DECEPTION BY DESIGN

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I. INTRODUCTION

Big data, ubiquitous tracking, and machine learning and other types of artificial intelligence increasingly shape business interactions with consumers. Through algorithms, businesses employ these tools to design advertising, sales portals, return and cancellation processes, pricing, and even products and services themselves. Ultimately, these algorithms are programmed to optimize profit. At the same time, digital interfaces can exploit features of the online environment to manipulate and deceive, a phenomenon so common that the term "dark patterns" has been coined for it.[1] Although dark patterns can be intentionally programmed, today's machine learning systems can teach themselves to deceive people even when humans have not designed them to do so. One of this Article's insights is that when deception of consumers is profitable, business communications and conduct designed by algorithms optimized only for profit will inevitably engage in deception.[2]

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1. The term "dark patterns," encompassing both deceptive and unfair digital practices, was coined by Harry Brignull a decade ago. *See* Harry Brignull, *Dark Patterns: Dirty Tricks Designers Use to Make People Do Stuff*, 90 PERCENT OF EVERYTHING (July 8, 2010), https://www.90percentofeverything.com/2010/07/08/dark-patterns-dirty-tricks-designers-use-to-make-people-do-stuff/ [https://perma.cc/3NES-WHWP]. Today, the term is used widely in the media, the academy, and even the halls of Congress. *See, e.g.*, Jennifer Valentino-DeVries, *How E-Commerce Sites Manipulate You Into Buying Things You May Not Want*, N.Y. TIMES (June 24, 2019), https://nyti.ms/2X0ctp5 [https://perma.cc/36NR-WSTK]; Jamie Luguri & Lior Jacob Strahilevitz, *Shining a Light on Dark Patterns*, 12 J. LEGAL ANALYSIS (Forthcoming 2020) (https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3431205 [https://perma.cc/3VJ8-ASR3]); Press Release, Senator Mark R. Warner, Warner, Fischer Announce Growing Support for Protecting Consumers Against Dark Patterns Online, (Jan. 7, 2020), https://www.warner.senate.gov/public/index.cfm/2020/1/warner-fischer-announce-growing-support-for-protecting-consumers-against-dark-patterns-online [https://perma.cc/4B6W-SD4T] (announcing the Deceptive Experiences to Online Users Reduction Act, S. 1084, 116th Cong. (2019)).

2. Other legal academics have revealed the *existence* of digital manipulation and deception and explained how it works, including Ryan Calo in his path-breaking *Digital Market Manipulation,* 82 GEO. WASH. L. REV. 995, 1003–18 (2014) (explaining how marketers use online personalization to manipulate consumers by exploiting consumers' behavioral biases), and Roger Allan Ford in *Data Scams*, 57 HOUS. L. REV. 111 (2019) (explaining how scammers use data to target victims online and avoid enforcement agency detection). This

The law prohibits business representations, omissions, or practices that deceive or are likely to deceive consumers acting reasonably under the circumstances.[3] Prohibitions on deception are under-enforced for many of the same reasons consumer law generally is under-enforced: enforcement agencies lack sufficient resources and impose penalties too small to deter;[4] a single competitor rarely has sufficient incentive to sue;[5] and consumers under-report deception[6] and are blocked from filing suit by contractual fine print.[7]

But the technology that designs business interactions with consumers today also poses a new and heretofore unrecognized problem — it threatens to immunize deception of consumers from legal prohibitions on deceptive business practices. Technology today allows businesses to produce multitudes of unique permutations of online advertisements, websites, and software applications ("apps"). Each permutation can be tailored for and delivered to particular consumers in particular contexts at particular times. The resulting deluge of increasingly algorithmically-designed, micro-targeted, and ever-changing digital communications and conduct effectively renders the leading methods of proving misleading or deceptive business practices obsolete. In sum, not only is deception inevitable online, it also evades the legal apparatus intended to enjoin, punish, and deter it. Identifying and analyzing this issue are the primary contributions of this Article.

Article recognizes the *inevitability* of manipulation and deception if recent advances in artificial intelligence (particularly, machine learning) remain unchecked.

3. This is the definition generally applicable in suits brought by enforcement agencies and private consumer plaintiffs. Business plaintiffs suing competitors must show actual deception of consumers, not a mere likelihood of deception. For further discussion, see *infra* Part III.

4. *See, e.g.*, Lauren E. Willis, *Performance-Based Remedies: Ordering Firms to Eradicate Their Own Fraud*, 80 LAW & CONTEMP. PROBS. 7 (2017) (analyzing the weakness of penalties imposed for violations of consumer law and suggesting remedies).

5. Jean Wegman Burns, *The Paradox of Antitrust and Lanham Act Standing*, 42 UCLA L. REV. 47, 85 (1994) (explaining that competitors alone will under-enforce false advertising prohibitions because "where a false advertiser diverts only a small amount of business from each rival, no one rival will have a financial incentive to sue"); Lauren E. Willis, *Introduction: Why Didn't the Courts Stop the Mortgage Crisis?*, 43 LOY. L.A. L. REV. 1195, 1199–2000 (2010) (noting reticence of competing businesses to sue one another for unfair competition). Current standing rules also impede competitor enforcement of false advertising law. *See* Rebecca Tushnet, *Running the Gamut from A to B: Federal Trademark and False Advertising Law*, 159 U. PA. L. REV. 1305, 1375–82 (2011).

6. *See, e.g.*, KEITH B. ANDERSON, CONSUMER FRAUD IN THE UNITED STATES: AN FTC SURVEY 80 tbl.5-1 (2004), https://www.ftc.gov/sites/default/files/documents/reports/consumer-fraud-united-states-ftc-survey/040805confraudrpt.pdf [https://perma.cc/G336-HZTY] (finding that fewer than 10% of defrauded consumers contacted enforcement agencies or the Better Business Bureau and fewer than 3% contacted an attorney).

7. *See, e.g.*, Myriam Gilles & Gary B. Friedman, *After Class: Aggregate Litigation in the Wake of AT&T Mobility v. Concepcion*, 79 U. CHI. L. REV. 623 (2012) (analyzing the effects of arbitration clauses and class action bans in the fine print of standard form contracts and suggesting remedies).

The first barrier to demonstrating digital deception today is that the machines that design online business materials lack intent. Although intent to mislead is not an element of federal or most state deceptive practices claims, testimony or business records showing an intent to mislead are frequently introduced as powerful evidence of such practices. Machines, however, lack intent, and a business today can design deceptive digital interactions without intending to mislead. That scienter can be difficult to prove, even where it exists, has long been recognized by the law and was one motivation for the omission of an intent requirement from most statutes prohibiting deceptive business practices.[8] But recognition of a true absence of any human deceptive intent on the part of the business engaging in digital deceptive practices is a new finding of this Article.

Another set of barriers to demonstrating digital deception flow from the micro-targeted nature of the design and delivery of digital business materials.[9] Most methods for proving consumer deception focus on specifically-identified marketing and sales materials. These methods include reliance on: factfinder or expert application of the "reasonable consumer" standard to specific materials; expert analysis of consumer test subject responses to those materials; and today's evidentiary gold standard, randomized controlled experiments showing the proportion of consumer subjects deceived by those materials. However, digital materials are designed not for the reasonable person but for ever-narrowing and increasingly unintuitive segments. Consumer testing and experiments flounder because subjects cannot be identified who match, in pertinent respects, the consumers to whom specific digital materials were directed. Successful micro-targeting entails reaching consumers in the contexts and at the moments when they are most likely to respond in the manner desired by the business. The relevant aspects of these contexts and moments cannot be recreated when factfinders, experts, or consumer test subjects examine the materials.

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8. *See* CHRIS JAY HOOFNAGLE, FEDERAL TRADE COMMISSION PRIVACY LAW AND POLICY 346 (2016) (explaining that Congress did not include an intent requirement in the prohibition on unfair and deceptive trade practices in the Federal Trade Commission Act because of the difficulty of proving intent); Jack E. Karns, *State Regulation of Deceptive Trade Practices Under "Little FTC Acts": Should Federal Standards Control?*, 94 DICK. L. REV. 373, 374 (1990) (explaining that difficulty proving the intent element of common law fraud motivated states to adopt statutes prohibiting unfair and deceptive trade practices with no scienter requirement). But note that the omission of an intent or knowledge requirement from the FTC Act was also grounded in principles of equity. *See* FTC v. Algoma Lumber Co., 291 U.S. 67, 81 (1934) (recognizing violation of FTC Act regardless of defendant's knowledge of the falsity of its representations and noting "there is a kind of fraud, as courts of equity have long perceived, in clinging to a benefit which is the product of misrepresentation, however innocently made").

9. Digital "materials" encompasses both communications and conduct, including, for example, the static and dynamic aspects of a website or app.

Finally, the volume of unique designs of digital business materials poses a practical obstacle to demonstrating that a business's digital practices are deceptive. Not all of the thousands of micro-targeted versions of a business's advertisements, websites, or apps can be analyzed for litigation purposes. Analyzing or testing even a statistically representative sample would exceed practicable limits.

How can the legal system restore the enforceability of prohibitions on deception of consumers in the digital age? Elsewhere, I have proposed a new consumer law paradigm that would address deceptive business practices along with other challenges to consumer protection and fair competition.[10] This Article's goal is narrower: to suggest how judicial treatment of unfair and deceptive business practices claims under existing law can and should adapt to address the evidentiary barriers to enforcing deception prohibitions in the digital age.

Without new legislation, there are at least two routes for future-proofing the law. The first route is judicial adoption of the presumption that when consumers have false beliefs about facts material to a transaction in which they have engaged — including a false belief that they have not engaged in the transaction at all — the likely source of those false beliefs is the business that will benefit. The business could rebut the presumption with evidence that an independent source was responsible for its customers' false beliefs.

But does the source of the false beliefs matter? Sales based on false consumer beliefs, even where the seller did not create consumers' confusion, undermine the law's consumer protection and fair competition goals. The second route to future-proofing the law against digital consumer deception is, therefore, for the law to recognize that no matter how consumers are deceived, exploiting consumer confusion for profit is inherently an unfair practice.

Both a presumption that the business that benefitted caused the false beliefs and a recognition that a transaction based on false consumer beliefs is unfair regardless of the source of those beliefs would move the focus from the business and its myriad of contacts with consumers to consumers themselves.[11] It would eliminate the need to pinpoint which particular representations, omissions, or practices in particular micro-moments deceived a business's customers. Instead, enforcement agencies, competing businesses, and private plaintiffs would be required to demonstrate that a business's customers transacted with the business under false beliefs about facts material to the transaction. Businesses would then have the incentive to program their algorithms and design their digital materials to produce accurate

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10. Lauren E. Willis, *Performance-Based Consumer Law*, 82 U. CHI. L. REV. 1309, 1311 (2015).

11. Even if a business were to intentionally or knowingly incorporate deceptive elements into its digital materials, these two changes in the legal doctrine would address that situation.

consumer beliefs and to optimize profit within that constraint. That is, the law would compel businesses to engage in fair marketing by design.

This Article is part of a larger conversation about the digital manipulation of consumers and the capacity of existing law to regulate the unintended consequences of algorithms and artificial intelligence, such as perpetuating race and gender discrimination and propagating online extremism. Many insights here are applicable to those broader topics. As the design of digital materials becomes more automated, these materials will not only inevitably deceive, but they will also inevitably manipulate consumers in other unfair ways, for both commercial and political advantage.[12]

Limiting the analysis here to deception rather than analyzing all dark patterns sets aside thorny questions about when marketing crosses from fair persuasion to unfair or abusive manipulation.[13] This is not to say that non-deceptive manipulation is not a problem, but rather that we lack societal consensus on where to draw the line.[14] A focus on deception is also warranted because it is one of the most commonly-pleaded claims in consumer protection cases.[15] In part, this is because the boundaries of deception prohibitions are relatively noncontroversial. In addition, many forms of consumer manipulation involve deception. For instance, businesses sometimes manipulate consumers by misleading them into falsely believing that the opportunity to engage in a transaction is about to end or that a failure to engage in a transaction will lead to dire consequences.[16] Consumer

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12. *See, e.g.*, *Types of Dark Patterns*, DARK PATTERNS, https://www.darkpatterns.org/types-of-dark-pattern [https://perma.cc/SP8D-QSNS] (discussing deceptive patterns and manipulative but non-deceptive patterns, such as digital designs that annoy people into taking actions that benefit the business and that consumers otherwise would not take).

13. For insights on distinguishing acceptable from unacceptable manipulation, see Cass R. Sunstein, *Fifty Shades of Manipulation*, 1 J. MKT. BEHAV. 213 (2016).

14. How many times can a website ask consumers whether they are sure they want to discontinue a service before the question crosses from a fair check to ensure against unintended error to the manipulative imposition of unnecessary time costs? Jamie Luguri and Lior Strahilevitz are beginning to try to answer these sorts of questions using experiments. Luguri & Strahilevitz, *supra* note 1.

15. *See, e.g.*, Christopher L. Peterson, *Consumer Financial Protection Bureau Law Enforcement: An Empirical Review*, 90 TUL. L. REV. 1057, 1095 (2016) (finding that in the 122 publicly announced enforcement actions brought by the Consumer Financial Protection Bureau in its first five years, "[d]eception was, by far, the most commonly pleaded claim" and that "[c]ases including deceptive-practices claims generated over 93% of all relief provided to U.S. consumers"); HOOFNAGLE, *supra* note 8, at 345 (noting that deception claims are the Federal Trade Commission's "bread and butter").

16. *See, e.g.*, Robert B. Cialdini, *The Science of Persuasion*, 284 SCI. AM. 76, 80 (2001) (discussing how marketers use "limited time only" and "limited supply" to elicit consumer psychological responses that increase the likelihood of a sale); Arunesh Mathur et al., *Dark Patterns at Scale: Findings from a Crawl of 11K Shopping Websites*, 3 PROCS. ACM ON HUM.-COMPUT. INTERACTION 81:1, 81:5 (2019), https://arxiv.org/pdf/1907.07032.pdf [https://perma.cc/B5L2-MUKU] (documenting prevalence of website designs that create a false sense of scarcity or urgency).

protection and fair competition law fundamentally rely upon enforceable prohibitions on deception.

Part II of this Article documents the digital design process increasingly employed by businesses and explains why, without intervention, it produces transactions in which consumers are deceived. Part III explains why the primary methods of proving deception are undermined by this technology. Part IV suggests ways to protect the integrity of a consumer marketplace in which machine-based micro-targeting is ubiquitous. Part V concludes.

II. PROGRAMMED TO DECEIVE

Today's technology, when successfully programmed to optimize only consumer responses that profit the firm, will inevitably deceive. Although some businesses seek lifetime consumer trust and brand loyalty, even these businesses find deception to be worthwhile surprisingly often.[17] Other businesses are not playing the long game.

A. Modern Marketing and Sales Design

Today's digital marketing and sales ideal is to present each consumer with a unique experience that has been micro-targeted in two ways: (1) it has been personalized for that consumer and (2) it has been optimized in real time.[18] Many businesses do not have a single website; rather, the website's home pages, landing pages, and interior pages are compiled in real-time and customized for targeted consumers.[19] The

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17. *See, e.g.*, John Brownlee, *Why Dark Patterns Won't Go Away*, FAST COMPANY (Aug. 22, 2016), https://www.fastcompany.com/3060553/why-dark-patterns-wont-go-away [https://perma.cc/CG6J-AG4Q] (listing companies that use or have used dark patterns, including Microsoft, Skype, LinkedIn, TicketMaster, Amazon, and Adobe); Linda Di Geronimo et al., *UI Dark Patterns and Where to Find Them: A Study on Mobile Applications and User Perception*, CHI '20: PROC. 2020 CONF. ON HUM. FACTORS COMPUTING SYS. 1, 5 (2020), https://www.sback.it/publications/chi2020.pdf [https://perma.cc/N5BS-EFDB] (finding that 95% of 240 top-trending apps on the Google Play store contain dark patterns and that, on average, these apps included seven different types of deceiving interfaces).

18. *See, e.g.*, Caroline Tien-Spalding, *Five Trends Redefining the Role of Chief Marketing Officer in 2019,* FORBES (Mar. 7, 2019, 8:00 AM), https://www.forbes.com/sites/forbescommunicationscouncil/2019/03/07/five-trends-redefining-the-role-of-chief-marketing-officer-in-2019 [https://perma.cc/Y7AX-GGTT] ("Advances in marketing technology are moving [businesses] infinitely closer to achieving the ultimate goal of the 'segmentation of one' — the ability to target and tailor marketing to a single person."); *id.* (reporting that artificial intelligence enables marketing campaigns "where the timing of the message is fine-tuned for maximum effect"). Not every aspect of every digital design is personalized in real-time, however; businesses can benefit from consistency in brand image, for example.

19. RESEARCHSCAPE INT'L & EVERGAGE, INC., 2019 TRENDS IN PERSONALIZATION 19 (2019), https://www.evergage.com/resources/ebooks/trends-in-personalization-survey-report/ [https://perma.cc/U5HL-PN42] (reporting survey results showing that marketers are using personalization in email, home pages, landing pages, interior pages, online ads, product

same is becoming true for apps.[20] Much like in-person sales, this digital conduct collapses the distinction between marketing and sales; micro-targeted digital materials are both communications by which messages are transmitted to consumers and interfaces through which businesses sell to consumers.[21]

For purposes of online interface design, to "personalize" is to consider anything known or inferred from data about consumers, including, for example, their resources, habits, recent life events, and demographic and psychographic profiles. An early example was Target's alleged use of demographic information and unscented soap and vitamin supplement purchase history to predict whether a shopper was pregnant and her due date and leveraging these inferred data points to send pregnant women coupons timed to each stage of pregnancy.[22] Today, technology can personalize not only what is marketed to whom and when it is marketed to them, but also how it is marketed and sold to them.

An interface that is optimized in "real time" is designed based on dimensions of a moment that might affect whether consumers respond in the manner desired by the business. This might include, for example, time of day, week, or year, location, weather, present activity, and emotional or physical state.[23] To illustrate, a company might use video

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detail pages, search results, pricing, and blog posts); Cara Harshman, *The Homepage is Dead: A Story of Website Personalization*, MOZ (May 2, 2017), https://moz.com/blog/homepage-personalization [https://perma.cc/JD2D-K8KF]; Raj Roy, *What is Dynamic Content? Definition, Types, Strategy, Best Practices with Examples*, MARTECH ADVISOR (July 10, 2019, 6:26 PM), https://www.martechadvisor.com/articles/content-experience/what-is-dynamic-content-definition-types-strategy-best-practices-with-examples/ [https://perma.cc/W3DA-KLBN] (illustrating the dynamic production of email and webpage content).

20. *See, e.g., App Personalization*, OPTIMIZELY, https://www.optimizely.com/optimization-glossary/app-personalization/ [https://perma.cc/RWM8-7HN9]; Daniel Susser, *Invisible Influence: Artificial Intelligence and the Ethics of Adaptive Choice Architectures*, AIES '19: PROC. 2019 AAAI/ACM CONF. ON AI, ETHICS & SOC'Y 403, 404 (2019) ("The websites we visit and apps we use are dynamic . . . [T]he options they present to us and the way those options are framed constantly change, producing different choice architectures for each user, and for the same user in different instances.").

21. Some have distinguished deceptive marketing from deceptive interface design, with the argument that "dark patterns" is a term that should apply only to the latter. *See, e.g.,* Arvind Narayanan et al., *Dark Patterns: Past, Present, and Future*, 18 ACM QUEUE 67, 67, 79 (2020), https://dl.acm.org/ft_gateway.cfm?id=3400901&ftid=2118638&dwn=1 [https://perma.cc/GKR8-TNAY]. But in an age when online marketing materials and sales interfaces are created by machines optimized for business profit, the distinction is illusory. Marketing today means maximizing selected business metrics, whether that be accomplished through statements, omissions, photos, information placement, or interactive webpage elements.

