GLAZ-00100799
GOOG-GLAZ-00101518
GOOG-GLAZ-00101814
GOOG-GLAZ-00106193
GOOG-GLAZ-00107030
GOOG-GLAZ-00107962
GOOG-GLAZ-00108358
GOOG-GLAZ-00109617
GOOG-GLAZ-00111292
GOOG-GLAZ-00112466
GOOG-GLAZ-00114667
GOOG-GLAZ-00115868
GOOG-GLAZ-00117506
GOOG-GLAZ-00122386
GOOG-GLAZ-00125192

GOOG-GLAZ-00125482
GOOG-GLAZ-00126368
GOOG-GLAZ-00127414
GOOG-GLAZ-00128588
GOOG-GLAZ-00130685
GOOG-GLAZ-00135059
GOOG-GLAZ-00146003
GOOG-GLAZ-00149241
GOOG-GLAZ-00149867
GOOG-GLAZ-00150448
GOOG-GLAZ-00151516
GOOG-GLAZ-00151943
GOOG-GLAZ-00154593
GOOG-GLAZ-00155209
GOOG-GLAZ-00157550
GOOG-GLAZ-00161717
GOOG-GLAZ-00161951
GOOG-GLAZ-00163209
GOOG-GLAZ-00163234
GOOG-GLAZ-00163411
GOOG-GLAZ-00164220
GOOG-GLAZ-00166095
GOOG-GLAZ-00167940
GOOG-GLAZ-00195364
GOOG-GLAZ-00195490
GOOG-GLAZ-00195766
GOOG-GLAZ-00197290
GOOG-GLAZ-00198467
GOOG-GLAZ-00200456
GOOG-GLAZ-00203120
GOOG-GLAZ-00203642
GOOG-GLAZ-00203655
GOOG-GLAZ-00205306
GOOG-GLAZ-00209358
GOOG-GLAZ-00210248
GOOG-GLAZ-00210527
GOOG-GLAZ-00210574
GOOG-GLAZ-00212997
GOOG-GLAZ-00215973
GOOG-GLAZ-00216028
GOOG-GLAZ-00216124
GOOG-GLAZ-00216126
GOOG-GLAZ-00216162
GOOG-GLAZ-00222226
GOOG-GLAZ-00224647
GOOG-GLAZ-00224739
GOOG-GLAZ-00224887
GOOG-GLAZ-00226213
GOOG-GLAZ-00234771
GOOG-GLAZ-00241698
GOOG-GLAZ-00242126

GOOG-GLAZ-00244861 GOOG-GLAZ-00246795 GOOG-GLAZ-00255523 GOOG-GLAZ-00261675 GOOG-GLAZ-00274982 GOOG-GLAZ-00275934 GOOG-GLAZ-00283334 GOOG-GLAZ-00290225 GOOG-GLAZ-00294304 GOOG-GLAZ-00297712 GOOG-GLAZ-00298797 GOOG-GLAZ-00299082 GOOG-GLAZ-00299107 GOOG-GLAZ-00299120 GOOG-GLAZ-00299199 GOOG-GLAZ-00309399 GOOG-GLAZ-00309633 GOOG-GLAZ-00311962 GOOG-GLAZ-00312069 GOOG-GLAZ-00312075 GOOG-GLAZ-00312666 GOOG-GLAZ-00313060 GOOG-GLAZ-00313082 GOOG-GLAZ-00313445 GOOG-GLAZ-00315032 GOOG-GLAZ-00315175 GOOG-GLAZ-00317845 GOOG-GLAZ-00317862 GOOG-GLAZ-00317865 GOOG-GLAZ-00317867 GOOG-GLCA-00330299 GOOG-RDGZ-00013681 GOOG-RDGZ-00017367 GOOG-RDGZ-00019903 LGEUS-AZ-0000336 LGEUS-AZ-0000343 LGEUS-AZ-0000386 LGEUS-AZ-0000392 LGEUS-AZ-0000409

