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Selling the American People

Advertising, Optimization, and the Origins of Adtech

By: Lee McGuigan

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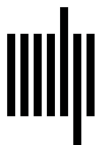
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NOTES

INTRODUCTION

1. "The Curse of Stereotyped Marketing," *Broadcasting*, June 26, 1961, 48; Albert W. Frey, "Approaches to Determining the Advertising Appropriation," in *Effective Marketing Coordination: Proceedings of the Forty-Fourth National Conference of the American Marketing Association*, ed. George L. Baker Jr. (Chicago: AMA, 1961), 332.
2. Russell H. Colley, "Squeezing the Waste out of Advertising," *Harvard Business Review* 40, no. 5 (1962): 77. On rationalization in US manufacturing and management, see David F. Noble, *America by Design: Science, Technology, and the Rise of Corporate Capitalism* (New York: Alfred A. Knopf, 1977); James R. Beniger, *The Control Revolution: Technological and Economic Origins of the Information Society* (Cambridge, MA: Harvard University Press, 1986).
3. Frey, "Approaches," 327.
4. Frey, 332; "The Curse of Stereotyped Marketing," 48.
5. Frey, 335.
6. Paul N. Edwards, *The Closed World: Computers and the Politics of Discourse in Cold War America* (Cambridge, MA: MIT Press), 114–115.
7. Oscar H. Gandy Jr., *The Panoptic Sort: A Political Economy of Personal Information*, 2nd ed. (New York: Oxford University Press, 2021); Helen Nissenbaum, *Privacy in Context: Technology, Policy, and the Integrity of Social Life* (Stanford, CA: Stanford University Press, 2009); Joseph Turow, *The Daily You: How the New Advertising Industry Is Defining Your Identity and Your Worth* (New Haven, CT: Yale University Press, 2011); Mark Andrejevic, *Automated Media* (New York: Routledge, 2020); Greg Elmer, *Profiling Machines: Mapping the Personal Information Economy* (Cambridge, MA: MIT Press, 2003); Josh Lauer, *Creditworthy: A History of Consumer Surveillance and Financial Identity in America* (New York: Columbia University Press, 2017); Frank Pasquale,

The Black Box Society: The Secret Algorithms that Control Money and Information (Cambridge, MA: Harvard University Press, 2015); Sven Brodmerkel and Nicholas Carah, *Brand Machines, Sensory Media and Calculative Culture* (London: Palgrave Macmillan, 2016); Solon Barocas and Andrew D. Selbst, "Big Data's Disparate Impact," *California Law Review* 104 (2016): 671–732; Marion Fourcade and Kieran Healy, "Seeing Like a Market," *Socio-Economic Review* 15, no. 1 (2017): 9–29; Jake Goldenfein, *Monitoring Laws: Profiling and Identity in the World State* (New York: Cambridge University Press, 2020); Salomé Viljoen, "A Relational Theory of Data Governance," *Yale Law Journal* 131, no. 2 (2021): 573–654.

8. Nick Srnicek, *Platform Capitalism* (Cambridge: Polity, 2017); Robin Mansell and W. Edward Steinmueller, *Advanced Introduction to Platform Economics* (Northampton, MA: Edward Elgar, 2020); Sarah Myers West, "Data Capitalism: Redefining the Logics of Surveillance and Privacy," *Business & Society* 58, no. 1 (2019): 20–41; Joseph Turow and Nick Couldry, "Media as Data Extraction: Towards a New Map of a Transformed Communications Field," *Journal of Communication* 68, no. 2 (2018): 415–423; Nicole S. Cohen, "The Valorization of Surveillance: Towards a Political Economy of Surveillance," *Democratic Communiqué* 22, no. 1 (2008): 5–22; Christian Fuchs, *Social Media: A Critical Introduction*, 3rd ed. (New York: Routledge, 2021); Kean Birch, "Automated Neoliberalism? The Digital Organisation of Markets in Technoscientific Capitalism," *New Formations* 100–101 (2020): 10–27.

9. Jeremy Wade Morris, "Curation by Code: Infomediaries and the Data Mining of Taste," *European Journal of Cultural Studies* 18, nos. 4–5 (2015): 446–463; Karen Yeung, "'Hypernudge': Big Data as a Mode of Regulation by Design," *Information, Communication & Society* 20, no. 1 (2017): 118–136; Selena Nemorin, *Biosurveillance in New Media Marketing* (Cham, Switzerland: Palgrave Macmillan, 2018); Aaron Darmody and Detlev Zwick, "Manipulate to Empower: Hyper-relevance and the Contradictions of Marketing in the Age of Surveillance Capitalism," *Big Data & Society* 7, no. 1 (2020): 1–12; Andrew McStay, "Micro-moments, Liquidity, Intimacy and Automation: Developments in Programmatic Ad-tech," in *Commercial Communication in the Digital Age—Information or Disinformation?* ed. G. Siegert, M. B. von Rimscha, and S. Grubenmann (Munich: De Gruyter, 2017), 143–159; Emily West, "Amazon: Surveillance as a Service," *Surveillance & Society* 17, nos. 17–18 (2019): 27–33.

10. Wolfie Christl, "How Companies Collect, Combine, Analyze, Trade, and Use Personal Data on Billions," Cracked Labs, June 2017, https://crackedlabs.org/dl/CrackedLabs_Christl_CorporateSurveillance.pdf.

11. Alibaba, Tencent, and ByteDance (TikTok) rank alongside these giants in global advertising revenue.

12. Salomé Viljoen, Jake Goldenfein, and Lee McGuigan, "Design Choices: Mechanism Design and Platform Capitalism," *Big Data & Society* 8, no. 2 (2021): 1–13.

13. John Law, "Technology and Heterogeneous Engineering: The Case of Portuguese Expansion," in *The Social Construction of Technological Systems*, ed. Wiebe E. Bijker, Thomas P. Hughes, and Trevor Pinch (Cambridge, MA: MIT Press, 1987), 111–134.

14. Karen Weise, "Amazon Knows What You Buy: And It's Building a Big Ad Business from It," *New York Times*, January 20, 2019, <https://www.nytimes.com/2019/01/20/technology/amazon-ads-advertising.html>; Sam Biddle, "Facebook Uses Artificial Intelligence to Predict Your Future Actions for Advertisers, Says Confidential Document," *Intercept*, April 13, 2018, <https://theintercept.com/2018/04/13/facebook-advertising-data-artificial-intelligence-ai/>; "Google, Mastercard Cut Secret Ad Deal to Track Retail Sales," *Advertising Age*, August 30, 2018, <http://adage.com/article/digital/google-mastercard-cut-secret-ad-deal-track-retail-sales/314776>.

15. Shoshana Zuboff, *The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power* (New York: PublicAffairs, 2019).

16. Ian Leslie, "The Death of Don Draper," *New Statesman*, July 25, 2018, <https://www.newstatesman.com/science-tech/internet/2018/07/death-don-draper>.

17. Cambridge Analytica, "Don Draper's Dead: Alexander Nix Meets Ogilvy's Rory Sutherland," *CA Commercial* (blog), August 8, 2017, <https://ca-commercial.com/news/don-drapers-dead-alexander-nix-meets-ogilvys-rory-sutherland>; Ken Auletta, "How the Math Men Overthrew the Mad Men," *New Yorker*, May 21, 2018, <https://www.newyorker.com/news/annals-of-communications/how-the-math-men-overthrew-the-mad-men>. The gendered term "math men" is problematic, especially when applied to media buying and research, where women have broken barriers to advancement in the male-dominated advertising industry. The term hints, not for the first time, that a discourse of scientism and technical expertise is being used to designate increasingly high-status activities as masculine.

18. "Surveillance capitalism" is usually associated with Zuboff, who claims that Google and other technology companies inaugurated a new logic of capital accumulation. The term is also used by John Bellamy Foster and Robert McChesney to make a more rigorous historical argument. They locate the emergence of surveillance capitalism within a trio of forces that articulated information, computer databases, and communication media: the capitalist sales effort, militarization, and financialization. Zuboff's critique of contemporary conditions has its merits, but Foster and McChesney provide a stronger basis for understanding surveillance capitalism's rise and structure. John Bellamy Foster and Robert W. McChesney, "Surveillance Capitalism: Monopoly-Finance Capital, the Military-Industrial Complex, and the Digital Age," *Monthly Review* 66, no. 3 (2014): 1–31. See also Evgeny Morozov, "Capitalism's New Clothes," *Baffler*, February 4, 2019, <https://thebaffler.com/latest/capitalisms-new-clothes-morozov>.

19. Dallas W. Smythe and H. H. Wilson, "Cold-War-Mindedness and the Mass Media," in *Struggles against History: United States Foreign Policy in an Age of Revolution*, ed. Neal D. Houghton (New York: Simon & Schuster, 1968), 59–78; Erik Barnouw, *The Sponsor: Notes on a Modern Potentate* (New York: Oxford University Press, 1978); Stuart Ewen, *Captains of Consciousness: Advertising and the Social Roots of the Consumer Culture* (New York: Basic Books, 1976); Raymond Williams, "Advertising: The Magic System," in *Problems in Materialism and Culture* (London: Verso, 1980), 170–195; Susan Strasser, *Satisfaction Guaranteed: The Making of the American Mass Market* (New York: Pantheon

Books, 1989); C. Edwin Baker, *Advertising and a Democratic Press* (Princeton, NJ: Princeton University Press, 1994); George Gerbner, "Cultivation Analysis: An Overview," *Mass Communication & Society* 1, nos. 3–4 (1998): 175–194; Graham Murdock, "Producing Consumerism: Commodities, Ideologies, Practices," in *Critique, Social Media and the Information Society*, ed. Christian Fuchs and Marisol Sandoval (New York: Routledge, 2013), 125–143.

20. Dallas W. Smythe, *Dependency Road: Communications, Capitalism, Consciousness, and Canada* (Norwood, NJ: Ablex, 1981); Susan Smulyan, *Selling Radio: The Commercialization of American Broadcasting 1920–1934* (Washington, DC: Smithsonian Institution Press, 1994); Richard Ohmann, *Selling Culture: Magazines, Markets, and Class at the Turn of the Century* (London: Verso, 1996); Joseph Turow, *Breaking up America: Advertisers and the New Media World* (Chicago: University of Chicago Press, 1997); Mark Andrejevic, *Reality TV: The Work of Being Watched* (Lanham, MD: Rowman & Littlefield, 2004); Eileen R. Meehan, *Why TV Is Not Our Fault* (Lanham, MD: Rowman & Littlefield, 2005); Vincent Manzerolle, "Mobilizing the Audience Commodity: Digital Labour in a Wireless World," *Ephemera* 10, no. 4 (November 2010): 455–469.

For some outstanding works illustrating competing values, see Anna McCarthy, *The Citizen Machine: Governing by Television in 1950s America* (New York: New Press, 2010); David Hesmondhalgh, *The Cultural Industries*, 4th ed. (Los Angeles: Sage, 2019); Angèle Christin, *Metrics at Work: Journalism and the Contested Meaning of Algorithms* (Princeton, NJ: Princeton University Press, 2020).

21. For insightful discussions of distinctive elements, see Detlev Zwick and Janice Denegri Knott, "Manufacturing Customers: The Database as New Means of Production," *Journal of Consumer Culture* 9, no. 2 (2009): 221–247; Adam Arvidsson, "Facebook and Finance: On the Social Logic of the Derivative," *Theory, Culture & Society* 33, no. 6 (2016): 3–23; Adrian Mackenzie, *Machine Learners: Archaeology of a Data Practice* (Cambridge, MA: MIT Press, 2017); Bernhard Rieder, "Scrutinizing an Algorithmic Technique: The Bayes Classifier as an Interested Reading of Reality," *Information, Communication & Society* 20, no. 1 (2017): 100–117; Nick Dyer-Witheford, Atle Mikola Kjøsen, and James Steinhoff, *Inhuman Power: Artificial Intelligence and the Future of Capitalism* (London: Pluto Press, 2019); Jenna Burrell and Marion Fourcade, "The Society of Algorithms," *Annual Review of Sociology* 47 (2021): 213–247.

22. Inger Stole, "Persistent Pursuit of Personal Information: A Historical Perspective on Digital Advertising Strategies," *Critical Studies in Media Communication* 31, no. 2 (2014): 129–133.

23. On these "cyborg sciences" and the "rationality project" more broadly, see Philip Mirowski, *Machine Dreams: Economics Becomes a Cyborg Science* (New York: Cambridge University Press, 2002); S. M. Amadae, *Rationalizing Capitalist Democracy: The Cold War Origins of Rational Choice Liberalism* (Chicago: University of Chicago Press, 2003).

24. Melvin Anshen, "Management Science in Marketing: Status and Prospects," *Management Science* 2, no. 3 (1956): 224.

25. Wroe Alderson, *Marketing Behavior and Executive Action* (Homewood, IL: Richard D. Irwin, 1957), 408.

26. Martin Kenneth Starr, "Management Science and Marketing Science," *Management Science* 10, no. 3 (1964): 568.

27. For broader but related claims about science and technology, see Dallas W. Smythe, "The Political Character of Science (Including Communication Science), or Science Is Not Ecumenical," in *Communication and Class Struggle*, vol. 1, *Capitalism, Imperialism*, ed. Armand Mattelart and Seth Siegelau (New York: International General, 1979), 171–176.

28. Ohmann, *Selling Culture*, 13.

29. Smulyan, *Selling Radio*; Robert W. McChesney, *Telecommunications, Mass Media, and Democracy* (New York: Oxford University Press, 1993); Victor Pickard, *America's Battle for Media Democracy: The Triumph of Corporate Libertarianism and the Future of Media Reform* (New York: Cambridge University Press, 2015); Erik Barnouw, *Tube of Plenty*, 2nd rev. ed. (New York: Oxford University Press, 1990); Cynthia B. Meyers, *A Word from Our Sponsor: Admen, Advertising, and the Golden Age of Radio* (New York: Fordham University Press, 2014); Harold A. Innis, "The Press, a Neglected Factor in the Economic History of the Twentieth Century," in *Changing Concepts of Time* (Lanham, MD: Rowman & Littlefield, 2004), 73–104; William Boddy, *Fifties Television: The Industry and Its Critics* (Urbana: University of Illinois Press, 1990); Thomas Streeter, *Selling the Air: A Critique of the Policy of Commercial Broadcasting in the United States* (Chicago: University of Chicago Press, 1996).

30. "TV: Medium Too Good Not to Use," *Broadcasting*, December 9, 1957, 40; emphasis added.

31. Peter Drucker, *The Practice of Management* (New York: Harper, 1954), 371.

32. The phrase "selling the American people" is not meant to conflate the commodification of consumers with the ownership and sale of bodies through slavery or human trafficking. Racialization and long histories of injustice do relate to how marketing systems classify, evaluate, and engage (or not) with individuals or groups. For a superb essay connecting audience commodification to racial capitalism, see Marcel Rosa-Salas, "Making the Mass White: How Racial Segregation Shaped Consumer Segmentation," in *Race in the Marketplace: Crossing Critical Boundaries*, ed. Guillaume D. Johnson, Kevin D. Thomas, Anthony Kwame Harrison, and Sonya A. Grier (Cham, Switzerland: Palgrave Macmillan, 2019), 21–38. On audience commodification, see Dallas W. Smythe, "Communications: Blindspot of Western Marxism," *Canadian Journal of Political and Social Theory* 1, no. 3 (1977): 1–27; Graham Murdock, "Blindspots about Western Marxism: A Reply to Dallas Smythe," *Canadian Journal of Political and Social Theory* 2, no. 2 (1978): 109–119; Eileen R. Meehan, "Ratings and the Institutional Approach: A Third Answer to the Commodity Question," *Critical Studies in Mass Communication* 1, no. 2 (1984): 216–225; Sut Jhally and Bill

Livant, "Watching as Working: The Valorization of Audience Consciousness," *Journal of Communication* 36, no. 3 (1986): 124–143; Ien Ang, *Desperately Seeking the Audience* (New York: Routledge, 1991); Philip M. Napoli, *Audience Economics* (New York: Columbia University Press, 2003); Fernando Bermejo, "Audience Manufacture in Historical Perspective: From Broadcasting to Google," *New Media & Society* 11, nos. 1–2 (2009): 133–154; Zoe Sherman, *Modern Advertising and the Market for Audience Attention* (New York: Routledge, 2020). The terms "attention merchant" and "choice architect" come, respectively, from Tim Wu, *The Attention Merchants: The Epic Scramble to Get Inside Our Heads* (New York: Vintage, 2017), and Richard Thaler and Cass Sunstein, *Nudge: Improving Decisions about Health, Wealth, and Happiness* (New Haven, CT: Yale University Press, 2008).

33. Lizabeth Cohen, *A Consumers' Republic: The Politics of Mass Consumption in Post-war America* (New York: Vintage Books, 2004), 298–305; Sarah E. Igo, *The Averaged American: Surveys, Citizens, and the Making of a Mass Public* (Cambridge, MA: Harvard University Press, 2007); Adam Arvidsson, "On the 'Prehistory of the Panoptic Sort': Mobility in Market Research," *Surveillance & Society* 1, no. 4 (2004): 456–474.

34. Arlene Dávila, *Latinos Inc.: The Marketing and Making of a People*, updated ed. (Berkeley: University of California Press, 2012); Rena Bivens and Oliver L. Haimson, "Baking Gender into Social Media Design: How Platforms Shape Categories for Users and Advertisers," *Social Media + Society* 2, no. 4 (2016): 1–12; Kelley Cotter, Mel Medeiros, Chakyung Pak, and Kjerstin Thorson, "'Reach the Right People': The Politics of 'Interests' in Facebook's Classification System for Ad Targeting," *Big Data & Society* 8, no. 1 (2021): 1–16.

35. John B. Watson, "Influencing the Mind of Another" (1935), reprinted from an address delivered to the Montreal Ad Club, J. Walter Thompson Publications Collection, box DG10, John W. Hartman Center for Sales, Advertising & Marketing History, Duke University, Durham, NC (hereafter Hartman Center).

36. Armand Mattelart, *Advertising International: The Privatisation of Public Space*, trans. Michael Chanan (London: Routledge, 1991); Mark Bartholomew, *Adcreep: The Case against Modern Marketing* (Stanford, CA: Stanford University Press, 2017).

37. See Hesmondhalgh, *Cultural Industries*, 112–129.

38. Robert W. McChesney, "The Internet and U.S. Communication Policy-Making in Historical and Critical Perspective," *Journal of Communication* 46, no. 1 (1996): 98–124; Dan Schiller, *Digital Capitalism: Networking the Global Market System* (Cambridge, MA: MIT Press, 1999); Robin Mansell, *Imagining the Internet: Communication, Innovation, and Governance* (New York: Oxford University Press, 2012); Matthew Crain, *Profit over Privacy: How Surveillance Advertising Conquered the Internet* (Minneapolis: University of Minnesota Press, 2021).

39. Turow, *Daily You*; David Golumbia, *The Cultural Logic of Computation* (Cambridge, MA: Harvard University Press, 2009); Robert W. Gehl, *Reverse Engineering Social Media: Software, Culture, and Political Economy in New Media Capitalism* (Philadelphia: Temple

University Press, 2014); Andrew McStay, *The Mood of Information: A Critique of Online Behavioural Advertising* (London: Continuum, 2011); Tanya Kant, *Making It Personal: Algorithmic Personalization, Identity, and Everyday Life* (New York: Oxford University Press, 2020).

40. Zygmunt Bauman and David Lyon, *Liquid Surveillance: A Conversation* (Cambridge: Polity, 2013); Sun-ha Hong, *Technologies of Speculation: The Limits of Knowledge in a Data-Driven Society* (New York: NYU Press, 2019).

41. Crain, *Profit over Privacy*; Srnicek, *Platform Capitalism*; Jathan Sadowski, "When Data Is Capital: Datafication, Accumulation, and Extraction," *Big Data & Society* 6, no. 1 (2019): 1–12.

42. Ryan Calo, "Digital Market Manipulation," *George Washington Law Review* 82, no. 4 (2014): 995–1051; Daniel Susser, Beate Roessler, and Helen Nissenbaum, "Technology, Autonomy, and Manipulation," *Internet Policy Review* 8, no. 2 (2019): 1–22.

43. Safiya Umoja Noble, *Algorithms of Oppression* (New York: NYU Press, 2018), 5.

44. Joshua Braun and Jessica Eklund, "Fake News, Real Money: Ad Tech Platforms, Profit-Driven Hoaxes, and the Business of Journalism," *Digital Journalism* 7, no. 1 (2019): 1–21; Siva Vaidhyanathan, *Antisocial Media: How Facebook Disconnects Us and Undermines Democracy* (New York: Oxford University Press, 2018).

45. Brenton J. Malin, "Advertising as a Tax Expenditure: The Tax Deduction for Advertising and America's Hidden Public Media System," *International Journal of Communication* 8, no. 1 (2020): 2–17.

46. See, e.g., Julia Angwin and Terry Parris Jr., "Facebook Lets Advertisers Exclude Users by Race," *ProPublica*, October 28, 2016, <https://www.propublica.org/article/facebook-lets-advertisers-exclude-users-by-race>.

47. Muhammad Ali, Piotr Sapiezynski, Miranda Bogen, Aleksandra Korolva, Alan Mislove, and Aaron Rieke, "Discrimination through Optimization: How Facebook's Ad Delivery Can Lead to Biased Outcomes," *Proceedings of the ACM on Human-Computer Interaction* 3 (2019): 1–30.