22. Charles Duhigg, *How Companies Learn Your Secrets*, N.Y. TIMES MAG. (Feb. 16, 2012), https://nyti.ms/AyNgCY [https://perma.cc/7MMF-95LB].

23. *See, e.g.,* Ryan Nakashima, *Google Tracks Your Movements, Like It or Not*, CHI. TRIB. (Aug. 13, 2018, 8:40 AM), https://www.chicagotribune.com/business/ct-biz-google-privacy-20180813-story.html [https://perma.cc/LC3R-D2QU].

capture and emotion recognition software to target "females ages 18 to 30 who look sad" at that moment.[24]

Micro-targeted materials can be more effective than mass communications and standardized sales interfaces in obtaining "conversions," meaning clicks, page views, sales, customer retention, or whatever consumer response is desired by the business. Consulting firm McKinsey reports that "data-activated marketing based on a person's real-time needs, interests, and behaviors . . . can boost total sales by 15 to 20 percent."[25] In one experiment, academics discovered that customizing even a single banner advertisement nearly doubled the rate at which consumers clicked on the ad.[26] Micro-targeted digital materials do not always hit their targets, but the technology that sets their aim is continually becoming more accurate.

Four key elements allow businesses to approach the ideal of delivering the most effective digital design for each consumer at each moment: ubiquitous data collection, connected digital interfaces, machine learning, and creative artificial intelligence. Businesses have not yet exploited these to their fullest, but the race to do so is underway.

1. Ubiquitous Data Collection

Through ubiquitous data collection, businesses gather enormous amounts of fine-grained data about people, much of which can be matched to individuals across devices and contexts.[27] Data is extracted from credit and debit card records; online search, browsing, gaming, reading, and social media activity; emails and online calendars; voices

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24. Lisa Lacy, *How Brands Are Tapping into Consumers' Faces — and Brains*, THE DRUM (Aug. 1, 2017, 5:14 PM), https://www.thedrum.com/news/2017/08/01/how-brands-are-tapping-consumers-faces-and-brains [https://perma.cc/9CF2-TW29].

25. Julien Boudet et al., *The Heartbeat of Modern Marketing: Data Activation and Personalization*, MCKINSEY & CO. (Mar. 22, 2017), https://www.mckinsey.com/business-functions/marketing-and-sales/our-insights/the-heartbeat-of-modern-marketing [https://perma.cc/7FUU-JDYK].

26. Glen L. Urban et al., *Morphing Banner Advertising*, 33 MKTG. SCI. 27, 35 (2014).

27. Stuart A. Thompson & Charlie Warzel, Opinion, *Twelve Million Phones, One Dataset, Zero Privacy,* N.Y. TIMES (Dec. 19, 2019), https://nyti.ms/2r7oVt3 [https://perma.cc/9GM6-M3AV] (explaining how businesses tie together data about a single consumer's activity across platforms).

and video captured through the Internet of Things;[28] smartphone geolocation tracking sensors;[29] and more.[30]

Even small details are recorded. To authenticate users on its online banking website and mobile app, one bank, as of 2016, was already using 500 data points — "from the angle at which the user holds her iPhone to the amount of pressure she uses when she taps on a screen to the cadence of her keyboard strokes to the kinds of typographical errors she tends to make."[31] Details amass to a torrent. The computer systems of social networking giant Facebook "ingest[] trillions of data points" daily.[32]

Businesses can use this "big data"[33] to make inferences and predictions about consumer identity, resources, needs, habits, mood, behavior, and responses to stimuli. The information that can be inferred or predicted with enough accuracy to be commercially valuable is stunning. Location data alone can offer "hints of faltering marriages, evidence of drug addiction, [and] records of visits to psychological facilities."[34] Keystroke and accelerometer data collected through mobile phones can be used to identify individual consumers with surprising accuracy.[35] Age, gender, sexual orientation, ethnicity,

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28. *See* Grant Clauser, *Amazon's Alexa Never Stops Listening to You. Should You Worry?*, WIRECUTTER (Aug. 8, 2019), https://thewirecutter.com/blog/amazons-alexa-never-stops-listening-to-you [https://perma.cc/2NKL-G2WK]. The internet of things is vast and ubiquitous, from connected cars to connected toys. *See, e.g.*, Geoffrey A. Fowler, *What Does Your Car Know About You? We Hacked a Chevy to Find Out*, WASH. POST (Dec. 17, 2019, 7:00 AM), https://www.washingtonpost.com/technology/2019/12/17/what-does-your-car-know-about-you-we-hacked-chevy-find-out/ [https://perma.cc/5ZQP-V2B4]; Kate Fazzini, *Toys and Apps Often Track Your Kids and Collect Information About Them — Here's How to Keep Them Safe*, CNBC (Nov. 26, 2018, 11:29 AM), https://www.cnbc.com/2018/11/23/connected-toys-privacy-risks.html [https://perma.cc/6LPN-DJNK].

29. *See, e.g.*, Lily Hay Newman, *Hundreds of Apps Can Listen for Marketing 'Beacons' You Can't Hear*, WIRED (May 2, 2017, 7:00 AM), https://www.wired.com/2017/05/hundreds-apps-can-listen-beacons-cant-hear/ [https://perma.cc/8Z5G-CQPJ] (explaining how smartphone apps listen for ultrasonic beacons broadcast from brick-and-mortar store shelves, websites, and television commercials to track who is in a store, on a website, or watching a commercial).

30. *See, e.g.*, WOLFIE CHRISTL, CRACKED LABS, CORPORATE SURVEILLANCE IN EVERYDAY LIFE (2017), https://crackedlabs.org/en/corporate-surveillance [https://perma.cc/MUH6-CRGD].

31. Penny Crosman, *Next-Gen Biometrics: Using the Force of Habit*, AM. BANKER (Nov. 17, 2016, 1:30 PM), https://www.americanbanker.com/news/next-gen-biometrics-using-the-force-of-habit [https://perma.cc/2TBZ-MYK5].

32. Shoshana Zuboff, Opinion, *You Are Now Remotely Controlled*, N.Y. TIMES (Jan. 24, 2020), https://nyti.ms/2sXbT2d [https://perma.cc/A2D9-HZ9A].

33. "Big data" refers not to large quantities of data so much as to large data sets across which information can be analyzed. *See, e.g.*, danah boyd & Kate Crawford, *Critical Questions for Big Data: Provocations for a Cultural, Technological, and Scholarly Phenomenon*, 15 INFO., COMMC'N & SOC'Y 662, 663 (2012).

34. Thompson & Warzel, *supra* note 27.

35. Lichao Sun et al., *Sequential Keystroke Behavioral Biometrics for Mobile User Identification via Multi-view Deep Learning*, EUR. CONF. ON MACH. LEARNING &

religion, political views, personality, cognitive capacities, and satisfaction with life can be inferred quite well from Facebook "likes."[36] To measure advertising effectiveness and determine which future ads to serve when and to whom, businesses can now link data on television advertisement impressions to data from consumers' smartphones, tablets, and computers, as well as to individual or household purchase data.[37]

Businesses have long collected and analyzed customer information, but the volume and granularity of data and the speed at which it can be mined for correlations makes today's collection and analysis different in kind. In particular, big data analytics can uncover relationships that humans might never have considered.

One unintuitive but significant finding is that metadata, meaning data about data, can be as predictive as the content or substance of what consumers are viewing or doing online.[38] For example, it is well known that personality targeting can increase marketing effectiveness. What big data has revealed is that the hue, brightness, and saturation of photographs consumers post online can be as indicative of posters' personalities as the content of the photos.[39] Similarly, how widely consumers share information on social media and the length, complexity, and grammar with which they write emails may be as predictive of their responses to marketing as what they share or write.[40]

KNOWLEDGE DISCOVERY DATABASES 228, 228 (2017), https://arxiv.org/pdf/1711.02703.pdf [https://perma.cc/M43S-LKNR].

36. Michal Kosinski et al., *Private Traits and Attributes Are Predictable from Digital Records of Human Behavior*, 110 PROC. NAT'L ACAD. SCIS. 5802, 5802 (2013).

37. *See, e.g.*, Geoffrey A. Fowler, *You Watch TV. Your TV Watches Back*, WASH. POST (Sept. 18, 2019, 8:00 AM), https://www.washingtonpost.com/technology/2019/09/18/you-watch-tv-your-tv-watches-back/ [https://perma.cc/W9TM-2T22].

38. *See, e.g.*, SHOSHANA ZUBOFF, THE AGE OF SURVEILLANCE CAPITALISM 272–75 (2019) (discussing research regarding the predictivity of metadata).

39. *See, e.g.*, Bruce Ferwerda & Marko Tkalcic, *Predicting Users' Personality from Instagram Pictures: Using Visual and/or Content Features?*, 26 CONF. ON USER MODELING, ADAPTATION & PERSONALIZATION 157, 157–61 (2018), https://www.researchgate.net/publication/326215171_Predicting_Users'_Personality_from_Instagram_Pictures_Using_Visual_andor_Content_Features [https://perma.cc/6JM5-28JY]. *See generally* Sandra Matz & Michal Kosinski, *Using Consumers' Digital Footprints for More Persuasive Mass Communication*, 11 NIM MKTG. INTELL. REV. 19 (2019) (discussing how online behavior can predict personality which can be used to increase advertising effectiveness).

40. Jennifer Golbeck et al., *Predicting Personality with Social Media*, CHI '11 EA: EXTENDED ABSTRACTS ON HUM. FACTORS COMPUTING SYS. 253, 256 (2011); *see also* Jonah Berger et al., *Uniting the Tribes: Using Text for Marketing Insight*, 84 J. MKTG. 1, 2–3 (2019) (discussing marketer use of computerized analysis of consumer writing style); Ricardo Buettner, *Predicting User Behavior in Electronic Markets Based on Personality-Mining in Large Online Social Networks*, 27 ELEC. MKTS 247, 252 (2017) (finding that metadata about individuals' use of social media predicted personality traits relevant to marketers).

2. Connected Digital Interfaces

Increasingly, people are living their lives — shopping, playing, socializing, organizing, reading, learning, etc. — through online digital interfaces. Digital interfaces are both the conduit through which much of today's ubiquitous data collection is performed and the medium that then delivers the advertisements, webpages, emails, texts, and other materials that have been shaped by the collected data. Moreover, digital interfaces are not passive message boards with which consumers can easily decline to interact; they are "dynamic, interactive, intrusive, and adaptive."[41] They flash messages, insert content into news and social media feeds, and even alter digital billboard displays along consumers' physical paths.[42]

Offline, marketing can be targeted to a degree, as in the above-noted case of Target mailing coupons to customers designed to correspond to pregnant customers' trimesters. But an online interface allows this process to occur in real time; the design of digital materials can change immediately in response to cues from the consumer or the context.[43] For example, travel company Expedia announced in 2016 that through webcams and smartphone cameras it was able to analyze consumers' facial expressions as they looked at a sales website and instantaneously deliver offers personalized to those consumers' nonverbal responses to the website.[44]

Finally, connected interfaces give businesses fine-grained control over the immediate context surrounding consumers' interactions with businesses.[45] A human salesclerk could say anything, but what a digital interface says, the fonts, colors, and layouts with which it is said, and the images, graphics, product search flow, and everything else surrounding what it says, is dictated by the business. This control

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41. Daniel Susser et al., *Technology, Autonomy, and Manipulation*, 8 INTERNET POL'Y REV., June 30, 2019, at 7, https://policyreview.info/node/1410/pdf [https://perma.cc/FP8A-GP5T].

42. *See, e.g.*, Thomas Germain, *Digital Billboards Are Tracking You. And They Really, Really Want You to See Their Ads.*, CONSUMER REPS. (Nov. 20, 2019), https://www.consumerreports.org/privacy/digital-billboards-are-tracking-you-and-they-want-you-to-see-their-ads/ [https://perma.cc/7QS2-CY8X].

43. This is not to say that a consumer-facing digital interface is a necessary component to this kind of instantaneous machine analysis. *See, e.g.*, Katie Johnston, *Feeling Emotional? The Machines Know*, BOS. GLOBE (Feb. 8, 2019, 9:57 AM), https://www.bostonglobe.com/business/2019/02/08/feeling-emotional-the-machines-know/zWmGiTGC7jCtSI1TrnIs4O/story.html [https://perma.cc/Q3NT-H8TB] (describing customer service departments' use of real-time artificial intelligence analysis of customer voice tone to guide service representatives' responses).

44. Press Release, Expedia Media Solutions, The Hawai'i Tourism Authority and Expedia Media Solutions Use Custom-Built Facial Recognition Software to Create Personalized Travel Marketing Campaign (Sept. 26, 2016), https://advertising.expedia.com/about/press-releases/hawaii-tourism-authority-and-expedia-media-solutions-use-custom-built-facial-recognition-software-create-personalized-travel-mar [https://perma.cc/XVE6-PM3Z].

45. *See* Calo, *supra* note 2, at 1003–07 (dubbing this the issue of "the mediated consumer").

allows the business to design the interaction for the individual consumer and to optimize that interaction for the result the business seeks.[46] The business value of digital marketing can be seen in businesses' choices; more advertising now takes place online than in print media.[47]

3. Machine Learning and Experimentation

Through machine learning[48] and experimentation, computers develop continuously-evolving algorithms[49] that micro-target digital business materials and then respond to feedback to optimize the effectiveness of these materials as consumers and the market change over time. These systems operate quickly, accurately, autonomously, and opaquely. Although marketers have long used testing to predict which advertisements will be most effective, the difference between offline human-directed and online real-time machine-controlled experimentation is profound.[50] The speed, scale, and thoroughness of machine experimentation "make[s] accessible a vast design space that ordinary human iteration wouldn't be able to explore."[51]

Even simple A/B tests[52] of a few alternative designs now can be performed at a much faster pace and with many more subjects online than off. A key finding from these tests has been the unpredictability of

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46. Connected interfaces also facilitate field experimentation to assess and increase marketing and sales processes' effectiveness, discussed further below.

47. Kurt Wagner, *Digital Advertising in the US Is Finally Bigger than Print and Television*, Vox (Feb. 20, 2019, 9:02 AM), https://www.vox.com/2019/2/20/18232433/digital-advertising-facebook-google-growth-tv-print-emarketer-2019 [https://perma.cc/ QX3D-XA4Q].

48. Machine learning is a type of artificial intelligence in which computers use data to teach themselves to perform tasks. For a useful summary, see Atif M., *Artificial Intelligence vs Machine Learning vs Data Science*, Towards Data Science (Sept. 11, 2020), https://towardsdatascience.com/artificial-intelligence-vs-machine-learning-vs-data-science-2d5b57cb025b [https://perma.cc/7SEJ-9ZVV].

49. For a definition of "algorithm," see Solon Barocas & Andrew D. Selbst, *Big Data's Disparate Impact*, 104 Cal. L. Rev. 671, 674 n.10 (2016) ("An 'algorithm' is a formally specified sequence of logical operations that provides step-by-step instructions for computers to act on data and thus automate decisions. Algorithms play a role in both automating the discovery of useful patterns in datasets and automating decision making that relies on these discoveries." (internal citation omitted)).

50. *See, e.g.*, Tien-Spalding, *supra* note 18 ("Long gone are the days of marketers conducting focus groups and then launching worldwide campaigns with billboards or newspaper ads based on that information, and then hoping for the best . . . . [Marketers] now run iterative sprints, adapting products in real time based on market conditions and feedback."); Chris Pitt, *What Can Machine Learning Do for Me Right Now in Marketing?*, Vertical Leap (Mar. 16, 2018), https://www.vertical-leap.uk/blog/what-can-machine-learning-do-for-me-in-marketing/ [https://perma.cc/CBS7-7MB2].

51. Jon Brune, *Artificial Intelligence and the Future of Design*, O'Reilly Radar (Sept. 12, 2016), https://www.oreilly.com/radar/artificial-intelligence-and-the-future-of-design/ [https://perma.cc/2VFW-X2Z3].

52. An A/B test randomly distributes an "A" version of something to some people and a "B" version to others and measures differences between the responses of the two groups.

human responses to design. For some consumer segments in some contexts, a streamlined, visually-attractive webpage is more effective, but for others, a webpage crammed with dull text is better. Adding a comma or exclamation mark sometimes increases conversions, but the reverse can also be true. Surprising A/B test findings, many of which run counter to conventional marketing wisdom, are legion.[53] A 2014 experiment showed targeting marketing texts based on a model derived by machine learning from past data resulted in thirteen times more conversions than targeting texts based on variables selected by human marketers.[54]

In the hunt for accuracy and speed, machines are generating algorithms that are increasingly freed from human assumptions and limitations.[55] In "unsupervised" machine learning, computers process unlabeled data to find patterns and use these patterns to make predictions about new data. Software company Oracle notes that an unsupervised system is "useful for customer segmentation because it will return groups based on parameters that a human may not consider."[56] In 2020, Google Brain announced a new automated machine learning system that eliminates human involvement in algorithm design; the system tests 10,000 models per second until it discovers the optimal algorithm for the task.[57]

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53. *See, e.g.*, Elisa Gabbert, *24 of the Most Surprising A/B Tests of All Time*, WORDSTREAM (Feb. 7, 2020), https://www.wordstream.com/blog/ws/2012/09/25/a-b-testing [https://perma.cc/C3YF-CAJF]; Ron Kohavi & Stefan Thomke, *The Surprising Power of Online Experiments*, HARV. BUS. REV., Sept.–Oct. 2017, at 74.

54. Pål Sundsøy et al., *Big Data-Driven Marketing: How Machine Learning Outperforms Marketers' Gut-Feeling*, 7 INT'L SOC. COMPUTING, BEHAV.-CULTURAL MODELING & PREDICTION 367, 367 (2014).

55. *See, e.g.*, Gijs Overgoor et al., *Letting the Computers Take Over: Using AI to Solve Marketing Problems*, 61 CAL. MGMT REV. 156, 158 (2019) ("[Machine learning] can learn from data without relying on assumptions or rules-based programming and it can often model much more complex interactions between variables."); DATA & SOC'Y, UNDERSTANDING ALGORITHMS 1 (2018), https://datasociety.net/wp-content/uploads/2018/04/Data_Society_Understanding_Algorithms_Explainer_FINAL-web.pdf [https://perma.cc/JX2X-MQW9] ("Combining calculation, processing, and reasoning, algorithms can be exceptionally complex, encoding for thousands of variables across millions of data points.").

56. Nikki Castle, *Supervised vs. Unsupervised Machine Learning*, ORACLE AI & DATA SCI. BLOG (July 13, 2017), https://www.datascience.com/blog/supervised-and-unsupervised-machine-learning-algorithms [https://perma.cc/S4QM-VQJ9].

57. The system starts with a set of randomly created algorithms that the system tests against the data available; it selects the top performers for the desired task; and it then randomly and iteratively mutates the top performers until the optimal algorithm for the task, given the data available, emerges. Esteban Real et al., *AutoML-Zero: Evolving Machine Learning Algorithms from Scratch*, PROC. 37TH INT'L CONF. ON MACH. LEARNING 1 (2020), https://arxiv.org/pdf/2003.03384.pdf [https://perma.cc/HXR2-YA5T]. For a less technical explanation, see Courtney Linder, *This Is How Algorithms Will Evolve Themselves*, POPULAR MECHANICS (Apr. 23, 2020), https://www.popularmechanics.com/technology/a32221995/google-automl-zero-evolve-algorithms/ [https://perma.cc/ZPQ7-VR8C].