Location History Disclosures

Copy of web_3118687_version_100_2014-07-0400_08_50
Copy of web_3118687_version_101_2014-07-0401_06_42
Copy of web_3118687_version_102_2014-07-04_02_22_48
Copy of web_3118687_version_103_2014-07-04_04_45_11
Copy of web_3118687_version_104_2014-07-0404_52_04
Copy of web_3118687_version_105_2014-07-04_07_56_41
Copy of web_3118687_version_106_2014-07-0408_07_04
Copy of web_3118687_version_107_2014-07-0410_25_28
Copy of web_3118687_version_108_2014-07-07_03_36_28
Copy of web_3118687_version_109_2014-07-0706_20_49

Convertise 2119697 variant 11 2012 07 00 22 27 21
Copy of web_3118087_version_11_2013-07-09_22_37_31
Copy of web_3118687_version_110_2014-07-07_22_19_52
Copy of web_ 3118687 version_ $111_2014-07-08_03_39_16$
Copy of web_3118687_version_112_2014-07-08_05_48_23
Copy of web_3118687_version_113_2014-07-08_06_40_49
Copy of web_3118687_version_114_2014-07-0809_07_26
Copy of web_3118687_version_115_2014-07-08_11_32_06
Copy of web_3118687_version_116_2014-07-10_04_05_59
Copy of web_3118687_version_121_2014-07-1610_21_05
Copy of web_3118687_version_123_2014-09-12_09_25_56
Copy of web_3118687_version_128_2014-11-2511_43_39
Copy of web_3118687_version_13_2013-08-0718_44_26
Copy of web_3118687_version_150_2015-01-0716_09_34
Copy of web 3118687 version 154 2015-01-08 20 24 21
Copy of web 3118687 version 157 2015-01-09 11 56 21
Copy of web 3118687 version 158 2015-01-09 17 36 38
Copy of web 3118687 version 159 2015-01-11 14 54 13
Copy of web 3118687 version 160 2015-01-11 14 55 54
Copy of web 3118687 version 161 2015-01-11 15 13 18
Copy of web_3118687_version_162_2015-01-1410_42_47
Copy of web 3118687 version 163 $2015-01-14$ 11 10 41
Copy of web_3118687_version_164_2015_01_1411_10_41
Copy of web_3118087_version_104_2015-01-1415_11_24
Copy of web_3118687_version_166_2015-02-1710_28_00
Copy of web_311868/_version_182_2015-03-09_18_43_4/
Copy of web_311868/_version_186_2015-03-09_18_44_21
Copy of web_3118687_version_191_2015-03-17_15_10_05
Copy of web_3118687_version_192_2015-03-1715_41_07
Copy of web_3118687_version_194_2015-05-1110_44_23
Copy of web_3118687_version_197_2015-06-1014_57_21
Copy of web_3118687_version_2_2013-05-0914_09_19
Copy of web_3118687_version_202_2015-06-18_12_02_04
Copy of web_3118687_version_205_2015-07-09_22_44_40
Copy of web_3118687_version_208_2015-07-2808_29_03
Copy of web_3118687_version_211_2015-08-2418_58_22
Copy of web_3118687_version_213_2015-10-0511_57_28
Copy of web 3118687 version 216 2015-10-21 12 31 10
Copy of web 3118687 version 219 2015-10-21 12 36 08
Copy of web 3118687 version 22 2013-09-27 16 03 31
Copy of web 3118687 version 220 2016-06-07 09 19 36
Copy of web 3118687 version 221 2016-06-07 10 50 05
Copy of web 3118687 version 222 2016-07-15 13 02 44
Copy of web_3118687_version_222_2016-09-77_18_37_22
Conv of web 3118687 version 225 2016-09-27 18 38 13
Copy of web_3118687_version_227_2016_10_1410_11_47
Copy of web 2118687 version $22,2010-10-14$ $10,02,12,51,12$
Copy of web_3110007_version_232_2015-10-05_12_31_15
Copy of web_311000/_version_232_2010-10-2410_31_02
Copy of web_311808/_version_235_2016-10-2/16_55_09
Copy of Web_ 311868 / version_ $235_2016_{10}-31_09_53_09$
Copy of web_311868/_version_239_2016-12-01_11_0/_00
Copy of web_3118687_version_24_2013-10-0312_56_23
Copy of web_3118687_version_242_2017-02-2314_01_01