48. Virginia Eubanks, *Automated Inequality: How High-Tech Tools Profile, Police, and Punish the Poor* (New York: St. Martin's Press, 2017); Cathy O'Neil, *Weapons of Math Destruction* (New York: Crown, 2016).

49. John Cheney-Lippold, *We Are Data: Algorithms and the Making of Our Digital Selves* (New York: NYU Press, 2017); Göran Bolin and Jonas Andersson Schwarz, "Heuristics of the Algorithm: Big Data, User Interpretation, and Institutional Translation," *Big Data & Society* 2, no. 2 (2015): 1–12; Liz Moor and Celia Lury, "Price and the Person: Markets, Discrimination, and Personhood," *Journal of Cultural Economy* 11, no. 6 (2018): 501–513; Eran Fisher and Yoav Mehozay, "How Algorithms See Their Audience: Media Epistemes and the Changing Conception of the Individual," *Media, Culture & Society* 41, no. 8 (2019): 1176–1191.

50. Marcel Rosa-Salas, "Total Market American: Race, Data, and Advertising" (PhD diss., New York University, 2020); Tressie McMillan Cottom, "Where Platform Capitalism and Racial Capitalism Meet: The Sociology of Race and Racism in the Digital Society," *Sociology of Race and Ethnicity* 6, no. 4 (2020): 441–449.
51. Oscar H. Gandy Jr., "Coming to Terms with the Panoptic Sort," in *Computers, Surveillance, and Privacy*, ed. David Lyon and Elia Zureik (Minneapolis: University of Minnesota Press, 1996), 133.
52. José van Dijck, *The Culture of Connectivity: A Critical History of Social Media* (New York: Oxford University Press, 2013); Taina Bucher, *If . . . Then: Algorithmic Power and Politics* (New York: Oxford University Press, 2018); Elinor Carmi, "Rhythmmedia: A Study of Facebook Immune System," *Theory, Culture & Society* 37, no. 5 (2020): 119–138.
53. Robert Cluley, "The Politics of Consumer Data," *Marketing Theory* 20, no. 1 (2020): 45–63.
54. Nick Seaver, "Algorithmic Recommendations and Synaptic Functions," *Limn* 2 (2012), <https://escholarship.org/uc/item/7g48p7pb>; Robert Prey, "Nothing Personal: Algorithmic Individuation on Music Streaming Platforms," *Media, Culture & Society* 40, no. 7 (2018): 1086–1100.
55. See Mark Andrejevic, *iSpy: Surveillance and Power in the Interactive Era* (Lawrence: University Press of Kansas, 2007).
56. Luke Stark, "Algorithmic Psychometrics and the Scalable Subject," *Social Studies of Science* 48, no. 2 (2018): 204–231.
57. See Zuboff, *Age of Surveillance Capitalism*, 87–92.
58. Gandy, "Coming to Terms with the Panoptic Sort," 134.
59. Peter C. Newman, "The Lost Marshall McLuhan Tapes," *Maclean's*, July 16, 2013, <https://www.macleans.ca/society/life/the-lost-mcluhan-tapes-2/>.
60. Andrea Mennicken and Wendy Nelson Espeland, "What's New with Numbers? Approaches to the Study of Quantification," *Annual Review of Sociology* 45 (2019): 223–245; John Durham Peters, *The Marvelous Clouds: Toward a Philosophy of Elemental Media* (Chicago: University of Chicago Press, 2015); Dan Bouk, "The History and Political Economy of Personal Data over the Last Two Centuries in Three Acts," *Osiris* 32 (2017): 85–106; Theodora Dryer, "Algorithms under the Reign of Probability," *IEEE Annals of the History of Computing* 40, no. 1 (2018): 93–96; Josh Lauer and Kenneth Lipartito, eds., *Surveillance Capitalism in America* (Philadelphia: University of Pennsylvania Press, 2021); Justin Joque, *Revolutionary Mathematics: Artificial Intelligence, Statistics and the Logic of Capitalism* (New York: Verso, 2022).
61. Simone Browne, *Dark Matters: On the Surveillance of Blackness* (Durham, NC: Duke University Press, 2015); Caitlin Rosenthal, *Accounting for Slavery: Masters and Management* (Cambridge, MA: Harvard University Press, 2018).
62. Lauer, *Creditworthy*; Dan Bouk, *How Our Days Became Numbered: Risk and the Rise of the Statistical Individual* (Chicago: University of Chicago Press, 2015).

63. Caitlin Zaloom, *Out of the Pits: Traders and Technology from Chicago to London* (Chicago: University of Chicago Press, 2006).
64. Thomas P. Hughes, *Human-Built World: How to Think about Technology and Culture* (Chicago: University of Chicago Press, 2004), 77–110.
65. Vincent Mosco, “Introduction: Information in the Pay-Per Society,” in *The Political Economy of Information*, ed. Vincent Mosco and Janet Wasko (Madison: University of Wisconsin Press, 1988), 4.
66. Tim Hwang, *Subprime Attention Crisis: The Timebomb at the Heart of the Internet* (New York: FSG, 2020).
67. Comment from an audience member, “Advanced TV Ads: The Rise to Scale,” Advanced Advertising Summit, New York City, March 27, 2017.
68. Andrew McStay, *Emotional AI: The Rise of Empathic Media* (Los Angeles: Sage, 2018); Aaron Shapiro, *Design, Control, Predict: Logistical Governance in the Smart City* (Minneapolis: University of Minnesota Press, 2020).
69. Mattelart, *Advertising International*, 170.

CHAPTER 1

1. Ethan Cramer-Flood, “Worldwide Digital Ad Spending Year-End Update,” *eMarketer*, November 23, 2021, <https://www.emarketer.com/content/worldwide-digital-ad-spending-year-end-update>; Sara Lebow, “Google, Facebook, and Amazon to Account for 64% of US Digital Ad Spending This Year,” *eMarketer*, November 3, 2021, <https://www.emarketer.com/content/google-facebook-amazon-account-over-70-of-us-digital-ad-spending>.
2. Tim Hwang, *Subprime Attention Crisis: The Timebomb at the Heart of the Internet* (New York: FSG, 2020), 116.
3. Ronan Shields, “Apple’s Latest Privacy Announcement Could Be More Impactful than CCPA or GDPR,” *Adweek*, June 23, 2020; Natasha Lomas, “On Meta’s ‘Regulatory Headwinds’ and Adtech’s Privacy Reckoning,” *TechCrunch*, February 4, 2022, <https://techcrunch.com/2022/02/04/on-metas-regulatory-headwinds-and-adtechs-privacy-reckoning/>.
4. Further details about how adtech works are available in a growing body of cross-disciplinary research. See, e.g., Joseph Turow, *The Daily You: How the New Advertising Industry Is Defining Your Identity and Your Worth* (New Haven, CT: Yale University Press, 2011); Robert W. Gehl, *Reverse Engineering Social Media: Software, Culture, and Political Economy in New Media Capitalism* (Philadelphia: Temple University Press, 2014); Andrew McStay, “Digital Advertising and Adtech: Programmatic Platforms, Identity and Moments,” in *The Advertising Handbook*, 4th ed., ed. Jonathan Hardy, Helen Powell, and Iain MacRury (New York: Routledge, 2018), 88–101; Ramon Lobato and Julian Thomas, “Formats and Formalization in Internet Advertising,” in *Format Matters*, ed. Marek Jancovic, Axel Volmar, and Alexandra Schneider (Lüneburg, Germany:

- Meson Press, 2020), 65–80; Christina Alaimo and Jannis Kallinikos, “Objects, Metrics and Practices: An Inquiry into the Programmatic Advertising Ecosystem,” in *Living with Monsters? Social Implications of Algorithmic Phenomena, Hybrid Agency, and the Performativity of Technology*, ed. Ulrike Schultze, Margunn Aanestad, Magnus Mähring, Carsten Østerlund, and Kai Riemer (Cham, Switzerland: Springer, 2018), 110–123; Muhammad Ahmad Bashir, “On the Privacy Implications of Real Time Bidding” (PhD diss., Northeastern University, 2019); Reuben Binns, “Tracking on the Web, Mobile, and the Internet-of-Things,” accessed April 29, 2022, <https://arxiv.org/pdf/2201.10831.pdf>.
5. Gabriel Nicholas and Aaron Shapiro, “Failed Hybrids: The Death and Life of Bluetooth Proximity Marketing,” *Mobile Media & Communication* 9, no. 3 (2020): 465–487.
 6. Jack Marshall, “WTF is Programmatic Advertising?,” *Digiday*, February 20, 2014, <https://digiday.com/media/what-is-programmatic-advertising/>.
 7. William Ammerman, *The Invisible Brand: Marketing in the Age of Automation, Big Data, and Machine Learning* (New York: McGraw-Hill, 2019), 30.
 8. “About Value Optimization,” Meta Business Help Center, accessed April 29, 2022, <https://www.facebook.com/business/help/296463804090290?id=561906377587030>.
 9. Aaron Shapiro, *Design, Control, Predict: Logistical Governance in the Smart City* (Minneapolis: University of Minnesota Press, 2020), 64–71.
 10. Chris Kane, “How to Train Your DSP,” *Programmatic I/O*, 2018, <https://jouncemedia.com/blog/2018/4/12/catch-the-replay-how-to-train-your-dsp>.
 11. Fernando N. van der Vlist and Anne Helmond, “How Partners Mediate Platform Power: Mapping Business and Data Partnerships in the Social Media Ecosystem,” *Big Data & Society* 8, no. 1 (2021): 1–16.
 12. Alexandra Bruell, “Inside the Hidden Costs of Programmatic,” *Advertising Age* 86, no. 17 (2015): 14.
 13. Nick Kostov and David-Gauthier-Villars, “Digital Revolution Upends Ad Industry—A Divide between Old Guard and New Tech Hires,” *Wall Street Journal*, January 20, 2018, A1.
 14. John Sinclair, “Advertising and Media in the Age of the Algorithm,” *International Journal of Communication* 10 (2016): 3522–3535.
 15. John Deighton, “Rethinking the Profession Formerly Known as Advertising,” *Journal of Advertising Research* 58, no. 4 (2017): 357–361.
 16. Dina Srinivasan, “Why Google Dominates Advertising Markets,” *Stanford Technology Law Review* 24, no. 1 (2020): 55–175.
 17. Srinivasan, 101.
 18. Srinivasan, 122–127.
 19. Gilad Edelman, “Google’s Alleged Scheme to Corner the Online Ad Market,” *Wired*, January 14, 2022, <https://www.wired.com/story/google-antitrust-ad-market-lawsuit/>.

20. Claire Melford and Craig Fagan, "Cutting the Funding of Disinformation: The Ad-Tech Solution," *Global Disinformation Index*, May 2019, https://disinformationindex.org/wp-content/uploads/2019/05/GDI_Report_Screen_AW2.pdf.
21. Ryan Barwick, "Brands Are Still Playing Ball with Clickbait Ad Sites, Advertising's Roach that Will Survive the Bomb," *Morning Brew*, September 8, 2021, <https://www.morningbrew.com/marketing/stories/2021/09/08/brands-still-playing-ball-clickbait-ad-sites-advertisings-roach-will-survive-bomb>.
22. Caitlin Petre, "The Traffic Factories: Metrics at Chartbeat, Gawker Media, and the New York Times," *Tow Center for Digital Journalism*, May 7, 2015, <https://academiccommons.columbia.edu/doi/10.7916/D80293W1>. Relatedly, on "content factories," see Nicole S. Cohen, *Writers' Rights: Freelance Journalism in a Digital Age* (Montreal, QC: McGill-Queens University Press, 2016), chap. 5.
23. Oscar H. Gandy Jr., *The Panoptic Sort: A Political Economy of Personal Information*, 2nd ed. (New York: Oxford University Press, 2021).
24. Donald MacKenzie, "Cookies, Pixels and Fingerprints," *London Review of Books* 43, no. 7 (2021): 31–34.
25. "Identity Graphs on AWS," accessed October 13, 2021, <https://aws.amazon.com/neptune/identity-graphs-on-aws/>.
26. Tarleton Gillespie, "The Relevance of Algorithms" in *Media Technologies: Essays on Communication, Materiality, and Society*, ed. Tarleton Gillespie, Pablo J. Boczkowski, and Kirsten A. Foot (Cambridge, MA: MIT Press, 2016), 167–194; Angèle Christin, *Metrics at Work: Journalism and the Contested Meaning of Algorithms* (Princeton, NJ: Princeton University Press, 2020).
27. Kane, "How to Train Your DSP."
28. Solon Barocas and Helen Nissenbaum, "Big Data's End Run around Anonymity and Consent," in *Privacy, Big Data, and the Public Good*, ed. Julia Lane, Victoria Stodden, Stefan Bender, and Helen Nissenbaum (New York: Cambridge University Press, 2014), 44–75; Michael Veale and Frederik Zuiderveen Borgesius, "Adtech and Real-Time Bidding under European Data Protection Law," *German Law Journal* 23, no. 2 (2022): 226–256.
29. "Dr. Johnny Ryan Testimony," *Understanding the Digital Advertising Ecosystem and the Impact of Data Privacy and Competition Policy*, US Senate Committee on the Judiciary, May 21, 2019, Washington, DC, <https://www.judiciary.senate.gov/imo/media/doc/Ryan%20Testimony.pdf>.
30. Joseph Cox, "How the U.S. Military Buys Location Data from Ordinary Apps," *Motherboard*, November 16, 2020, <https://www.vice.com/en/article/jgqm5x/us-military-location-data-xmode-locate-x>; Byron Tau and Georgia Wells, "Grindr User Data Was Sold through Ad Networks," *Wall Street Journal*, May 2, 2022, <https://www.wsj.com/articles/grindr-user-data-has-been-for-sale-for-years-11651492800>.

31. Joseph Cox, "Data Broker Is Selling Location Data of People Who Visit Abortion Clinics," *Vice*, May 3, 2022, <https://www.vice.com/en/article/m7vzjb/location-data-abortion-clinics-safegraph-planned-parenthood>.
32. Gilad Edelman, "Follow the Money: How Digital Ads Subsidize the Worst of the Web," *Wired*, July 28, 2020, <https://www.wired.com/story/how-digital-ads-subsidize-worst-web/>.
33. Shoshana Wodinsky, "Target Is Sponsoring News Stories of Its Own Destruction—and Likely Has No Idea," *Gizmodo*, May 26, 2020, <https://gizmodo.com/target-is-sponsoring-news-stories-of-its-own-destructio-1843759747>.
34. Sophie Bishop, "Influencer Management Tools: Algorithmic Cultures, Brand Safety, and Bias," *Social Media + Society* 7, no. 1 (2021): 1–13; Robyn Caplan and Tarleton Gillespie, "Tiered Governance and Demonetization: The Shifting Terms of Labor and Compensation in the Platform Economy," *Social Media + Society* 6, no. 2 (2020): 1–13.
35. Shoshana Wodinsky, "The Newest Chrome Update Is about Power, Not Privacy," *Gizmodo*, May 20, 2020, <https://gizmodo.com/the-newest-chrome-update-is-about-power-not-privacy-1843546136>.
36. Jérôme Bourdon and Cécile Méadel, "Globalizing the Peoplemetered Audience," in *The Routledge Companion to Global Television*, ed. Shawn Shimpach (New York: Routledge, 2019), 121–129.
37. This section builds on a large body of work, including Todd Gitlin, *Inside Prime Time* (New York: Pantheon Books, 1983); Eileen R. Meehan, "Ratings and the Institutional Approach: A Third Answer to the Commodity Question," *Critical Studies in Mass Communication* 1, no. 2 (1984): 216–225; Ien Ang, *Desperately Seeking the Audience* (New York: Routledge, 1991); Philip Napoli, *Audience Economics* (New York: Columbia University Press, 2003); Jérôme Bourdon and Cécile Méadel, "Inside Television Audience Measurement: Deconstructing the Ratings Machine," *Media, Culture & Society* 33, no. 5 (2011): 791–800.
38. Dallas W. Smythe, *Dependency Road: Communications, Capitalism, Consciousness, and Canada* (Norwood, NJ: Ablex, 1981), chap. 2.
39. Harold A. Innis, *The Bias of Communication*, 2nd ed. (Toronto: University of Toronto Press, 2008), xliii.
40. Fernando Bermejo, *The Internet Audience: Constitution and Measurement* (New York: Peter Lang, 2007).
41. On continuities in audience measurement and the work of self-surveillance, see Jennifer Hessler, "Peoplemeter Technologies and the Biometric Turn in Audience Measurement," *Television & New Media* 22, no. 4 (2021): 400–419.
42. Matthew Crain, *Profit over Privacy: How Surveillance Advertising Conquered the Internet* (Minneapolis: University of Minnesota Press, 2020), 67.
43. Companies like Meta also produce evidence of behavior for an audience of investors who carefully monitor user metrics.

44. Josh Lauer, "Surveillance History and the History of New Media: An Evidential Paradigm," *New Media & Society* 14, no. 4 (2011): 568.

45. Lauer, 579.

46. See Michael Buckland, "What Is a 'Document'?" *Journal of the American Society for Information Science* 48, no. 9 (1997): 806.

47. I am drawing on Bronwyn Parry, *Trading the Genome: Investigating the Commodification of Bio-Information* (New York: Columbia University, 2004).

48. Astrid Mager, "Algorithmic Ideology: How Capitalist Society Shapes Search Engines," *Information, Communication & Society* 15, no. 5 (2012): 769–787; Micky Lee, "Google Ads and the Blindspot Debate," *Media, Culture & Society* 33, no. 3 (2011): 443–447; Bernhard Rieder and Guillaume Sire, "Conflicts of Interest and Incentives to Bias: A Microeconomic Critique of Google's Tangled Position on the Web," *New Media & Society* 16, no. 2 (2013): 195–221; Carolin Gerlitz and Anne Helmond, "The Like Economy: Social Buttons and the Data-Intensive Web," *New Media & Society* 15, no. 8 (2013): 1348–1365; Ramon Lobato, "The Cultural Logic of Digital Intermediaries: YouTube Multichannel Networks," *Convergence* 22, no. 4 (2016): 348–360; David B. Nieborg and Thomas Poell, "The Platformization of Cultural Production: Theorizing the Contingent Cultural Commodity," *New Media & Society* 20, no. 11 (2018): 4275–4292; Elizabeth Van Couvering, "Faces and Charts: Platform Strategies for Visualising the Audience, the Case of Facebook," *Information, Communication & Society* 25, no. 11 (2022): 1524–1541.

49. On the institutionally effective audience, see James S. Ettema and D. Charles Whitney, "The Money Arrow: An Introduction to Audiencemaking," in *Audiencemaking: How the Media Create the Audience*, ed. James S. Ettema and D. Charles Whitney (Thousand Oaks, CA: Sage, 1994), 1–18. For discussions of framing and markets, see Michel Callon, "Introduction: The Embeddedness of Economic Markets in Economics," *Sociological Review* 46, no. S1 (1998): 1–57; Michel Callon and Fabian Muniesa, "Peripheral Vision: Economic Markets as Calculative Collection Devices," *Organization Studies* 26, no. 8 (2005): 1229–1250; N. Anand and Richard A. Peterson, "When Market Information Constitutes Fields: Sensemaking of Markets in the Commercial Music Industry," *Organization Science* 11, no. 3 (2000): 270–284.

50. Vincent Manzerolle and Michael Daubs, "Friction-Free Authenticity: Mobile Social Networks and Transactional Affordances," *Media, Culture & Society* 43, no. 7 (2021): 1279–1296.

51. Garrett Sloane, "Instagram Gives Brands New Way to Sell in 'Collection' Ads," *Advertising Age*, February 6, 2018, <https://adage.com/article/digital/instagram-brands-sell-collection-ads/312273>; Matthew Schneier, "Instagram Introduces Shoppable Influencers," *New York Times*, April 30, 2019, <https://www.nytimes.com/2019/04/30/style/instagram-introduces-shoppable-influencers.html>; Alison Weissbrot, "Google Extends Shopping Ads to YouTube," *AdExchanger*, November 5, 2019, <https://www.adexchanger.com/platforms/google-extends-shopping-ads-to-youtube/>; Scott Nover, "TikTok Makes Moves in Social Commerce with Shopify Integration," *Adweek*,

October 27, 2020, <https://www.adweek.com/programmatic/tiktok-makes-moves-in-social-commerce-with-shopify-integration/>.

52. Mark Andrejevic, *Automated Media* (New York: Routledge, 2020), 97.

53. Garrett Sloane, "How TikTok, Instagram and Snapchat Sell Everything from Ranch Dressing to Lip Gloss," *Advertising Age*, May 18, 2021, <https://adage.com/article/media/how-tiktok-instagram-and-snapchat-sell-everything-ranch-dressing-lip-gloss/2335766>.

54. Nicole Perrin, "Digital Identity Crisis Will Be a Boon for Retail Media Sellers," *eMarketer*, October 4, 2020, <https://www.emarketer.com/content/digital-identity-crisis-will-boon-retail-media-sellers>.

55. Stephen Fox, *The Mirror Makers: A History of American Advertisers and Its Creators* (Urbana: University of Illinois Press, 1994).