Because machine learning can discover and exploit relationships humans never would have tested or even noticed, A/B testing is being replaced with "algorithmic marketing," "a marketing process that is automated to such a degree that it can be steered by setting a business objective in a marketing software system."[58] Algorithmic marketing systems autonomously experiment by engaging in random actions on a subset of cases. The systems analyze responses with reference to a business objective, such as sales to new customers or revenue maximization. They then continuously adapt to select which actions to take in the future, balancing "exploratory learning and exploitation of that learning."[59]

The inputs and results of A/B experiments are observable by a business's marketing department, but this requires human oversight, which costs time and money and is infected by human assumptions.[60] Machine learning facilitates greater complexity and autonomy in experimentation, making the process faster and the results more accurate and precise than A/B testing, but less observable and less interpretable by humans.[61] Algorithmic marketing does not infer personality or mood and then micro-target particular materials based on those inferences; it takes the raw data available and micro-targets directly based on correlations in that data. One marketer opines that to understand causation, an A/B test is best, but "[i]f . . . you actually care about optimization, rather than understanding," algorithmic marketing is best.[62]

Most machine-driven marketing experiments have taken place at the population level, using data associated with one set of consumers and contexts to predict what designs will be most effective for

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58. ILYA KATSOV, INTRODUCTION TO ALGORITHMIC MARKETING 4 (2018). Algorithmic marketing is sometimes called "programmatic marketing."

59. *Automated Personalization*, ADOBE TARGET GUIDE (Aug. 13, 2020), https://docs.adobe.com/content/help/en/target/using/activities/automated-personalization/automated-personalization.html [https://perma.cc/M3WV-9SWP] ("Because [the machine learning system] can adapt to changes in visitor behavior, it can be run without a set end date to provide ongoing lift and personalization . . . . The marketer does not need to run a test, analyze the results, then deliver a winner before realizing the lift found from optimization."). *See also* *Multi-Armed Bandit*, OPTIMIZELY, https://www.optimizely.com/optimization-glossary/multi-armed-bandit/ [https://perma.cc/9YTM-9GGT] (describing a similar system that optimizes digital materials for business-defined goals).

60. *See, e.g.*, Alex Birkett, *When to Run Bandit Tests Instead of A/B/n Tests*, ALL THINGS DATA-DRIVEN MKTG., https://cxl.com/blog/bandit-tests/ [https://perma.cc/RM34-MFJX]. In addition, results of A/B tests can be quickly outdated. *Id.*

61. *See, e.g.*, Matthew Stewart, *The Actual Difference Between Statistics and Machine Learning*, TOWARDS DATA SCI. (Mar. 24, 2019), https://towardsdatascience.com/the-actual-difference-between-statistics-and-machine-learning-64b49f07ea3 [https://perma.cc/N45A-DPXQ] (explaining that statistics aims primarily to understand the relationships among variables and machine learning aims to produce accurate predictions without necessarily understanding causation).

62. Birkett, *supra* note 60 (internal quotation marks omitted).

consumers and contexts with similar associated data. Now, the cutting edge is "interactive marketing" — experimenting on a single consumer to discover which digital designs in which micro-moments lead that consumer to the desired action.[63] The digital interface presented to a user then adapts as it learns more about that specific user.[64]

Further, note that businesses do not need the technological capacity in-house to engage in all of this. Thousands of third-party vendors offer services that perform various parts of the algorithmic marketing process.[65] Automation's efficiency means even small companies will adopt these techniques.[66] As Google announced in 2018, its services are "putting machine learning into the hands of every advertiser."[67]

4. Creative Artificial Intelligence

An emerging tool is generative or creative artificial intelligence, meaning artificial intelligence that can use data to design, in the moment, the digital material most likely to lead consumers to engage in actions desired by the business. To understand how this works, take a typical Facebook ad, which has just a few possible components — a headline, main text, visuals and/or videos, and a call-to-action button — each of which can be altered.[68] Machines can take a set of human-created component options and predict what mix will work best for individual consumers in their micro-moments.[69]

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63. Maurits Kaptein, *Customizing Persuasive Messages: The Value of Operative Measures*, 35 J. CONSUMER MKTG. 208, 208 (2018) (describing how technology enables a "move toward true one-to-one marketing by measuring individual responses to marketing communication[s]" (internal citation omitted)).

64. *See* Shasha Deng et al., *Smart Generation System of Personalized Advertising Copy and Its Application to Advertising Practice and Research*, 48 J. ADVERT. 356, 356–57 (2019); Maurits Kaptein et al., *Automated Adaptive Selling*, 52 EUR. J. MKTG 1037, 1038 (2018); John R. Hauser et al., *Website Morphing 2.0: Switching Costs, Partial Exposure, Random Exit, and When to Morph*, 60 MGMT. SCI. 1594, 1595 (2014).

65. *See, e.g.*, Tien-Spalding, *supra* note 18 ("[T]he [marketing technology services] landscape reached a staggering 6,800 companies in 2018.").

66. A 2018 report from consulting firm Forrester highlights the efficiency gains possible through dynamic creative advertising technologies. *See* Susan Bidel & Joanna O'Connell, *Make It Personal and Reap the Profits*, FORRESTER BLOG (Nov. 7, 2018), https://go.forrester.com/blogs/make-it-personal-and-reap-the-profits/ [https://perma.cc/JN5K-QVCL] (discussing the report).

67. Jerry Dischler, *Putting Machine Learning into the Hands of Every Advertiser*, GOOGLE: THE KEYWORD (July 10, 2018), https://www.blog.google/technology/ads/machine-learning-hands-advertisers/ [https://perma.cc/K3AM-JFKR].

68. Animalz, *We Analyzed 752,626 Facebook Ads, and Here's What We Learned (2018 Update)*, ADESPRESSO (July 10, 2018), https://adespresso.com/blog/we-analyzed-37259-facebook-ads-and-heres-what-we-learned/ [https://perma.cc/FA5M-L4ZE].

69. *See* Chris Pemberton, *3 Personalization Principles for Marketers*, GARTNER (Feb. 8, 2019) https://www.gartner.com/en/marketing/insights/articles/3-personalization-principles-for-marketers [https://perma.cc/DQV6-GED2] (discussing how "atomic" content facilitates marketing customization). In a 2019 survey of marketers, 50% of respondents said that they

But artificial intelligence now allows machines to go further, generating their own content and potentially creating digital business materials without a single component that was directly designed by a human.[70] One car manufacturer used artificial intelligence to write text for thousands of different advertisements, each tailored to one of more than 100 different consumer segments.[71] That an entire trailer for a 2016 film was created using images, speech, and text generated by artificial intelligence gives some idea of the capabilities that are being developed.[72] Consulting firm Gartner predicts that "by 2022, [marketing] content creators will produce more than 30% of their digital content with the aid of [artificial intelligence] content-generation techniques."[73]

Machine-generated content is not only inexpensive — it also can be very effective. Machines can create text that is more persuasive than text written by human marketers.[74] Images, graphics, speech, and videos are not far behind.[75] In 2019, one financial services firm concluded that its chatbot, "trained with the company's call center voice data," was as successful as top human telemarketers at selling loans and four times as successful as inexperienced telemarketers.[76]

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used personalization "to dynamically add or insert sections of content on a page/screen/email." RESEARCHSCAPE INT'L & EVERGAGE, INC., *supra* note 19, at 17.

70. *See, e.g.*, Gang Chen et al., *Understanding Programmatic Creative: The Role of AI*, 48 J. ADVERT. 347, 348 (2019). The artificial intelligence predominantly used for visual content generation is generative adversarial networks. *See, e.g.*, Kyle Wiggers, *Generative Adversarial Networks: What GANs Are and How They've Evolved*, VENTUREBEAT (Dec. 26, 2019, 1:45 PM), https://venturebeat.com/2019/12/26/gan-generative-adversarial-network-explainer-ai-machine-learning/ [https://perma.cc/8XSJ-GM86].

71. *See* Jan Kietzmann et al., *Artificial Intelligence in Advertising*, 58 J. ADVERT. RES. 263, 264 (2018).

72. *See id.*

73. Heather Pemberton Levy, *5 Key Take-Aways from Gartner Marketing Symposium/Xpo™ 2019*, GARTNER (May 9, 2019), https://www.gartner.com/en/marketing/insights/articles/5-key-take-aways-from-gartner-marketing-symposium-xpo-2019 [https://perma.cc/2RZL-JC5V].

74. *See, e.g.*, Adrianne Pasquarelli, *Chase Commits to AI After Machines Outperform Humans in Copywriting Trials*, ADAGE (July 30, 2019), https://adage.com/article/cmo-strategy/chase-commits-ai-after-machines-outperform-humans-copywriting-trials/2187606 [https://perma.cc/BJJ4-N99H] ("Chase [Bank] says that ads created by . . . machine learning performed better than ads written by humans, with a higher percent of consumers clicking on them — more than twice as many in some cases."); Patrick Kulp, *An Enormously Powerful Text Generator Has Set a New Bar for AI's Ability to Write Copy*, ADWEEK (June 4, 2020), https://www.adweek.com/creativity/an-enormously-powerful-text-generator-has-set-a-new-bar-for-ais-ability-to-write-copy/ [https://perma.cc/ACR5-7WRJ].

75. *See, e.g.*, Yitong Li et al., *Video Generation from Text*, 32 AAAI CONF. ON ARTIFICIAL INTEL. 7065, 7065 (2018).

76. Xueming Luo et al., *Frontiers: Machines vs. Humans: The Impact of AI Chatbot Disclosure on Customer Purchases*, 38 MKTG. SCI. 937, 938 (2019). Disclosure that the telemarketer was a chatbot reduced sales dramatically. *Id.*

B. The Digital Environment Facilitates Deception

The digital environment in which modern marketing and sales materials are deployed facilitates deception for at least three reasons. First, consumers perceive digital interfaces as lacking agency, which primes consumers not to notice the degree to which online materials may be designed to deceive. Second, consumers routinely interact with the online environment in an efficient, task-focused, and habitual way, leading them to routinely ignore information within digital interfaces. Third, big data and real-time tracking can identify consumers who are particularly vulnerable due to personal traits or physical or emotional state, giving businesses the opportunity to exploit this vulnerability. Digital materials might even trigger emotions that lead to cognitive vulnerability. The following discusses each of these in turn.

1. Benefitting from Consumers' Illusion that They Control Digital Interfaces

People generally understand digital interfaces as tools they use to interact with content and with other people. Like all tools, these interfaces are largely unseen by users while they are using the interface.[77] As philosophers have discussed, "once we become habituated to a particular technology, the device or interface itself recedes from conscious attention, allowing us to focus on the tasks we are using it to accomplish."[78] Users do not attend to how the design of the interface shapes their interactions with, and perception of, online content.[79]

In fact, consumers — i.e., users — construct themselves as controlling the interface. In one experiment, some subjects were offered identity theft protection in a neutral manner, and others were offered the service through webpages employing deceptive and manipulative dark patterns. Subjects reported that they felt "more free than unfree" to refuse the service, even in the most aggressively deceptive and manipulative condition.[80] This was true even though the aggressive

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77. *See, e.g.*, Jeffrey Heer & Peter Khooshabeh, *Seeing the Invisible*, AVI WORKSHOP ON INVISIBLE & TRANSPARENT INTERFACES 2 (2004), https://idl.cs.washington.edu/files/2004-Invisibility-AVI-ITI.pdf [https://perma.cc/Z2MC-SP2X] ("Ranging from pencils to computers, invisibility-in-use refers to the phenomena in which people directly employ tools or concepts without consciously monitoring them; when people work *through* their tools rather than *with* them.").

78. Susser et al., *supra* note 41, at 7.

79. See Langdon Winner, *Do Artifacts Have Politics?,* 109 DAEDALUS 121, 125 (1980) ("[T]echnologies are seen as neutral tools that can be used . . . for good [or] evil . . . . [We rarely] inquire whether a given device might have been designed and built in such a way that it produces a set of consequences logically and temporally prior to any of its professed uses.").

80. Luguri & Strahilevitz, *supra* note 1, at 35.

dark patterns led four times as many subjects to agree to the offer as selected the offer in the neutral condition.[81]

Consumers underappreciate the constructed nature of the information and choices presented in offline shopping environments too. A salesperson can frame a choice using various techniques of interpersonal influence, which are powerful in part because they go unnoticed.[82] Stores place certain foods at adult eye level and others at child eye level, yet the fact that the shelves are designed to increase sales is generally out of mind.[83] Yet while consumers have limited awareness that businesses might try to deceive them offline, consumers are even less likely to believe that a business might deceive them online.[84]

Businesses, therefore, have an incentive to cultivate and maintain consumers' illusion of control. Website visitors, one web design consultant observes, "like to think they are in charge of their actions."[85] When users perceive themselves to have more control over the commercial messages targeted at them, they find the messages to be more persuasive.[86] This is true even when the control is over the form of an avatar delivering the message and not the message itself.[87]

Consumers' illusion of control and their failure to perceive that digital interfaces are designed for the benefit of businesses form the backdrop against which deceptive design is unlikely to be questioned or even noticed. After being deceived, users may blame themselves for not examining the interface closely enough or not having read the text

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81. *Id.* at 28.

82. *See, e.g.*, ROBERT B. CIALDINI, INFLUENCE: THE PSYCHOLOGY OF PERSUASION 11 (rev. ed. 2007).

83. *See* Jon D. Hanson & Douglas A. Kysar, *Taking Behavioralism Seriously: Some Evidence of Market Manipulation*, 112 HARV. L. REV. 1420, 1448 (1999).

84. *See* Nora Moran, *Illusion of Safety: How Consumers Underestimate Manipulation and Deception in Online (vs. Offline) Shopping Contexts*, 54 J. CONSUMER AFFS. 890, 900, 904 (2020) (reporting survey evidence that consumers are less likely to feel that businesses will try deceive them when shopping online rather than offline, a result that is attenuated when a pop-up image of a sales agent appears on the online screen).

85. Liraz Margalit, *The Psychology Behind Web Browsing*, THE NEXT WEB: LIFE HACKS (June 9, 2015), https://thenextweb.com/lifehacks/2015/06/09/the-psychology-behind-web-browsing/ [https://perma.cc/H3DN-NDRB]. *See also* Matthew William Fendt et al., *Achieving the Illusion of Agency*, 5 INT'L INTERACTIVE STORYTELLING 114, 114 (2012) (teaching online game designers how to create the illusion of game player control over the course of the game).

86. *See, e.g.*, Brahim Zarouali et al., *"Everything Under Control?": Privacy Control Salience Influences Both Critical Processing and Perceived Persuasiveness of Targeted Advertising Among Adolescents*, 12 CYBERPSYCHOLOGY: J. PSYCHOSOCIAL RSCH. ON CYBERSPACE, no. 1, 2018, at 1, https://cyberpsychology.eu/article/view/9536/9085 [https://perma.cc/B8AQ-X5S2] (finding that as adolescents perceive themselves to have more control over the advertising targeted at them, they find the advertising to be more persuasive).

87. Michael D. Hanus & Jesse Fox, *Source Customization Reduces Psychological Reactance to a Persuasive Message via User Control and Identity Perceptions*, 17 J. INTERACTIVE ADVERT. 1, 9 (2017) (finding that the greater consumers' ability to customize an on-line advertising avatar, the more persuasive consumers find the avatar).

on the screen carefully enough.[88] Micro-targeting may exacerbate self-blame because showing different digital materials to different consumers likely obscures the commonality behind their experiences, reducing the likelihood that consumers will recognize personal victimization.[89] Even a single consumer might not have the opportunity to examine the same webpage twice so as to discern deceptive elements; to the extent digital content is micro-targeted, artificial intelligence "routinely generates web pages on demand that no human has ever seen before, or will ever see again."[90]

2. Exploiting Consumers' Online Habits

Effective internet usage is all about efficiency and speed. Users multitask, dividing their attention among devices, windows, and, when using mobile devices, navigating the world. They perceive only a fraction of online content; given the quantity, any other approach would be paralyzing. Even offline, consumers generally do not read fine print. But online, three things happen: first, consumer focus narrows further, excluding large print as well as fine; second, the amount of invisible content can expand dramatically; and third, consumers read less carefully and make assumptions about web design on which they base reflexive habits, both of which can lead to results the consumers do not intend.

Experienced internet users direct their attention online in a highly goal-directed manner. They unconsciously ignore anything that appears to be routine, such as "terms of service" hyperlinks or scroll-boxes. Consumers claim that they read text before clicking "I agree," but the physical evidence shows that they do not.[91] One study found that, in natural conditions, only one or two of every one thousand software purchasers click to view terms and conditions, and even these rare consumers are unlikely to read what they find.[92]

The quantity of terms that can be inserted into the fine print online is virtually unlimited. Transactions that take place offline without any terms beyond the identity of an item and its price are accompanied

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88. Ivana McConell, *How Bad UX Makes Users Blame Themselves*, UXPIN: STUDIO (Dec. 18, 2014), https://www.uxpin.com/studio/blog/bad-ux-makes-users-blame/ [https://perma.cc/HQD9-T6GN].

89. *See, e.g.*, DON NORMAN, THE DESIGN OF EVERYDAY THINGS 63 (rev. & expanded ed. 2013) ("When people have trouble using technology, especially when they perceive (usually incorrectly) that nobody else is having the same problems, they tend to blame themselves.").

90. Brune, *supra* note 51.

91. Jonathan A. Obar & Anne Oeldorf-Hirsch, *The Biggest Lie on the Internet: Ignoring the Privacy Policies and Terms of Service Policies of Social Networking Services*, 23 INFO., COMMC'N. & SOC'Y 128, 135 (2020).

92. Yannis Bakos, Florencia Marotta-Wurgler & David R. Trosser, *Does Anyone Read the Fine Print? Consumer Attention to Standard-Form Contracts*, 43 J. LEGAL STUD. 1, 3 (2014).

online with reams of additional provisions.[93] And the length of online fine print may be expanding.[94] As a result, businesses have more space online than offline in which to hide material information about their transactions.

More importantly, consumers often unconsciously ignore even large print, graphics, and videos online. Internet users are "highly focused on the current task and ruthlessly ignore[] content unrelated to [their] goal."[95] Their eyes flit across headings and subheadings.[96] Users routinely ignore any content that is adjacent to advertisements, that is located where advertisements conventionally appear, or that stands out visually from surrounding content, because they assume content in any of these positions or formats is an ad.[97] For websites viewed on large screens such as laptops or desktops, users on average spend only 8% of their time on the bottom 20% of the screen.[98] They spend almost 60% of their time on a website on the first visible screen, without looking "below the fold."[99]

Consumers use mobile devices simultaneously with many other tasks, making them even more distracted, with shorter attention spans.[100] To illustrate, using a mobile device while riding the subway requires dividing attention among viewing the screen, maintaining personal space, and keeping track of the stations, reducing mental bandwidth available for examining the digital interface. Consumers

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93. Colin P. Marks, *Online and As Is*, 45 PEPP. L. REV. 1, 3 (2018) (finding that all the top U.S. retailers with both online and offline sales inserted lengthy terms and conditions into their online transactions, and none attempted to impose any of these terms and conditions when selling the same goods in brick-and-mortar stores).

94. *See* Florencia Marotta-Wurgler & Robert Taylor, *Set in Stone? Change and Innovation in Consumer Standard-Form Contracts*, 88 N.Y.U. L. REV. 240, 253 (2013) (finding that between 2003 and 2010, online mass-market consumer software fine print terms on average grew 27%).

95. Kara Pernice, *Scanning Patterns on the Web Are Optimized for the Current Task*, NIELSEN NORMAN GRP. (Mar. 19, 2017), https://www.nngroup.com/articles/eyetracking-tasks-efficient-scanning/ [https://perma.cc/ZG6C-7TE3].

96. *See* Dan Farber, *Eye Tracking Web Usability*, ZDNET (Mar. 27, 2006, 12:26 PM), https://www.zdnet.com/article/eye-tracking-web-usability/ [https://perma.cc/X6SK-9XQX].

97. *See, e.g.*, Kara Pernice, *Banner Blindness Revisited: Users Dodge Ads on Mobile and Desktop*, NIELSEN NORMAN GRP. (Apr. 22, 2018), https://www.nngroup.com/articles/banner-blindness-old-and-new-findings/ [https://perma.cc/P5U9-A4LA].

98. Therese Fessenden, *Scrolling and Attention*, NIELSEN NORMAN GRP. (Apr. 15, 2018), https://www.nngroup.com/articles/scrolling-and-attention/ [https://perma.cc/TJ93-8W78].