Copy of web_3118687_version_243_2017-02-2314_06_26
Copy of web_3118687_version_244_2017-02-2314_08_10
Copy of web_3118687_version_245_2017-03-0918_06_54
Copy of web_3118687_version_246_2017-03-0918_07_42
Copy of web_3118687_version_247_2017-03-2718_36_02
Copy of web_3118687_version_248_2017-04-0418_07_42
Copy of web_3118687_version_249_2017-04-1310_18_11
Copy of web_3118687_version_256_2017-08-2914_01_27
Copy of web_3118687_version_257_2017-08-2914_28_31
Copy of web_3118687_version_259_2018-04-0309_24_03
Copy of web_3118687_version_26_2013-10-11_09_12_29
Copy of web_3118687_version_263_2018-05-2911_02_44
Copy of web_3118687_version_264_2018-06-2913_41_31
Copy of web_3118687_version_267_2018-08-1609_53_50
Copy of web_3118687_version_268_2018-08-2414_16_04
Copy of web_3118687_version_269_2018-08-2414_28_39
Copy of web_3118687_version_270_2018-09-1013_59_19
Copy of web_3118687_version_271_2018-09-14_22_06_25
Copy of web_3118687_version_272_2018-09-14_22_07_49
Copy of web_3118687_version_274_2018-09-14_22_35_49
Copy of web_3118687_version_28_2013-10-2320_43_38
Copy of web_3118687_version_281_2018-10-0412_41_53
Copy of web_3118687_version_30_2013-10-3113_25_46
Copy of web_3118687_version_301_2019-06-2609_01_33
Copy of web_3118687_version_307_2019-07-1108_08_20
Copy of web_3118687_version_309_2019-07-11_08_26_50
Copy of web_3118687_version_310_2019-07-12_12_14_12
Copy of web_3118687_version_315_2019-07-22_12_25_38
Copy of web_3118687_version_319_2019-07-2917_42_50
Copy of web_3118687_version_34_2013-11-0516_09_42
Copy of web_3118687_version_38_2013-12-12_07_50_52
Copy of web_3118687_version_44_2014-02-2714_08_19
Copy of web_3118687_version_52_2014-04-0112_17_59
Copy of web_3118687_version_53_2014-05-19_17_10_10
Copy of web_3118687_version_57_2014-06-0615_25_44
Copy of web_3118687_version_6_2013-05-09_21_40_40
Copy of web_3118687_version_74_2014-06-3014_23_43
Copy of web_3118687_version_75_2014-07-02_02_06_01
Copy of web_3118687_version_76_2014-07-0204_12_41
Copy of web_3118687_version_77_2014-07-0207_36_32
Copy of web_3118687_version_78_2014-07-0208_16_44
Copy of web_3118687_version_79_2014-07-0221_34_57
Copy of web_3118687_version_80_2014-07-0300_04_13
Copy of web_3118687_version_81_2014-07-0301_51_31
Copy of web_3118687_version_82_2014-07-03_02_12_21
Copy of web_3118687_version_83_2014-07-0303_58_04
Copy of web_3118687_version_84_2014-07-03_04_15_25
Copy of web_3118687_version_85_2014-07-03_04_27_04
Copy of web_311868/_version_86_2014-07-03_04_27_22
Copy of web_3118687_version_87_2014-07-03_07_20_57
(1 - 1) = 1 + 2 + 1 + 2 + 1 + 2 + 2 + 2 + 2 + 2 +
Copy of web_3118687_version_89_2014-07-0308_33_36
--
Copy of web_3118687_version_90_2014-07-0308_34_23
Copy of web_3118687_version_91_2014-07-0308_54_51
Copy of web_3118687_version_92_2014-07-0308_56_33
Copy of web_3118687_version_93_2014-07-0309_04_22
Copy of web_3118687_version_94_2014-07-0309_20_18
Copy of web_3118687_version_95_2014-07-0310_17_47
Copy of web_3118687_version_96_2014-07-0310_36_27
Copy of web_3118687_version_97_2014-07-03_12_00_29
Copy of web_3118687_version_98_2014-07-03_12_21_15
Copy of web_3118687_version_99_2014-07-03_13_00_58