56. Adam Arvidsson, "On the 'Prehistory of the Panoptic Sort': Mobility in Market Research," *Surveillance & Society* 1, no. 4 (2004): 456–474; Jason Pridmore and Detlev Zwick, "Marketing and the Rise of Commercial Consumer Surveillance," *Surveillance & Society* 8, no. 3 (2011): 269–277.

CHAPTER 2

Epigraph: Wroe Alderson and Stanley J. Shapiro, eds., *Marketing and the Computer* (Englewood Cliffs, NJ: Prentice-Hall, 1963), 2.

1. Thomas Frank, *The Conquest of Cool: Business Culture, Counterculture, and the Rise of Hip Consumerism* (Chicago: University of Chicago Press, 1997).

2. Joseph Turow, *Breaking up America: Advertisers and the New Media World* (Chicago: University of Chicago Press, 1997); Lizabeth Cohen, *A Consumers' Republic: The Politics of Mass Consumption in Postwar America* (New York: Vintage Books, 2004).

3. On the status of data science in marketing today, see Ken Auletta, *Frenemies: The Epic Disruption of the Ad Business (and Everything Else)* (New York: Penguin Press, 2018); Steve Lohr, *Data-ism: The Revolution Transforming Decision Making, Consumer Behavior, and Almost Everything Else* (New York: HarperCollins, 2015).

4. See, e.g., Shoshana Zuboff, *The Age of Surveillance Capitalism* (New York: Public-Affairs, 2019). My analysis supports the argument in John Bellamy Foster and Robert W. McChesney, "Surveillance Capitalism: Monopoly-Finance Capital, the Military-Industrial Complex, and the Digital Age," *Monthly Review* 66, no. 3 (2014): 1–31. See also Kevin Robins and Frank Webster, "Cybernetic Capitalism: Information, Technology, Everyday Life," in *The Political Economy of Information*, ed. Vincent Mosco and Janet Wasko (Madison: University of Wisconsin Press, 1988), 44–75.

5. Pamela Walker Laird, *Advertising Progress: American Business and the Rise of Consumer Marketing* (Baltimore: Johns Hopkins University Press, 1998); Roland Marchand, *Advertising the American Dream: Making Way for Modernity, 1920–1940* (Berkeley: University of California Press, 1985); Susan Strasser, *Satisfaction Guaranteed: The Making*

of the American Mass Market (New York: Pantheon Books, 1989); Jackson Lears, *Fables of Abundance: A Cultural History of Advertising in America* (New York: Basic Books, 1994); Stephen Leiss, William Klein, Sut Jhally, Jacqueline Botterill, and Kyle Asquith, *Social Communication in Advertising*, 4th ed. (New York: Routledge, 2018); Stephen Fox, *The Mirror Makers: A History of American Advertisers and Its Creators* (Urbana: University of Illinois Press, 1994); Daniel Pope, *The Making of Modern Advertising* (New York: Basic Books, 1983); Peggy J. Kreshel, "The 'Culture' of J. Walter Thompson, 1915–1925," *Public Relations Review* 16, no. 3 (1990): 80–93; Peggy J. Kreshel, "John B. Watson at J. Walter Thompson: The Legitimation of 'Science' in Advertising," *Journal of Advertising* 19, no. 2 (1990): 49–59.

6. Joseph Turow, *The Daily You: How the New Advertising Industry Is Defining Your Identity and Your Worth* (New Haven, CT: Yale University Press, 2011), 19.

7. Michael Schudson, *Advertising, the Uneasy Persuasion* (New York: Basic Books, 1984), chap. 2.

8. Gary L. Lilien and Philip Kotler, *Marketing Decision Making: A Model-Building Approach* (New York: Harper & Row, 1983), 511. Notably, that researcher was working for the Scott Paper Company, which might have been happy to see agencies sink more money into the production of ads.

9. Geoffrey Bowker and Susan Leigh Star, *Sorting Things Out: Classification and Its Consequences* (Cambridge, MA: MIT Press, 1999), 53.

10. On how precarious relationships can increase the status of quantification, see Bruce G. Carruthers and Wendy Nelson Espeland, "Accounting for Rationality: Double-Entry Bookkeeping and the Rhetoric of Economic Rationality," *American Journal of Sociology* 97, no. 1 (1991): 31–69; Theodore Porter, *Trust in Numbers: The Pursuit of Objectivity in Science and Public Life* (Princeton, NJ: Princeton University Press, 1995).

11. Caitlin Rosenthal, *Accounting for Slavery: Masters and Management* (Cambridge, MA: Harvard University Press, 2018).

12. William Leach, *Land of Desire: Merchants, Power, and the Rise of a New American Culture* (New York: Vintage Books, 1994), 35–38.

13. James R. Beniger, *The Control Revolution: Technological and Economic Origins of the Information Society* (Cambridge, MA: Harvard University Press, 1986); Alfred D. Chandler, *The Visible Hand: The Managerial Revolution in American Business* (Cambridge, MA: Belknap Press of Harvard University Press, 1977).

14. Harold A. Innis, *Political Economy in the Modern State*, ed. Robert E. Babe and Edward A. Comor (1946; reprint, Toronto: University of Toronto, 2018), 89.

15. Innis, 89.

16. Dan Schiller, *Digital Depression: Information Technology and Economic Crisis* (Urbana: University of Illinois Press, 2014), 18.

17. Laird, *Advertising Progress*, 254–260.

18. See the works cited above in note 5.
19. Roger Barton, *Advertising Agency Operations and Management* (New York: McGraw-Hill, 1955), 3–4.
20. Zoe Sherman, *Modern Advertising and the Market for Audience Attention* (New York: Routledge, 2020), 36.
21. *Printers' Ink* 14, no. 2 (1896): 80.
22. Fox, *Mirror Makers*, 29–31.
23. Quoted in Laird, *Advertising Progress*, 284.
24. Richard Ohmann, *Selling Culture: Magazines, Markets, and Class at the Turn of the Century* (London: Verso, 1996), 112–113.
25. Innis, *Political Economy in the Modern State*, 27.
26. Laird, *Advertising Progress*, 254.
27. Douglas B. Ward, “Capitalism, Early Market Research, and the Creation of the American Consumer,” *Journal of Historical Research in Marketing* 1, no. 2 (2009): 200–223.
28. Richard K. Popp, “The Information Bazaar: Mail-Order Magazines and the Gilded Age Trade in Consumer Data,” in *Surveillance Capitalism in America*, ed. Josh Lauer and Kenneth Lipartito (Philadelphia: University of Pennsylvania Press, 2021), 46–64.
29. Daniel Robinson, *The Measure of Democracy* (Toronto: University of Toronto Press, 1999); Sarah E. Igo, *The Averaged American: Surveys, Citizens, and the Making of a Mass Public* (Cambridge, MA: Harvard University Press, 2008); Marcel Rosa-Salas, “Making the Mass White: How Racial Segregation Shaped Consumer Segmentation,” in *Race in the Marketplace: Crossing Critical Boundaries*, ed. Guillaume D. Johnson, Kevin D. Thomas, Anthony Kwame Harrison, and Sonya A. Grier (Cham, Switzerland: Palgrave Macmillan, 2019), 21–38.
30. Ian Hacking, “Making up People,” in *Reconstructing Individualism*, ed. Thomas C. Heller, Morton Sosna, and David Wellbery (Stanford, CA: Stanford University Press, 1986), 222–236.
31. Stefan Schwarzkopf, “In Search of the Consumer: The History of Market Research from 1890 to 1960,” in *The Routledge Companion to Marketing History*, ed. D. G. Brian Jones and Mark Tadajewski (New York: Routledge, 2016), 61–83.
32. Earnest Elmo Calkins and Ralph Holden, *Modern Advertising* (New York: D. Appleton, 1907), 261. Quoted also in Strasser, *Satisfaction Guaranteed*, 147–148.
33. James B. Griffith, *Advertising and Sales Organization* (Chicago: American School of Correspondence, 1909), 3.
34. JoAnne Yates, *Control through Communication: The Rise of System in American Management* (Baltimore: Johns Hopkins University Press, 1989).
35. Sherman, *Modern Advertising and the Market for Audience Attention*, 121–125.

36. Popp, "The Information Bazaar," 47.
37. Richard K. Popp, "Making Advertising Material: Checking Departments, Systematic Reading, and Geographic Order in Nineteenth-Century Advertising," *Book History* 14 (2011): 58–87.
38. Griffith, *Advertising and Sales Organization*, 23.
39. Hebert Newton Casson, *Ads and Sales: A Study of Advertising and Selling, from the Standpoint of the New Principles of Scientific Management* (Chicago: A. C. McClung, 1911), 6–7.
40. Casson, 9–11.
41. Merle Curti, "The Changing Concept of 'Human Nature' in the Literature of American Advertising," *Business History Review* 41, no. 4 (1967): 342.
42. Curti, 347.
43. Laird, *Advertising Progress*, 279.
44. Pope, *Making Modern Advertising*, 141; Beniger, *Control Revolution*, 379, 384.
45. Fox, *Mirror Markers*, 60–61.
46. Fox, 61.
47. Calkins and Holden, *Modern Advertising*, 262–270.
48. Schwarzkopf, "In Search of the Consumer," 66.
49. Daniel J. Robinson, "Mail-Order Doctors and Market Research, 1890–1930," in *The Rise of Marketing and Market Research*, ed. Harmut Berghoff, Philip Scranton, and Uwe Spiekermann (New York: Palgrave Macmillan, 2012), 73–93.
50. Sherman, *Modern Advertising and the Market for Audience Attention*, 110–111.
51. Schwarzkopf, "In Search of the Consumer"; Pope, *Making Modern Advertising*, 141–143.
52. Martin Kenneth Starr, "Management Science and Marketing Science," *Management Science* 10, no. 3 (1964): 557–558.
53. Starr, 558.
54. Wroe Alderson, "Charles Coolidge Parlin," *Journal of Marketing* 21, no. 1 (1956): 1.
55. Alderson, 1.
56. Ward, "Capitalism, Early Market Research, and the Creation of the American Consumer," 209–210.
57. Beniger, *Control Revolution*, 387.
58. Marchand, *Advertising the American Dream*, chaps. 2, 3.
59. E. G. Platt, "Data Publishers Should Furnish Agents," *Printers' Ink*, January 29, 1914, 50.

60. Kreshel, "'Culture' of J. Walter Thompson," 83.
61. Kreshel, "John B. Watson at J. Walter Thompson," 53.
62. Marchand, *Advertising the American Dream*, 26.
63. Fox, *Mirror Makers*, 85.
64. Paul T. Cherington, "Statistics in Market Studies," *Annals of the American Academy of Political and Social Science* 115 (1924): 132.
65. Jan Logemann, "Consumer Engineering and the Rise of Marketing Knowledge, 1920s–1970s," *History of Knowledge*, June 27, 2019, <https://historyofknowledge.net/2019/06/27/consumer-engineering-and-the-rise-of-marketing-knowledge-1920s-1970s/>
66. See Franck Cochoy, "Another Discipline for the Market Economy: Marketing as a Performative Knowledge and Know-how for Capitalism," *Sociological Review* 46, no. S1 (1998): 205–209.
67. "What the J. Walter Thompson Company Stands For," June 1955, 1, JWT Information Center Records, box 8, Hartman Center.
68. Kreshel, "'Culture' of J. Walter Thompson," 85.
69. Henry C. Link, *The New Psychology of Selling and Advertising* (New York: Macmillan, 1932), 248.
70. Link, 267.
71. *A Report of the Eleventh Meeting of the ARF Operations Research Discussion Group* (New York: Advertising Research Foundation, 1964), 30.
72. Leo Bogart, "Is It Time to Discard the Audience Concept?," *Journal of Marketing* 30, no. 1 (1966): 49.
73. Igo, *Averaged American*, 113.
74. Todd Gitlin, "Media Sociology: The Dominant Approach," *Media, Culture & Society* 6, no. 2 (1978): 233–240.
75. Darrell Lucas quoted in "Mathematical Programming for Better Selection of Advertising Media," *Computers and Automation* 10, no. 12 (1961): 21.
76. Wadsworth H. Mullen, "A Money Measure of Magazine Reader Interest," *Harvard Business Review* 14, no. 3 (1936): 371.
77. Darrell Blaine Lucas and Steuart Henderson Britt, *Measuring Advertising Effectiveness* (New York: McGraw-Hill, 1963), 270.
78. Lucas and Britt, 270–272.
79. Lucas and Britt, 281.
80. Charles Sinclair, "Arrival of Arbitron System Puts Madison Ave. into Tizzy," *Billboard*, December 23, 1957, 2.

81. "Should Agencies Get 20% for Spot TV?," *Broadcasting*, April 28, 1969, 20.
82. Karen Buzzard, *Tracking the Audience: The Ratings Industry from Analog to Digital* (New York: Routledge, 2012); Philip M. Napoli, *Audience Economics* (New York: Columbia University Press, 2003); Ien Ang, *Desperately Seeking the Audience* (New York: Routledge, 1991); Eileen R. Meehan, *Why TV Is Not Our Fault* (Lanham, MD: Rowman & Littlefield, 2005).
83. Buzzard, *Tracking the Audience*, 22.
84. Vance Packard, *The Hidden Persuaders* (New York: Pocket Books, 1957).
85. Ronald A. Fullerton, "The Birth of Consumer Behavior: Motivation Research in the 1940s and 1950s," *Journal of Historical Research in Marketing* 5, no. 2 (2013): 212–222.
86. Robert Vincent Zacher, *Advertising Techniques and Management* (Homewood, IL: R. D. Irwin, 1961), 89.
87. Michael Halbert, "Empirical Research in Consumer Shopping and Motivation," in *Proceedings of the Thirty-Seventh National Conference of the American Marketing Association, New York, December 27th–29th 1955* (New York: American Marketing Association, 1955), 15.
88. Beniger, *Control Revolution*.

CHAPTER 3

Epigraphs: Marion Harper Jr., "A New Profession to Aid Management," *Journal of Marketing* 25, no. 3 (1961): 1; William J. Horvath, "Operations Research—A Scientific Basis for Executive Decisions," *American Statistician* 2, no. 5 (1948): 18.

1. Marshall McLuhan, *The Mechanical Bride: Folklore of Industrial Man* (New York: Vanguard Press, 1951), v.
2. "Ivied Towers Spawn New Breed of Automation Men Searching Ad Answers," *Advertising Age*, December 1962, 3, 36.
3. Jill Lepore, *If Then: How the Simulmatics Corporation Invented the Future* (New York: Liveright, 2020); Fenwick McKelvey, "The Other Cambridge Analytics: Early 'Artificial Intelligence' in American Political Science," in *The Cultural Life of Machine Learning: An Incursion into Critical AI Studies*, ed. Jonathan Roberge and Michael Castelle (London: Palgrave Macmillan, 2020), 117–142.
4. Thomas B. Morgan, "The People-Machine," *Harper's Magazine*, January 1, 1961, 53–57.
5. The widely used term "math men" is problematic, but it is more appropriate in this context than it is today. Although women climbed the ranks in agency research and media departments, they were *not* included among the mathematical experts coming from operations research and management science. In the 1950s and 1960s

the Advertising Research Foundation convened an operations research discussion group, with more than forty members at its peak. As far as I can tell from the records of their meetings, no women participated—except perhaps as the stenographers who produced those records.

6. “Ivied Towers,” 3.

7. “Y&R, BBDO Unleash Media Computerization,” *Advertising Age*, October 1, 1962, 118.

8. Tim Wu, *The Attention Merchants: The Epic Scramble to Get Inside Our Heads* (New York: Vintage, 2017), 105.

9. James W. Cortada, *The Digital Hand*, vol. 2, *How Computers Changed the Work of American Financial, Telecommunications, Media, and Entertainment Industries* (New York: Oxford University Press, 2004), 353.

10. “Nielsen Reports,” *Broadcasting*, September 6, 1948, 29, 34. Eckert and Mauchly’s fledgling company failed to fill Nielsen’s initial order due to internal problems. Nancy Stern, “The Eckert-Mauchly Computers: Conceptual Triumphs, Commercial Tribulations,” *Technology & Culture* 23, no. 4 (October 1982): 579–582.

11. For more on ENIAC, see Jennifer Light, “When Computers Were Women,” *Technology & Culture* 40, no. 3 (1999): 455–483; Paul E. Ceruzzi, *Computing: A Concise History* (Cambridge, MA: MIT Press, 2012), 46–48.

12. “Intra-Computer Testing by 2012 Seen by Inventor,” *Advertising Age*, December 10, 1962, 89.

13. “As [Dallas] Smythe put it, ‘the shotgun is being superseded by rifles.’” William H. Melody, “Audiences, Commodities, and Market Relations: An Introduction to the Audience Commodity Thesis,” in *The Audience Commodity in a Digital Age*, ed. Lee McGuigan and Vincent Manzerolle (New York: Peter Lang, 2014), 27.

14. Peter Langhoff, “The Setting: Some Non-Metric Observations,” in *Models, Measurement, and Marketing*, ed. Peter Langhoff (Englewood Cliffs, NJ: Prentice-Hall, 1965), 5.

15. Ronald R. Kline, “Cybernetics, Management Science, and Technology Policy: The Emergence of ‘Information Technology’ as a Keyword, 1948–1985,” *Technology & Culture* 47, no. 3 (2006): 521.

16. Nathan Ensmenger, *The Computer Boys Take Over: Computers, Programmers, and the Politics of Technical Expertise* (Cambridge, MA: MIT Press, 2010); Thomas Haigh, “Inventing Information Systems: The Systems Men and the Computer, 1950–1968,” *Business History Review* 75, no. 1 (2001): 15–61.

17. Daniel Bell, “The Social Framework of the Information Society,” in *The Computer Age: A Twenty-Year View*, ed. Michael L. Dertouzos and Joel Moses (Cambridge, MA: MIT Press, 1979), 166–167.

18. “The RCA 301 Computer,” *J. Walter Thompson Company News* 18, no. 11 (April 5, 1963), JWT Staff Newsletters, box MN12, Hartman Center.

19. Caitlin Zaloom, *Out of the Pits: Traders and Technology from Chicago to London* (Chicago: University of Chicago Press, 2006), 165.
20. Philip Mirowski, *Machine Dreams: Economics Becomes a Cyborg Science* (New York: Cambridge University Press, 2002), 177.
21. For important exceptions, see Franck Cochoy, "Another Discipline for the Market Economy: Marketing as a Performative Knowledge and Know-How for Capitalism," *Sociological Review* 46, no. 1 supplement (1998): 194–221; Adam Arvidsson, "Facebook and Finance: On the Social Logic of the Derivative," *Theory, Culture & Society* 33, no. 6 (2016): 3–23; Bernhard Rieder, "Scrutinizing an Algorithmic Technique: The Bayes Classifier as an Interested Reading of Reality," *Information, Communication & Society* 20, no. 1 (2017): 100–117; Adrian Mackenzie, "Personalization and Probabilities: Impersonal Propensities in Online Grocery Shopping," *Big Data & Society* 5, no. 1 (2018): 1–15.
22. Ensmenger, *Computer Boys Take Over*, 154–155.
23. Paul N. Edwards, *The Closed World: Computers and the Politics of Discourse in Cold War America* (Cambridge, MA: MIT Press), 115, 394n5.
24. Theodora Dryer, "Designing Certainty: The Rise of Algorithmic Computing in an Age of Anxiety 1920–1970" (PhD diss., University of California–San Diego, 2019); Zoë Hitzig, "Optimize This," *ŠUM: Journal for Contemporary Art Criticism* 15 (2020): 2064–2080.
25. Mirowski, *Machine Dreams*; Stephen P. Waring, *Taylorism Transformed: Scientific Management Theory since 1945* (Chapel Hill: University of North Carolina Press, 1991), chap. 2; Marion Fourcade and Rakesh Khurana, "From Social Control to Financial Economics: The Linked Ecologies of Economics and Business in Twentieth Century America," *Theory & Society* 42, no. 2 (2013): 121–159.
26. Herbert A. Simon, "Two Heads Are Better than One: The Collaboration between AI and OR," *Interfaces* 17, no. 4 (1987): 10.
27. Letter and Industrial Dynamics Pamphlet from Jay W. Forrester to Frank M. Verzuh, March 29, 1959, AC.0062, box 2, folder 22, Records of the Massachusetts Institute of Technology Computation Center, MIT Libraries Department of Distinctive Collections.
28. Harlan D. Mills, "Marketing as a Science," *Harvard Business Review* 39, no. 5 (1961): 137.
29. Alfred A. Kuehn and Ralph L. Day, "Probabilistic Models of Consumer Buying Behavior," *Journal of Marketing* 28, no. 4 (1964): 27.
30. William Lazer, "Operations Research and Marketing Science," in *Science in Marketing*, ed. George Schwartz (New York: John Wiley & Sons, 1965), 435.
31. Lazer, 432.