99. *Id.*

100. *See, e.g.*, *Shared Web Experiences: Barriers Common to Mobile Device Users and People with Disabilities*, W3: WEB ACCESSIBILITY INITIATIVE (Jan. 22, 2013), https://www.w3.org/WAI/standards-guidelines/shared-experiences/ [https://perma.cc/A4BR-FJHL] (noting that when using a mobile device, the "user is often distracted by ambient conditions (background noise, conversations, moving objects in field of vision)").

using mobile devices are remarkably impatient: over half of them will wait only three seconds or less for a website to load.[101]

These digital viewing habits leave substantial areas in which a business might display content that consumers routinely fail to read. The benefits of a product or service can be touted within the regions that consumers view, and the costs, risks, and conditions or limitations on benefits can be hidden within the regions to which consumers pay little attention.[102] This leaves consumers vulnerable to deception because a majority of the population fully neglects both unknown and unattended-to information in decision making.[103]

To take a common example, the webpage in Figure 1 below might lead some consumers to believe they are being offered a twelve-month contract at a monthly price of $59.99, when the offer is for a two-year contract at an undisclosed price in the second year[104]:

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101. *The Need for Mobile Speed: How Mobile Latency Impacts Publisher Revenue*, THINK WITH GOOGLE (Sept. 2016), https://www.thinkwithgoogle.com/intl/en-154/marketing-strategies/app-and-mobile/need-mobile-speed-how-mobile-latency-impacts-publisher-revenue/ [https://perma.cc/2DLJ-W6YA].

102. *See, e.g.*, CONSUMER ACTION L. CTR., WHAT WARNING? OBSERVATIONS ABOUT MANDATED WARNINGS ON PAYDAY LENDER WEBSITES 6 (2013), https://consumeraction.org.au/wp-content/uploads/2013/10/What-warning-August-2013.pdf [https://perma.cc/6QTX-ZHHN] (finding warnings mandated by Australian law were either a color that blended into the background or not visible unless the consumer scrolled down).

103. *See, e.g.*, Benjamin Enke, *What You See Is All There Is*, 135 Q.J. ECON. 1363, 1365–66 (2020) (finding, in a simple experimental decision task, that a significant fraction of subjects fully neglect missing information); Raj Chetty et al., *Salience and Taxation: Theory and Evidence*, 99 AM. ECON. REV. 1145, 1146 (2009) (finding neglect of taxes when taxes are not added until after consumers place items in their baskets). *See also* Benjamin Handel & Joshua Schwartzstein, *Frictions or Mental Gaps: What's Behind the Information We (Don't) Use and When Do We Care?*, 32 J. ECON. PERSP. 155, 157–61 (2018) (reviewing literature about information consumers do not use in decision-making).

104. Direct TV Offers, AT&T (Nov. 20, 2020), https://www.att.com/directv/packages/ [https://perma.cc/92C4-6EH6] (sides of the image have been cropped to make the text readable). *See also* Consent Decree at 7, State v. DirecTV Group Inc., No. 09-2-44903-1 SEA (King Cnty. Super Ct. 2010) (settling charges that consumers were misled as to the length and price of their contracts by DirecTV's advertising).

Figure 1: Deceptive TV Advertisement. A twenty-four-month offer for DIRECTV, displaying the price for the first twelve months in large print and noting in fine print below that the price will be an unspecified higher amount for the subsequent twelve months.

The content consumers do view is examined and read less carefully online than offline.[105] This leaves consumers vulnerable to deception when faced with unintuitive features, wording, or visual cues. For instance, the following apparently appeared during the checkout process from the Wall Street Journal Wine website[106]:

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105. *See, e.g.*, Kara Pernice, *Text Scanning Patterns: Eyetracking Evidence*, NIELSEN NORMAN GRP. (Aug. 25, 2019), https://www.nngroup.com/articles/text-scanning-patterns-eyetracking/ [https://perma.cc/CHC8-J8XK] ("On the web, people don't read every word on a page; instead, they scan.").

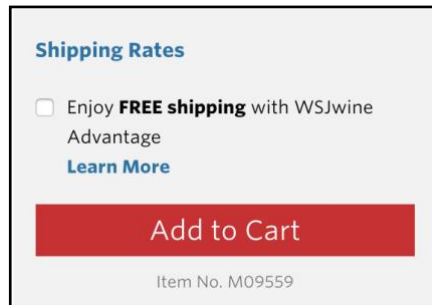106. Mathur et al., *supra* note 16, at 81:14 Fig. 3(c).

Figure 2: Deceptive Subscription Offer. A checkout interface from Wall Street Journal Wine offering free shipping with the addition of WSJwine Advantage to the customer's cart.

Read quickly, "WSJwine Advantage" appears to be a shipping option, but when added to a cart has an $89 price. Unless consumers click "Learn More," they might be deceived into agreeing to a subscription they did not realize they were purchasing.[107]

To conserve time and effort, consumers also develop reflexive shortcuts based on assumptions about online interactions.[108] When they sign up for a service, install a program, or buy a product online, "many people are so eager to start using a new service or complete a task . . . that they will often click one 'Next' button after another as if on autopilot — without necessarily understanding the terms they have agreed to along the way."[109] In one experiment, pre-checking an "accept and continue" button nearly doubled the proportion of subjects who agreed to an identity theft protection service.[110]

Consumers routinely act online based on only a few visual cues, not attending to the rest of the screen.[111] This means that small formatting changes that violate online design norms can have large effects. Even a single business can train consumers to associate visual cues with particular functions remarkably quickly and then exploit this

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107. *Id.*

108. Brett Frischmann and Evan Selinger call this "engineered habituation." BRETT FRISCHMANN & EVAN SELINGER, RE-ENGINEERING HUMANITY 235 (2d ed. 2018).

109. Natasha Singer, *When Websites Won't Take No for an Answer*, N.Y. TIMES (May 14, 2016), https://nyti.ms/1OqosqI [https://perma.cc/Q5BT-VQ2J]. *See also Aggressive Sales Tactics on the Internet and their Impact on American Consumers: Hearing Before the Committee on Commerce, Science, and Transportation*, 111th Cong. 12 (2009) (statement of Robert J. Meyer, Gayfryd Steinberg Professor of Marketing, University of Pennsylvania) ("[W]eb environments [] lead consumers to make decisions using automated or unconscious processes that do not fully consider all the information that is available on a website or presented in a decision setting.").

110. Luguri & Strahilevitz, *supra* note 1, at 23, 30 (11.3% accepted in the control condition and 20.7% accepted in the treatment condition).

111. *See* Thomas Davies & Ashweeni K. Beeharee, *The Case of the Missed Icon: Change Blindness on Mobile Devices*, CHI '12: PROC. SIGCHI CONF. ON HUM. FACTORS COMPUTING SYS. 1451, 1451 (2012).

association to deceive. One mobile phone game provides an illustration: "Players are trained to associate the green buttons with gameplay. You select a green button to start the game once you've opened the app. Then once again when you've selected the level you'd like to play, and yet again before you begin that level."[112] If a player loses a round, another green button with the same shape, font, and screen placement is displayed, but this one is labeled "Buy Moves"; to avoid paying, the user must click a small "x" instead of the green button[113]:

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112. Jennifer Derome, *Dark Patterns: The Sinister Side of UX*, USER TESTING BLOG (Oct. 1, 2015), https://www.usertesting.com/blog/dark-patterns-the-sinister-side-of-ux/ [https:// perma.cc/E9CN-TRDD]. The reader is also referred to the online version of this article, at http://jolt.law.harvard.edu/volumes, to see the figures in color.
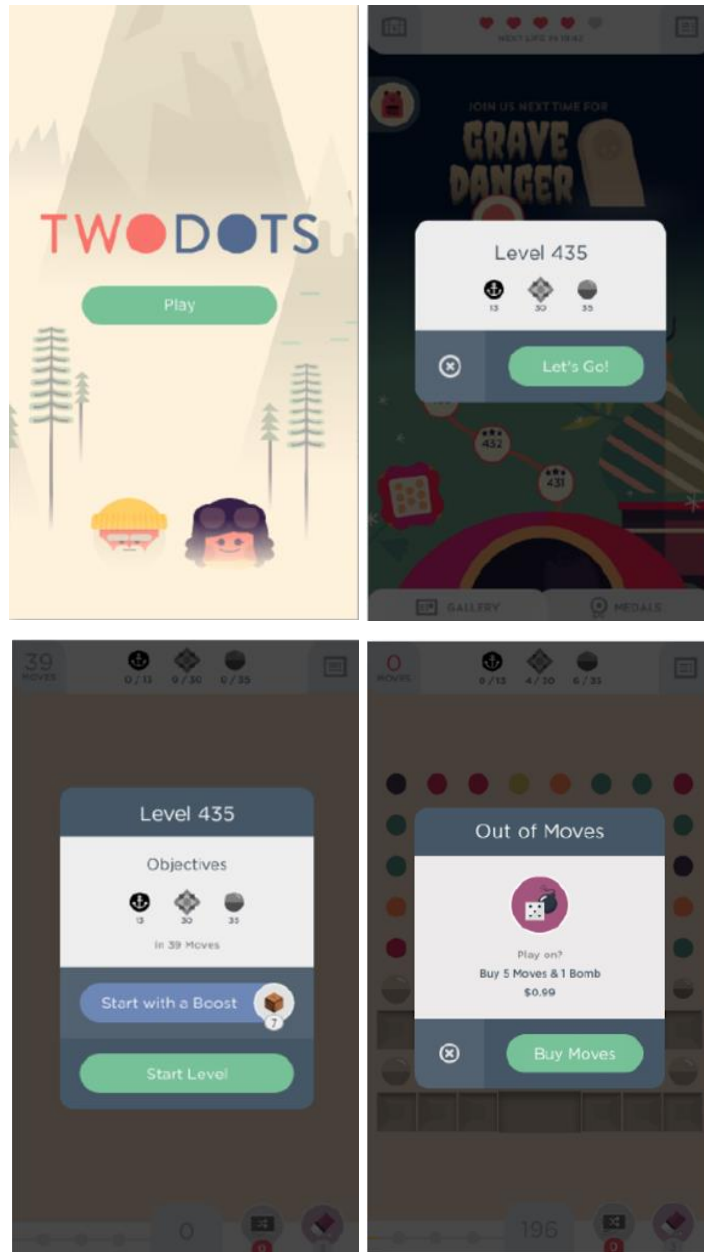
113. *Id*.

Figure 3: Deceptive Online Game. A series of screenshots from the game Two
Dots; the "Buy Moves" button on the bottom right panel is the same green color
as the buttons for "Play," "Let's Go," and "Start Level" in the top left, top right,
and bottom left panels, respectively.

Even though the "Buy Moves" button is clearly labeled, players who want to continue to play without buying anything may click the green button because their brains are "already hardwired" by the first three screens to think that the green button means "continue."[114]

Finally, the dynamic nature of digital content provides opportunities for harnessing a perceptual quirk called change blindness and the common user assumption that if a screen changes the user will notice the change. Change blindness is the failure to perceive changes in a visual field when focus is elsewhere or when no visual clues, such as movement, alert consumers to the change.[115] For example, by changing the content of a webpage when a page reloads or flickers, new content will not appear to be moving relative to the rest of the page, and will not draw user attention.[116] Alternatively, movement can be timed to occur when users remove their attention from the screen or a portion of it. One of PayPal's online interfaces allegedly uses timed movement so that consumers attempting to click one element instead click another. Specifically, consumers have reported that as they click the "continue" button on the screen below and remove their attention momentarily as they wait for the next page to load, a new button offering to charge the transaction to PayPal Credit inserts itself into the page in the precise location where the "continue" button had been. This leads them to "select" PayPal credit, for which they must pay a fee, rather than their existing transaction accounts[117]:

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114. *Id.*

115. *See, e.g.*, Davies & Beeharee, *supra* note 111, at 1451.

116. Kathryn Whitenton, *Change Blindness Causes People to Ignore What Designers Expect Them to See*, NIELSEN NORMAN GRP. (Mar. 29, 2015), https://www.nngroup.com/articles/change-blindness/ [https://perma.cc/D9MN-JW2K].

117. Phil Roberts (@philip_roberts), TWITTER (Nov. 2, 2018, 5:29 AM), https://twitter.com/philip_roberts/status/1058354405089714176 [https://perma.cc/D8XU-WPFL] ("Dark pattern or bad UX? As PayPal's checkout page loads, the 'signup for a credit card' form takes a few seconds to load, and appears where the checkout button used to be. Guess which button I meant to press vs which one I ended up pressing?"). *See also* Ben Stewart (@yousability), TWITTER (Nov. 8, 2018, 1:29 PM), https://twitter.com/yousability/status/1060645399583694850 [https://perma.cc/GX75-48VT] ("@PayPal you're using @darkpatterns by loading the continue button first, waiting, then loading the Credit button in exactly the same position (pushing the continue button down). I accidentally click on Credit EVERY TIME!!!!!").

These examples are from the U.K., but PayPal also refunded $15 million and paid a $10 million civil penalty to settle charges of using deception to trick U.S. consumers into paying with PayPal Credit instead of their PayPal transaction accounts. Stipulated Final Judgment and Order, Consumer Fin. Prot. Bureau v. PayPal, No. 1:15-cv-01426, 2015 WL 3995264, at *10 (D. Md. May 21, 2015). *See also* Complaint at 7–8, Consumer Fin. Prot. Bureau v. PayPal, Inc., No. 1:15-cv-01426 (D. Md. May 19, 2015), ECF No. 1.
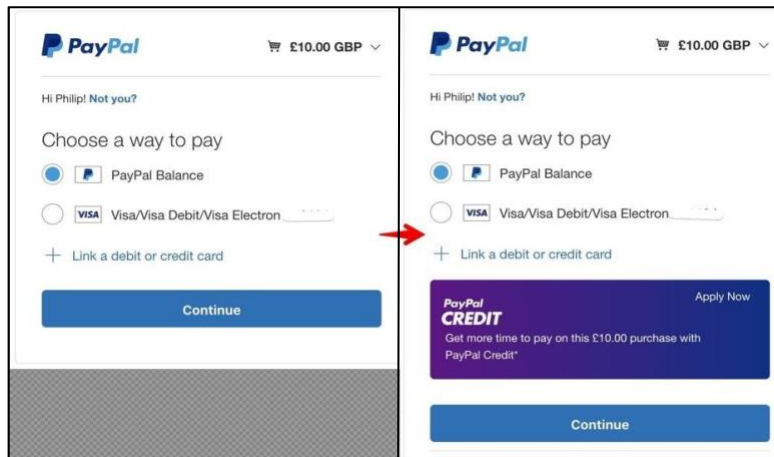
Figure 4: Deceptive Payment Interface. A pair of checkout screens for PayPal. Consumers have complained that when they try to click the "continue" button on the screen on the left, the button to use PayPal Credit appears where the "continue" button was located as shown in the screen on the right, such that they unintentionally use PayPal Credit (for a price) instead of their free PayPal transaction accounts

To achieve imperceptibility, the timing of these deceptive patterns is likely to be crucial. Offline, salespeople can cover a fee with an arm or distract a client with chatter. Online, analogous actions can be honed with machine-learned precision unavailable to human salespeople. Moreover, digital screens are ephemeral, frequently disappearing before consumers have the chance to take a second look.

3. Targeting and Eliciting Vulnerability

Well-known dark patterns have the capacity to trick many consumers regardless of their mental or physical state,[118] but designs that are more subtly deceptive are likely to be equally or more effective when targeted at the right consumer in the right micro-moment. Moreover, some online business conduct may heighten consumer vulnerability. Computer scientists have suggested that business use of "personalized dark patterns that push each user's specific buttons" is

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118. Even Google software engineers have been deceived by the design of Google's own interface into sharing location data they did not intend to share. *See* Jerod MacDonald-Evoy, *Unsealed Google Lawsuit Docs Show its own Engineers Were Confused by Privacy Settings*, ARIZ. MIRROR (Aug. 26, 2020, 9:39 AM), https://www.azmirror.com/2020/08/24/unsealed-google-lawsuit-docs-show-its-own-engineers-were-confused-by-privacy-settings/ [https://perma.cc/HD2W-3YMU].

not yet pervasive only "because companies are busy picking lower-hanging fruit," but note that "this can change at any time."[119]

Permanent or transitory cognitive or perceptual impairment can be inferred from data about consumer demographics and behavior.[120] For instance, aging can diminish perception of the periphery of screens and the color blue, the conventional color of hyperlinks.[121] Real-time data can signal states that impair perception by reducing consumer attention. A consumer playing an online game might be in a flow state and therefore more likely to mindlessly click a highlighted button to continue playing, for example.[122] Temporary cognitive and psychomotor incapacity, including incapacity caused by tiredness or intoxication, can be inferred from geospatial movements of mobile devices, manner of keyboarding, and even patterns of tweets.[123]

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119. *See* Narayanan et al., *supra* note 21, at 79.

120. If susceptibility to deception is correlated with protected traits such as race, sex, religion, or disability, targeting deceptive communications based on vulnerability could have a disparate impact on a protected group. Federal antidiscrimination laws prohibit such predatory practices only in a limited range of transactions, such as housing, 42 U.S.C. § 3601 et seq., lending, 15 U.S.C. § 1691 et seq., and public accommodations (e.g., hotels, restaurants), 42 U.S.C. § 2000a. The federal statute broadly addressing race discrimination in contracting, 42 U.S.C. § 1981, prohibits excluding consumers from contracting based on race, *see, e.g.*, Hammond v. Kmart Corp., 733 F.3d 360, 362 (1st Cir. 2013), but has not been interpreted to prohibit targeting consumers based on race. Some states provide special protection for seniors, persons with disabilities, and veterans targeted for deceptive practices. *See* CAL. CIV. CODE § 3345 (West 2020) (authorizing treble penalties or treble damages when defendants target senior citizens or disabled persons for unfair or deceptive practices); KAN. STAT. ANN. §§ 50-676, 50-677 (2020) (authorizing additional civil penalties for violations of Kansas consumer protection act committed against, e.g., elderly persons, disabled persons, and veterans).

121. Jennifer C. Romano Bergstrom et al., *Older Adults Fail to See the Periphery in a Web Site Task,* 15 UNIVERSAL ACCESS INFO. SOC'Y 261, 267 (2014), https://static1.squarespace.com/static/540cbdd0e4b0aa09e97dab0b/t/54161ae6e4b037d2d58 333c2/1410734822171/Bergstrom+et+al.+2014.pdf [https://perma.cc/4TPT-UTW6] (finding declining ability to perceive periphery of screens); Cassandra Naji, *Hyperlink Usability: Guidelines for Usable Links*, USABILITY GEEK (Oct. 10, 2016), https://usabilitygeek.com/hyperlink-usability-guidelines-usable-links/ [https://perma.cc/935R-ESK2] (reporting similar findings for the color blue).

This is not to say that the elderly people are disproportionately deceived; this age group reported a lower incidence of fraud than all others in a 2017 Federal Trade Commission survey. KEITH B. ANDERSON, FED. TRADE COMM'N, MASS-MARKET CONSUMER FRAUD IN THE UNITED STATES: A 2017 UPDATE 76 (Oct. 2019), https://www.ftc.gov/system/files/documents/reports/mass-market-consumer-fraud-united-states-2017-update/p105502massmarketconsumerfraud2017report.pdf. [https://perma.cc/Q42G-SPZY].

122. *See, e.g.*, Ralf Terlutter & Michael L. Capella, *The Gamification of Advertising: Analysis and Research Directions of In-Game Advertising, Advergames, and Advertising in Social Network Games*, 42 J. ADVERT. 95, 98–99 (2013); *id.* at 101 ("[D]ynamic in-game technology allows in-game billboards to show different ads to different players based on their demographic, former navigation, the time of day, the day of week, etc.").