Other Documents

Conversation with Dr. Gretchen Gelke.

Conversation with Marlo McGriff.

Conversation with David Monsees.

Conversation with David Warren.

Email from Argemira Florez to Michael Eshaghian and others, subject "AZ v. Google - August 13, 2018 Meeting," sent December 6, 2021

Email from Joshua Anderson to Michael Eshaghian and others, subject "RE: AZ v. Google - Rule 26.1(c) Meet and Confer re ESI," sent August 5, 2021

FTC Dark Patterns Workshop Transcript, April 29, 2021

Screenshot 2022-05-11 at 11-19-57 Google Location Services Spam - UXP2 Dark Patterns

Screenshot 2022-05-11 at 11-21-12 Google Ads Disguised as Search Results - UXP2 Dark Patterns

Screenshot 2022-05-11 at 11-29-31 Mark Shields LinkedIn

Screenshot 2022-05-11 at 11-35-21 Privacy Policy – Privacy _ Terms – Google

Screenshot 2022-05-11 at 11-39-20 Vint Cerf Internet Hall of Fame

Screenshot 2022-05-11 at 11-55-45 AP Exclusive Google tracks your movements like it or not

Publicly Available Documents

Alphabet, Inc., Form 10-K, filed December 31, 2021, available at

https://abc.xyz/investor/static/pdf/20220202_alphabet_10K.pdf?cache=fc81690

Android Developers, "Request location permissions," available at

https://developer.android.com/training/location/permissions

Android Help, "Change app permissions on your Android phone," available at

https://support.google.com/android/answer/9431959?hl=en#zippy=%2Ctypes-of-permissions

Android Quickstart Guide, Android Mobile Technology Platform, 4.4 KitKat, 2013, available at

https://static.googleusercontent.com/media/www.google.com/en//help/hc/images/android/android_ug_42/en-GB_Kitkat-1.11.pdf

Android Source, "Android Settings Design Guidelines," available at:

https://source.android.com/devices/tech/settings/settings-guidelines

Australian Competition and Consumer Commission, "Google, Android and Location Tracking," September 2018, available at https://www.accc.gov.au/system/files/Oracle-Submission-2-%28September-2018%29.pdf

Babich, Nick, "Progressive Disclosure: Simplifying the Complexity," Shopify Partners, available at www.shopify.com/partners/blog/progressive-disclosure

Beke, Frank T., Felix Eggers, Peter C. Verhoef, and Jaap E. Wieringa. "Consumers' privacy calculus: The PRICAL index development and validation." International Journal of Research in Marketing 39, no. 1 (2022): 20-41.

Brignull, Harry, "Dark Patterns: Deception vs. Honesty in UI Design," A List Apart (blog), November 1, 2011, available at https://alistapart.com/article/dark-patterns-deception-vs-honesty-in-ui-design

ATTORNEYS' EYES ONLY - SUBJECT TO PROTECTIVE ORDER

Brignull, Harry, "Dark Patterns: dirty tricks designers use to make people do stuff," Harry Brignull's 90 Percent of Everything, July 8, 2010, available at https://90percentofeverything.com/2010/07/08/dark-patterns-dirty-tricks-designers-use-to-make-people-do-stuff/index html