32. Benjamin Lipstein, "Prospects for the Management Sciences in Advertising," *Management Science* 13, no. 2 (1966): B5.
33. Edwards, *Closed World*, 114.
34. Horvath, "Operations Research," 6.
35. Michael Halbert, "Empirical Research in Consumer Shopping and Motivation," in *Proceedings of the Thirty-Seventh National Conference of the American Marketing Association, New York, December 27th–29th 1955* (New York: American Marketing Association, 1955), 15.
36. Simon, "Two Heads," 15.
37. Peter F. Drucker, *The Practice of Management* (New York: Harper & Row, 1954), 370.
38. Waring, *Taylorism Transformed*, 28.
39. "Business Statistics Going PhD," *Business Week*, May 30, 1953, 96.
40. Eugene Ladin, "The Role of the Accountant in Operations Analysis," *Accounting Review* 37, no. 2 (1962): 291.
41. "Business Statistics Going PhD," 96.
42. George E. Kimball, "Some Industrial Applications of Military Operations Research Methods," *Operations Research* 5, no. 2 (1957): 203.
43. Philip Kotler, "Operations Research in Marketing," *Harvard Business Review* 45, no. 1 (1967): 30–34, 37–38, 40, 42, 44, 187–188; Melvin Anshen, "Management Science in Marketing: Status and Prospects," *Management Science* 2, no. 3 (1956): 222–231.
44. National Research Council, *Operations Research with Special Reference to Non-Military Applications: A Brochure* (Washington, DC: National Academies Press, 1951), 3.
45. Charles Kittel, "The Nature and Development of Operations Research," *Science* 105, no. 2719 (1947): 150.
46. Kittel, 152.
47. Russell L. Ackoff, "Some New Statistical Techniques Applicable to Operations Research," *Journal of the Operations Research Society of America* 1, no. 1 (1952): 10–17; Bernard O. Koopman, "The Optimum Distribution of Effort," *Journal of the Operations Research Society of America* 1, no. 2 (1953): 52–63; John F. Magee, "The Effect of Promotional Effort on Sales," *Journal of the Operations Research Society of America* 1, no. 2 (1953): 64–74.
48. Philip M. Morse, "Trends in Operations Research," *Journal of the Operations Research Society of America* 1, no. 4 (1953): 159.
49. Kimball, "Some Industrial Applications of Military Operations Research Methods," 203.
50. Elizabeth A. Richards, "Operations Research or the Scientific Method," *Journal of Marketing* 19, no. 2 (1954): 159–160.

51. Drucker, *Practice of Management*, 366.
52. Russell L. Ackoff, "Comments on Operations Research," *Journal of Marketing* 20, no. 1 (1955): 47–48.
53. John A. Howard, "Operations Research and Market Research," *Journal of Marketing* 20, no. 2 (1955): 143.
54. Kenneth A. Longman, "Marketing Effort—How Productive Is It?," in *Minutes of the Third Meeting of the Operations Research Discussion Group, Friday, April 22, 1960* (New York: Advertising Research Foundation, 1960), 4.
55. National Research Council, *Operations Research*, 4.
56. Horace C. Levinson, "Experiences in Commercial Operations Research," *Journal of the Operations Research Society of America* 1, no. 4 (1953): 234.
57. National Research Council, *Operations Research*, 4.
58. Levinson, "Experiences in Commercial Operations Research," 221–222.
59. See, e.g., Cyril C. Herrmann and John F. Magee, "'Operations Research' for Management," *Harvard Business Review* 31, no. 4 (1953): 100–112.
60. Marcello Vidale quoted in *Minutes of the First Meeting of the Operations Research Discussion Group, October 5, 1959* (New York: Advertising Research Foundation, 1959), 7.
61. Tibor Fabian quoted in *Minutes of the Second Meeting of the Operations Research Discussion Group, February, 16, 1960* (New York: Advertising Research Foundation, 1960), 1.
62. Herrmann and Magee, "'Operations Research' for Management," 101–102.
63. Jerome D. Herniter and John F. Magee, "Customer Behavior as a Markov Process," *Operations Research* 9, no. 1 (1961): 105.
64. Ronald A. Howard, "Comments on the Origin and Application of Markov Decision Processes," *Operations Research* 50, no. 1 (2002): 100–102.
65. Howard, 100.
66. *Minutes of the Second Meeting of the Operations Research Discussion Group*, 10.
67. *Transcript of the Fourth Meeting of the Operations Research Discussion Group* (New York: Advertising Research Foundation, 1960), 37, Charles H. Sandage Papers, 1910–1999, box 11, Speeches, 1955–1964, Transcripts of Operations Research, University of Illinois Archives, Urbana; emphasis added.
68. Herniter and Magee, "Customer Behavior as a Markov Process," 121–122.
69. Richard Maffei, "A Mathematical Model of Brand Switching," in *Operations Research in Advertising: A Summary of Papers Presented to ARF's Operations Research Discussion Group* (New York: Advertising Research Foundation, 1961), 36.
70. Albert Wesley Frey, *Advertising*, 3rd ed. (New York: The Ronald Press Company, 1961), 3.

71. Frey, 13.
72. Frey, 505.
73. "A Profit Yardstick for Advertising," *Business Week*, November 22, 1958, 49.
74. Charles K. Ramond, "Science in Wonderland," *Journal of Advertising Research* 1, no. 1 (September 1960): 32.
75. John F. Magee, "The Problem: Can the Results of the Ad Budget be Scientifically Predicted?," in *Proceedings of the 4th ARF Conference* (New York: Advertising Research Foundation, 1958), 15.
76. Jay W. Forrester, "The Relationship of Advertising to Corporate Management," in *Proceedings of the 4th ARF Conference*, 76.
77. Forrester, 75, 92.
78. Jay W. Forrester, "Advertising: A Problem in Industrial Dynamics," *Harvard Business Review* 37, no. 2 (1959): 102.
79. Forrester, 110; Forrester, "Relationship of Advertising to Corporate Management," 90.
80. John D. C. Little, "Interview by Robert Klein," September 4, 2014, <https://www.informs.org/content/download/348559/3217056/file/Robert%20Klein%20Interviews%20John%20D.%20C.%20Little,%20September%204,%202014.pdf>.
81. John D. C. Little and Russell L. Ackoff, "How Techniques of Mathematical Analysis Have Been Used to Determine Advertising Budgets and Strategy," in *Proceedings of the 4th ARF Conference*, 19.
82. Little, "Interview by Robert Klein."
83. *Operations Research in Advertising*, iii.
84. *Operations Research in Advertising*, iii.
85. *A Report of the Ninth Meeting of the ARF Operations Research Discussion Group, November 7, 1963* (New York: Advertising Research Foundation, 1963).
86. Roger Barton, *Advertising Agency Operations and Management* (New York: McGraw-Hill, 1955), 52.
87. Barton, 52–53.
88. Robert Vincent Zacher, *Advertising Techniques and Management* (Homewood, IL: R. D. Irwin, 1961), 31.
89. Robert J. Kegerreis, "Marketing Management and the Computer: An Overview of Conflict and Contrast," *Journal of Marketing* 35, no. 1 (1971): 5.
90. Lipstein, "Prospects for the Management Sciences in Advertising," B2.
91. *Minutes of the First Meeting of the Operations Research Discussion Group*, 4.

92. David W. Miller and Martin K. Starr, *Executive Decisions and Operations Research* (New York: Prentice-Hall, 1961), 190–209.
93. Martin Starr, “Interview by Henrique Correa,” May 9, 2019, <https://www.informs.org/Explore/History-of-O.R.-Excellence/Biographical-Profiles/Starr-Martin-K>.
94. *Minutes of the First Meeting of the Operations Research Discussion Group*, 4.
95. David B. Learner and Fred Y. Philips, “Contributions to Marketing,” in *Systems and Management Science by Extremal Methods: Research Honoring Abraham Charnes at Age 70*, ed. Fred Young Philips and John James Rousseau (New York: Springer, 1992), 30–31.
96. See, e.g., A. Charnes, W. W. Cooper, J. K. DeVoe, D. B. Learner, and W. Reinecke, “Generation of Approximation of Reach and Distribution of Frequencies,” Systems Research Memorandum 171, Technological Institute, Northwestern University, February 14, 1967, <https://apps.dtic.mil/sti/pdfs/AD0656905.pdf>.
97. Letter to Dr. R. A. Wachsler, June 5, 1968, William W. Cooper Papers, box 26, folder 15, Carnegie Mellon University Archives.
98. “BBDO Advertising Agency—Meeting Minutes, 1965–1968,” William W. Cooper Papers, box 26, folder 15, Carnegie Mellon University Archives.
99. Lewis G. Pringle, “The Academy and the Practice: In Principle, Theory and Practice Are Different, but, in Practice, They Never Are,” *Marketing Science* 20, no. 4 (2001): 373.
100. Edward Brody, “Marketing Engineering at BBDO,” *Interfaces* 31, no. 3 (2001): S76.
101. “Into 1963,” January 1, 1963, 10, JWT New Business Records, box 8, Hartman Center; “Thompson a Pioneer in Field; Started Using Computer in '62,” *J. Walter Thompson Company News* 24, no. 5 (January 31, 1969), JWT Staff Newsletters, box MN15, Hartman Center.
102. “An Integrated System for Media Planning,” March 14, 1968, JWT Information Center Records, box 13, Documents Relating to Media and Media Buying, Hartman Center.
103. “Advertising Management,” J. Walter Thompson New York Office (1970), 4–5.
104. John David, *Operational Research and Marketing* (London: J. Walter Thompson Company, 1967), 1, JWT Publications, box IL2, Hartman Center.
105. David, 14.
106. Philip Kotler, “A Design for the Firm’s Marketing Nerve Center,” *Business Horizons* 9, no. 3 (1966): 63–74; John D. C. Little, “Adaptive Experimentation,” in *A Report of the Twelfth Meeting of the ARF Operations Research Discussion Group, April 19, 1965* (New York: Advertising Research Foundation, 1965), 1–27.
107. A. P. Zentler and Dorothy Ryde, “An Optimum Distribution of Publicity Expenditure in a Private Organisation,” *Management Science* 2, no. 4 (1956): 337–352.

108. B. Benjamin and J. Maitland, "Operational Research and Advertising: Some Experiments in the Use of Analogies," *Operational Research Quarterly* 9, no. 3 (1958): 207–217.
109. B. Benjamin, W. P. Jolly, and J. Maitland, "Operational Research and Advertising: Theories of Response," *Operations Research Quarterly* 11, no. 4 (1960): 205–218.
110. Simon Broadbent, "Media Planning and Computers by 1970: A Review of the Use of Mathematical Models in Media Planning," *Journal of the Royal Statistical Society Series C* 15, no. 3 (1966): 242–243.
111. Stanley I. Cohen, "The Rise of Management Science in Advertising," *Management Science* 13, no. 2 (1966): B10.
112. John C. Maloney, "Advertising Research and an Emerging Science of Mass Persuasion," *Journalism Quarterly* 41, no. 4 (1964): 518.
113. Maloney, 521.
114. Albert R. Kroeger, "The Computers Move in on Advertising," *Television* 20, no. 6 (1963): 43.
115. Langhoff, "The Setting," 3.
116. "Ule of K&E: Marketing Prophet," *Television* 17, no. 8 (1960): 89.
117. "Ule of K&E," 52.
118. John Nuccio, "Automation—Final Step in a Media Man's Evolution," *Sponsor*, July 13, 1964, 42.
119. Richard F. Reynolds, "They Laughed When I Sat Down to Play with My Dictionary," *Broadcasting*, June 18, 1962, 24.
120. Robert Bodeau, "Advertising Media: An Appraisal," *Journal of Advertising* 5, no. 1 (1976): 7–8.
121. William T. Moran, "Practical Media Decisions and the Computer," *Journal of Marketing* 27, no. 3 (1963): 32.
122. Lazer, "Operations Research and Marketing Science," 439.
123. "Math Penetrates the Social Sciences," *New York Times*, December 16, 1969, 49–51; Jagdish N. Sheth, "The Multivariate Revolution in Marketing Research," *Journal of Marketing* 35, no. 1 (1971): 13–19.
124. Jagdish N. Sheth, "Multivariate Analysis in Marketing," *Journal of Advertising Research* 10, no. 1 (1970): 29.
125. Philip Kotler, "The Use of Mathematical Models in Marketing," *Journal of Marketing* 27, no. 4 (1963): 41.
126. Fred J. Gross, "Critique of OR," *Journal of Marketing* 30, no. 1 (1966): 108.
127. Little and Ackoff, "How Techniques of Mathematical Analysis Have Been Used," 23.

128. Brody, "Marketing Engineering at BBDO," 577.
129. Charles Ramond, "E=mc²," *Television* 18, no. 2 (1961): 59.
130. Dudley M. Ruch, "Management Decision Guided by Quantitative Research," in *A Report of the Seventh Meeting of the ARF Operations Research Discussion Group* (New York: Advertising Research Foundation, 1962), 3.
131. Herbert A. Simon, "Theories of Decision-Making in Economics and Behavioral Science," *American Economic Review* 49, no. 3 (1959): 253–283.
132. Donald C. Marschner, "Theory versus Practice in Allocating Advertising Money," *Journal of Business* 40, no. 3 (1967): 301.
133. Pillsbury's Dudley Ruch quoted in "OR Discussion Group, Thursday Morning Session, June 28, 1962," in *Report of the Seventh Meeting of the ARF Operations Research Discussion Group*, 7.
134. "Longman Warns of Marketing 'Fads,'" *J. Walter Thompson Company News* 18, no. 22 (June 28, 1963): 8, JWT Staff Newsletters, box MN12, Hartman Center.
135. *Minutes of the Second Meeting of the Operations Research Discussion Group*, 21.
136. Michael Halbert quoted in "Discussion of Learner and Godfrey Papers," in *Mathematical Methods of Media Selection: A Report of the Sixth Meeting of the ARF Operations Research Discussion Group, December 18* (New York: Advertising Research Foundation, 1961), 6.
137. A. S. C. Ehrenberg, "Models of Fact: Examples from Marketing," *Management Science* 16, no. 7 (March 1970): 435–445.
138. A. S. C. Ehrenberg, "Laws in Marketing: A Tail-Piece," *Journal of the Royal Statistical Society Series C Applied Statistics* 15, no. 3 (1966): 267.
139. Ehrenberg, "Models of Fact," 339.
140. John F. Magee, "Application of Operations Research to Marketing and Related Management Problems," *Journal of Marketing* 18, no. 4 (1954): 367.
141. Rieder, "Scrutinizing an Algorithmic Technique," 110.
142. Howard, "Operations Research and Market Research," 145.
143. *Minutes of the First Meeting of the Operations Research Discussion Group*, 13.
144. *Minutes of the First Meeting of the Operations Research Discussion Group*, 14.
145. Kenneth A. Longman, "Galileo Galilei's Ghost," *Management Science* 13, no. 12 (1967): B852–B853.
146. "OR Discussion, Thursday Morning Session, June 28, 1962" in *Report of the Seventh Meeting of the ARF Operations Research Discussion Group*, 23.
147. A. Charnes, W. W. Cooper, D. B. Learner, and F. Y. Phillips, "Management Science and Marketing Management," *Journal of Marketing* 49, no. 2 (1985): 96, 102.

148. Ilyse Liffreing, "Confessions of a Data Scientist," *Digiday*, November 19, 2018, <https://digiday.com/marketing/confessions-data-scientist-marketers-dont-know-theyre-asking/>.

149. A. C. Nielsen Jr., "Marketing Expenditures: The Staff of Product Life," in *Effective Marketing Coordination: Proceedings of the Forty-Fourth National Conference of the American Marketing Association*, ed. George L. Baker Jr. (Chicago: AMA, 1961), 321.

150. Nielsen, 325.

151. Nielsen, 321.

152. Darrell Blaine Lucas and Steuart Henderson Britt, *Measuring Advertising Effectiveness* (New York: McGraw-Hill, 1963), 379–380.

CHAPTER 4

1. "A Media Rule of Thumb Is Ended," *New York Times*, November 16, 1961, 52; "Mathematical Programming for Better Selection of Advertising Media," *Computers and Automation* 10, no. 12 (1961): 12.

2. Wilson quoted in "Mathematical Programming for Better Selection of Advertising Media," 13.

3. Richard P. Jones, "The Quiet Revolution in Media Planning," *Media Decisions* 2, no. 9 (1967): 36.

4. John D. C. Little and Leonard M. Lodish, "MEDIAC: An On-Line Media Selection System" (working paper 298–67, Alfred P. Sloan School of Management, Massachusetts Institute of Technology, November 1967), 2.

5. Douglas B. Brown, "A Practical Procedure for Media Selection," *Journal of Marketing Research* 4, no. 2 (1967): 263.

6. Philip A. Doherty, "A Closer Look at Operations Research," *Journal of Marketing* 27, no. 2 (1963): 65.

7. David Aaker, "Management Science in Marketing: The State of the Art," *Interfaces* 3, no. 4 (1973): 20.

8. Ronald R. Kline, *The Cybernetics Moment: Or Why We Call Our Age the Information Age* (Baltimore: Johns Hopkins University Press, 2015), 136.

9. Robert S. Weinberg, *An Analytical Approach to Advertising Expenditure Strategy* (New York: Association of National Advertisers, 1960), viii.

10. Martin L. Bell, "Leaders in Marketing: Robert Stanley Weinberg," *Journal of Marketing* 35, no. 1 (1971): 49.

11. Weinberg, *Analytical Approach to Advertising Expenditure Strategy*, 6.

12. Weinberg, 89.

13. Gwyn Collins, "Basic Math for Big Problems," *Journal of Advertising Research* 1, no. 1 (1960): 24.
14. "Mathematical Models and Marketing Strategy," *Television* 17, no. 11 (1960): 58.
15. John F. Magee, "The Problem: Can the Results of the Ad Budget be Scientifically Predicted?," *Proceedings of the 4th ARF Conference* (New York: Advertising Research Foundation, 1958): 15.
16. David B. Montgomery and Glen L. Urban, *Management Science in Marketing* (Englewood Cliffs, NJ: Prentice-Hall, 1969), 95.
17. David W. Miller and Martin K. Starr, *Executive Decisions and Operations Research* (Englewood Cliffs, NJ: Prentice-Hall, 1960), 190.
18. Miller and Starr, 192.
19. Miller and Starr, 193.
20. Alec M. Lee, "Decision Rules for Media Scheduling: Static Campaigns," *Operational Research Quarterly* 13, no. 3 (1962): 229.
21. Simon Broadbent, "Media Planning and Computers by 1970: A Review of the Use of Mathematical Models in Media Planning," *Journal of the Royal Statistical Society Series C* 15, no. 3 (1966): 248.
22. Philip Shabecoff, "Research in Revolution," *Sponsor*, January 28, 1963, 33.
23. Ien Ang, *Desperately Seeking the Audience* (New York: Routledge, 1991), 50.
24. Alexander Henderson and Robert Schlaifer, "Mathematical Programming: Better Information for Better Decision Making," *Harvard Business Review* 32, no. 3 (1954): 94.
25. Wroe Alderson, *Marketing Behavior and Executive Action* (Homewood, IL: R. D. Irwin, 1957), 406.
26. Marion Harper Jr., "A New Profession to Aid Management," *Journal of Marketing* 25, no. 3 (1961): 2.
27. Peter Langhoff, "The Setting: Some Non-Metric Observations," in *Models, Measurement, and Marketing*, ed. Peter Langhoff (Englewood Cliffs, NJ: Prentice-Hall, 1965), 9.
28. Wiebe E. Bijker, "How Is Technology Made? That Is the Question!," *Cambridge Journal of Economics* 34, no. 1 (2010): 63–76.
29. Kenneth J. Arrow, "Decision Theory and Operations Research," *Operations Research* 5, no. 6 (1957): 765.
30. Roger Barton, *Advertising Agency Operations and Management* (New York: McGraw-Hill, 1955), 17.
31. Thomas A. Wright, "The Timebuyer: What's His Future?," *Sponsor*, January 20, 1964, 40.

32. Shabecoff, "Research in Revolution," 26.
33. "Buyers Should Know the Big Picture," *Sponsor*, March 30, 1964, 40. ARB stands for American Research Bureau, and SRDS is Standard Rate and Data Service.
34. Shabecoff, "Research in Revolution," 25.
35. Beardsley Graham, "Is TV Management Flying Blind," *Television* 23, no. 1 (1966): 47.
36. Shabecoff, "Research in Revolution," 25.
37. Albert R. Kroeger, "The Computers Move in on Advertising," *Television* 20, no. 6 (1963): 78.
38. "Media Departments—1966," *Sponsor*, October 23, 1961, 26. See also Jones, "Quiet Revolution in Media Planning," 36.
39. William G. White, "Timebuyer of the Seventies: What Will His Job Be?," *Sponsor*, January 27, 1964, 38.
40. White, 41.
41. E. Lawrence Deckinger, "Media Selection Is an Art, Not a Science," *Television* 17, no. 8 (1960): 49.
42. Joseph St. George, "How Practical Is the Media Model?," *Journal of Marketing* 27, no. 3 (1963): 31–32.
43. Robert S. Weinberg, "Management Science and Marketing Strategy," in *Marketing and the Computer*, ed. Wroe Alderson and Stanley J. Shapiro (Englewood Cliffs, NJ: Prentice-Hall, 1963), 106.
44. David Learner, "Mathematical Programming for Better Media Selection," in *Mathematical Methods of Media Selection: A Report of the Sixth Meeting of the ARF Operations Research Discussion Group* (New York: Advertising Research Foundation, 1961); Clark Wilson, "Linear Programming Basics," in *Proceedings of the 8th Annual ARF Conference* (New York: Advertising Research Foundation, 1962), 78–83.
45. "Questions to Clark L. Wilson and Herbert D. Maneloveg," in *Proceedings of the 8th Annual ARF Conference*, 96.
46. "Mathematical Programming for Better Selection of Advertising Media," 14.
47. Broadbent, "Media Planning and Computers by 1970," 242.
48. "Discussion of Learner and Godfrey Papers," in *Mathematical Methods of Media Selection*, 10.
49. "Computers Speed up Tedious Job of Selecting Advertising Media," *Business Week*, November 18, 1961, 49.
50. Quoted in Robert Dow Buzzell, *Mathematical Models and Marketing Management* (Boston: Division of Research, Graduate School of Business Administration, Harvard University, 1964), 95–96.