123. Ann Gledson et al., *Combining Mouse and Keyboard Events with Higher Level Desktop Actions to Detect Mild Cognitive Impairment*, 2016 IEEE INT'L CONF. ON HEALTHCARE INFORMATICS 139, 140, http://publications.aston.ac.uk/id/eprint/32793/1/Aggregating_Mouse_keyboard_and_higher _level_events_Cam_ready.pdf [https://perma.cc/BJV2-5XS3]; L. Giancardo et al.,

Detection of impairment could be exploited by deceptive design to effectuate sales that would not have happened but for the impairment.[124]

Big data can facilitate targeting consumers by their personality traits, education levels, or recent life events, all of which can influence susceptibility to deception.[125] Matching banner advertisements to consumer impulsivity increases advertising effectiveness immensely.[126] Dark patterns more powerfully affect the decisions of consumers with less education than the decisions of those with more education.[127] Surveys indicate a direct relationship between a recent negative life event (e.g., divorce, job loss, or death of a family member or close friend) and susceptibility to fraud.[128]

Other predictors of susceptibility to deception are more surprising; for example, consumers who are more numerate and less impulsive appear to be more likely to believe some types of misleading advertising.[129] Machine-based experimentation with actual consumers in real time would likely discover more complex correlates of susceptibility at the population level. "Interactive marketing" that experiments with individual consumers might identify even idiosyncratic signs of vulnerability.

Emotional states that can affect susceptibility to deceptive design can also be detected through big data analytics.[130] In 2017, Facebook

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Psychomotor Impairment Detection via Finger Interactions with a Computer Keyboard During Natural Typing, 5 SCI. REPS. 9678, 9679 (2016), https://www.nature.com/articles/srep09678.pdf [https://perma.cc/87V4-SHG9]; Emerging Techn. from the arXiv, *Machine-Learning Algorithm Identifies Tweets Sent Under the Influence of Alcohol*, MIT TECH. REV. (Mar. 16, 2016), https://www.technologyreview.com/s/601051/machine-learning-algorithm-identifies-tweets-sent-under-the-influence-of-alcohol/ [https://perma.cc/2PLZ-CF3A].

124. *Cf.*, Stephanie Clifford, *Online Merchants Home in on Imbibing Consumers*, N.Y. TIMES (Dec. 27, 2011), http://www.nytimes.com/2011/12/28/business/online-retailers-home-in-on-a-new-demographic-the-drunken-consumer.html?smid=pl-share [https://perma.cc/488S-5FSX]; Rick Moss, *Online Merchants Benefit from SWI (Shopping While Intoxicated)*, RETAIL WIRE (Dec. 29, 2011), https://www.retailwire.com/discussion/online-merchants-benefit-from-swi-shopping-while-intoxicated/ [https://perma.cc/2CD6-3SMB].

125. *Cf.* Ford, *supra* note 2, at 146–53 (discussing ways in which the online environment combined with data about individuals' susceptibilities, personality, and recent life events facilitate scams).

126. Urban et al., *supra* note 26, at 27.

127. Luguri & Strahilevitz, *supra* note 1, at 48 (reporting findings from study that employed both deceptive dark patterns and non-deceptive manipulative dark patterns).

128. ANDERSON, *supra* note 121, at vii–viii.

129. Patrick McAlvanah et al., *Fraudulent Advertising Susceptibility: An Experimental Approach* 32 (Fed. Trade Comm'n, Working Paper No. 325, 2015), https://www.ftc.gov/es/system/files/documents/reports/fraudulent-advertising-susceptibility-experimental-approach/wp325.pdf [https://perma.cc/SFS7-WTRY].

130. *E.g.*, NORWEGIAN CONSUMER COUNCIL, DECEIVED BY DESIGN 23 (2018), https://fil.forbrukerradet.no/wp-content/uploads/2018/06/2018-06-27-deceived-by-design-final.pdf [https://perma.cc/P7UT-QD3Z] ("[F]ace recognition technology could be used for targeted advertising based on emotional states[.]").

told advertisers that it could "monitor posts and photos in real time to determine when young people feel 'stressed', 'defeated', 'overwhelmed', 'anxious', 'nervous', 'stupid', 'silly', 'useless' and a 'failure'."[131] One need not accept the company's claims at face value to see how even imperfect predictions about these feelings could be used to reach consumers who are vulnerable to deception. Stress and anxiety can impair cognitive function and decision-making performance.[132] Depression is associated with diminished cognitive performance.[133]

Discovery of the relationship between emotional states and responsiveness to advertising is not new. As marketing experts explain: "Mood is one situational context that advertisers can greatly influence. Advertisers can, for instance, choose the programming or magazine or newspaper, or even Internet site, by the mood elicited by that medium's content."[134] The difference online is that emotional targeting can be very precise, using data about a particular consumer in a particular moment, such as "content emotion analysis" of the consumer's email or other online "conversation scrapes."[135]

Digital communications can also steer individuals into more vulnerable states, facilitating deception. As Ryan Calo has colorfully put it, "firms will increasingly be in the position to *create* suckers, rather than waiting for one to be born."[136] One high-profile example is Facebook's success in manipulating newsfeeds to influence users' emotions.[137] A more pedestrian example is commercial messages falsely claiming that an offer will soon expire or that limited quantities are available, putting consumers in the mindset that they must act immediately, without further reflection.[138]

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131. Sam Levin, *Facebook Told Advertisers It Can Identify Teens Feeling 'Insecure' and 'Worthless'*, GUARDIAN (May 1, 2017, 3:01 PM), https://www.theguardian.com/technology/2017/may/01/facebook-advertising-data-insecure-teens [https://perma.cc/69H8-KPDC].

132. *See, e.g.*, S.J. Lupien et al., *The Effects of Stress and Stress Hormones on Human Cognition: Implications for the Field of Brain and Cognition*, 65 BRAIN & COGNITION 209, 231 (2007).

133. Carrie Shilyansky et al., *Effect of Antidepressant Treatment on Cognitive Impairments Associated with Depression: A Randomised Longitudinal Study*, 3 LANCET PSYCHIATRY 425, 433 (2016).

134. Kathryn A. LaTour & Michael S. LaTour, *Positive Mood and Susceptibility to False Advertising*, 38 J. ADVERT. 127, 128 (2009).

135. Anthony Nadler & Lee McGuigan, *An Impulse to Exploit: The Behavioral Turn in Data-Driven Marketing*, 35 CRITICAL STUD. MEDIA COMMC'N. 151, 156 (2018) (citing Liam Brennan, *Behaviors, Emotions & Moments: A New Approach to Audience Targeting*, ADAGE (Mar. 24, 2017), https://adage.com/article/digitalnext/bem-a-approach-audience-targeting/308383 [https://perma.cc/34ZB-QQ7W]).

136. Calo, *supra* note 2, at 1018.

137. Adam D. I. Kramer et al., *Experimental Evidence of Massive-Scale Emotional Contagion Through Social Networks*, 111 PROC. NAT'L ACAD. SCIS. 8788, 8788 (2014).

138. *See, e.g.*, Scott D. Swain et al., *How Time Restrictions Work: The Roles of Urgency, Anticipated Regret, and Deal Evaluations*, 33 ADVANCES CONSUMER RSCH. 523, 523 (2006);

Online games present another opportunity to influence emotions, and, in turn, susceptibility to deception. In 2016, one academic described the next stage of in-game advertising as being "able to manipulate either valence of feedback or difficulty level" so as to affect players' perceptions and thereby affect their "brand evaluation and decision making processes."[139] Given that "game design elements, such as winning and losing, are highly influential in terms of motivating consumers,"[140] it can be anticipated that profit-maximizing algorithms at some point will design games to adjust in real time to produce a win or a loss, depending on which result will "motivate" the gamer to act in the manner most profitable for the business.[141]

However, the relationships among emotional state, vulnerability to deception, and consumer behavior are incredibly complex. For example, some studies have found that consumers in a positive mood are better able to detect falsity in advertising.[142] Other research has shown that subjects in a negative mood state and subjects in a positive mood state both experience reduced logical reasoning performance, as compared to subjects in a neutral state.[143] Still other research indicates that degree of emotional impact of stimuli, not the mood valence (positive or negative), affects subjects' attention.[144]

Businesses and individuals seeking to deceive others offline have always targeted vulnerable consumers and manipulated consumer emotions to make consumers more vulnerable to deception.[145]

Edward Dennis, *23 Tactics to Create Urgency and Grow Your eCommerce Conversions*, CₒₑₑDNA (Sept. 9, 2020), https://www.coredna.com/blogs/how-to-create-urgency-in-ecommerce [https://perma.cc/693X-RRCL].

139. Tathagata Ghosh, *Winning Versus not Losing: Exploring the Effects of In-Game Advertising Outcome on its Effectiveness*, 36 J. Iɴᴛᴇʀᴀᴄᴛɪᴠᴇ Mᴋᴛɢ. 134, 145 (2016). *See also, e.g.*, Laura Herrewijn & Karolien Poels, *Putting Brands into Play,* 32 Iɴᴛ'ʟ J. Aᴅᴠᴇʀᴛ. 17, 19 (2013) (noting that players' emotional experiences may affect their perception of advertising).

140. Vincent J. Cicchirillo, *Digital Game Advertising (IGA and Advergames): Not All Fun and Games*, 19 J. Iɴᴛᴇʀᴀᴄᴛɪᴠᴇ Aᴅᴠᴇʀᴛ. 202, 202 (2019).

141. *See* Matthew S. Eastin et al., *Customizing the Win: Demonstrating a Positive Way to Consumer Brand Attitude*, 19 J. Iɴᴛᴇʀᴀᴄᴛɪᴠᴇ Aᴅᴠᴇʀᴛ. 236, 237 (2019) (advocating "enhancement of [gamer] self-efficacy through successful game performance" (i.e., making sure the consumer wins) and other game design features as a way to increase the value of in-game advertising).

142. LaTour & LaTour, *supra* note 134, at 129; *see also id*. at 139 ("Media context is a decision advertisers routinely make, and knowing that their advertising may be less likely to be elaborated on in either a neutral or negative mood context may cause the less scrupulous advertisers to seek out those contexts.").

143. Nadine Jung et al., *How Emotions Affect Logical Reasoning*, Fʀᴏɴᴛɪᴇʀs Psʏᴄʜ., June 10, 2014, at 9, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4050437/pdf/fpsyg-05-00570.pdf [https://perma.cc/6G6S-XVSS].

144. Julia Vogt et al., *Allocation of Spatial Attention to Emotional Stimuli Depends Upon Arousal and Not Valence*, 8 Eᴍᴏᴛɪᴏɴ 880, 883 (2008).

145. *See, e.g.*, Cialdini, *The Science of Persuasion*, *supra* note 16, at 80 (discussing marketers use of "limited time only" and "limited supply" advertising to create urgency); *Top 10 Financial Scams Targeting Seniors*, Nᴀᴛ'ʟ Cᴏᴜɴᴄɪʟ ᴏɴ Aɢɪɴɢ,

However, the complexity of the relationship between emotions and susceptibility to deception means that it is difficult, if not impossible, for human-directed marketing to exploit the relationship thoroughly. Machine learning is ideal for leveraging the effect of mood on vulnerability because, as explained above, it can identify relationships unexpected by humans or involving too many interacting variables for humans to assess. As one journalist concluded after interviewing marketers of scam products (e.g., sham diet pills, fake antivirus software), "Facebook's targeting algorithm is so powerful . . . [the marketers] don't need to identify suckers themselves — Facebook does it automatically."[146] Although businesses selling legitimate products might not realize that they are micro-targeting vulnerability, algorithms optimized for conversions will no doubt identify consumers who, in the moment, are "suckers" for subtler deception too.

C. Unchecked by Law, the Digital Design Process Will Produce Deception

Unchecked, algorithmic marketing will inevitably lead businesses to engage in deceptive practices. The following describes how this occurs, points to analogous problems such as algorithmic radicalization and discrimination, and demonstrates the capacity of algorithms to deceive, even when not programmed to do so. Like any machine learning system, algorithmic marketing needs guardrails to prevent problematic consequences. Now is the time, as these algorithmic marketing systems are being developed, for the law to give businesses the incentive to add these guardrails.

In the past, marketers' primary mission was to influence consumers' cognitive and emotional appraisals of a brand and that brand's products or services, with the idea that these appraisals would affect sales. Today's marketing strategies "aim not for inciting swells of feeling or stirring stories imbuing brands with cultural meaning," but instead "aim to influence consumers at a mundane, and sometimes microscopic, level of habits and cognitive shortcuts that humans rely

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https://www.ncoa.org/economic-security/money-management/scams-security/top-10-scams-targeting-seniors/ [https://perma.cc/DD9K-M693] ("[S]cammers read obituaries and call or attend the funeral service of a complete stranger to take advantage of the grieving widow or widower. Claiming the deceased had an outstanding debt with them, scammers will try to extort money from relatives to settle the fake debts.").

146. Zeke Faux, *How Facebook Helps Shady Advertisers Pollute the Internet*, BLOOMBERG BUSINESSWEEK (Mar. 28, 2018, 12:15 PM), https://www.bloomberg.com/news/features/2018-03-27/ad-scammers-need-suckers-and-facebook-helps-find-them [https://perma.cc/635B-BC25] ("[Shady businesses] once had to guess what kind of person might fall for their unsophisticated cons . . . . Now Facebook does that work for them . . . . [T]heir ad campaigns lose money for a few days as Facebook gathers data through trial and error, then . . . sales take off exponentially.").

on to cope with the endless decisions necessary in daily life."[147] Marketing consultants advise businesses to shift away from "brand advertising" and to invest instead in measuring consumer "habits" and in monitoring "real-time actionable data" so as to engage in "sales methods" that are "tied to buyers' processes" and can "react[] to customers' habits."[148] The distinction between marketing and sales is thus collapsed.[149] Both are ruthlessly driven by data on measurable consumer actions.

Industry refers to algorithmic marketing as "real-time personalization," implying that consumers are shown information relevant to their current personal needs and wants. But businesses optimize their digital conduct for conversions, the measurable result businesses seek for profitmaking purposes. Businesses do not optimize for consumer enjoyment or satisfaction unless these happen to coincide with conversions.[150]

Algorithmic marketing, absent intervention, will not distinguish between conversions of deceived consumers and conversions of comprehending consumers. An algorithm does not recognize whether the consumer was intoxicated and under a misimpression material to the transaction because the system only measures conversions. Under conditions in which deceived consumers are more likely to take the desired action, the technology will inevitably deceive so as to maximize conversions.

This is a straightforward manifestation of one of the primary dangers of artificial intelligence — that it will be programmed to achieve a permissible goal but will develop a problematic method for achieving that goal.[151] One scientific institute provides a theoretical example: "If you ask an obedient intelligent car to take you to the airport as fast as possible, it might get you there chased by helicopters

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147. Nadler & McGuigan, *supra* note 135, at 160.

148. *Id.* at 158.

149. For further discussion, see *supra* note 21.

150. Marketing designed to show consumers only products that best satisfy their inferred existing needs and desires often is not profit maximizing. Relatively expensive items sell better if they are shown next to an even more expensive version of the same item. *See, e.g.*, Una Savcenko, *How to Market Expensive Products So They Look Like a Steal*, PRINTFUL BLOG, https://www.printful.com/ blog/how-to-market-expensive-products/ [https://perma.cc/VQP3-LZJW] (reporting that kitchenware company Williams-Sonoma nearly doubled sales of a $275 bread maker by offering a $429 model next to it). Similarly, triggering anxiety or fear can stimulate sales, but hardly maximizes consumer enjoyment or satisfaction. *See, e.g.*, Jacques Peretti, *SUVs, Handwash and FOMO: How the Advertising Industry Embraced Fear*, GUARDIAN (July 6, 2014, 12:00 PM), https://www.theguardian.com/media/2014/jul/06/how-advertising-industry-concept-fear [https://perma.cc/9W64-RSE7] (reporting that advertising stokes anxieties so as to sell products to alleviate those anxieties).

151. Dario Amodei et al., *Concrete Problems in AI Safety*, ARXIV, July 25, 2016, at 2, https://arxiv.org/abs/1606.06565v2 [https://perma.cc/AJ7C-Y3BP] (dubbing this the negative side effects problem in artificial intelligence).

and covered in vomit, doing not what you wanted but literally what you asked for."[152] A similar problem already exists with respect to YouTube's recommendation algorithm being optimized for user engagement. Through machine learning, the algorithm discovered and exploits the fact that people are drawn to edgy content, resulting in increasing dissemination of and exposure to hate speech and other radical and radicalizing content.[153]

As has recently become well-known, artificial intelligence systems in pursuit of non-discriminatory business goals also can engage in illegal discrimination.[154] An infamous series of events illuminates the process. Google's search algorithm is programmed to increase consumer clicks on advertisements because advertisers pay Google for these clicks. At first, advertisements selling criminal records appeared alongside Google search results randomly. Consumers clicked on those advertisements more often when searching for black race-associated names than when searching for white race-associated names.[155] To maximize clicks and thus Google's ad revenue, its algorithm learned to show advertisements for criminal background checks alongside consumer searches for black race-associated names more often than alongside searches for white race-associated names.[156] Until an academic researcher discovered it, Google presumably did not even know that its algorithm engaged in racially-biased advertising.[157]

That machine-learning systems optimizing business revenue can result in radicalization, discrimination, and deception does not mean that algorithmic marketing will always produce these outcomes. For some products and services, the optimal sales strategy employs non-deceptive business practices. For others, a particular design might deceive some consumers, at some times, or in some situations. But where the technology is optimized for sales and a particular design in

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152. Max Tegmark, *Benefits & Risks of Artificial Intelligence*, FUTURE LIFE INST., https://futureoflife.org/background/benefits-risks-of-artificial-intelligence/ [https://perma.cc/J84Z-9VH5].

153. *See, e.g.*, Zeynep Tufekci, *YouTube Has a Video for That*, 320 SCI. AM. 77 (Apr 2019) (describing this phenomenon); Kevin Roose, *YouTube Unleashed a Conspiracy Theory Boom. Can It Be Contained?*, N.Y.TIMES (Feb. 19, 2019), https://nyti.ms/2V7m9gD [https://perma.cc/GN6E-FANX] (same).

154. *See, e.g.*, Barocas & Selbst, *supra* note 49, at 677–93.

155. Latanya Sweeney, *Discrimination in Online Ad Delivery*, 56 COMMC'NS ACM 44, 48–51 (2013).

156. *Id.*

157. Facebook's advertising algorithm has similar effects. The algorithm automatically takes advertisements that the business has not asked to be targeted and delivers them nonetheless along stereotyped racial and gender lines. Because discriminatory targeting maximizes Facebook revenue and because Facebook's algorithms are set to maximize revenue, discrimination has been the result. *See* Muhammad Ali et al., *Discrimination Through Optimization: How Facebook's Ad Delivery Can Lead to Biased Outcomes*, 3 PROC. ACM ON HUMAN-COMPUTER INTERACTION, Nov. 2019, 199:1–199:3, https://www.ccs.neu.edu/home/ amislove/publications/FacebookDelivery-CSCW.pdf [https://perma.cc/74W3-TEQH].

particular contexts is associated with more sales to deceived than to informed consumers, the technology will learn to direct that particular design more often to consumers similar to those who have been deceived in the past, and in similar contexts.

That machines can successfully deceive is widely understood. Machine-produced online profiles and bots have deceived voters, daters, and others, often as part of financial scams.[158] What is less well-known is that machine learning systems can teach themselves to select and engage in deception as a strategy even when humans did not design the systems to engage in deception. When Facebook's artificial intelligence research lab used machine learning to train bots to negotiate with humans, the bots quickly adopted strategies that involved "initially feigning interest in a valueless item, only to later 'compromise' by conceding it."[159] The researchers did not expect this result: "Our agents [learned] to deceive without any explicit human design, simply by trying to achieve their goals."[160] In 2018, an artificial intelligence system deceived its own programmers about how it was performing a task.[161]

Digital designers know that deception is inevitable when success is measured only by how well the ad, website, or app performs along business metrics. As one designer admits, even when humans are doing the designing: "When instructed just to maximize certain numbers like 'Growth' or 'Engagement', even good people come up with bad patterns sometimes. Especially when design teams are unfamiliar with dark patterns, it is easy to wander into a deceptive design. Because at least in the short term, they seem to work."[162] Another digital interface designer is blunt: "Dark patterns tend to perform very well . . . simply because a design that tricks users into doing something is likely to achieve more conversions than one that allows users to make an informed decision."[163]

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158. *See generally* Woodrow Hartzog, *Unfair and Deceptive Robots*, 74 MD. L. REV. 785 (2015).