Brignull, Harry, "Dark Patterns: inside the interfaces designed to trick you," August 29, 2018, available at https://www.theverge.com/2013/8/29/4640308/dark-patterns-inside-the-interfaces-designed-to-trick-you

Brignull, Harry, "Darkpatterns.org: naming and shaming sites that use black hat, anti-usability design patterns," Harry Brignull's 90 Percent of Everything, August 16, 2010, available at

https://90percentofeverything.com/2010/08/16/darkpatterns-org-naming-and-shaming-sites-that-use-black-hat-anti-usability-design-patterns/index.html

Business News Daily, "Location-Based Services: Definition and Examples," May 4, 2022, available at

https://www.businessnewsdaily.com/5386-location-based-services html.

BusinessofApps, "Top Grossing Apps (2022)," May 4, 2022, available at https://www.businessofapps.com/data/top-grossing-apps/

Carroll, John M., and Caroline Carrithers. "Training wheels in a user interface." Communications of the ACM 27, no. 8 (1984): 800-806.

Carroll, John M., and Mary Beth Rosson. "Paradox of the Active User." In Interfacing thought: Cognitive aspects of human-computer interaction (1987): 80-111.

Cavoukian, Ann, "Privacy by Design: The 7 Foundational Principles," available at https://www.ipc.on.ca/wp-content/uploads/resources/7foundationalprinciples.pdf

Choi, Hanbyul, Jonghwa Park, and Yoonhyuk Jung. "The role of privacy fatigue in online privacy behavior." Computers in Human Behavior 81 (2018): 42-51.

Crestodina, Andy, "Website Footer Design Best Practices: 27 Things to Put at the Bottom," Orbit Media Studios, available at https://www.orbitmedia.com/blog/website-footer-design-best-practices/

data.ai, "The State of Mobile in 2022: How to Succeed in a Mobile-First World As Consumers Spend 3.8 Trillion Hours on Mobile Devices," available at https://www.data.ai/en/insights/market-data/state-of-mobile-2022/

Dean, Brian, "How People Use Google Search (New User Behavior Study)," Backlinko, August 20, 2020, available at https://backlinko.com/google-user-behavior

Fader, Peter. Customer Centricity: Focus on the Right Customers for Strategic Advantage. University of Pennsylvania Press, 2020.

FTC Staff Report, Internet of Things: Privacy and Security in a Connected World, 34, 36 (Jan. 2015),

https://www.ftc.gov/system/files/documents/reports/federal-trade-commission-staffreport-november-2013-workshopentitled-internet-things-privacy/150127iotrpt.pdf

FTC Staff Report, Mobile Privacy Disclosures: Building Trust Through Transparency, February 2013, available at http://www.ftc.gov/os/2013/02/130201mobileprivacyreport.pdf

Galitz, Wilbert O. The essential guide to user interface design: an introduction to GUI design principles and techniques. John Wiley & Sons, 2007

Galov, Nick, "17+ Google Maps Statistics to Survey in 2022," Web tribunal, April 6, 2022, available at https://webtribunal.net/blog/google-map-statistics/#gref.

GeoMarketing, "Consumers Deem Location Services 'Crucial' For Apps — But Only Half Of Them Leave Geo Signals On," October 20, 2015, available at https://geomarketing.com/consumers-deem-location-services-crucial-for-apps-but-only-half-of-them-leave-geo-signals-on

Georgiev, Deyan, "111+ Google Statistics and Facts That Reveal Everything About the Tech Giant," Review42, May 12, 2022, available at https://review42.com/resources/google-statistics-and-facts/

Glass, Russell, and Sean Callahan. The Big Data-Driven Business: How to Use Big Data to Win Customers, Beat Competitors, and Boost Profits. John Wiley & Sons, 2014.