51. Dennis H. Gensch, "Computer Models in Advertising Media Selection," *Journal of Marketing Research* 5, no. 4 (1968): 415.
52. Aaker, "Management Science in Marketing," 20.
53. Donald E. Sexton Jr., "Microsimulating Consumer Behavior," in *Models of Buyer Behavior: Conceptual, Quantitative, and Empirical*, ed. Jagdish N. Sheth (New York: Harper & Row, 1974), 88.
54. Ralph L. Day, "Linear Programming in Media Selection," *Journal of Advertising Research* 2 (1962): 44.
55. Broadbent, "Media Planning and Computers by 1970," 242.
56. See, e.g., Martin Kenneth Starr, "Management Science and Marketing Science," *Management Science* 10, no. 3 (1964): 563.
57. Stanley Canter quoted in "Discussion of Learner and Godfrey Papers," in *Mathematical Methods of Media Selection*, 5.
58. Harold Weitz, "The Promise of Simulation in Marketing," *Journal of Marketing* 31, no. 3 (1967): 30.
59. Broadbent, "Media Planning and Computers by 1970," 242.
60. Charles B. Weinberg, "Frontiers in Marketing," *Journal of Advertising Research* 9, no. 2 (1969): 59; A. Charnes, W. W. Cooper, J. K. DeVoe, D. B. Learner, and W. Reinecke, "A Goal Programming Model for Media Planning," *Management Science* 14, no. 8 (1968): B423-B430; John D. C. Little and Leonard M. Lodish, "A Media Selection Model and Its Optimization by Dynamic Programming," *Industrial Management Review* 8, no. 1 (1966): 15-24.
61. "Tune Down Gain, Urges Harper," *Broadcasting*, November 19, 1962, 54.
62. Buzzell, *Mathematical Models and Marketing Management*, 97.
63. Learner, "Mathematical Programming for Better Media Selection," 2.
64. "Advertising Enters Age of Computers," *Sponsor*, January 29, 1962, 28-29.
65. "Mathematical Programming for Better Selection of Advertising Media," 21.
66. "Discussion of Learner and Godfrey Papers," 1.
67. Jones, "Quiet Revolution in Media Planning," 38.
68. Stanley I. Cohen, "The Rise of Management Science in Advertising," *Management Science* 13, no. 2 (1966): B25.
69. "Y&R, BBDO Unleash Media Computerization," *Advertising Age*, October 1, 1962, 118.
70. "Questions to William T. Moran, Kenneth Longman (Assistant Director of Research), Joseph F. St. George (Associate Media Director), Young and Rubicam, Inc.," in *Proceedings of the 8th Annual ARF Conference*, 90.

71. Gary L. Lilien and Philip Kotler, *Marketing Decision Making: A Model-Building Approach* (New York: Harper & Row, 1983), 517.
72. "Y&R, BBDO Unleash Media Computerization," 118.
73. Kroeger, "Computers Move in on Advertising," 74.
74. William T. Moran, "Practical Media Decisions and the Computer," *Journal of Marketing* 27, no. 3 (1963): 29–30.
75. Bill Harvey, "A Brief Personal History of Media Optimization" (unpublished manuscript, shared by the author, February 2018), 3.
76. Kroeger, "Computers Move in on Advertising," 74.
77. "Orange-Bordered Reminder Heralds New Golden Age," *J. Walter Thompson Company News* 19, no. 30 (August 14, 1964): 7, JWT Staff Newsletters, box MN 13, Hartman Center.
78. "An Integrated System for Media Planning," March 14, 1968, JWT Information Center Records, box 13, Documents Relating to Media and Media Buying, Hartman Center.
79. "Integrated System for Media Planning," 1.
80. "Integrated System for Media Planning," 2–3.
81. "Integrated System for Media Planning," 3.
82. See, e.g., "Local Market Network/Spot TV Analysis System," January 28, 1972, JWT Staff Newsletters, box DO18, Media Reports, 1972–1973, Hartman Center.
83. "Media Analysis Bibliography 1970–1972," June 1973, JWT Information Center Records, box 13, Documents Relating to Media and Media Buying, Hartman Center.
84. "Advertising Management" (1970), JWT Publications, London Office, box IL3, Hartman Center.
85. Jill Lepore, *If Then: How the Simulmatics Corporation Invented the Future* (New York: Liveright, 2020), 152; "Du Pont Signs to Use Simulmatics' Media-Mix," *Broadcasting*, December 10, 1962, 10.
86. Ithiel de Sola Pool, "Automated New Tool for Decision Makers," *Challenge* 11, no. 6 (1963): 26.
87. "Mechanized 'Dry Runs' for Ad Campaigns," *Broadcasting*, May 28, 1962, 40.
88. "Discussion of Bernstein Paper," in *Mathematical Methods of Media Selection*, 8.
89. Alex Bernstein, "Computer Simulation of Media Exposure," in *Mathematical Methods of Media Selection*, 10.
90. Bernstein, 4.
91. "What Computer Simulation Can Do," *Broadcasting*, October 16, 1961, 38.
92. "Mechanized 'Dry Runs' for Ad Campaigns," 45.

93. Pool, "Automated New Tool," 27.
94. William R. Fair, "Analogue Computations of Business Decisions," *Journal of the Operations Research Society of America* 1, no. 4 (1953): 210–211.
95. Magee, "The Problem," 17.
96. *Transcript of the Fourth Meeting of the Operations Research Discussion Group* (New York: Advertising Research Foundation, 1960), 2.
97. Lepore, *If Then*, 153.
98. Moran, "Practical Media Decisions and the Computer," 30.
99. Moran, 26.
100. "Discussion of Bernstein Paper," 5–6.
101. "Tune Down Gain, Urges Harper," 54.
102. "Canned 'Public?'," *Broadcasting*, April 23, 1962, 44.
103. John R. Hauser and Glen L. Urban, "John D. C. Little," in *Profiles in Operations Research: Pioneers and Innovators*, ed. Arjang A. Assad and Saul I. Gass (New York: Springer, 2011), 662.
104. Franck Cochoy, "Another Discipline for the Market Economy: Marketing as a Performative Knowledge and Know-How for Capitalism," *Sociological Review* 46, no. S1 (1998): 212.
105. John D. C. Little and Leonard Lodish, "A Media Planning Calculus," *Operations Research* 17, no. 1 (1969): 3.
106. Little and Lodish, "MEDIAC," 4.
107. Little and Lodish, 1.
108. Little and Lodish, "Media Planning Calculus," 3.
109. Little and Lodish, "MEDIAC," 6.
110. Little and Lodish, 8.
111. Little and Lodish, "Media Planning Calculus," 31.
112. Little and Lodish, 4.
113. Little and Lodish, 29.
114. Little named Coca-Cola and Nabisco as clients acquired through these seminars. John D. C. Little, "Interview by Robert Klein," September 4, 2014, <https://www.informs.org/content/download/348559/3217056/file/Robert%20Klein%20Interviews%20John%20D.%20C.%20Little,%20September%204,%202014.pdf>.
115. Philip H. Dougherty, "Computer Aid for Media Men," *New York Times*, June 26, 1968, 70.
116. Montgomery and Urban, *Management Science in Marketing*, 362.

117. Malcom McNiven and Bob D. Hilton, "Reassessing Marketing Information Systems," *Journal of Advertising Research* 10, no. 1 (1970): 6, 9.
118. John D. Leckenby and Heejin Kim, "How Media Directors View Reach/Frequency Estimation: Now and a Decade Ago," *Journal of Advertising Research* 34, no. 5 (1994): 13.
119. Lilien and Kotler *Marketing Decision Making*, 523.
120. Herbert Maneloveg, "A Year of L.P. Media Planning for Clients," in *Proceedings of the 8th Annual ARF Conference*, 88–89.
121. Anna McCarthy, *The Citizen Machine: Governing by Television in 1950s America* (New York: New Press, 2010).
122. "A Profit Yardstick for Advertising," *Business Week*, November 22, 1958, 49–50, 52.
123. Zygmunt Bauman, *Consuming Life* (Cambridge: Polity, 2007).
124. "Questions to Moran, Longman, St. George, Young and Rubicam," 91.
125. "Questions to Wilson and Maneloveg," 97; emphasis added.
126. Philip M. Napoli, *Audience Evolution: New Technologies and the Transformation of Media Audiences* (New York: Columbia University Press, 2011), 30–31.
127. See Bruce G. Carruthers and Wendy Nelson Espeland, "Accounting for Rationality: Double-Entry Bookkeeping and the Rhetoric of Economic Rationality," *American Journal of Sociology* 97, no. 1 (1991): 31–69.
128. Jenna Burrell and Marion Fourcade, "The Society of Algorithms," *Annual Review of Sociology* 47 (2021): 218.
129. Peter Drucker, "Automation—Forerunner of a Marketing Revolution?," in *The Marketing Revolution: Proceedings of the Thirty-Seventh National Conference of the American Marketing Association, New York, December 27th–29th, 1955* (New York: American Marketing Association, 1956), 37.
130. Caitlin Zaloom, *Out of the Pits: Traders and Technology from Chicago to London* (Chicago: University of Chicago Press, 2006), 165.

INTERLUDE

Epigraph: Jay W. Forrester, "Industrial Dynamics," *Harvard Business Review* 36, no. 4 (1958): 37.

1. James J. Gibson, *The Ecological Approach to Visual Perception* (Hillsdale, NJ: Lawrence Erlbaum Associates, 1979); Erica Robles Anderson and Scott Ferguson, "The Visual Cliff: Eleanor Gibson and the Origins of Affordance," *Money on the Left*, April 19, 2022, <https://moneyontheleft.org/2022/04/19/the-visual-cliff-eleanor-gibson-the-origins-of-affordance/>.
2. Ian Hutchby, "Technologies, Texts and Affordances," *Sociology* 35, no. 2 (2001): 441–456; Paul M. Leonardi, "Theoretical Foundations for the Study of Sociomateriality,"

Information and Organization 23, no. 1 (2013): 59–76; Adrien Shaw, “Encoding and Decoding Affordances: Stuart Hall and Interactive Media Technologies,” *Media, Culture & Society* 39, no. 4 (2017): 592–602.

3. Peter Nagy and Gina Neff, “Imagined Affordance: Reconstructing a Keyword for Communication Theory,” *Social Media + Society* 1, no. 2 (2015): 1–9.

4. Shoshana Zuboff, “Big Other: Surveillance Capitalism and the Prospects of an Information Civilization,” *Journal of Information Technology* 30, no. 1 (2015): 75–89.

5. Carolyn Marvin helped me think through this perspective during many patient conversations.

CHAPTER 5

1. Charles Sinclair, “‘Automation Buying’ Era Dawns on Agency Row,” *Billboard*, September 16, 1957, 1, 13.

2. James W. Cortada, *The Digital Hand*, vol. 2, *How Computers Changed the Work of American Financial, Telecommunications, Media, and Entertainment Industries* (New York: Oxford University Press, 2004), 353.

3. See, e.g., Jeffery F. Rayport, “Is Programmatic Advertising the Future of Marketing?,” *Harvard Business Review*, June 22, 2015, <https://hbr.org/2015/06/is-programmatic-advertising-the-future-of-marketing>.

4. David Beer, “Envisioning the Power of Data Analytics,” *Information, Communication & Society* 21, no. 3 (2018): 466.

5. Joseph Turow, *The Daily You: How the New Advertising Industry Is Defining Your Identity and Your Worth* (New Haven, CT: Yale University Press, 2011).

6. Advertising was one of many industries heralding the revolutionary power of computers, management science, and information systems in the 1950s. Thomas Haigh shows how corporations positioned operations research and computers as harbingers of optimization and clerical automation—the same claims discussed in this chapter. Thomas Haigh, “The Chromium-Plated Tabulator: Institutionalizing an Electronic Revolution, 1954–1958,” *IEEE Annals of the History of Computing* 23, no. 4 (2001): 75–104; Thomas Haigh, “Inventing Information Systems: The Systems Men and the Computer, 1950–1968,” *Business History Review* 75, no. 1 (2001): 15–61.

7. For textbook explanations of spot advertising, see Bruce M. Owen and Steven S. Wildman, *Video Economics* (Cambridge, MA: Harvard University Press, 1999), 11–14; Helen Katz, *The Media Handbook: A Complete Guide to Advertising Media Selection, Planning, Research, and Buying*, 6th ed. (New York: Routledge, 2016), 60.

8. Cathy Taylor, “The Repping of the Web,” *Mediaweek* 6, no. 9 (1996): IQ20.

9. “Room at the Top” (advertisement), *Sponsor*, January 9, 1960, 15.

10. “Buyers Should Know the ‘Big Picture,’” *Sponsor*, March 30, 1964, 40.

11. "MGM-TV to Ride Demographic Trend," *Sponsor*, December 28, 1964, 15.
12. "JWT Orders Advanced Computer from RCA," *J. Walter Thompson Company News* 17, no. 37 (September 12, 1962): 3, JWT Staff Newsletters, box MN12, Hartman Center.
13. "Walter Herman—The Man behind the Machine," *J. Walter Thompson Company News* 18, no. 3 (January 23, 1963), JWT Staff Newsletters, box MN12, Hartman Center.
14. ARB was bought by CEIR in 1960, and both organizations were absorbed by Control Data Corporation around 1967.
15. "Electronic Brain for Timebuying," *Broadcasting*, May 25, 1959, 31.
16. "Electronic Brain for Timebuying," 31–32.
17. "Automation Buying in Pilot Use at BBDO," *Broadcasting*, November 13, 1961, 9.
18. "Media Buying: With or without the Numbers?," *Broadcasting*, November 20, 1961, 50.
19. Douglas B. Brown and Martin R. Warshaw, "Media Selection by Linear Programming," *Journal of Marketing Research* 2, no. 1 (1965): 86.
20. "Two Big Agencies Pack Electronic Hardware," *Broadcasting*, October 1, 1962, 34.
21. "More Agencies Automate Operations," *Broadcasting*, September 24, 1962, 36.
22. "Tyson's Advice to Time Buyer: 'Gotta Play It the Computer Way,'" *Variety*, January 16, 1963, 50.
23. "Mathematical Programming for Better Selection of Advertising Media," *Computers and Automation* 10, no. 12 (1961): 19.
24. "Two Big Agencies Pack Electronic Hardware," 34.
25. "NAB Convention: Computers Work Praised," *Broadcasting*, April 8, 1963, 66.
26. "Status Report: Agency Automation," *Broadcasting*, July 1, 1963, 32.
27. "Data Processing at H-R in '64," *Broadcasting*, June 17, 1963, 44.
28. "Computer Use Rises," *Sponsor*, April 13, 1964, 40; "A World of Computers Plugged in by Humans," *Broadcasting*, June 1, 1964, 30.
29. "Are Computers Worth What They Cost?," *Broadcasting*, June 13, 1966, 42.
30. "Top 50 Agencies . . . and Their 1966 Radio-TV Billings," *Broadcasting*, November 28, 1966, 30–31.
31. Rena Bartos, *The Future of the Advertising Agency Research Function* (New York: American Association of Advertising Agencies, 1974), 33, JWT Staff Writings & Speeches, box RL.00762, Hartman Center.
32. "Top 50 Agencies . . . and Their 1960 Radio-TV Billings," *Broadcasting*, November 21, 1960, 28–29.
33. "Top 50 Agencies . . . and Their 1966 Radio-TV Billings."

34. "NAB Convention: Computers Work Praised," 66.
35. "Y&R, BBDO Unleash Media Computerization," *Advertising Age*, October 1, 1962, 118.
36. "Are Computers Worth What They Cost?," 43.
37. "Are Computers Worth What They Cost?," 43.
38. Albert R. Kroeger, "The Computers Move in on Advertising," *Television* 20, no. 6 (1963): 45.
39. Simon Broadbent, "Media Planning and Computers by 1970: A Review of the Use of Mathematical Models in Media Planning," *Journal of the Royal Statistical Society Series C* 15, no. 3 (1966): 243.
40. "Y&R, BBDO Unleash Media Computerization," 118.
41. "Are Computers Worth What They Cost?," 43.
42. "Seven Top Agencies to Tackle Computerized Media Planning," *Sponsor*, December 21, 1964, 3.
43. "Are Computers Worth What They Cost?," 43.
44. Richard P. Jones, "The Quiet Revolution in Media Planning," *Media Decisions* 2, no. 9 (1967): 36.
45. Jones, 38.
46. "The Battle of the Computer Marketeers," *Fortune*, January 1, 1965, 171–172.
47. "Advertising: Fine Points Get Finer?," *Broadcasting*, November 6, 1961, 36.
48. A 1963 advertisement showcased this symbiotic relationship, promoting SRDS Data Incorporated—an information service that analyzed masses of media data at "finger-snapping speed"—and Honeywell computers, "the muscle behind this magic." Honeywell is "big in marketing circles," the ad explained: "BBDO, the ad agency, uses a [Honeywell] 400 to help stretch media dollars. A. C. Nielsen Co.—the world's largest market-research organization—has three Honeywell computers." *Wall Street Journal*, June 11, 1963, 30.
49. "The Ad Thinkers and the Computers," *Broadcasting*, October 8, 1962, 36.
50. Richard C. Christian, "The Computer and the Marketing Man," *Journal of Marketing* 26, no. 3 (1962): 80.
51. US Department of Commerce, Bureau of the Census, *Statistical Abstract of the United States, 1970* (Washington, DC: Government Printing Office, 1970), 495.
52. Del DePierro, "TV Buyer's Obstacle Course," *Sponsor*, September 8, 1964, 36.
53. "Reps Surviving Greatest Crisis," *Broadcasting*, February 26, 1962, 80.
54. Erik Barnouw, *The Sponsor: Notes on a Modern Potentate* (New Brunswick, NJ: Transaction Publishers, 2009), 47–58; William Boddy, *Fifties Television: The Industry and Its Critics* (Urbana: University of Illinois Press, 1990), 157–164; Cynthia B. Meyers,

"From Sponsorship to Spots: Advertising and the Development of Electronic Media," in *Media Industries: History, Theory, and Method*, ed. Jennifer Holt and Alisa Perren (Malden, MA: Wiley-Blackwell, 2009), 69–80.

55. Boddy, *Fifties Television*, 159.

56. Sinclair, "'Automation Buying' Era Dawns on Agency Row," 1.

57. Cortada, *Digital Hand*, 2:352–356.

58. "How Data Processing Fits into Networking," *Broadcasting*, June 13, 1966, 48–49.

59. "World of Computers Plugged in by Humans," 34.

60. "Are Computers Worth What They Cost?," 43.

61. "NAB Convention: Computers Work Praised," 66.

62. Gene Accas, "What to Do 'Til the Univac Comes," *Broadcasting*, January 19, 1959, 29.

63. "For Reps, Computers Are the Rainbow's End," *Broadcasting*, June 13, 1966, 52.

64. "Lavin Says TV Rates Are High," *Broadcasting*, November 25, 1963, 57.

65. "There's No Business Like Computer Business," *Broadcasting*, June 27, 1977, 47.

66. "Shake-out among the Station Reps," *Broadcasting*, May 19, 1969, 67; US Department of Commerce, *Statistical Abstract of the United States, 1970*, 497.

67. US Department of Commerce, Bureau of the Census, *Statistical Abstract of the United States, 1980* (Washington, DC: Government Printing Office, 1980), 587.

68. "How TV Business Has Come Back," *Broadcasting*, November 25, 1968, 42–43.

69. "Private Eyes for TV Advertisers," *Broadcasting*, September 11, 1967, 31.

70. George J. Simko, "The Problem of Surviving in the Paperwork Jungle," *Broadcasting*, February 16, 1970, 18.

71. "Commercial Misplacement," *Broadcasting*, July 1, 1963, 5.

72. Media Payment Corporation, "A \$149 Misunderstanding" (advertisement), *Broadcasting*, March 26, 1973, 12.

73. Tom Lux, "Computer Power: Taking the Machete to Advertising's Paper Jungle," *Broadcasting*, June 24, 1974, 22.

74. "Computers in the Paper Jungle," *Broadcasting*, June 13, 1966, 42.

75. "Bristol-Myers Hard Sell," *Fortune*, February 1967, 118.

76. "Spot TV's Heaviest Spenders in 1966," *Broadcasting*, April 3, 1967, 56–57.

77. "World of Computers Plugged in by Humans," 32.

78. Robert Heady, "Computers Bring New Dimension to Ad Field," *Advertising Age*, December 10, 1962, 88–90.

79. "Leo Burnett Adopts Computer Processes," *Broadcasting*, October 15, 1962, 30.