159. Mike Lewis et al., *Deal or No Deal? End-to-End Learning for Negotiation Dialogues*, 2017 CONF. ON EMPIRICAL METHODS NAT. LANGUAGE PROCESSING 2443, 2444, https://arxiv.org/abs/1706.05125 [https://perma.cc/W74Z-7NWS].

160. *Id.* In 2019, an artificial intelligence system trained itself to bluff better than any human in multiplayer poker games. Noam Brown & Tuomas Sandholm, *Superhuman AI for Multiplayer Poker*, 365 SCI. 885, 885 (2019).

161. Devin Coldewey, *This Clever AI Hid Data from Its Creators to Cheat at Its Appointed Task*, TECHCRUNCH (Dec. 31, 2018, 6:14 PM), https://techcrunch.com/2018/12/31/this-clever-ai-hid-data-from-its-creators-to-cheat-at-its-appointed-task/[https://perma.cc/5HGS-G4ST].

162. Caitria O'Neill, *Fear Is the Path to the Dark Side — How to Keep Dark Patterns Out of Good Products*, MEDIUM: UX COLLECTIVE (Feb. 7, 2018), https://uxdesign.cc/fear-is-the-path-to-the-dark-side-how-to-keep-dark-patterns-out-of-good-products-7fc281c07d7b [https://perma.cc/257B-E7MX].

163. Harry Brignull, *Dark Patterns: Deception vs. Honesty in UI Design*, A LIST APART (Nov. 1, 2011), https://alistapart.com/article/dark-patterns-deception-vs.-honesty-in-ui-

Nobel Laureates George Akerlof and Bob Shiller have discussed how the invisible hand of competition inevitably pushes firms toward deception.[164] Algorithmic marketing systems optimized for profit will do so just as invisibly and inevitably, but faster.

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Deceptive business practices employ many of the same tricks both online and off. Phrasing certain offers in a manner to encourage misinterpretation, placing information in unread locations or in unreadable fonts, and designing the tone and pitch of cost or risk information delivered orally to ensure no one listens to what is said are all routine deceptive offline practices. What is different online is that this can all be done more effectively, as demonstrated above, and with a lower probability of being found deceptive by the legal system. It is to the latter problem that this Article now turns.

III. DIGITAL DECEPTION IMMUNITY

Deceptive digital business practices will increasingly threaten the enforceability of laws intended to protect consumers and ensure fair competition. These laws include broad prohibitions on unfair, abusive, and deceptive practices,[165] as well as targeted prohibitions on misleading representations, omissions, or practices in particular contexts.[166] The following sets forth the core legal understanding of

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design [https://perma.cc/WG66-AFLV]; *see also* Lennart Overkamp, *Daily Ethical Design*, A LIST APART (May 30, 2019), https://alistapart.com/article/daily-ethical-design/ [https://perma.cc/CE8U-GZWQ] ("Conversion optimization . . . can easily turn into 'How do we squeeze out more revenue from our customers by turning their unconsciousness against them?'"); Narayanan et al., *supra* note 21, at 80 ("[A] design process hyperfocused on A/B testing can result in dark patterns even if that's not the intent[.]").

164. GEORGE A. AKERLOF & ROBERT J. SHILLER, PHISHING FOR PHOOLS: THE ECONOMICS OF MANIPULATION AND DECEPTION 163–65 (2015).

165. *See, e.g.*, Federal Trade Commission Act § 5(a), 15 U.S.C. § 45(a) (prohibiting "[u]nfair methods of competition in or affecting commerce, and unfair or deceptive acts or practices in or affecting commerce"); Alabama Deceptive Trade Practices Act, ALA. CODE § 8-19-5(27) (2020) (prohibiting "[e]ngaging in any . . . unconscionable, false, misleading, or deceptive act or practice in the conduct of trade or commerce"); Massachusetts's Regulation of Business Practices for Consumers' Protection, MASS. GEN. LAWS ch. 93A, § 2 (2020) ("Unfair methods of competition and unfair or deceptive acts or practices in the conduct of any trade or commerce are hereby declared unlawful.").

166. *See, e.g.*, Lanham Act § 43(a)(1), 15 U.S.C. § 1125(a)(1) (prohibiting, in commercial advertising, labeling, or promotion, false representations and misleading omissions about a firm's own products or services or a competitor's products or services); Consumer Financial Protection Act, 12 U.S.C. § 5531(a) (prohibiting "unfair, deceptive, or abusive" practices in connection with consumer financial transactions); Investment Advisers Act of 1940, 15 U.S.C. § 80b-6 (prohibiting investment advisers from engaging in deceptive or manipulative practices); Fair Debt Collection Practices Act, 15 U.S.C. § 1692e (prohibiting the use of "any false, deceptive, or misleading representation or means in connection with the collection of any debt").

what these statutes prohibit. It then traces the primary methods by which public enforcement agencies,[167] business competitors,[168] and consumer plaintiffs[169] prove deceptive business conduct in court.[170] Finally, it exposes the declining efficacy of each of these methods in demonstrating digital consumer deception. At the very time that unchecked algorithmic marketing is leading inevitably to consumer deception, consumer protection and unfair competition claims are becoming more difficult to prove, leaving digital deception increasingly immunized from the law.

This is not to say that only the law can keep businesses in check; the difficulty of committing deception successfully, employee moral qualms,[171] and business reputation concerns[172] can curtail deceptive business practices in some circumstances. But each of these falters in the face of algorithmic marketing. The limits on human skill at misleading others are at least partially overcome by the machine learning processes discussed above. When machines teach themselves to target vulnerability and deceive consumers without human involvement, ethical restraints on deceptive practices may vanish.[173]

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167. Federal enforcement agencies, most prominently the Federal Trade Commission and the Consumer Financial Protection Bureau, can take legal action against businesses engaged in deceptive practices under 15 U.S.C. § 45(a) and 12 U.S.C. § 5531(a)), respectively. State and some local enforcement agencies have their own statutory authority to pursue these practices. *See, e.g.*, California Unfair Competition Law, CAL. BUS. & PROF. CODE § 17204 (West 2020) (authorizing state and local agencies to pursue claims); Massachusetts Consumer Protection Law, MASS. GEN. LAWS ch. 93A, § 4 (2020) (authorizing suits by state Attorney General); FLA. STAT. § 501.207 (same).

168. A business can sue a competitor under the Lanham Act § 43(a)(1)(B), and state law analogues, e.g., CAL. BUS. & PROF. CODE § 17204 (authorizing competitor suits); MASS. GEN. LAWS ch. 93A, § 11 (same). *See also* Caribbean Cruise Line, Inc. v. Better Bus. Bureau of Palm Beach Cnty., Inc., 169 So. 3d 164, 166 (Fla. Dist. Ct. App. 2015) (holding that injured competitors have standing to sue under FLA. STAT. § 501.211).

169. State statutes, sometimes called Unfair or Deceptive Acts and Practices (UDAAP) statutes, give consumers private rights of action against unfair and deceptive business practices. *See, e.g.*, FLA. STAT. § 501.211 (authorizing consumer suits); CAL. BUS. & PROF. CODE § 17204 (same); MASS. GEN. LAWS ch. 93A, § 9 (same).

170. For ease of reference, the discussion here generally does not distinguish between judicial or administrative proceedings: parties pursuing claims are called "plaintiffs" and businesses against which claims are pursued are referred to as "defendants" in both fora.

171. When employees observe or are asked to commit unethical actions, turnover is high and whistleblowing is not uncommon. *See, e.g.*, Kristen Bell DeTienne et al., *The Impact of Moral Stress Compared to Other Stressors on Employee Fatigue, Job Satisfaction, and Turnover: An Empirical Investigation*, 110 J. BUS. ETHICS 377, 387–88 (2012) (showing that ethical stress increases employee turnover intentions); Alexander Dyck et al., *Who Blows the Whistle on Corporate Fraud?*, 65 J. FIN. 2213 (2010) (documenting the prevalence of employee whistleblowing).

172. However, returns on deception can be high even when accounting for reputational damage. *See* Anita Rao & Emily Wang, *Demand for "Healthy" Products: False Claims in Advertising*, 54 J. MKTG. RSCH. 968, 972, 980–81 (2017) (showing how, controlling for other factors, breakfast cereal company Kellogg's used a false health claim to increase its revenue by between $59 and $144 million and paid only $4 million to settle litigation regarding that claim).

173. Thanks to Chris Hoofnagle for this point.

As for reputation, in a fleeting interaction with a digital screen, consumers might not realize they have been deceived and may blame themselves for not examining the screen more closely. Moreover, when businesses target different consumers with different materials, consumers might not understand each other's experiences. Finally, businesses may avoid transacting online with consumers who are likely to complain.[174] The evanescent and micro-targeted nature of digital materials therefore undermines any reputational price businesses might otherwise pay for digital deception.

A. Deceptive Business Conduct as a Legal Construct

The Federal Trade Commission Act defines prohibited deception as a "representation, omission, or practice" by a business that is "likely to mislead" a consumer "acting reasonably under the circumstances."[175] Other federal and state laws against deceptive business conduct also use this general formulation.[176] To make a successful claim, a plaintiff must pinpoint the specific communication or activity of the defendant that is unlawful[177] and demonstrate that this specific communication or activity caused or is likely to cause reasonable consumers to harbor

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174. For further discussion of how businesses can apply big data and machine-learning to avoid consumers who complain, see *infra* Section III.C.3.

175. FED. TRADE COMM'N, POLICY STATEMENT ON DECEPTION (1983), *reprinted in In re* Cliffdale Associates, Inc., 103 F.T.C. 110, app. 175 (1984); [hereinafter "FTC Policy Statement on Deception"] (defining "deceptive practices" for purposes of the Federal Trade Commission Act, 15 U.S.C. § 45(a)).

176. *See, e.g.*, CONSUMER FIN. PROT. BUREAU, CFPB EXAMINATION MANUAL at UDAAP 5 (2012) (defining "deceptive practices" for the purpose of the Consumer Financial Protection Act, 12 U.S.C. 5531(a)); Angelo v. Parker, 275 So. 3d 752, 755 (Fla. Dist. Ct. App. 2019) (defining deceptive practice for purposes of FLA. STAT. § 501.202 (2019)); Benson v. Kwikset Corp., 62 Cal. Rptr. 3d 284, 299 (Cal. Ct. App. 2007), *as modified on denial of reh'g* (July 26, 2007) (same under CAL. CIV. CODE § 1770(a) (West 2020)). Business competitors suing under the Lanham Act § 43(a)(1), 15 U.S.C. § 1125(a)(1), must demonstrate "actual" deception, not a mere likelihood of deception. *See, e.g.*, Johnson & Johnson-Merck Consumer Pharms. Co. v. Rhone-Poulenc Rorer Pharms., Inc, 19 F.3d 125, 129–30 (3d Cir. 1994) (explaining that a Lanham Act plaintiff "cannot obtain relief by arguing how consumers *could* react; it must show how consumers *actually do* react") (emphasis in original).

177. *See, e.g.*, Colgan v. Leatherman Tool Grp., Inc., 38 Cal. Rptr. 3d 36, 46 (Cal. Ct. App. 2006) ("In determining whether a statement is misleading . . . , the primary evidence in a false advertising case is the advertising itself." (internal citation omitted)). Consumer plaintiffs in deception cases have been required to identify the specific misleading advertisement or website they each saw. *See, e.g.*, *In re* NJOY, Inc. Consumer Class Action Litig., No. CV 14-00428, 2014 WL 12586074, at *10 (C.D. Cal. Oct. 20, 2014) (dismissing state law deception claims: "[P]laintiffs do not state which 'material, deceptive marketing claims' they saw . . . . Absent such factual allegations, [defendant] is not on notice of 'what' misrepresentation plaintiffs are challenging — as each advertisement and communications medium contained different purportedly misleading and/or deceiving representations."); Goldemberg v. Johnson & Johnson Consumer Cos., 8 F. Supp. 3d 467, 480 (S.D.N.Y. 2014) (dismissing complaint for failing to allege the specific misleading statements plaintiff saw before he purchased defendant's product).

false beliefs.[178] In addition, deception is only actionable if those false consumer beliefs are material, meaning "likely to affect the consumer's conduct or decision with regard to a product or service" and thus likely to result in injury to consumers and competition.[179]

As machine-learning systems increasingly generate business materials and micro-target bespoke versions to consumers in real time, this legal construct becomes difficult if not impossible to prove. Specifically, digital deception challenges the legal system's abilities to: (1) identify which specific business communication or conduct is unlawful, (2) establish causation between that communication or conduct and consumers' false beliefs, and (3) apply the reasonable person standard to causation. To understand these challenges, it is helpful first to review the methods used in legal proceedings to prove deceptive practices.

B. Methods of Proving Deceptive Business Conduct

Over time, legal proceedings have employed a variety of methods to ascertain whether a business engaged in deceptive practices. The first such method is facial analysis, in which a fact-finder examines specific business communications or conduct and applies the fact-finder's own judgment, common sense, and intuition to ascertain whether the "net impression" left by the communication or conduct is deceptive.[180] Extrinsic evidence beyond the allegedly deceptive materials themselves is also accepted as circumstantial proof of deception. Examples include business documents or internal market research that reveal an intent to

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178. *See, e.g.*, Freeman v. Time, Inc., 68 F.3d 285, 289 (9th Cir. 1995) ("[T]he reasonable person standard is well ensconced in the law in a variety of legal contexts in which a claim of deception is brought. It is the standard for false advertising and unfair competition under the Lanham Act." (citation omitted)); Krommenhock v. Post Foods, LLC, 255 F. Supp. 3d 938, 962–63 (N.D. Cal. 2017) ("The 'reasonable consumer' standard governs misrepresentation and omission claims under California's [deceptive trade practices statutes]."); Oswego Laborers' Local 214 Pension Fund v. Marine Midland Bank, N.A., 647 N.E.2d 741, 745 (N.Y. 1995) (adopting "an objective definition of deceptive acts and practices, whether representations or omissions, limited to those likely to mislead a reasonable consumer acting reasonably under the circumstances" under New York law).

179. *See* FTC Policy Statement on Deception, *supra* note 175, at 175–76 (explaining that materiality is required under the F.T.C. Act); *see also* Apotex Inc. v. Acorda Therapeutics, Inc., 823 F.3d 51, 62–63 (2d Cir. 2016) (explaining that materiality is required under the Lanham Act).

180. *See, e.g.*, *In re* ECM Biofilms, Inc., No. 9358 (F.T.C. Oct. 19, 2015) (redacted public version), https://www.ftc.gov/public-statements/2015/10/opinion-commission-commissioner-terrell-mcsweeny-matter-ecm-biofilms [https://perma.cc/M2SJ-2X3D] (using facial analysis to identify the "net impression" left by the defendant's materials). Courts are divided on whether deceptiveness is a question of law or of fact. *See, e.g.*, Christian Stueben, *Judge or Jury? Determining Deception or Misrepresentation under the Fair Debt Collection Practices Act*, 78 FORDHAM L. REV. 3107, 3112, 3122–26 (2010). But as a practical matter judges or administrative bodies usually decide the matter, either because no jury right applies (as when enforcement agencies seek only equitable relief) or because the case is decided on dispositive motion.

deceive,[181] testimony from deceived consumers,[182] and records of customer complaints.[183] In recent decades, the legal system has turned to social-scientific forms of extrinsic evidence that are created for the purposes of litigation. These include expert facial analysis of the business's materials,[184] copy testing to elicit from consumer subjects the messages those materials convey,[185] and survey experiments in which beliefs about the transaction held by subjects after exposure to the pertinent business materials are compared to beliefs held by subjects after exposure to a control.[186]

The digital user experience ("UX") field offers analogues to expert facial analyses, copy tests, and survey experiments for assessing the deceptiveness of digital interfaces. Usability inspections, the online equivalent of facial analyses, consist of expert application of the UX field's design standards.[187] These UX standards are intended to ensure

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181. *E.g.*, *In re* Novartis Corp., 127 F.T.C. 580, 612–27, 665–66 (1999) (reviewing defendant's own copy tests demonstrating that defendant knew its advertisements were misleading); Davis v. S. Bell Tel. & Tel. Co., No. 89-2839-CIV, 1994 WL 912242, at *7 (S.D. Fla. Feb. 1, 1994) (explaining that in an antitrust case involving allegations of willful customer deception, one piece of relevant evidence was the defendant's decision to continue to use the same confusing elements in its mailings to customers after focus group research it commissioned warned it that these elements were misleading). *See also* Manoj Hastak & Michael B. Mazis, *Three Decades of Marketing Academic Input at the Federal Trade Commission: Contributions to Research, Policy Making, and Litigation*, 33 J. Pub. Pol'y & Mktg. 232, 233 (2014) (surveying methods used in litigation to demonstrate deceptiveness, including company-sponsored consumer research).

182. *See, e.g.*, FTC v. John Beck Amazing Profits, L.L.C., 865 F. Supp. 2d 1052, 1061, 1073 (C.D. Cal. 2012) (holding consumers' testimony is relevant to their understanding of statements made in marketing materials); FTC v. Commerce Planet, Inc., 878 F. Supp. 2d 1048, 1073 (C.D. Cal. 2012), *aff'd in part*, 815 F.3d 593 (9th Cir. 2016), and *aff'd in part*, 642 F. App'x 680 (9th Cir. 2016) (referencing consumers who "testified that they were misled" by the defendant's webpages).

183. *E.g.*, Iowa *ex rel.* Miller v. Vertrue, Inc., No. EQ 53486, 2010 WL 1652448, at *4 (D. Iowa Mar. 18, 2010) (finding pattern of consumer complaints to the Better Business Bureau "highly probative of whether Defendants' practices have a tendency or capacity to deceive, or are unfair"); FTC v. Partners in Health Care Ass'n, 189 F. Supp. 3d 1356, 1359, 1362 (S.D. Fla. 2016) (observing that the defendant "received a couple of customer complaints *per day*" for a span of four years).

184. *See* Hastak & Mazis, *supra* note 181, at 236 (surveying methods used in litigation to demonstrate deceptiveness, including expert facial analysis).

185. *See, e.g.*, *In re* Telebrands Corp., 140 F.T.C. 278, 318 (2005) (relying in part on results of copy test performed for the litigation); *see also* Hastak & Mazis, *supra* note 181, at 234–35 (surveying methods used in litigation to demonstrate deceptiveness, including copy testing).

186. *See, e.g.*, FTC v. DIRECTV, Inc., No. 15-cv-01129, 2018 WL 3911196, *10 (N.D. Cal. Aug. 16, 2018) (referencing a survey experiment that compared subject beliefs about a telecom subscription offer after viewing an actual ad or after viewing a modified, clearer version of the ad). The terminology with regard to survey tests has evolved over time and is used inconsistently. Survey experiments and copy tests are both frequently referred to as "consumer surveys." *See, e.g.*, Shari Seidman Diamond, *Reference Guide on Survey Research, in* Reference Manual on Scientific Evidence 359 (3d ed. 2011). The distinction is that an experiment uses a control group.

187. *See, e.g.*, *Commerce Planet*, 878 F. Supp. 2d at 1071 ("The Court finds that a usability inspection, with its emphasis on user perception and comprehension of the information

that users understand the information conveyed by the interface and the results that their interactions with the interface will produce. In contrast, usability tests are akin to copy tests; they ask consumer participants for their understanding of the information that a digital interface conveys. In addition, participants may perform various tasks on the interface so that a UX expert can observe to what extent participants are able to perform the tasks accurately.[188] Usability experiments performed for litigation purposes are analogous to survey experiments. They compare a treatment group interacting with the allegedly deceptive digital interface and a control group interacting with a version of that interface that has been altered to remove deceptiveness.[189]

C. Barriers to Demonstrating Digital Deception

As algorithmic marketing expands, each of the foregoing methods of proof will become increasingly problematic. Moreover, the very standard these methods seek to establish — whether the reasonable person would be deceived — is becoming irrelevant.