GlobeNewsWire, "Global Location Based Advertising (LBA) Market Report 2021: Market to Reach \$133 Billion by the Year 2026, from \$63.9 Billion in 2020," February 10, 2022, available at https://www.globenewswire.com/news-release/2022/02/10/2382926/28124/en/Global-Location-Based-Advertising-LBA-Market-Report-2021-Market-to-Reach-133-Billion-by-the-Year-2026-from-63-9-Billion-in-2020.html

ATTORNEYS' EYES ONLY - SUBJECT TO PROTECTIVE ORDER

Google Account Help, "Find & control your Web & App Activity," available at

https://support.google.com/websearch/answer/54068?hl=en&co=GENIE.Platform%3DAndroid

Google Account Help, "Manage your Location History," available at

https://support.google.com/accounts/answer/3118687?hl=en

Google Maps Platform, "Location Data," available at https://developers.google.com/maps/documentation/android-sdk/location

Google Privacy & Terms, "How Google uses location information," available at

https://policies.google.com/technologies/location-data?hl=en-US

Gosh, Sudipto, "New Google Analytics Brings in Customer-centric Measurement, YouTube Conversions Report and Much More," MarTech Series, October 14, 2020, available at https://martechseries.com/analytics/new-google-analytics-brings-in-customer-centric-measurement/

Gray, Colin M., Shruthi Sai Chivukula, and Ahreum Lee. "What Kind of Work Do 'Asshole Designers' Create? Describing Properties of Ethical Concern on Reddit." In Proceedings of the 2020 ACM Designing Interactive Systems Conference (Eindhoven, Netherlands) (DIS '20). Association for Computing Machinery, pp. 61-73. 2020.

Gray, Colin M., Yubo Kou, Bryan Battles, Joseph Hoggatt, and Austin L. Toombs. "The Dark (Patterns) Side of UX design." In Proceedings of the 2018 CHI conference on human factors in computing systems, pp. 1-14. 2018.

Gutierrez, Anabel, Simon O'Leary, Nripendra P. Rana, Yogesh K. Dwivedi, and Tatiana Calle. "Using privacy calculus theory to explore entrepreneurial directions in mobile location-based advertising: Identifying intrusiveness as the critical risk factor." Computers in Human Behavior 95 (2019): 295-306.

Hoffman, Donna L., and Thomas P. Novak. "Flow Online: Lessons Learned and Future Prospects." Journal of Interactive Marketing 23, no. 1 (2009): 23-34.

Hoffman, Donna L., and Thomas P. Novak. "Marketing in Hypermedia Computer-Mediated Environments: Conceptual Foundations." Journal of Marketing 60, no. 3 (1996): 50-68.

How Google Uses Location Information, available at https://policies.google.com/technologies/location-data?hl=en-US

Hühn, Arief Ernst, Vassilis-Javed Khan, Paul Ketelaar, Jonathan van't Riet, Ruben Konig, Esther Rozendaal, Nikolaos Batalas, and Panos Markopoulos. "Does location congruence matter? A field study on the effects of location-based advertising on perceived ad intrusiveness, relevance & value." Computers in Human Behavior 73 (2017): 659-668.

Interaction Design Foundation, "Progressive Disclosure," available at https://www.interactiondesign.org/literature/topics/progressive-disclosure

International Association of Privacy Professionals, "Fair Information Practice Principles," available at https://iapp.org/resources/article/fair-information-practices/

International Association of Privacy Professionals, "What does privacy mean?," available at https://iapp.org/about/whatis-privacy/

Internet Hall of Fame, "Vint Cerf," available at https://www.internethalloffame.org/inductees/vint-cerf Internet Live Stats, "Google Search Statistics," available at https://www.internetlivestats.com/google-search-statistics/

Jansen, Mark and Parrish, Kevin. "How to use gesture navigation in Android 11, or how to turn it off," digitaltrends, March 26, 2021, available at https://www.digitaltrends.com/mobile/how-to-use-gesture-navigation-in-android-10/

Junglas, Iris A., Norman A. Johnson, and Christiane Spitzmüller. "Personality traits and concern for privacy: an empirical study in the context of location-based services." European Journal of Information Systems 17, no. 4 (2008): 387-402.