80. "Computers to Make Media Buying More Marketing-Oriented, 4A's Told," *Advertising Age*, November 19, 1962, 108.
81. Bruce Hirsch, "Media Department Goes Computerized for Savings in Expense and Time," *Broadcasting*, May 7, 1973, 18.
82. Frank L. McKibbin, "Computerization, the Great Equalizer," *Broadcasting*, May 24, 1971, 18.
83. "Automation Speeds up Spot Sales," *Broadcasting-Telecasting*, October 7, 1957, 70.
84. "Univac to Invade Timebuying, Selling," *Broadcasting-Telecasting*, November 19, 1956, 98.
85. Sinclair, "'Automation Buying' Era Dawns on Agency Row," 2.
86. "Automation Speeds up Spot Sales," 70, 72.
87. "For Reps, Computers Are the Rainbow's End," 56.
88. "Data Processing at H-R in '64," 44.
89. "Data Processing at H-R in '64," 44.
90. "For Reps, Computers Are the Rainbow's End," 50-51.
91. "Codel: The Computer Is Slowed by Doubters," *Broadcasting*, April 25, 1966, 36.
92. "Katz to Get Computer and Increase Staff," *Broadcasting*, November 16, 1964, 34.
93. "There's No Business Like Computer Business," 56.
94. Kroeger, "Computers Move in on Advertising," 69.
95. "Agencies Praise H-R Move," *Broadcasting*, June 17, 1963, 46.
96. See JoAnne Yates, "Business Use of Information and Technology during the Industrial Age," in *A Nation Transformed by Information*, ed. Alfred D. Chandler Jr. and James W. Cortada (New York: Oxford University Press, 2000), 107-135.
97. "JWT Orders Advanced Computer from RCA," *J. Walter Thompson Company News* 17, no. 37 (September 12, 1962): 1, JWT Staff Newsletters, box MN12, Hartman Center.
98. Heady, "Computers Bring New Dimension to Ad Field," 3.
99. Robert Heady, "Computer Taking over Media-Market Selection," *Advertising Age*, December 17, 1962, 25. The source does not stipulate whether this was a one-time or recurring expense.
100. Herb Maneloveg, "The Function of the Media Man: Media Planning" (speech transcript), BBDO Client Media Seminar, St. Moritz Hotel, December 1, 1966, 15.
101. "World of Computers Plugged in by Humans," 30.
102. World of Computers Plugged in by Humans," 32.
103. "Computers Make Media Buying More Marketing-Oriented, 4A's Told," 108.
104. "Shake-out among the Station Reps," 66.

105. "The Competition Gets Keener as the Pie Gets Larger," *Broadcasting*, June 4, 1979, 46.
106. "Tyson's Advice to Time Buyer," 27.
107. Heady, "Computer Taking over Media-Market Selection."
108. "What Food for Computers?," *Broadcasting*, April 29, 1963, 28.
109. Kroeger, "Computers Move in on Advertising," 72.
110. Bennett Cyphers and Gennie Gebhart, "Behind the One-Way Mirror: A Deep Dive into the Technology of Corporate Surveillance," Electronic Frontier Foundation, December 2, 2019, <https://www.eff.org/wp/behind-the-one-way-mirror>.
111. Simko, "Problem of Surviving in the Paperwork Jungle," 18.
112. George Simko, "New Technology for an 'Old' Problem," *Broadcasting*, November 8, 1971, 14.
113. "Y&R, BBDO Unleash Media Computerization," 118. See also Heady, "Computers Bring New Dimension to Ad Field," 88.
114. "AAA's Demographic 'White Paper,'" *Broadcasting*, July 15, 1963, 33.
115. "Computers in the Paper Jungle," 42.
116. "Way to Make Spot Buying Easy," *Broadcasting*, September 25, 1967, 31.
117. "How TV Business Has Come Back," *Broadcasting*, November 25, 1968, 43. See also "The Computer and the Buyers and Sellers of of [sic] Broadcast Time," *Broadcasting*, April 22, 1974, 44–46.
118. "There's No Business Like Computer Business," 50.
119. Taina Bucher, *If . . . Then: Algorithmic Power and Politics* (New York: Oxford University Press, 2018), 4–5.
120. "SOS Accepted by Most Reps," *Broadcasting*, February 5, 1968, 25.
121. "Agencies Praise H-R Move," 46.
122. "Lavin Says TV Rates are High," 57.
123. "Agencies Praise H-R Move," 46.
124. Malcolm B. Ochs, "Computer Technology: The Potential Revolution in Media Buying," *Broadcasting*, November 27, 1967, 20.
125. "World of Computers Plugged in by Humans," 30
126. "Failures Mark Machine Billing," *Broadcasting*, June 13, 1966, 58.
127. "For Reps, Computers Are the Rainbow's End," 50.
128. "For Reps, Computers Are the Rainbow's End," 50–51.
129. "Future Shock: It's Here Now for the Reps," *Broadcasting*, July 14, 1975, 32.
130. "What Will Television Be Like in '72," *Broadcasting*, November 30, 1967, 39, 42.

131. "ANA Session Spotlights Broadcast Buying," *Broadcasting*, December 10, 1973, 39.
132. "Digital Deal," *Broadcasting*, April 15, 1974, 65.
133. "Instant Avails," *Broadcasting*, January 19, 1976, 7.
134. "World of Computers Plugged in by Humans," 32.
135. "New Setup at Campbell-Ewald," *Broadcasting*, September 6, 1965, 44.
136. "RCA Computer Starts Automation at NH&S," *Broadcasting*, May 16, 1966, 40.
137. Bern Kanner, "The Computer Can Be Useful When Its Limits Are Recognized," *Broadcasting*, October 8, 1962, 26.
138. "Pellegrin Warns of 'Slideruling,'" *Variety*, February 5, 1958, 50.
139. "Should Agencies Get 20% for Spot TV?," *Broadcasting*, April 28, 1968, 20. The consultant was Lee Rich, who became a celebrated television producer.
140. "Shake-out among the Station Reps," 66.
141. "For Reps, Computers Are the Rainbow's End," 51.
142. "Goose and Gander," *Broadcasting*, April 8, 1991, 8.
143. "There's No Business Like Computer Business," 49.
144. "Cosmos Broadcasting Corporation" (advertisement), *Broadcasting*, January 1, 1979, 20–21.
145. Heady, "Computers Bring New Dimension to Ad Field," 88.
146. "Let's Unshackle the Timebuyer," *Broadcasting*, October 24, 1955, 52.
147. "Media Buying: With or without the Numbers?," 56.
148. "Advertising Enters the Age of Computers," *Sponsor*, January 29, 1962, 50.
149. "Electronic Brain for Timebuying," 31.
150. "Buying by Computer," *Broadcasting*, August 12, 1963, 30.
151. Bill Greeley, "Automation Displacing Media Buyer?," *Variety*, February 28, 1962, 34; "People Not Computers, Make Agency Buying Decisions," *Broadcasting*, October 5, 1964, 40.
152. "Ad Thinkers and the Computers," 36.
153. William A. Murphy, "Of Timebuyers: Human and Machine," *Sponsor*, January 13, 1964, 40.
154. John Nuccio, "Automation—Final Step in a Media Man's Evolution," *Sponsor*, July 13, 1964, 43.
155. "Media Departments—1966," *Sponsor*, October 23, 1961, 25–30; "Computers' Future," *Broadcasting*, January 14, 1963, 43–44; "NAB Convention: Computers Work Praised," 66, 68; Lydia R. Reeve, "Challenge: Selling Time in the Computer Age," *Broadcasting*, April 4, 1966, 32. Describing programmatic buying in 2014, the vice

president of US investment at Interpublic's MagnaGlobal media agency said, "This whole thing is about freeing up those [human] resources for more actual human conversation and human creativity." Tim Peterson and Alex Kantrowitz, "The CMO's Guide to Programmatic Buying," *Advertising Age*, May 19, 2014, 25.

156. "Ross Roy Spot Buying Speeded by GE Computer," *Broadcasting*, December 15, 1969, 42; "EDP for Ad Agencies," *Broadcasting*, April 16, 1962, 40; "Computers to Make Media Buying More Marketing-Oriented, 4A's Told," 108; Kroeger, "Computers Move in on Advertising," 42.

157. "Advertising Enters the Age of Computers," 50.

158. Ithiel de Sola Pool, "Automation: New Tool for Decision Makers," *Challenge* 11, no. 6 (1963): 26.

159. Lynn Spigel, *Make Room for TV: Television and the Family Ideal in Postwar America* (Chicago: University of Chicago Press, 1992).

160. "Y&R, BBDO Unleash Media Computerization," 118.

161. Thomas Haigh, "We Have Never Been Digital," *Communications of the ACM* 57, no. 9 (2014): 24.

162. Heady, "Computer Taking over Media-Market Selection," 3.

163. "Shake-out among the Station Reps," 66.

164. "New Middlemen in Spot," *Broadcasting*, July 15, 1968, 23–24; "Middleman—The Specialist of the Future?," *Broadcasting*, September 29, 1969, 33–35.

165. Leo Bogart, "Buying Services and the Media Marketplace," *Journal of Advertising Research* 40, no. 5 (2000): 37–41.

166. Kelly O'Neill and Paul Schulman, "Goodbye to Glad Hand, Farewell to Free Lunches," *Broadcasting*, May 24, 1976, 14.

167. Helen Katz, "How Major U.S. Advertising Agencies Are Coping with Data Overload," *Journal of Advertising Research* 31, no. 1 (1991): 16.

168. "Media Systems Catalogue," memorandum, July 31, 1989, JWT Chicago Office Media Resources and Research Department Records, box 4, Hartman Center.

CHAPTER 6

1. Margaret Graham, "The Threshold of the Information Age: Radio, Television, and Motion Pictures Mobilize the Nation," in *A Nation Transformed by Information: How Information Has Shaped the United States from Colonial Times to the Present*, ed. Alfred D. Chandler Jr. and James W. Cortada (New York: Oxford University Press, 2000), 138.

2. Segmentation, in general, is even older. Ronald A. Fullerton, "Segmentation in Practice: An Historical Overview of the Eighteenth and Nineteenth Centuries," in

The Routledge Companion to Marketing History, ed. D. G. Brian Jones and Marj Tada-jewski (New York: Routledge, 2016), 85–95.

3. John F. Lawrence, “Many Big Firms Revise Advertising Programs, Work to Trim Waste,” *Wall Street Journal*, May 28, 1963, 1, 16.

4. Quoted in Leo Bogart, “Is It Time to Discard the Audience Concept?,” *Journal of Marketing* 30, no. 1 (1966): 52.

5. Jennifer Karns Alexander, *The Mantra of Efficiency: From Waterwheel to Social Control* (Baltimore: Johns Hopkins University Press, 2008).

6. “Computers Open New Vistas in Pinpointing Audiences, Seminar Told,” *Advertising Age*, May 26, 1964, 3, 98.

7. “Two Big Agencies Pack Electronic Hardware,” *Broadcasting*, October 1, 1962, 34; emphasis added.

8. Frank L. McKibbin, “Computerization, the Great Equalizer,” *Broadcasting*, May 24, 1971, 18.

9. Kelly O’Neill and Paul Schulman, “Goodbye to Glad Hand, Farewell to Free Lunches,” *Broadcasting*, May 24, 1976, 14.

10. *Are There Consumer Types?* (New York: Advertising Research Foundation, 1964).

11. Albert R. Kroeger, “The Computers Move In on Advertising,” *Television*, June 1963, 43.

12. “Computers to Make Media Buying More Marketing-Oriented, 4A’s Told,” *Advertising Age*, November 19, 1962, 3.

13. “Advertising Management” (1970), JWT Publications, London Office, box IL3, Hartman Center.

14. Philip M. Napoli, *Social Media and the Public Interest: Media Regulation in the Disin-formation Age* (New York: Columbia University Press, 2019), 22–40.

15. *Cable Avails*, June–July 1999.

16. Local origination often meant a channel displaying time, temperature, and advertisements printed on small cue cards, orchestrated by a clever but somewhat ramshackle mechanism that automatically rotated a camera across a clock, a thermometer, and one or more ads positioned about a foot in front of the camera. One humorous anecdote I heard involves a cable system in Hawaii that received agitated calls from viewers about a dragon-like monster terrorizing the local channel. In fact, the light affixed to the apparatus displaying the time and temperature had attracted moths, which in turn had attracted a lizard. The reptile appeared quite monstrous crawling only inches from the camera lens. This story was related to me at the Cable Center’s Barco Library in Denver.

17. “CATV Headed for Ad-Supported Network?,” *Broadcasting*, May 4, 1970, 23–24.

18. Bruce B. Cox, "Cable Advertising: Where to Buy It," *Broadcasting*, January 27, 1975, 14.
19. Cox, 14.
20. Cox, 14.
21. Interview with Jim Chiddix (former chief technical officer, Time Warner Cable; former president of Interactive Video Group, Time Warner Cable; former CEO and chairman, OpenTV), January 28, 2018.
22. Texscan, *Cable Advertising: The First Comprehensive Guidebook for System Operators* (1980), 8, Barco Library, Cable Center, University of Denver (hereafter Barco Library).
23. Texscan, 4; Patrick R. Parsons and Robert M. Frieden, *The Cable and Satellite Television Industries* (Boston: Allyn & Bacon, 1998), 212–213.
24. Chuck Moozakis, "Return on Your Ad Sales Investment," *Cable Television Business*, April 15, 1983, 36.
25. Interview with Larry Zipin (former corporate vice president of advertising sales, Time Warner Cable), January 26, 2018.
26. "Here Comes Another Quantum Leap," *Broadcasting*, November 15, 1982, 68.
27. Paul E. Oliver, "Local Commercial Insertion: A Partnership Cable Operator, Programming Service and Manufacturer," *NCTA Technical Papers* (1983): 1–5.
28. Charles Kadlec, "Problems and Potentials of Cable TV Advertising," *Broadcasting*, September 3, 1984, 16.
29. Zipin interview.
30. "Addressing Addressability," *Broadcasting*, June 8, 1981, 85.
31. "Zenith Z-TAC" (advertisement), *Cable Television Business*, April 15, 1983, 24.
32. "Applications of Addressability Examined by Panel," *Broadcasting*, May 10, 1982, 75, 78.
33. Larry C. Brown, "Addressable Control—A Big First Step toward the Marriage of Computer, Cable, and Consumer," *NCTA Technical Papers* (1981): 42–46.
34. "The Righteous Wrath of Jack Valenti," *Broadcasting*, February 14, 1983, 62.
35. Patrick R. Parsons, *Blue Skies: A History of Cable Television* (Philadelphia: Temple University Press, 2008), 551.
36. Ross Benes, "Linear Addressable TV Ad Spend Will Grow 33.1% This Year," *eMarketer*, May 11, 2021, <https://www.emarketer.com/content/linear-addressable-tv-ad-spending-will-grow-33-percent-this-year>.
37. "On the Brink with Cable TV," *Broadcasting*, July 5, 1971, 16; "The Gear for Pay, Two-Way Service Stars at NCTA," *Broadcasting*, June 25, 1973, 39–40.
38. Brown, "Addressable Control," 42. Pioneer manufactured the set-top boxes that supported Warner's futuristic Qube system. Qube provided a template for a wide

range of interactive applications, as well as incubating the program networks that matured into MTV and Nickelodeon.

39. Scientific-Atlanta Inc., "8500 Addressable Terminal" (brochure), April 1982, Barco Library.

40. Paul Baran, "Packetcable: A New Interactive Cable System Technology," *NCTA Technical Papers* (1982): 1.

41. SNL Kagan, "U.S. Multichannel Industry Benchmarks," SNL Media & Telecommunications dataset, accessed September 1, 2017, [https://www.marketplace.spglobal.com/en/datasets/snl-media-telecommunications-\(194\)](https://www.marketplace.spglobal.com/en/datasets/snl-media-telecommunications-(194)).

42. "Sure, Boss!," *Cable Avails*, June 1993, 16.

43. Gary Kim, "New Gear, New Markets Promise Higher Ad Gains," *Multichannel News*, September 24, 1990, 58; "By the Numbers," *Cable Avails*, September 1995, 20.

44. "Local Cable Requires Major Overhaul," *Advertising Age*, April 14, 1997, S9.

45. "The Hot Market in Local Cable Ad Sales," *Broadcasting & Cable*, June 24, 1996, 58.

46. "Sure, Boss!," 16.

47. "Machinova Named to Top TCI Post," *Cable Avails*, February 1995, 1.

48. David E. Wachob (General Instrument Corporation), "Method and Apparatus for Providing Demographically Targeted Television Commercials," US Patent Number 5,155,591, October 13, 1992.

49. J. Scott Bachman and Stephen Dukes, "Compressed Digital Commercial Insertion: New Technology Architectures for the Cable Advertising Business," *NCTA Technical Papers* (1992): 447.

50. Dave Zornow, "Multimedia: Who Pays?," *Cable Avails*, June 1993, 23.

51. Jim McConville, "Direct-Mail Cable on Tap," *Broadcasting & Cable*, December 16, 1996, 88.

52. Rich Brown, "Cable Moving to Digital Ad Inserts," *Broadcasting*, April 6, 1992, 52-53.

53. "Exhorting Cable Advertising's Faithful," *Broadcasting*, April 2, 1984, 62, 64.

54. "Cable TV: An Advertising Medium Coming of Age," *Broadcasting*, April 18, 1988, 87.

55. See, e.g., this exchange between a sales executive at ABC-TV and the vice president of research at Warner Amex Satellite Entertainment Company: Walter Flynn, "A Broadcaster's View of Cable Research," *Broadcasting*, April 12, 1982, 26; Marshall Cohen, "Open Mike: He Who Hesitates . . .," *Broadcasting*, May 31, 1982, 19.

56. "Open Mike: Computer Solution," *Broadcasting*, June 14, 1982, 22, 26.

57. "Pioneer M5P Addressable Controller System" (brochure, 1993), Barco Library.

58. Pioneer, "The BA-6000" (brochure, 1988), Barco Library.

59. Wachob, "Method and Apparatus for Providing Demographically Targeted Television Commercials."
60. "Changing Nature of Cable Advertising," *Broadcasting*, April 15, 1991, 78.
61. Michael J. Freeman (ACTV Inc.), "Method for Providing Targeted Profile Interactive CATV Displays," US Patent Number 4,602,279, July 22, 1986.
62. "More MSO's Want into Rep Business," *Broadcasting*, April 18, 1988, 89.
63. "Changing Nature of Cable Advertising," 79.
64. Interview with Bruce Anderson (chief operations officer and global chief technology officer, Invidi Technologies Corporation), February 20, 2018.
65. Interview with Chet Kanojia (former CEO, Navic Networks), February 12, 2018.
66. "Cable Advertising Approaching \$2 Billion," *Broadcasting*, April 10, 1989, 49–50; Michael Katz, "Local Cable's Ace in the Hole: Digital Interconnection," *Broadcasting & Cable*, June 24, 1996, 59.
67. Interview with Paul Woidke (former chief technology officer, Adlink; former senior vice president of technology, Comcast Spotlight), February 9, 2018.
68. Jill Marks, "Power Bases: Clustering for Numbers," *Cable Television Business*, April 15, 1983, 18, 25.
69. "Exhorting Cable Advertising's Faithful," 62, 64.
70. "At Large," *Broadcasting*, November 8, 1982, 48, 50, 52, 54, 58; "Group W Presents Picture of Confidence to Security Analysts," *Broadcasting*, June 7, 1982, 68, 70, 73. See also Megan Mullen, *Television in the Multichannel Age* (Malden, MA: Blackwell Publishing, 2008), 144–146.
71. "Exhorting Cable Advertising's Faithful," 62, 64; "Nationwide," *Broadcasting*, February 24, 1986, 12.
72. "Sawhill Takes over at NCC," *Broadcasting & Cable*, December 9, 1996, 105.
73. Chuck Ross, "TCI Buys Equity Stake in Cable TV Rep NCC," *Advertising Age*, September 28, 1998, 68.
74. "Leading National Cable Reps Mulling Merger," *Advertising Age*, July 13, 1998, 3.
75. "Cable Advertising Approaching \$2 Billion," *Broadcasting*, April 10, 1989, 49–50.
76. Zipin interview.
77. "Satellite Cable Interconnect," *Broadcasting*, September 19, 1988, 77.
78. Katz, "Local Cable's Ace in the Hole," 58.
79. Woidke interview.
80. Alan Salomon, "Cable's Mass Customization a Hit with Dealers," *Advertising Age*, April 12, 1999, 16.
81. Anderson interview.