1. The Irrelevance of the Reasonable Person

As stated above, the touchstone for proof of consumer deception by businesses is the reasonable person standard. This standard is not monolithic; courts understand mass market segmentation. Courts and administrative agencies have held that for business conduct aimed at particularly susceptible consumers, such as children or cancer patients, the applicable standard is a reasonable member of those groups.[190]

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presented to them on a webpage, is consonant with a 'net impression' test . . . which turns on a facial examination of the relevant marketing materials.").

188. *See   Usability   Testing*,   USABILITY.GOV   (Sept.   27,   2020), https://www.usability.gov/how-to-and-tools/methods/usability-testing.html [https://perma.cc/MY2H-BUTJ]; Cathy Herzon at al., *Usability Testing*, USABILITY BODY OF KNOWLEDGE, http://www.usabilitybok.org/usability-testing [https://perma.cc/J2JT-CT8A]. Usability inspections, tests, and experiments are sometimes all called "usability evaluations" or "usability testing."

189. *See* Declaration of Tülin Erdem, Ph.D. at 2–5, FTC v. DIRECTV, No. 15-cv-01129, 2018 WL 3911196 (N.D. Cal. Aug. 16, 2018) (Document 261-3), 2017 WL 2958802 (reporting results of a survey experiment performed on a print advertisement and a usability experiment performed on a website).

190. *E.g.*, CONSUMER FIN. PROT. BUREAU, CFPB SUPERVISION AND EXAMINATION MANUAL, at UDAAP 6 (2012); Lavie v. Procter & Gamble Co., 129 Cal. Rptr. 2d 486, 498 (Cal Ct. App. 2003) ("[T]he question whether [a business practice] is misleading to the public will be viewed from the vantage point of members of the targeted group[.]"); *In re* Heinz W. Kirchner Trading as Universe Co., 63 F.T.C. 1282, 1290 (1963), *aff'd sub nom.* Kirchner v. FTC, 337 F.2d 751, 752–53 (9th Cir. 1964). Further, in recognition that consumers who owe past due debts are likely to be vulnerable to deceptive statements and practices, courts apply an "unsophisticated" consumer standard to claims of misleadingness under the Fair Debt

Evidence that a business's representations, omissions, or practices have deceived or are likely to deceive "a significant minority," "substantial segment," or "not insubstantial number" of the relevant group of consumers satisfies the reasonable consumer standard.[191] Although judges eschew announcing a number, when quantitative evidence is introduced the threshold for finding liability hovers around what courts refer to as a consumer "confusion rate" of fifteen percent.[192]

The reasonable person standard is nonsensical in a world of micro-targeting because digital materials are no longer produced for the reasonable person. Unsupervised machine learning means that these materials are not even designed for the reasonable child or cancer patient, but for unintuitive micro-segments, such as internet users who write long, grammatically-incorrect emails.[193] Further, digital business materials are designed for micro-moments. When profitable to do so, algorithmic marketing will aim specific materials at the most vulnerable consumers at their most susceptible moments, not average consumers when they are at their most reasonable.[194]

Ultimately, algorithmic marketing aims to design digital materials for a single consumer at a single moment in time and space. Who is the reasonable member of the targeted group in a world of one-to-one marketing? By definition, it is only the consumer to whom the communication is directed. Modern marketing thus erases the distinction between the actual consumer and the reasonable consumer, making the latter standard irrelevant.

2. The Absence of Intent

A business can violate legal prohibitions on misleading or deceptive practices without a human having intended to deceive.[195]

Collection Practices Act. *See* McMahon v. LVNV Funding, LLC, 744 F.3d 1010, 1020 (7th Cir. 2014); *accord* Clomon v. Jackson, 988 F.2d 1314, 1318 (2d Cir. 1993).

191. *See, e.g.*, FTC Policy Statement on Deception, *supra* note 175, at 177; Pom Wonderful, LLC v. FTC, 777 F.3d 478 (D.C. Cir. 2015) (FTC Act claim); Muzikowski v. Paramount Pictures Corp., 477 F.3d 899, 907 (7th Cir. 2007) (Lanham Act case).

192. *See, e.g.*, Bimbo Bakeries USA, Inc. v. Sycamore, 372 F. Supp. 3d 1291, 1302 (D. Utah 2019) (in a Lanham Act misleading advertising case, stating: "While there is no bright line rule on what constitutes a statistically significant group, courts have held that survey evidence of 15% confusion is sufficient[.]" (internal citation omitted)); *In re* Telebrands Corp., 140 F.T.C. 278, 325 (2005) (finding 10% to 17% confusion rate sufficient to show deceptive practices in FTC Act case).

193. Recall that length and grammar of emails can be as predictive of responses to advertising as the content of those emails. *See supra* note 40.

194. *Cf.* Calo, *supra* note 2, at 1033 (discussing targeting of consumers at vulnerable moments).

195. For sources, see *supra* note 8. Although some have claimed that manipulation by definition requires an intent to manipulate, e.g., Cass R. Sunstein, *supra* note 13 at 213 ("[M]anipulation cannot occur without intentional manipulators."); Shaun B. Spencer, *The Problem of Online Manipulation*, 2020 U. ILL. L. REV. 959, 990 (2020), this is not true as a legal or descriptive matter. Normatively, intent ought not be required for legal claims of

Nonetheless, deception cases often rely heavily on evidence of the defendant's intent to deceive or knowledge of the deceptiveness of its practices. Under some statutes, this evidence can relieve plaintiffs of the burden of obtaining costly expert witness evidence. If a business intended to deceive consumers, courts will generally assume it was successful in doing so.[196]

As machines perform more marketing and sales tasks using artificial rather than human intelligence, however, deceptive intent is likely to disappear. As detailed above, businesses are moving toward the use of artificial intelligence both to design and target digital materials. At some point, no human will need to be directly involved.[197] The only discernable business intent is likely to be intent to maximize business metrics such as click rates, sales, or retentions. No human needs to intend to deceive or know that the design is deceptive.

Computers have no intent. Nor do they recognize that they are deceiving consumers unless programmed to recognize deception. To illustrate, a machine might glean from available data that certain keyboarding patterns are associated with more sales. Through experimentation, the machine might discover that formatting a dynamic button to appear on a screen in a particular position at a specific moment in the checkout process will increase the use of costly credit accounts to pay for those sales. If the system is set to optimize credit

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business manipulation or deception of consumers, given that commercial transactions based on manipulation or deception by definition reduce consumer autonomy and market fairness and likely harm consumer welfare and market efficiency.

196. *See, e.g.*, CollegeNET, Inc. v. XAP Corp., 483 F. Supp. 2d 1058, 1065–66 (D. Or. 2007) (explaining, in a Lanham Act case: "In the absence of actual evidence of deception, the court may presume consumers were deceived if the deception was intentional. The defendant may rebut the presumption by presenting evidence that it did not succeed in the deception." (internal citations omitted)); *Telebrands Corp*., 140 F.T.C. at 304 (showing that the business intended to make a particular false claim is "powerful evidence that the alleged claim in fact was conveyed to consumers" in an FTC Act case). *But see* Sims v. GC Services, L.P., 445 F.3d 959, 964 (7th Cir. 2006) (holding intent to deceive irrelevant in Fair Debt Collection Practices Act cases).

197. *See, e.g.,* Norbert Streitz et al., *Grand Challenges for Ambient Intelligence and Implications for Design Contexts and Smart Societies*, 11 J. AMBIENT INTEL. & SMART ENV'TS 87, 90 (2019) ("Smart devices and underlying algorithms are gaining ground in controlling processes, services and devices as well as the interaction between devices and humans. Humans are increasingly removed . . . from being in control."). A human might design a digital communication in the first instance, but machines might then change the content or the target audience to which the communication is sent. *Cf.* Colin M. Gray et al., *The Dark (Patterns) Side of UX Design*, CHI '18: PROC. 2018 CONF. ON HUM. FACTORS COMPUTING   SYS.,   9   (2018), https://www.researchgate.net/profile/Colin_Gray3/publication/322916969_The_ Dark_Paterns_Side_of_UX_Design/links/5a75bf1a45851541ce5871a7/The-Dark-Patterns-Side-of-UX-Design.pdf [https://perma.cc/3EF4-3SH2] ("A design decision may have been made with good intentions for a specific audience, but resulted in manipulative outcomes when exposed to a broader audience."). Recall that computer scientists are developing machine learning systems that will generate optimizing algorithms with as little human input as possible. *See supra* note 57.

sales, it will deliver the checkout webpage with the dynamic button when a user is keyboarding in the identified manner. The computer will not recognize whether the keyboarding pattern is caused by intoxication[198] or whether the use of credit reflects deception because the presence of intoxication and deception are not data points directly available to the machine.[199]

A human looking at the correlations among keyboarding patterns, use of credit, and webpage content that features a dynamic button will not necessarily understand that consumers using the website could be intoxicated and deceived into using credit. A human might not even realize that the data reflects a keyboarding pattern, never mind that it reflects a drunken keyboarding pattern — if a human looks at all.[200] Further, an algorithm could be using hundreds of other data points simultaneously to decide which sales portal design to display to which consumer at any particular moment.

In addition, the market research and UX usability studies from which businesses could have learned of the deceptiveness of their own marketing are becoming increasingly scarce. In the digital environment, as discussed above, businesses are moving toward reliance on algorithmic marketing and its capacity to autonomously experiment on real consumers in the field. This experimentation produces fast, ecologically valid results that the system then uses to continuously improve and adapt. There is no longer a point at which humans must review a test result and decide what to do with that result.

Thus, in the age of algorithmic marketing, a business can deceive its customers unintentionally or even unknowingly. Without business scienter, plaintiffs must look elsewhere to demonstrate digital deception.

3. The Contraction of Customer Behavior Evidence

As noted previously, evidence of customer complaints to businesses, enforcement authorities, or nonprofit organizations can bolster deceptive trade practices claims. However, micro-targeting is likely to reduce the incidence of this sort of evidence. Big data can help

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198. Recall that certain keyboarding patterns are associated with intoxication. *See supra* note 123.

199. To be clear, this is a hypothetical. There is no allegation that the checkout webpage with the dynamic PayPal Credit button targeted intoxicated consumers. *Cf. supra* note 117.

200. *See* Kashmir Hill, *I Got Access to My Secret Consumer Score. Now You Can Get Yours, Too*, N.Y. TIMES (Nov. 5, 2019), https://nyti.ms/34tKTo9 [https://perma.cc/L3QY-WLV9] (quoting chief executive of a data analysis company: "We're not looking at the data. It's just machines and algorithms doing this work . . . . But it's incredible what machines can do when they can look under every stone."(internal citations omitted)).

businesses selectively avoid consumers who, if deceived, would likely publicize or pursue a complaint against the company.[201]

Winnowing out complainers will become easier over time. One academic study using a fraudulent business's records to compare victims who raised complaints with those who did not discovered that victimized residents of predominantly minority or less educated zip codes complained at lower rates than victimized residents of other neighborhoods.[202] Another study found that African Americans complain at significantly lower rates than non-Hispanic whites.[203] With today's technology, businesses will be able to target deceptive communications not merely at the zip code level or by race but also by predicting individual consumer propensity to complain, employing data about past complaining behavior, personality type, socioeconomic status, and more.[204] If those to whom deceptive designs are targeted are unlikely to complain, evidence of complaints will no longer be available to corroborate deceptive business practices claims.

4. The Invalidity of Results from Current Methods of Proof

The results of most of the legal methods of proof used to identify consumer deception have particularly weak scientific validity when applied to real-time micro-targeted deceptive practices.[205] The results of attempts to demonstrate offline deception do not always have strong scientific validity, but the problem is magnified online.

a. Lack of Population Validity

In empirical studies, population validity is the degree to which the results obtained from research subjects accurately reflect the results that would be obtained if the research were performed on the entire

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201. *See* Yonathan A. Arbel & Roy Shapira, *Theory of the Nudnik: The Future of Consumer Activism and What We Can Do to Stop It*, 73 VANDERBILT L. REV. 929, 960 (2020).

202. Devesh Raval, *Whose Voice Do We Hear in the Marketplace?: Evidence from Consumer Complaining Behavior*, 39 MKTG. SCI. 168, 174 (2020).

203. ANDERSON, *supra* note 6, at 87 tbl.5-3(G).

204. *See* Arbel & Shapira, *supra* note 201, at 960; *see also* Ford, *supra* note 2, at 154–57 (discussing how by approaching only the most gullible, online targeted scams are less likely to produce complaints from victims (who believe the scam) or from witnesses (targeting means fewer people are exposed to the scam) or be detected by law enforcement (who will not be in the targeted group)).

205. Greg Klass has recognized the same issues with respect to using field studies to demonstrate that in-person transactions are deceptive. Gregory Klass, *Meaning, Purpose, and Cause in the Law of Deception*, 100 GEO. L.J. 449, 476 (2012) ("[P]arties' relative intelligence, their biases and backgrounds, and the unique history of their relationship . . . are often difficult or impossible to replicate, and therefore escape the methods of empirical regulation."). *But see infra* Part IV (explaining that empirical surveys of actual customers can capture the effects of discrete transaction elements; deception need not categorically escape empirical regulation).

population of interest.[206] To the extent that the frequency and distribution of relevant traits in study subjects do not mirror those of the population of interest, the study risks generating results with weak population validity. To illustrate, when the aim is to measure whether customers are confused about facts material to a transaction, research performed on subjects who would never engage in that transaction has weak population validity.[207] The general concept of population validity can shed light on the results of any methods of proof that the law treats as accurately reflecting the results that would be obtained if all of the relevant population were tested.

The bespoke nature of digital business materials creates population validity challenges for many common methods for proving deception. Results obtained from judicial facial analyses are likely to lack population validity because judges' and consumers' background knowledge, information-processing skills, and perceptual capacities often differ.[208] What might deceive actual consumers might not fool a judge, and what might deceive a judge might not fool actual consumers. For example, judges are generally more literate and numerate than average consumers and are likely to process text more carefully than consumers.[209] Consumers can be influenced more strongly by non-textual elements of a digital interface.[210]

On the other hand, for many products, judges will lack the personal experience and social knowledge that inform customers of those products. As Judge Jerome Frank wrote in dissenting from his colleagues' finding, based on judicial facial analysis, that consumers were likely to be confused about whether a "Miss Seventeen" girdle was connected with Seventeen magazine: "As neither the trial judge nor any member of this court is (or resembles) a teen-age girl . . . our judicial notice apparatus will not work well unless we feed it with information directly obtained from 'teen-agers . . . .'"[211]

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206. *See, e.g.*, LARRY B. CHRISTENSEN ET AL, RESEARCH METHODS, DESIGN, AND ANALYSIS 176 (12th ed. 2014); Sema A. Kalaian & Rafa M. Kasim, *External Validity*, *in* ENCYCLOPEDIA OF SURVEY RESEARCH METHODS (Paul J. Lavrakas ed., 2011).

207. *See, e.g*., Diamond, *supra* note 186, at 377 ("The definition of the relevant population is crucial because there may be systematic differences in the responses of members of the population and nonmembers. For example, consumers who are prospective purchasers may know more about the product category than consumers who are not considering making a purchase.").

208. Juries might do better but few deception cases go to juries. *See supra* note 180.

209. *Cf*. J. THOMAS MCCARTHY, MCCARTHY ON TRADEMARKS & UNFAIR COMPETITION § 32:158 (5th ed.) ("[L]awyers and judges are in most cases not representative at all of the reasonably prudent buyer . . . . Lawyers and judges are too analytical, too likely to think the questions through logically . . . . The ordinary buyer is hurried, bombarded by hundreds of bits of advertising . . . and often reacts emotionally and without deliberate scrutiny.").

210. NORWEGIAN CONSUMER COUNCIL, *supra* note 130, at 7 ("In digital services, design of user interfaces is in many ways even more important than the words used.").

211. Triangle Publ'ns, Inc. v. Rohrlich, 167 F.2d 969, 976 (2d Cir. 1948) (Frank, J., dissenting).

The results of judicial facial analysis already have weak population validity in the offline context, but the digital medium adds to the problem several-fold. The digital format expands the quantity of text a business can cram into a communication, through hyperlinks, below-the-fold positioning, and the like. Simultaneously, online scanning habits reduce the proportion of text that consumers read. A judge with different browsing habits will not know how consumers interact with the interface (e.g., which hyperlinks consumers will click or how far consumers will scroll). Judges are inclined to be thorough; consumers are ruthlessly efficient. Judges who read all the text on a digital interface thus have a radically different set of information before them than consumers perceive, and the gulf between judges and consumers is likely to be wider online than offline.

Expert facial analyses and usability inspections might produce results with stronger population validity if experts are better at predicting reactions of targeted population segments. However, recall that consumers' responses are often unexpected, even for professional marketers.[212] Moreover, experts are unlikely to be familiar with the behavior and likely perceptions of the narrow, unintuitive segments — such as people who post deeply-saturated warm-hued photos online[213] — that marketing algorithms are designed to discover and micro-target.

To the extent that algorithms direct deceptive versions of marketing and sales materials toward people who have physical, personality, or demographic traits that make them particularly vulnerable to deception, two additional problems arise. First, judges and experts, who rarely hail from vulnerable populations, might have difficulty understanding the perspective of, for instance, consumers suffering cognitive deficits or under financial strain.[214] Second, as artificial intelligence becomes more inscrutable, it might not be possible to discern that the algorithm is targeting consumers based on vulnerability.

Recognizing that their own reactions may diverge from those of the population to which the allegedly deceptive materials are directed, courts frequently rely on, and sometimes require, expert testing of actual consumers. Yet these tests also suffer weak population validity. Subjects for litigation tests and experiments are drawn from a broad

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212. *See supra* note 53.

213. Recall that color saturation and hue of photos posted online can be as predictive of the poster's personality as the content of photos, and that personality can predict responses to advertising. *See supra* note 39.

214. *See, e.g.*, Walker v. Nat'l Recovery, Inc., 200 F.3d 500, 501 (7th Cir. 1999) ("How a particular notice affects its audience . . . may be explored by testimony and devices such as consumer surveys . . . . [W]hat seems pellucid to a judge, a legally sophisticated reader, may be opaque to someone whose formal education ended after sixth grade[.]").

demographic: all potential buyers of the product.[215] This may be appropriate for tests of offline mass marketing, but not for tests of online micro-targeted designs.

The relevant population for micro-targeted materials is only those consumers who have associated data profiles matching the precise combination of data points on which the algorithm selected consumers to be micro-targeted. This population may not be ascertainable by an expert witness, who therefore cannot match study subjects' associated data profiles to the particular version of an advertisement or webpage that the algorithm would have selected for that subject. Even if examination of an algorithm would reveal that a particular digital design was targeted at, for example, consumers with faltering marriages or drug abuse problems, obtaining samples of these types of consumers to participate in consumer testing is unlikely to be feasible.

b. Lack of Ecological Validity

In empirical research, ecological validity is the degree to which responses of study subjects to the stimuli used in the experiment are the same responses that those subjects would have when encountering those stimuli in the real world.[216] To illustrate, suppose the aim is to measure whether consumers who engage in a transaction have false beliefs about the transaction. Research that asks subjects to read a disclosure about the product or service and then tests them on their understanding of that product or service is likely to produce results that have weak ecological validity; as noted above, consumers actually engage in most transactions without reading disclosures.[217] As with population validity, the general concept of ecological validity can usefully be applied to the results of non-experimental adjudicatory methods of proof.