King, Jennifer. "Privacy, Disclosure, and Social Exchange Theory," University of California, Berkeley, 2018.

Lee, Jin-Myong, and Jong-Youn Rha. "Personalization-privacy paradox and consumer conflict with the use of location-based mobile commerce." Computers in Human Behavior 63 (2016): 453-462.

Li, Abner, "Google explains and defends Android Q gesture navigation," August 8, 2019, available at https://9to5google.com/2019/08/08/android-q-gesture-navigation-explained/

Lin, Ying, "10 Mobile Usage Statistics Every Marketer Should Know in 2021 [Infographic]," Oberlo, June 20, 2021, available at https://www.oberlo.com/blog/mobile-usage-statistics

Liu, Bin, Jialiu Lin, and Norman Sadeh. "Reconciling mobile app privacy and usability on smartphones: Could user privacy profiles help?." In Proceedings of the 23rd international conference on World wide web, pp. 201-212. 2014.

Lunn, Emma, "What Is Dark Mode – And Should You Be Using It?" Forbes, March 24, 2022, available at www forbes.com/uk/advisor/mobile-phones/what-is-dark-mode-and-should-you-be-using-it/

Marathe, Sampada, and S. Shyam Sundar. "What drives customization?: control or identity?." In Proceedings of the SIGCHI conference on human factors in computing systems, pp. 781-790. 2011.

Mathur, Arunesh, Mihir Kshirsagar, and Jonathan Mayer. "What Makes a Dark Pattern... Dark? Design Attributes, Normative Considerations, and Measurement Methods." In Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems, pp. 1-18. 2021.

McGowan, Sean, "UX Design Tips To Put Your Best Footer Forward," UsabilityGeek, available at https://usabilitygeek.com/ux-design-tips-best-footer/

Miller, Michael J., "Google Coud's Thomas Kurian Says Customer Success is Key," PCMag, October 30, 2019, available at https://www.pcmag.com/news/google-clouds-thomas-kurian-says-customer-success-is-key

Mills, Elinor, "Google buys ad firm DoubleClick for \$3.1 billion," CNET, April 13, 2007, available at https://www.cnet.com/tech/tech-industry/google-buys-ad-firm-doubleclick-for-3-1-billion/

Nakashima, Ryan, "AP Exclusive: Google tracks your movements, like it or not," AP News, August 13, 2018.

Nielsen, Jakob, "Defer Secondary Content When Writing for Mobile Users," Nielsen Norman Group, July 31, 2011, available at www.nngroup.com/articles/defer-secondary-content-for-mobile/

Nielsen, Jakob, "Iterative User Interface Design," Nielsen Norman Group, November 1, 1993, available at https://www.nngroup.com/articles/iterative-design/

Nielsen, Jakob, "Progressive Disclosure," Nielsen Norman Group, December 3, 2006, available at www nngroup.com/articles/progressive-disclosure/

Nielson, Jakob, "10 Usability Heuristics for User Interface Design," Nielsen Norman Group, April 24, 1994, available at www.nngroup.com/articles/ten-usability-heuristics/

Nissenbaum, Helen, Privacy in Context: Technology, Policy, and the Integrity of Social Life, Stanford University Press, 2009.

Palmatier, Robert W., and Shrihari Sridhar. Marketing strategy: Based on first principles and data analytics. Macmillian Education Limited, 2021.