82. Hernan Galperin, *New Media, Old Politics: The Transition to Digital TV in the United States and Britain* (Cambridge: Cambridge University Press, 2004).
83. Bachman and Dukes, "Compressed Digital Commercial Insertion," 447.
84. Bachman and Dukes, 448; emphasis added.
85. Bachman and Dukes, 453.
86. "Digital Compression: Cable Insertion's Enabling Technology," *Broadcasting*, April 6, 1992, 52–53.
87. "Digital Ads," *Broadcasting*, January 20, 1992, 41. See also Gary Kim, "Industry Ad Execs See Digital Future," *Multichannel News*, February 3, 1992, 28; Brown, "Cable Moving to Digital Ad Inserts," 52–53; "Digital Compression," 52–53.
88. "Digital Advertising," *Cable Week* [TV show], episode 36, August 20, 1993, Barco Library.
89. "Digital Compression," 53.
90. "Digital Advertising."
91. "Digital Insertion Vendors Hit CAB on a Roll," *Broadcasting & Cable*, June 24, 1996, 60. See also Chris McConnell, "Digital Equipment Eyes Ad Insertion Market," *Broadcasting & Cable*, February 6, 1995, 56; "Chicago to Launch Digital Ad Insertion System," *Broadcasting & Cable*, November 20, 1995, 42, 44; "Detroit to Build Fiber Interconnect," *Broadcasting & Cable*, October 7, 1996, 92.
92. "Digital Insertion Vendors Hit CAB on a Roll," 60.
93. Katz, "Local Cable's Ace in the Hole," 58.
94. Chiddix interview.
95. Glen Dickson, "Digital Goes to Work for Adlink," *Broadcasting & Cable*, November 6, 1996, 108.
96. James Dunaway, "Los Angeles," *Mediaweek*, October 25, 1999, 22–28.
97. "Adlink" (advertisement), *Broadcasting & Cable*, October 26, 1998, 47.
98. "The New Interconnects," *Broadcasting & Cable*, November 23, 1998, 38.
99. "Adlink Targets New Brand Campaign," *Cable Avails*, November 1998, 6.
100. Joan Van Tassel, "Cable's Trump Card: Digital Ad Insertion," *Broadcasting & Cable*, April 14, 1997, 76.
101. Woidke interview.
102. "Traffic and Billing Goes to Top of MSO's List," *Cable Avails*, December 1995, 9.
103. Zipin interview.
104. McConville, "Direct-Mail Cable on Tap."
105. "More Machinations in Traffic and Billing," *Cable Avails*, June–July 1999, 13.

106. "Big-Time Breakout Boosted in Buying Local Cable Time," *Advertising Age*, November 30, 1998, S7, S13.
107. Zipin interview.
108. "NCC Advancing EDI after TCI Deal," *Cable Avails*, November 1998, 8.
109. "Big-Time Breakout Boosted in Buying Local Cable Time," S7, S13.
110. "Bargains May Be over for T/B Systems," *Cable Avails*, February 1995, 27.
111. Kevin Bowe, "Thinking All the Way through the EDI Proposition," *Cable Avails*, June–July 1999, 28.
112. Kanojia interview.
113. William Boddy, *New Media and Popular Imagination: Launching Radio, Television, and Digital Media in the United States* (New York: Oxford University Press, 2004); Joseph Turow, *Niche Envy: Marketing Discrimination in the Digital Age* (Cambridge, MA: MIT Press, 2008).
114. Joe Mandese, "Death Knell for Demo?," *Advertising Age*, July 25, 1994, S2.
115. Interview with Bruce Thomas (former vice president of national ad sales, Tele-Communications Inc.; former general manager, Comcast Spotlight), February 2, 2018.
116. L. J. Davis, *The Billionaire Shell Game* (New York: Doubleday, 1998).
117. Anderson interview.
118. Tobi Elkin, "Addressable Ad Trials Start Up," *Advertising Age*, December 3, 2001, 42. Comcast soon acquired AT&T Broadband and most of the former TCI properties.

CHAPTER 7

Epigraph: George Winslow, "Getting TV Ads to Click with Consumers," *Broadcasting & Cable*, February 20, 2012, 27.

1. Thomas Streeeter, "The Cable Fable Revisited: Discourse, Policy, and the Making of Cable Television," *Critical Studies in Mass Communication* 4, no. 2 (1987): 174–200.
2. Patrick R. Parsons, *Blue Skies: A History of Cable Television* (Philadelphia: Temple University Press, 2008), ix.
3. Robert W. McChesney, John Bellamy Foster, Inger Stole, and Hannah Holleman, "The Sales Effort and Monopoly Capital," *Monthly Review* 60, no. 11 (2009): 15.
4. For more on transactivity, see Darin Barney, *Prometheus Wired: The Hope for Democracy in the Age of Network Technology* (Vancouver, BC: UBC Press, 2000), 163–167.
5. Emily Hund and Lee McGuigan, "A Shoppable Life: Performance, Selfhood, and Influence in the Social Media Storefront," *Communication, Culture & Critique* 12, no. 1 (2019): 18–35.

6. Carolyn Marvin, *When Old Technologies Were New: Thinking about Electric Communication in the Late Nineteenth Century* (New York: Oxford University Press, 1988).
7. Peter Nagy and Gina Neff, "Imagined Affordance: Reconstructing a Keyword for Communication Theory," *Social Media + Society* 1, no. 2 (2015): 1–9.
8. Mads Borup, Nik Brown, Kornella Konrad, and Harro van Lente, "The Sociology of Expectations in Science and Technology," *Technology Analysis & Strategic Management* 18, nos. 3–4 (2006): 285–298; Neil Pollock and Robin Williams, "The Business of Expectations: How Promissory Organizations Shape Technology and Innovation," *Social Studies of Science* 40, no. 4 (2010): 525–548.
9. For exemplary studies of these dynamics, see Susan J. Douglas, *Inventing American Broadcasting, 1899–1922* (Baltimore: Johns Hopkins University Press, 1987); Donald MacKenzie, *Inventing Accuracy: A Historical Sociology of Nuclear Missile Guidance* (Cambridge, MA: MIT Press, 1990).
10. Tarleton Gillespie, "The Politics of 'Platforms,'" *New Media & Society* 12, no. 3 (2010): 347–364.
11. Jonathan Gray, *Television Entertainment* (New York: Routledge, 2008), 122.
12. Raymond Williams, *Television: Technology and Cultural Form*, rev. ed. (New York: Routledge, 2003), 114.
13. Bill Gates, *The Road Ahead* (New York: Viking Penguin, 1995), 165.
14. Garth Johnston, "The iTV Evangelist," *Broadcasting & Cable*, March 19, 2007, 32.
15. Josh Bernoff, *Smarter Television* (Cambridge, MA: Forrester Research, 2000), 13.
16. Bernoff, 6–8.
17. Johnston, "iTV Evangelist."
18. "Clicking on Jennifer Aniston's Sweater," TV of Tomorrow Show, San Francisco, March 11, 2008; "Tcommerce: Transforming the Economics of Television," TV of Tomorrow Show, New York City, November 17, 2010; "The Changing Economics of Basic Cable Networks in the OTT Era," SNL Kagan's 6th Annual Multichannel Summit, New York City, November 19, 2015; "From CPM to ROI: The Science of Attribution and Its Impact on TV Advertising," TV of Tomorrow Show (virtual conference), April 27, 2021.
19. Jon Lafayette, "Samsung Adds T-Commerce Apps to Smart Sets," *Broadcasting & Cable*, January 7, 2013, <http://www.broadcastingcable.com/news/technology/ces-samsung-adds-t-commerce-apps-smart-sets/49719>.
20. Susan Strasser, *Satisfaction Guaranteed: The Making of the American Mass Market* (New York: Pantheon Books, 1989), 24; Richard R. John, *Network Nation: Inventing American Telecommunications* (Cambridge, MA: Belknap Press of Harvard University, 2010), 289.

21. Conversely, telephones also permitted unwelcome strangers to intrude into the home. Marvin, *When Old Technologies Were New*, chap. 2.
22. Bill Bailey, "P&G, Biggest Air User Doubles Sales," *Broadcasting*, June 4, 1945, 18, 28.
23. Noah Arceneaux, "A Sales Floor in the Sky: Philadelphia Department Stores and the Radio Boom of the 1920s," *Journal of Broadcasting & Electronic Media* 53, no. 1 (2009): 76–89.
24. William Leach, *Land of Desire: Merchants, Power, and the Rise of a New American Culture* (New York: Vintage, 1994).
25. "Lapel Mike for Department Stores," *Broadcasting*, May 1, 1933, 14.
26. "Macy's Going to Try WABD for Retail Selling," *Billboard*, December 30, 1944, 7. For more on WABD's television department store and "armchair shopping" strategy, see Lynn Spigel, *Make Room for TV: Television and the Family Ideal in Postwar America* (Chicago: University of Chicago Press, 1992), 79.
27. "Sell-a-Vision," *Broadcasting-Telecasting*, December 12, 1949, 64.
28. Spigel, *Make Room for TV*, 82–83.
29. "The Cox Plan for Cable TV," *Broadcasting*, November 25, 1968, 54; Nicholas Johnson, "CATV," *Saturday Review*, November 11, 1967, 87–88, 96–98.
30. Ralph Lee Smith, "The Wired Nation," *Nation*, May 18, 1970, 582–606; Eileen R. Meehan, "Technical Capability versus Corporate Imperatives: Toward a Political Economy of Cable Television and Information Diversity," in *The Political Economy of Information*, ed. Vincent Mosco and Janet Wasko (Madison: University of Wisconsin Press, 1988), 167–187.
31. Quoted in Parsons, *Blue Skies*, 239.
32. This discussion draws on Williams's argument that the institution of commercial broadcasting was produced within a contradictory social tendency toward both dislocation and home-centered living, which he called mobile privatization. *Television*, 19–22.
33. Parsons, *Blue Skies*, 233.
34. Smith, "Wired Nation," 584.
35. Parsons, *Blue Skies*, 259–268.
36. "Cable Promoters Start Thinking Big," *Broadcasting*, January 26, 1970, 54–57; "On the Brink with Cable TV," *Broadcasting*, July 5, 1971, 18; "How High Is the Peak on Cable's Mountain?," *Broadcasting*, January 2, 1978, 41, 44–45.
37. "Show Your Stuff, Burch Tells NCTA," *Broadcasting*, July 12, 1971, 18–26.
38. Walter S. Baer, *Interactive Television: Prospects for Two-Way Services on Cable* (Santa Monica, CA: Rand Corporation, 1971), 39.
39. "Kahn Plans a Satellite for CATV," *Broadcasting*, February 9, 1970, 38.

40. "Kahn Plans a Satellite for CATV."
41. "On the Brink with Cable TV," 19.
42. "Sides Drawn on N.Y. Cable Plans," *Broadcasting*, July 27, 1970, 50–51.
43. "Dialing up a Dialogue on Cable," *Broadcasting*, May 31, 1971, 45.
44. "Where Pay Cable Is Getting Started," *Broadcasting*, April 9, 1973, 47–49.
45. Erik Barnouw, *Tube of Plenty*, 2nd rev. ed. (New York: Oxford University Press, 1990), 498. For example, a game show called *Majic Touch* let viewers purchase merchandise from its sponsor, Lazarus department stores. "Horatio Alger Advice to Cable Advertising," *Broadcasting*, February 15, 1981, 66.
46. "Schmidt Re-emerged with New Company in Cable World," *Broadcasting*, December 3, 1979, 64–65.
47. L. J. Davis, *The Billionaire Shell Game* (New York: Doubleday, 1998), 54.
48. "Cox Cable Gets Omaha Franchise," *Broadcasting*, August 25, 1980, 110–111; "Cox Gets Another," *Broadcasting*, January 5, 1981, 34.
49. "ATC-Daniels Partnership Takes Denver Cable Franchise," *Broadcasting*, March 1, 1982, 34.
50. "They're on the Line in Chicago," *Broadcasting*, September 6, 1982, 28–29.
51. "Franchise Promises Come Back to Haunt Warner," *Broadcasting*, January 16, 1984, 39–40.
52. Barnouw, *Tube of Plenty*, 500.
53. "Showdown in Cerritos: Telco, Cable at Odds over System Control," *Broadcasting*, January 4, 1988, 45–46.
54. See Parsons, *Blue Skies*, 600–608, 643–647, 686–688.
55. "GTE Details Fiber Plans for Cerritos," *Broadcasting*, June 27, 1988, 66, 68; "Widening Main Street," *Broadcasting*, December 12, 1988, 10.
56. Mark Bernicker, "Independent Telcos Moving Quickly to Provide Video Services," *Broadcasting & Cable*, May 2, 1994, 41.
57. "TeleMediaWatch," *Broadcasting & Cable*, January 31, 1994, 14.
58. Mark Berniker, "US West Building an Interactive Mall," *Broadcasting & Cable*, August 1, 1994, 34, 36.
59. Dennis Wharton, "FCC Gives Bell Atlantic OK to Go Hollywood," *Variety*, January 16–22, 1995, 38.
60. Harry A. Jessell, "VOD, Gaming to Help Pave Superhighway," *Broadcasting & Cable*, December 6, 1993, 6, 10.
61. "Ellison: TV's Oracle," *Broadcasting & Cable*, January 17, 1994, 86.

62. Jim McConville, "News, Sports, Pizza from Time Warner," *Broadcasting & Cable*, December 4, 1995, 83.
63. "Cox's Jim Kennedy," *Broadcasting & Cable*, June 20, 1994, 23–27.
64. Price Colman, "Stand and Deliver," *Broadcasting & Cable*, December 8, 1997, 42.
65. "The Gear for Pay, Two-Way Services Stars at NCTA," *Broadcasting*, June 25, 1973, 39–40.
66. "Interactivity Seen as Key to Future Growth," *Broadcasting*, November 25, 1991, 37.
67. General Instrument, "CFT 2200" (product brochure, 1996), Barco Library.
68. Price Colman, "CableLabs in the Middle on Set-Tops," *Broadcasting & Cable*, October 20, 1997, 56.
69. William Boddy, *New Media and Popular Imagination: Launching Radio, Television, and Digital Media in the United States* (New York: Oxford University Press, 2004), 137–143; Dan Schiller, *Digital Capitalism: Networking the Global Market System* (Cambridge, MA: MIT Press, 1999), 108–113.
70. General Instrument and Scientific-Atlanta were both bought by larger hardware manufacturers—GI by Motorola in 1999 and S-A by Cisco in 2005. Google later acquired Motorola's STB business before appropriating the company's patents and selling the business again.
71. Andrew Kupfer and Byron Harmon, "Set-Top Box Wars," *Fortune*, August 22, 1994, 110–116; Price Colman, "Set-Top Scramble in Silicon Valley," *Broadcasting & Cable*, December 8, 1997, 14.
72. Catherine M. Skelly and Matthew Weiss, *Turning TV Sets into Cash Registers* (New York: Gruntal, 2000), 101.
73. Skelly and Weiss, 101.
74. Sean Scully, "Preparing to Convert the Converter." *Broadcasting & Cable*, May 3, 1993, 59.
75. Price Colman, "Interactive TV Ads on the Horizon," *Broadcasting & Cable*, January 4, 1999, 66.
76. Colman, 66.
77. Schiller, *Digital Capitalism*, 109.
78. Devin Leonard, "The Most Valuable Square Foot in America," *Fortune*, April 1, 2002.
79. "Revenues for Interactive TV Shopping to Reach \$4.3 Billion by 2005," *Direct Marketing* 64, no. 5 (2001): 8.
80. Skelly and Weiss, *Turning TV Sets into Cash Registers*, 38–43.
81. Mark Berniker, "Set-Top Chaos," *Broadcasting & Cable*, September 25, 1995, 58.
82. Mark Berniker, "Full Service Network Starts Small," *Broadcasting & Cable*, December 19, 1994, 18.

83. Mark Berniker, "Telcos Seek \$800 Million Worth of Set-Top Boxes," *Broadcasting & Cable*, March 6, 1995, 31, 34.
84. Hernan Galperin and François Bar, "The Regulation of Interactive Television in the United States and the European Union," *Federal Communications Law Journal* 55, no. 1 (2002): 61–84.
85. Leonard, "Most Valuable Square Foot in America."
86. Rich Brown and Richard Tedesco, "Promise vs. Performance," *Broadcasting & Cable*, April 29, 1996, 10, 12.
87. Craig Leddy, "Peering behind Jennifer Aniston's Sweater," *Multichannel News*, February 26, 2001, 52.
88. Monica Hogan, "Convergence Draws Cable to T-Commerce," *Multichannel News*, May 15, 2000, 76.
89. R. Cole, "Maybe There Isn't Gold in Rachel's Sweater," *Cable World*, June 18, 2001, 25.
90. Stuart Elliot, "Remote Clicks that Do More than Just Change Channels," *New York Times*, June 16, 2008, 8.
91. Lorrie Grant, "Networks Hope Remote-Control Shopping Clicks," *USA Today*, May 25, 2005, 1B.
92. Laura Petrecca, "Interactive TV Ads Click with Viewers," *USA Today*, July 6, 2008, 1B.
93. Stephanie Clifford, "Cablevision Promises Interactive TV Ads—This Time for Sure," *New York Times*, September 15, 2009, <https://mediadecoder.blogs.nytimes.com/2009/09/15/cablevision-promises-interactive-tv-ads-this-time-for-sure/>.
94. Yuyu Chen, "Target Turns TV Viewership into a Shoppable Experience on Second-Screen," *Clickz*, March 24, 2014, <https://www.clickz.com/target-turns-tv-viewership-into-a-shoppable-experience-on-second-screen/32550/>; Todd Spangler, "NBCU Teams with Amex, Zeebox for T-Commerce," *Multichannel News*, November 9, 2012, <https://www.nexttv.com/news/nbcu-teams-amex-zeebox-t-commerce-306182>.
95. George Winslow, "Tune in, Click through and Shop," *Broadcasting & Cable*, February 28, 2013, 28.
96. Anne Becker, "On Sale at Wisteria Lane," *Broadcasting & Cable*, September 18, 2006, 12.
97. Winslow, "Tune in, Click through and Shop."
98. Jason Lynch, "You Can Buy Everything You See on Lifetime & Wayfair's New TV Series," *Adweek*, October 19, 2016, <https://www.adweek.com/convergent-tv/you-can-buy-everything-you-see-lifetime-wayfair-s-new-tv-series-174120/>.
99. Ben Munson, "AT&T's Advertising Behemoth Is Coming for Facebook and Google," *FierceCable*, July 9, 2018, <https://www.fiercecable.com/video/at-t-s-advertising-behemoth-coming-for-facebook-and-google>.

100. Alex Kantrowitz, "Your TV and Phone May Soon Double Team You," *Advertising Age*, April 28, 2014, 8.
101. Laura Heller, "Amazon Makes Original Content Shoppable," *FierceRetail*, July 14, 2016, <https://www.fierceretail.com/operations/amazon-makes-original-content-shoppable>.
102. "Connecting Your Living Room for Shopping," CNBC, December 24, 2015, <https://www.cnbc.com/video/2015/12/24/connecting-your-living-room-for-shopping.html>.
103. George Winslow, "H&M Plans 'Shoppable' Super Bowl Ad," *Broadcasting & Cable*, January 6, 2014, <https://www.nexttv.com/news/ces-hm-plans-shoppable-super-bowl-ad-128280>.
104. Jeff Baumgartner, "Startup Eyes Deeper Connection to TV Advertising," *Broadcasting & Cable*, October 16, 2017, 40.
105. Terry Nguyen, "Online Shopping Changed, and We Barely Noticed," *Vox*, May 5, 2021.
106. Alice E. Marwick, "Instafame: Luxury Selfies in the Attention Economy," *Public Culture* 27, no. 1 (2015): 137–160; Brooke Erin Duffy and Emily Hund, "'Having It All' on Social Media: Entrepreneurial Femininity and Self-Branding among Fashion Bloggers," *Social Media + Society* 1, no. 2 (2015): 1–11; Brooke Erin Duffy, *(Not) Getting Paid to Do What You Love: Gender, Social Media, and Aspirational Work* (New Haven, CT: Yale University Press, 2017); Sophie Bishop, "Anxiety, Panic and Self-Optimization: Inequalities and the YouTube Algorithm," *Convergence* 24, no. 1 (2018): 69–84.
107. Shoshana Wodinsky, "TikTok Wants to Be QVC for Teens," *Gizmodo*, February 8, 2021, <https://gizmodo.com/tiktok-wants-to-be-qvc-for-teens-1846220742>.
108. Joseph Frydl, "How HSN and 'Eat Pray Love' Turn Content into Commerce," *Advertising Age*, August 4, 2010, <https://adage.com/article/madisonvine-news/branded-content-lessons-hsn-eat-pray-love/145235>.
109. See Amazon's StyleSnap at <https://affiliate-program.amazon.com/resource-center/amazon-influencers-introducing-stylesnap> (accessed April 4, 2022).

CHAPTER 8

Epigraph: Foreword to *Minutes of the First Meeting of the Operations Research Discussion Group*, October 5, 1959 (New York: Advertising Research Foundation, 1959).

1. Melvin Anshen, "Management Science in Marketing: Status and Prospects," *Management Science* 2, no. 3 (1956): 229, 231, 223.
2. Peter Miller, "Governing by Numbers: Why Calculative Practices Matter," *Social Research* 68, no. 2 (2001): 379–396.
3. Sigfried Giedion, *Mechanization Takes Command: A Contribution to Anonymous History* (Minneapolis: University of Minnesota Press, 2013), 24.

4. Michel Callon, "Introduction: The Embeddedness of Economic Markets in Economics," *Sociological Review* 46, no. S1 (1998): 27.
5. *Are There Consumer Types? An Attempt to Predict Buying Behavior from Demographic and Personality Traits* (New York: Advertising Research Foundation, 1964), 1.
6. Harry Roberts, "The Role of Research in Marketing Management," *Journal of Marketing* 22, no. 1 (1957): 26. On attribution, see Harrison Smith, "People-Based Marketing and the Cultural Economies of Attribution Metrics," *Journal of Cultural Economy* 12, no. 3 (2019): 201–214.
7. Bruce G. Carruthers and Wendy Nelson Espeland, "Accounting for Rationality: Double-Entry Bookkeeping and the Rhetoric of Economic Rationality," *American Journal of Sociology* 97, no. 1 (1991): 31–69.
8. Alfred Kuehn, "How Advertising Performance Depends on Other Marketing Factors," *Journal of Advertising Research* 2, no. 1 (1962): 3.
9. Frank M. Bass and Leonard J. Parsons, "Simultaneous-Equation Regression Analysis of Sales and Advertising," *Applied Economics* 1, no. 2 (1969): 103.
10. Leo Bogart, "Is It Time to Discard the Audience Concept?," *Journal of Marketing* 30, no. 1 (1966): 51.
11. Frank M. Bass, "Some Case Histories of Econometric Modelling in Marketing: What Really Happened?," in *Proceedings of the First ORSA/TIMS Special Interest Conference on Market Measurement and Analysis*, ed. David B. Montgomery and Dick R. Wittink (Stanford, CA: Stanford University, 1979), 4.
12. Lawrence Friedman, "Game-Theory Models in the Allocation of Advertising Expenditure," *Operations Research* 6, no. 5 (1958): 699.
13. "Seminars Explore Ad Goals, Ratings," *Back Stage*, October 8, 1965, 3; emphasis added.
14. Dan Horsky, "An Empirical Analysis of the Optimal Advertising Policy," *Management Science* 23, no. 10 (1977): 1037.
15. Daniel Pope, *The Making of Modern Advertising* (New York: Basic Books, 1983), 284.
16. "Impact Measurement Only True Yardstick for Radio, Declares Ted Hill, WTAG," *Billboard*, July 23, 1949, 11.
17. Michael J. Naples, "Electronic Media Research: An Update and a Look at the Future," *Journal of Advertising Research* 24, no. 4 (1984): 39, 43.
18. For example, pollster George Gallup got his start measuring the impact of print ads, eventually working for Young & Rubicam. Sarah E. Igo, *The Averaged American: Surveys, Citizens, and the Making of a Mass Public* (Cambridge, MA: Harvard University Press, 2007); Daniel J. Robinson, *The Measure of Democracy: Polling, Marketing, and Public Life, 1930–1945* (Toronto: University of Toronto Press, 1999).

19. Leo Bogart, "Media Models: A Reassessment," *Journal of Advertising* 4, no. 2 (1975): 28–29.
20. *Minutes of the Second Meeting of the Operations Research Discussion Group, February 16, 1960* (New York: Advertising Research Foundation, 1960), 3.
21. *Minutes of the Second Meeting of the Operations Research Discussion Group*, 4–5. Halbert could not have been speaking for all of DuPont, which invested in extensive efforts to measure how its institutional advertising succeeded in educating the public about the virtues of big business. See Anna McCarthy, *The Citizen Machine: Governing by Television in 1950s America* (New York: New Press, 2010), chap. 1.
22. "Operations Research Discussion Group, Wednesday Afternoon Session, November 21, 1962," in *A Report of the Eighth Meeting of the ARF Operations Research Discussion Group* (New York: Advertising Research Foundation, 1962), 31. Agency personnel, even those in optimum-seeking departments, were not so inclined to dismiss communication goals. For example, BBDO's media director underscored advertising's communication function in a draft of one casually sexist speech: Herbert D. Maneloveg, "36-24-36, but No Body," Magazine Advertising Sales Club of New York, Sheraton East Hotel, May 26, 1965, 6.
23. Richard E. Quandt, "Estimating the Effectiveness of Advertising: Some Pitfalls in Econometric Methods," *Journal of Marketing Research* 1, no. 2 (1964): 51.
24. Horace C. Levinson, "Experiences in Commercial Operations Research," *Journal of the Operations Research Society of America* 1, no. 4 (1953): 234.
25. Joel Dean, "Cyclical Policy on the Advertising Appropriation," *Journal of Marketing* 15, no. 3 (1951): 268.
26. Sidney Hollander Jr., "A Rationale for Advertising Expenditures," *Harvard Business Review* 27, no. 1 (1949): 81–82, 87.
27. Samuel P. Hayes Jr., "Behavioral Management Science," *Management Science* 1, no. 2 (1955): 179; Richard D. McKinzie, "Oral History Interview with Samuel P. Hayes," July 16, 1975, <https://www.trumanlibrary.gov/library/oral-histories/hayessp>.
28. Wendell R. Smith, "Product Differentiation and Market Segmentation as Alternative Marketing Strategies," *Journal of Marketing* 21, no. 1 (1956): 7. Smith worked for the Alderson & Sessions consultancy, which was among the leaders in marketing OR.
29. William J. Baumol and Charles H. Sevin, "Marketing Costs and Mathematical Programming," *Harvard Business Review* 35, no. 5 (1957): 52–60; Charles H. Sevin, "Measuring the Productivity of Marketing Expenditures," in *Marketing and the Computer*, ed. Wroe Alderson and Stanley J. Shapiro (Englewood Cliffs, NJ: Prentice-Hall, 1963), 164–177.
30. Charles H. Sevin, "Sales Cost Accounting and the Robinson-Patman Act," *Journal of Marketing* 2, no. 3 (1938): 216.
31. Sevin, 218.

32. Baumol and Sevin, "Marketing Costs," 57, 52. Baumol was listed as a member of the ARF's OR discussion group from 1962 to 1964.
33. John D. C. Little and Russell Ackoff, "How Techniques of Mathematical Analysis Have Been Used to Determine Advertising Budgets and Strategies," *Proceedings of the 4th Advertising Research Foundations Conference* (1958): 19–23.
34. John F. Magee, "The Effect of Promotional Effort on Sales," *Journal of the Operations Research Society of America* 1, no. 2 (1953): 64–74; M. L. Vidale and H. B. Wolfe, "An Operations-Research Study of Sales Response to Advertising," *Operations Research* 5, no. 3 (1957): 370–381.
35. G. A. Bradford, "What General Electric Is Doing to Evaluate the Effect on Sales of Its Industrial and Consumer Advertising," in *Minutes of the Second Meeting of the Operations Research Discussion Group*, 1–2, 15, 13.
36. Kenneth Longman, "Marketing Effort—How Productive Is It?," in *Minutes of the Third Meeting of the Operations Research Discussion Group, Friday, April 22, 1960* (New York: Advertising Research Foundation, 1960), 9.
37. Kenneth Longman, "Marketing Effort—How Productive Is It?," in *Operations Research in Advertising: A Summary of Papers Presented to ARF's Operations Research Discussion Group* (New York: Advertising Research Foundation, 1961), 28.
38. Longman, 28–31.
39. Robin Kaiser-Schatzlein, "How Money Talks," *Mother Jones* 46, no. 5 (2021): 65.
40. "A Profit Yardstick for Advertising," *Business Week*, November 22, 1958, 50.
41. "Profit Yardstick for Advertising," 50.
42. "Profit Yardstick for Advertising," 53.
43. "Test Tube Sales," *Broadcasting*, December 31, 1962, 5.
44. John F. Lawrence, "Reappraising Ads," *Wall Street Journal*, May 28, 1963, 1. Both General Motors and DuPont reportedly spent \$750,000 on this work in 1964. William S. Hoofnagle, "Experimental Designs in Measuring the Effectiveness of Promotion," *Journal of Marketing Research* 2, no. 2 (1965): 154.
45. Malcolm A. McNiven, "Choosing the Most Profitable Level of Advertising: A Case Study," in *How Much to Spend for Advertising?* (New York: Association of National Advertisers, 1969), 90.
46. McNiven, 96.
47. Philip Kotler, "Operations Research in Marketing," *Harvard Business Review* 45, no. 1 (1967): 187.
48. Arthur A. Porter, memorandum, December 7, 1956, 1, JWT Information Center Records, New York Media Department: Reports and Press Cuttings, 1956–1973, box 13, Hartman Center.
49. Porter.

50. Wroe Alderson, "Marketing and the Computer: An Overview," in *Marketing and the Computer* (Englewood Cliffs, NJ: Prentice-Hall, 1963), 5.
51. John D. C. Little, "Adaptive Experimentation," in *A Report of the Twelfth Meeting of the ARF Operations Research Discussion Group, April 19, 1965* (New York: Advertising Research Foundation, 1965), 10.
52. Little, 22.
53. Donald C. Marschner, "Theory versus Practice in Allocating Advertising Money," *Journal of Business* 40, no. 3 (1967): 292.
54. *A Report of the Eleventh Meeting of the ARF Operations Research Discussion Group, November 10, 1964* (New York: Advertising Research Foundation, 1964), 55.
55. Martin Kenneth Starr, "Management Science and Marketing Science," *Management Science* 10, no. 3 (1964): 568–569.
56. Kenneth A. Longman, "A Recent History of Media," *Management Science* 15, no. 10 (1969): B566, B567.
57. Roberts, "Role of Research," 25.
58. Quoted in Dallas W. Smythe, *Dependency Road: Communications, Capitalism, Consciousness, and Canada* (Norwood, NJ: Ablex Publishing, 1981), 33.
59. Charles E. Garvin, "The Thompson Viewpoint on Direct Mail," August 25, 1959, 2, JWT Information Center Records, Documents Relating to Media and Media Buying, 1957–1986, box 13, Hartman Center.
60. "Accountability Emerges as Factor in Agency Compensation: Harper to 4A's," *Advertising Age*, October 22, 1962, 1.
61. "Harper Proposes Agencies Share in Profits," *Broadcasting*, October 22, 1962 32.
62. Bill Harvey, "A Brief Personal History of Media Optimization" (unpublished manuscript, shared by the author, February 2018), 5.
63. John S. Wright, "Marion Harper, Jr.," *Journal of Marketing* 31, no. 1 (January 1967): 69–70.
64. Armand Mattelart, *Advertising International: The Privatisation of Public Space*, trans. Michael Chanan (London: Routledge, 1991).
65. Michael Farmer, *Madison Avenue Manslaughter*, 2nd ed. (New York: LIID Publishing, 2017), 90–91.
66. Russell L. Ackoff and James R. Emshoff, "Advertising Research at Anheuser-Busch, Inc. (1963–1968)," *Sloan Management Review* 16, no. 2 (1975): 1–15.
67. Ackoff and Emshoff, 13.
68. Dana Canedy, "Stanley D. Canter, 75, an Advisor to Corporations," *New York Times*, May 3, 1999.
69. "NAB Convention: Computers Work Praised," *Broadcasting*, April 8, 1963, 66.

70. "'Admen Must Improve Measurement Justification of Efforts,' Jones Says," *Advertising Age*, October 1, 1962, 1, 120.
71. "Computers' Future," *Broadcasting*, January 14, 1963, 44.
72. "Tune down Gain, Urges Harper," *Broadcasting*, November 19, 1962, 52–54.
73. "The Profit Squeeze" (display ad), *Wall Street Journal*, April 6, 1961, 27.
74. "Media Departments—1966," *Sponsor*, October 23, 1961, 27.
75. "Advertising Enters the Age of Computers," *Sponsor*, January 29, 1962, 25.
76. *Wall Street Journal*, October 8, 1962, 13.
77. "Mathematical Programming for Better Selection of Advertising Media," *Computers and Automation* 10, no. 12 (1961): 20.
78. Comment from Joseph Kelly in "Discussion of Learner and Godfrey Papers," in *Mathematical Methods of Media Selection: A Report of the Sixth Meeting of the ARF Operations Research Discussion Group* (New York: Advertising Research Foundation, 1961), 4.
79. Comment from Benjamin Lipstein in "Discussion of Learner and Godfrey Papers," 4.
80. Lipstein comment, 4.
81. Milton Godfrey, "Media Selection by Mathematical Programming: Linear and Non-Linear Models," in *Mathematical Methods of Media Selection*, 2.
82. John D. C. Little and Leonard M. Lodish, "MEDIAC: An On-Line Media Selection System" (working paper 298-67, Alfred P. Sloan School of Management, Massachusetts Institute of Technology, November 1967), 1.
83. "An Integrated System for Media Planning," March 14, 1968, 8, JWT Information Center Records, Documents Relating to Media and Media Buying, 1957–1986, box 13, Hartman Center.
84. Thomas P. Hughes, *Networks of Power* (Baltimore: Johns Hopkins University Press, 1983), 22.
85. Philip Shabecoff, "Research in Revolution," *Sponsor*, January 28, 1963, 61.
86. Joseph St. George, "How Practical Is the Media Model?," *Journal of Marketing* 27, no. 3 (1963): 32–33.
87. Shabecoff, "Research in Revolution," 61.
88. "Tune down Gain," 54.
89. Little and Lodish, "MEDIAC," 4; John David, *Operational Research and Marketing* (London: J. Walter Thompson Company, 1967), 10, JWT Publications, box IL2, Hartman Center.
90. John D. C. Little, "Models and Managers: The Concept of a Decision Calculus," *Management Science* 16, no. 8 (1970): B483.

91. Michael L. Ray and Alan G. Sawyer, "Behavioral Measurement for Marketing Models: Estimating the Effects of Advertising Repetition for Media Planning," *Management Science* 18, no. 4 (1971): P73–P89; David A. Aaker, "Management Science in Marketing: The State of the Art," *Interfaces* 3, no. 4 (1973): 17–31.
92. John A. Howard, "Buyer Behavior and Related Technological Advances," *Journal of Marketing* 34, no. 1 (1970): 20.
93. Ray and Sawyer, "Behavioral Measurement," P74.
94. Michael L. Ray and Alan G. Sawyer, "Repetition in Media Models: A Laboratory Technique," *Journal of Marketing* 8, no. 1 (1971): 22.
95. "WSM Nashville," *Broadcasting-Telecasting*, December 10, 1945, 13.
96. "NBC Spot Sales," *Broadcasting-Telecasting*, January 28, 1946, 37.
97. "TvB Presentation, Member Additions Portend Adulthood," *Billboard*, June 4, 1955, 13.
98. Oscar H. Gandy Jr. and Charles E. Simmons, "Technology, Privacy and the Democratic Process," *Critical Studies in Mass Communication* 3, no. 2 (1986): 155–168; Erik Larson, *The Naked Consumer: How Our Private Lives Become Public Commodities* (New York: Penguin Books, 1994), chap. 8.
99. Peter M. Guadagni and John D. C. Little, "A Logit Model of Brand Choice Calibrated on Scanner Data" (working paper 1304-82, Alfred P. Sloan School of Management, Massachusetts Institute of Technology, May 1982), 3.
100. Edward Wallerstein, "Measuring Commercials on CATV," *Journal of Advertising Research* 7, no. 2 (1967): 19.
101. Naples, "Electronic Media Research," 45.
102. Little and Ackoff, "How Techniques of Mathematical Analysis Have Been Used," 22.
103. Malcolm A. McNiven, introduction to *How Much to Spend for Advertising?* 8.
104. John D. C. Little, "Interview by Robert Klein," September 4, 2014, <https://www.informs.org/content/download/348559/3217056/file/Robert%20Klein%20Interviews%20John%20D.%20C.%20Little,%20September%204,%202014.pdf>.
105. John D. C. Little, "Decision Support Systems for Marketing Managers," *Journal of Marketing* 43, no. 3 (1979): 15.
106. Guadagni and Little, "Logit Model of Brand Choice," 2.
107. Little, "Decision Support Systems," 25.
108. Guadagni and Little, "Logit Model of Brand Choice," 1.
109. Guadagni and Little, 35.
110. Jack Honomichl, "Dawn of the Computer Age," *Advertising Age*, August 20, 1987, 117.

111. Dun & Bradstreet also owned the A. C. Nielsen Company, which was IRI's main competition in the market for retail data services. The deal was abandoned due to antitrust concerns. For more on BehaviorScan, see Larson, *Naked Consumer*, 138–145.

112. Gandy and Simmons, "Technology, Privacy and the Democratic Process."

113. Larson, *Naked Consumer*, 137.

114. Joe Coogole, "Data-Base Marketing," *Marketing & Media Decisions* 25, no. 1 (1990): 75.

115. Quoted in Gary L. Lilien and Philip Kotler, *Marketing Decision Making: A Model-Building Approach* (New York: Harper & Row, 1983), 524.

116. Patricia F. Phalen, "The Market Information System and Personalized Exchange: Business Practices in the Market for Television Audiences," *Journal of Media Economics* 11, no. 4 (1998): 17–34.

117. "Optimizers Redefine the Art of the Deal," *Advertising Age*, May 11, 1998.

118. Marc Gunther, "New Software Reprograms TV Advertising," *Fortune*, May 11, 1998, 27.

119. Erwin Ephron, "Ad World Was Ripe for Its Conversion to Optimizers," *Advertising Age*, February 22, 1999.

120. John Little and colleagues viewed clickstream data with the same enthusiasm as retail scanning data—as resources for modeling and predicting consumer choices. Randolph E. Bucklin et al., "Choice and the Internet: From Clickstream to Research Stream," *Marketing Letters* 13, no. 3 (2002): 245–258.

121. Philip M. Napoli, *Social Media and the Public Interest: Media Regulation in the Disinformation Age* (New York: Columbia University Press, 2019), 39.

122. Lorenzo Franceschi-Bicchierai, "Facebook Doesn't Know What It Does with Your Data, or Where It Goes: Leaked Document," *Motherboard*, April 26, 2022, <https://www.vice.com/en/article/akvmke/facebook-doesnt-know-what-it-does-with-your-data-or-where-it-goes>.

123. Charles K. Ramond, "How Advertising Became Respectable," *Journal of Marketing* 28, no. 4 (1964): 1–4. On how business forecasting both detects and directs trends, see Devon Powers, *On Trend: The Business of Forecasting the Future* (Urbana: University of Illinois Press, 2019).

124. "DataVision Killed the Demographic Star," *TV of Tomorrow Show*, New York City, December 7, 2017.

CONCLUSION

Epigraphs: Carolyn Marvin, "Fables for the Information Age: The Fisherman's Wishes," *Illinois Issues* 17 (1982): 19; Dallas W. Smythe, "New Directions for Critical Communications Research," *Media, Culture & Society* 6, no. 3 (1984): 205–217.

1. Jackson Lears, *Fables of Abundance: A Cultural History of Advertising in America* (New York: Basic Books, 1994), 251.
2. William Leiss, Stephen Kline, Sut Jhally, Jacqueline Botterill, and Kyle Asquith, *Social Communication in Advertising*, 4th ed. (New York: Routledge, 2018); Roland Marchand, *Advertising the American Dream: Making Way for Modernity, 1920–1940* (Berkeley: University of California Press, 1985); Michael Schudson, *Advertising, the Uneasy Persuasion: Its Dubious Impact on American Society* (New York: Basic Books, 1984); Russell W. Belk and Richard W. Pollay, “Images of Ourselves: The Good Life in Twentieth Century Advertising,” *Journal of Consumer Research* 11, no. 4 (1985): 887–897.
3. James V. Cook, “1970—Can Marketing Measure Up?,” in *Effective Marketing Coordination: Proceedings of the Forty-Fourth National Conference of the American Marketing Association*, ed. George L. Baker, Jr. (Chicago: AMA, 1961), 21–22, 25–27. For a much different vision of economic management that was forced into “freedom” by a US-backed military coup, see Eden Medina, *Cybernetic Revolutionaries: Technology and Politics in Allende’s Chile* (Cambridge, MA: MIT Press, 2011).
4. Mark Andrejevic, *iSpy: Surveillance and Power in the Interactive Era* (Lawrence: University Press of Kansas, 2007).
5. Paul Edwards, *The Closed World: Computers and the Politics of Discourse in Cold War America* (Cambridge, MA: MIT Press, 1996).
6. See, e.g., Mark Andrejevic, “Public Service Media Utilities: Rethinking Search Engines and Social Networking as Public Goods,” *Media International Australia* 146, no. 1 (2013): 123–132; Antoine Haywood and Victor Pickard, “Public Access Television Channels Are an Untapped Resource for Building Local Journalism,” *Nieman Lab*, November 10, 2021, <https://www.niemanlab.org/2021/11/public-access-television-channels-are-an-untapped-resource-for-building-local-journalism/>.
7. Dan Schiller, “Restructuring Public Utility Networks: A Program for Action,” *International Journal of Communication* 14 (2020): 4994.
8. Sanjay Jolly and Ellen P. Goodman, *A “Full Stack” Approach to Public Media in the United States* (Washington, DC: German Marshall Fund of the United States, 2021).
9. Schiller, “Restructuring Public Utility Networks,” 4995.
10. Robert W. McChesney, *Digital Disconnect: How Capitalism Is Turning the Internet against Democracy* (New York: New Press, 2013); Astra Taylor, *The People’s Platform: Taking Back Power and Culture in the Digital Age* (New York: Metropolitan Books, 2014); Jessa Lingel, *The Gentrification of the Internet: How to Reclaim Our Digital Freedom* (Berkeley: University of California Press, 2021).
11. Christopher R. Martin, *No Longer Newsworthy: How the Mainstream Media Abandoned the Working Class* (Ithaca, NY: Cornell University Press, 2019).
12. C. Edwin Baker, *Advertising and a Democratic Press* (Princeton, NJ: Princeton University Press, 1994), 66–68.

13. Todd Gitlin, *The Whole World Is Watching: Mass Media and the Making and Unmaking of the New Left* (Berkeley: University of California Press, 1980); Victor Pickard, *Democracy without Journalism? Confronting the Misinformation Society* (New York: Cambridge University Press, 2019); Rachel Kuo and Alice Marwick, "Critical Disinformation Studies: History, Power, and Politics," *Harvard Kennedy School Misinformation Review* 2, no. 4 (2021): 1–12.
14. Marvin, "Fables for the Information Age," 24.

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