Panko, Riley, "The Popularity of Google Maps: Trends in Navigation Apps in 2018," The Manifest, July 10, 2018, available at https://themanifest.com/app-development/trends-navigation-apps

Pew Research Center, "Mobile Fact Sheet," April 7, 2021, available at https://www.pewresearch.org/internet/fact-sheet/mobile/

Pew Research Center, "28% of American adults use mobile and social location-based services," September 6, 2011, available at https://www.pewresearch.org/internet/2011/09/06/28-of-american-adults-use-mobile-and-social-location-based-services/

Pew Research Center, "Location-Based Services," September 12, 2013, available at

https://www.pewresearch.org/internet/2013/09/12/location-based-services/

Pew Research Center, "More Americans using smartphones for getting directions, streaming TV," January 29, 2016, available at https://www.pewresearch.org/fact-tank/2016/01/29/us-smartphone-use/

Pichai, Sundar, "Keeping your private information private," Google The Keyword, June 24, 2020 available at https://blog.google/technology/safety-security/keeping-private-information-private/

Prater, Meg, "25 Google Search Statistics to Bookmark ASAP," HubSpot, June 9, 2021, available at https://blog hubspot.com/marketing/google-search-statistics

Raphael, JR, "10 hidden tricks for making the most of Android gestures," Computerworld, February 22, 2022, available at https://www.computerworld.com/article/3439060/android-gestures html

Rojas, Peter, "Google buys cellphone software company," Engadget, August 17, 2005, available at https://web.archive.org/web/20050925000247/http://www.engadget.com/entry/1234000780054854/

ATTORNEYS' EYES ONLY - SUBJECT TO PROTECTIVE ORDER

Rosala, Maria, "User Control and Freedom (Usability Heuristic #3)," Nielsen Norman Group, November 29, 2020, available at https://www.nngroup.com/articles/user-control-and-freedom/

Search history, available at https://myactivity.google.com/product/search?hl=en

Shugan, S.M., "Editorial: Introduction to the Special Classics Issue," Marketing Science 27, No. 1, 2008.

Statista, "Leading benefits of using location-based marketing according to industry professionals in the United States as of May 2019," November 19, 2020, available at https://www.statista.com/statistics/1040830/location-based-marketing-leading-benefits-us/

Statista, "Leading mapping apps in the United States in 2021, by downloads," May 11, 2022, available at https://www.statista.com/statistics/865413/most-popular-us-mapping-apps-ranked-by-audience/

Statista, "Mobile audience reach of leading smartphone apps in the United States in January 2022," March 7, 2022, available at https://www.statista.com/statistics/281605/reach-of-leading-us-smartphone-apps/

Stremersch, S., Verniers, I., and P.C. Verhoef, "The Quest for Citations: Drivers of Article Impact," Journal of Marketing 71, 2007.

Studio by UXPin, "UI and UX Design Trends that Dominate 2022 and Beyond," available at www.uxpin.com/studio/blog/ui-ux-design-trends/

TechCrunch, "T-Mobile officially announces the G1 Android phone," September 23, 2008, available at

https://techcrunch.com/2008/09/23/t-mobile-officially-announces-the-g1-android-phone/

Udacity, "Machine Learning for Big Data," August 14, 2020, available at

https://www.udacity.com/blog/2020/08/machine-learning-for-big-data html

UXP² Dark Patterns, "Google: Ads Disguised as Search Results," available at

https://darkpatterns.uxp2.com/pattern/google-ads-disguised-as-search-results/

Vanderbilt University, "Hoffman and Novak named 'Distinguished Graduate Alumni," June 6, 2003, available at https://news.vanderbilt.edu/2003/06/06/hoffman-and-novak-named-145distinguished-graduate-alumni146-59977

WARC, "Google's 'user-centric' brand mission," August 1, 2018, available at

https://www.warc.com/newsandopinion/news/googles-user-centric-brand-mission/en-gb/39839

Wise, Jason, "How Many People Use Google Maps in 2022?", June 4, 2022, available at https://earthweb.com/how-many-people-use-google-maps/

Wottrich, Verena M., Eva A. van Reijmersdal, and Edith G. Smit. "The privacy trade-off for mobile app downloads: The roles of app value, intrusiveness, and privacy concerns." Decision support systems 106 (2018): 44-52.

Zuboff, Shoshana. The Age of Surveillance Capitalism: The fight for a human future at the new frontier of power, Public Affairs, 2019.