There are many differences between the conditions in which consumers encounter materials in the real world and the conditions in which fact-finders, experts, or study subjects examine those materials. Specific to micro-targeted digital materials, two aspects of these

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215. *See* David H. Kaye & David A. Friedman, *Reference Guide on Statistics*, *in* REFERENCE MANUAL ON SCIENTIFIC EVIDENCE, *supra* note 186, at 240–44 (discussing sampling); *In re* Telebrands Corp., 140 F.T.C. at 315 (noting that study subjects were drawn from "those who might have some propensity to buy the product").

216. *See, e.g.*, Paul S. Appelbaum, *Reference Guide on Mental Health Evidence, in* REFERENCE MANUAL ON SCIENTIFIC EVIDENCE, *supra* note 186, at 884 (defining ecological validity as "the degree to which the environment in which the test took place resembled the real-world environment").

217. *Cf.* Conopco, Inc. v. Cosmair, Inc., 49 F. Supp. 2d 242, 253 (S.D.N.Y. 1999) (referring to a survey experiment in a competitor unfair competition case: "To have substantial probative value, a survey . . . must . . . be designed to examine the impression presented to the consumer by the accused product. Therefore, a survey must use the proper stimulus, one that tests for confusion by replicating marketplace conditions." (citations omitted)).

conditions are particularly likely to affect ecological validity: (1) the extent to which the context surrounding the materials differs in relevant ways from the context in which the materials appear in the real world, and (2) the extent to which study subjects are experiencing the same emotional or cognitive states when assessing the materials that they would experience when encountering the same materials in the real world.

Fact-finders, experts, and study subjects examine allegedly deceptive materials in a decontextualized setting because, as a practical matter, the contexts in which consumers encounter digital business materials are not replicable. What might mislead a consumer completing a transaction in the hurly-burly marketplace might not appear misleading to a fact-finder, expert, or study subject in the quietude of chambers, an office, or a testing lab.

Particular to the online context, other content on a screen is likely to affect a consumer's interaction with and interpretation of a business's materials that appear on the same screen. Likewise, consumers' prior interactions with green buttons in an online game likely affect their understanding of the next green button they encounter in the game. That a consumer is finished selecting items to purchase and is in the checkout process could affect whether the consumer interprets an interposed offer of a subscription with free shipping as simply an offer of free shipping. Even the path taken to the website might affect consumer reactions. To illustrate, if consumers search for "arthritis pain" and then view a search result that brings them to a webpage selling a product that claims to reduce joint pain, they might conclude that the product reduces joint pain caused by arthritis.[218] In the online context, at least one court discounted the results of a survey experiment that attempted to measure consumer confusion on the grounds that the normal process of reaching the website in question was not replicated.[219]

Such context effects are not replicable in a test setting. Subjects might be instructed to take a particular path from one webpage to another, but the effects on subjects of doing so are likely different than if the subjects were to select that path themselves in their own lives as consumers.

Similarly, state effects — impacts of physical, emotional, or cognitive states that consumers are in at the moment they interact with materials in the real world — cannot be replicated for litigation

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218. *See* Mullins v. Premier Nutrition Corp., 178 F. Supp. 3d 867, 879 (N.D. Cal 2016) (discussing defendant that paid to have its website for a joint pain relief product show up on search results for "arthritis treatments").

219. Smith v. Wal-Mart Stores, Inc., 537 F. Supp. 2d 1302, 1328 (N.D. Ga. 2008) (critiquing survey performed for the purpose of showing consumer confusion in a trademark infringement case).

purposes. If a marketing algorithm detects and leverages young people's feelings of stress, defeat, anxiety, or failure,[220] and fact-finders or experts are not experiencing those same states, their assessments of deceptiveness may suffer weak ecological validity.

An algorithm can integrate many interacting data points into an optimization function to micro-target consumers. A consumer test or experiment might recreate some aspects of the physical and emotional states consumers experience in the real world, but a study cannot manipulate all of these elements simultaneously. Realistically, a study cannot place subjects in the state of consumers who are, for example, riding home on the subway, playing a game on their smartphones, and feeling frustrated that they are losing the game. If a marketing algorithm takes all of these elements into account, a study that does not do so risks producing results with low ecological validity.

Matching study subject contexts and states to the specific permutations of digital materials that a business's marketing algorithm would have targeted at consumers in those contexts and states, however, is not possible. This matching problem thus undermines both population and ecological validity of the results of consumer tests and experiments performed for the purposes of litigation.

Finally, whether an algorithmic marketing system is targeting vulnerable states might be no more discernable than whether it is targeting vulnerable populations. Recall that a human looking at data used by an algorithm will not necessarily know that the data was produced by, for example, keyboarding patterns that are reflective of intoxication or sleep-deprivation. Without knowing that the precise moment at which particular digital materials are targeted at consumers is when those consumers are intoxicated or sleep-deprived, an expert cannot account for these states in constructing consumer tests or experiments and a judge or expert will not know to take the perspective of the "reasonable" drunk or sleepy consumer.

5. The Impracticability of Analyzing a Business's Digital Conduct

The automated nature of micro-targeting means that the number of unique digital materials to which consumers collectively are exposed by a single business is climbing exponentially. In 2017, Facebook's "dynamic creative" artificial intelligence systems could generate over 6,000 versions of a single ad.[221] YouTube's technology can do much

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220. Recall that Facebook claims it can detect such emotional states. *See supra* note 131.

221. *See* Tim Peterson, *Facebook's Dynamic Creative Can Generate up to 6,250 Versions of an Ad*, MKTG. LAND (Oct. 30, 2017, 8:30 AM), https://marketingland.com/facebooks-dynamic-creative-option-can-automatically-produce-6250-versions-ad-227250 [https://perma.cc/2L9P-LPLF].

the same for video advertisements.[222] The number of bespoke permutations of communications in an advertising campaign can be in the millions.[223]

This overwhelming number of bespoke versions presents a looming impracticability problem for proving digital deception.[224] Courts might be willing to analyze or accept testing of a "representative" sample of digital materials rather than requiring the plaintiff to present each one to the court.[225] However, even analyzing or testing a sample is likely to be cost-prohibitive. For example, if a business distributes 1000 unique online advertisements for a product, each of which is delivered to a single consumer, the required sample size to produce a result that is within a 5% margin of error at the 95% confidence level could be as large as 278 advertisements.[226] Performing

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222. *See* Lauren Johnson, *YouTube's Technology Can Now Spit Out Thousands of Different Video Ads at Once*, ADWEEK (Sept. 25, 2017, 10:25 PM), https://www.adweek.com/digital/youtubes-technology-can-now-spit-out-thousands-of-different-video-ads-at-once [https://perma.cc/V66J-7ML9].

223. *See* Matthew Rosenberg & Kevin Roose, *Trump Campaign Floods Web With Ads, Raking In Cash as Democrats Struggle*, N.Y. TIMES (Oct. 20, 2019), https://nyti.ms/2J8bWNz [https://perma.cc/73HG-GNV6] (reporting that Donald Trump's 2016 presidential campaign produced 5.9 million unique advertisements and quoting the campaign's 2016 digital director, Brad Parscale, as saying, "'We were making hundreds of thousands' of variations on similar ads . . . 'Changing language, words, colors.'").

224. This also presents potential obstacles to use of the class action device. Micro-targeting means that consumers are not deceived by the same materials. Where the relevant anti-deception law has a reliance requirement, courts have held that consumers who encountered different iterations of marketing materials cannot form a class. *See, e.g.*, Solomon v. Bell Atlantic Corp., 777 N.Y.S.2d 50, 53 (N.Y. App. Div. 2004). Where the law does not require reliance and the class seeks damages due to the inflationary effect of deceptive claims about the product, the class device can be used. *See* Hasemann v. Gerber Prod. Co., 331 F.R.D. 239, 255–58 (E.D.N.Y. 2019) (explicating the two lines of cases). However, at the same time that advertisements, websites, and apps are increasingly designed for individual consumers, the same is happening with prices and products. *See, e.g.*, Julie Meehan & Evert Gruyaert, *6 Disruptive Trends in Pricing*, WALL ST. J.: CMO TODAY (Mar. 3, 2018), https://deloitte.wsj.com/cmo/2018/03/02/6-disruptive-trends-in-pricing/ [https://perma.cc/4YJ4-ZSXT] (asserting that marketers can personalize "prices based on customers' real-time comments, browsing history, and physical location"); *see also* Mayank Mishra, *The Role of AI in the Future of Content Management Systems*, FORBES (Aug. 2, 2019), https://www.forbes.com/sites/forbestechcouncil/2019/08/02/the-role-of-ai-in-the-future-of-content-management-systems/#5b1d213b526b [https://perma.cc/E9TJ-YTF7] ("[I]ndividualized offers . . . based on the user's past purchase data and most recent actions are becoming table stakes in many industries."). As a result, the fact that some consumers encounter deceptive advertising will not necessarily affect the price at which any particular product is offered to other consumers.

225. *Cf.* FTC v. Johnson, 96 F. Supp. 3d 1110, 1121 (D. Nev. 2015) (noting that "the parties [had] not stipulated to a collection of representative [web]sites for the Court to analyze").

226. Calculations performed at https://surveysystem.com/sscalc.htm [https://perma.cc/FX73-SRTN]. The situation is more complicated, because each permutation is typically shown to a different number of consumers. A measure reflecting the deceptiveness of the collective universe of ads requires weighting results to reflect the differing numbers of times consumers were shown each permutation.

survey experiments on each of 278 advertisements for a single lawsuit is infeasible.[227]

At least one court has suggested that analysis or testing could be performed on a "handful" of a business's consumer-facing communications, and the rest then "scanned" to determine whether they convey "the same information to [consumers] in the same language," rendering the websites "essentially identical."[228] However, even small differences in wording or design, such as whether the length of a service contract or the price of a wine subscription is behind a hyperlink, can change whether a website deceives consumers.[229]

The impracticability problem posed by proliferating designs of digital materials has become manifest in deceptive trade practices litigation over the last decade. In a 2013 decision, the Federal Trade Commission analyzed 36 different advertisements distributed by a company for a single product and determined whether consumers were likely to receive false messages from each.[230] The Commission pronounced that evidence regarding consumers' interpretations of the business's billboards could not demonstrate whether the business's print advertisements conveyed deceptive claims. Although the print versions did contain the same headlines and imagery as the billboards, the print versions contained additional text that might have changed the message consumers received.[231]

Two years later, in a case alleging that a business's online marketing offers were deceptive, the business defended itself on the grounds that it "engaged in multivariate testing, in which live websites were repeatedly changed to determine which changes increased purchases," resulting in "hundreds (or possibly thousands) of different [web]pages."[232] The defendant argued that a summary analysis of 125

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227. A recent pair of survey experiments performed on just one ad and one website required, e.g., a programmer to reproduce the original website plus a control website, a survey instrument to be developed, subjects to be recruited and tested, and the results to be analyzed; the result was a nearly 400-page expert report (including appendices), produced by an expert who was paid hundreds of dollars an hour. Declaration of Tülin Erdem, Ph.D., FTC v. DIRECTV, No. 15-cv-01129, 2018 WL 3911196 (N.D. Cal. Aug. 16, 2018) (Document 261-3), 2017 WL 2958802.

228. FTC v. AMG Servs., Inc., 29 F. Supp. 3d 1338, 1342 n.5 (D. Nev. 2014) (internal quotation marks omitted).

229. *Cf.* Smith v. Wal-Mart Stores, Inc., 537 F. Supp. 2d 1302, 1340 (N.D. Ga. 2008) (holding that expert analysis of two t-shirt designs could not be extrapolated to other alleged instances of trademark infringement that used the same words but different graphics); ldris Adjerid et al., *Sleights of Privacy: Framing, Disclosures, and the Limits of* Transparency, SOUPS '13 PROC. 9TH SYMP. ON USABLE PRIV. & SEC., July 2013, at 2 (finding that adding even a 15-second distraction before the display of a disclosure on a website changed subjects' responses).

230. Final Order, *In re* Pom Wonderful, No. 9344 (F.T.C. Jan. 10, 2013), *aff'd in part*, POM Wonderful, LLC v. FTC, 777 F.3d 478, 489–92 (D.C. Cir. 2015).

231. *Id.*

232. FTC v. Johnson, 96 F. Supp. 3d 1110, 1118 (D. Nev. 2015) (internal quotation marks omitted).

of the defendant's websites by the plaintiff's expert could not demonstrate anything about the defendant's other websites. The court never directly addressed the issue of extrapolating from the 125 websites but rejected the plaintiff's argument that the court could rely on the expert's summary as to those 125 sites.[233] The court proceeded to painstakingly review dozens of the defendant's websites.[234]

In a 2018 deceptive practices case, the volume of unique marketing materials disseminated by a single defendant overwhelmed the legal system. The court hearing the case observed:

> All told, the [plaintiff's] theory of the case . . . requires the Court to attempt to determine the 'net impression' of more than 40,000 advertisements across print, television, and electronic formats. Simply to state this fact is to highlight the extraordinary ambition — and daunting challenges — inherent in the [plaintiff's] theory.[235]

The court held that a survey experiment conducted on one print advertisement and one version of the defendant's website, without proof that these were representative of the defendant's thousands of other advertisements and website permutations, could not demonstrate that the defendant engaged in deceptive practices.[236] "[V]ariation among [the defendant's] ads," the court pronounced, "precludes generalizing."[237]

*   *   *   *   *

Businesses today leverage big data, machine learning, and the digital environment to conduct real-time in-field experiments to gather evidence about actual consumer reactions.[238] They no longer rely exclusively on any of the methods used in litigation — not on expert judgment, not on copy and usability tests, and not on survey and usability experiments.[239] Moreover, businesses understand that

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233. *Id.* at 1121.

234. *See id.* at 1122; FTC v. Johnson, No. 2:10-cv-02203, 2015 WL 13284937, at *1 (D. Nev. Dec. 21, 2015); FTC v. Johnson, No. 2:10–cv–02203, 2017 WL 3503720 (D. Nev. Aug. 16, 2017).

235. Order on Motion for Judgement on Partial Findings at 12, FTC v. DirecTV, Inc., No. 15-cv-01129 (N.D. Cal. Aug. 16, 2018) (Document 396).

236. *Id.* at 29.

237. *Id.*

238. *See, e.g.*, *In re* Telebrands Corp., 140 F.T.C 278, 282–83 (2005) (noting that the respondent's "'test' ads were not simply shown to consumers who participated in consumer perception research, but were aired in selected markets for limited periods of time and generated actual sales").

239. *See, e.g.,* Jeri Smith, *The Perils of Copy Testing in Today's Advertising Environment*, Quirk Media (Mar. 2016), https://www.quirks.com/articles/the-perils-of-copy-testing-in-

consumer reactions are difficult to predict and are heavily influenced by the consumer traits and states reflected in the combination of data points selected by marketing algorithms for micro-targeting. The legal system's apparatus for demonstrating deception must change to account for these facts too.

IV. FUTURE-PROOFING DECEPTIVE TRADE PRACTICES LAW

Many ideas have been offered to address digital consumer deception.[240] Ryan Calo has suggested constraints on the experimentation that is crucial to the development of deceptive digital materials.[241] Paul Ohm has proposed placing a duty of forthrightness on businesses, a duty to not only refrain from trickery but also to affirmatively ensure consumer understanding on online interfaces.[242] Many have observed that online manipulation of consumers depends on data; tight restrictions on consumer data collection could extinguish problematic micro-targeted business practices.[243] Others advocate

today-s-advertising-environment [https://perma.cc/YC9V-6KPD] (explicating mismatch between copy testing, the environment in which consumers are exposed to advertising, and the way consumers filter and process information today); E.J. Shultz, *Need for Speed Puts Copy Testing to the Test*, ADAGE (Sept. 15, 2015), https://adage.com/article/cmo-strategy/speed-digital-putting-copy-testing-test/300338 [https://perma.cc/NN2R-S7LS] ("[E]xposing people to content and then optimizing it in real time is just so much more efficient."); Peter Daboll, *5 Reasons Why Big Data Will Crush Big Research*, FORBES (Dec. 3, 2013), https://www.forbes.com/sites/onmarketing/2013/12/03/5-reasons-why-big-data-will-crush-big-research/ [https://perma.cc/RY3S-MXCD] ("The cadence of marketing must match the just-in-time agility of consumers, and the cadence of marketing research must match the new cadence of marketing. Strategy needs to be prediction-led and tactics and optimization must move at near real-time speed.").

240. In addition, proposals to address adjacent issues could be used to address deceptive digital marketing and sales. Sonia Katyal's recommendations for identifying and preventing algorithmic discrimination — industry codes of conduct, artificial intelligence impact assessments, and whistleblower incentives — could be applied to digital deception. *See* Sonia K. Katyal, *Private Accountability in the Age of Artificial Intelligence*, 66 UCLA L. REV. 54, 108 (2019). Jack Balkin and Jonathan Zittrain's proposal to make internet platforms "information fiduciaries" would require companies that collect consumer data, such as Google, Facebook, and Twitter, to stop facilitating the use of consumer data for deception. Jack M. Balkin & Jonathan Zittrain, *A Grand Bargain to Make Tech Companies Trustworthy*, THE ATLANTIC, (Oct. 3, 2016) https://www.theatlantic.com/technology/archive/2016/10/information-fiduciary/502346/ [https://perma.cc/PR4Y-2VJB].

241. Calo, *supra* note 2, at 1045–47.

242. Paul Ohm, *Forthright Code*, 56 HOUS. L. REV. 471, 475–77, 493 (2018).

243. *See, e.g.,* Calo, *supra* note 2, at 1042; Tal Z. Zarsky, *Privacy and Manipulation in the Digital Age*, 20 THEORETICAL INQUIRIES L. 157, 171 (2019). Note, however, that to be effective against vulnerability targeting, data collection restrictions must be more capacious than most commentators have proposed. *See* Sandra C. Matz et al., *Psychological Targeting as an Effective Approach to Digital Mass Persuasion*, 114 PROC. NAT'L ACAD. SCIS. 12,714, 12,717 (2017) (demonstrating that experiments that successfully predict responsiveness to different marketing materials can be performed without collecting the type of consumer information covered by most proposals to ban personal data collection). Philipp Hacker therefore suggests consumers be given a right to remain invisible from commercial analysis

outlawing micro-targeting directly.[244] Some of these ideas appear in bills in Congress,[245] and a few have been adopted or proposed, in a limited fashion, by state legislatures.[246]

This Article suggests what courts might do now, without additional legislation, to address the barriers to proving online consumer deception that arise from the modern design process for digital marketing and sales. Most legal prohibitions on unfair and deceptive trade practices are drawn broadly to allow courts to address new challenges as they appear.[247] Courts are tasked with interpreting these prohibitions in a manner that effectuates the statutes' consumer-protective and competition-furthering purposes.[248] Given that digital deception undermines those purposes, courts have a duty to address it using current unfair and deceptive trade practices law.

The following first suggests an incremental legal change by which courts could address digital consumer deception within the current legal construct: adopting a rebuttable presumption of deceptive practices by

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of their online activities. Philipp Hacker, Manipulation by Algorithms. Exploring the Triangle of Unfair Commercial Practice, Data Protection, and Privacy Law 27 (Aug. 25, 2020) (working paper on file with author).

244. *See, e.g.*, David Dayen, *Ban Targeted Advertising*, NEW REPUBLIC (Apr. 10, 2018), https://newrepublic.com/article/147887/ban-targeted-advertising-facebook-google [https://perma.cc/B2UX-ZZL7].

245. The federal Deceptive Experiences to Online Users Reduction Act, if passed, might prevent much of the online experimentation that currently enables digital deception. *See* S. 1084, 116th Cong. § 3(a)(1) (2019), https://www.congress.gov/bill/116th-congress/senate-bill/1084/text [https://perma.cc/LJ9U-BWV2] (making it unlawful for the largest online platforms to "design, modify, or manipulate a user interface with the purpose or substantial effect of obscuring, subverting, or impairing user autonomy, decision-making, or choice to obtain consent" or "segment consumers of online services into groups for the purposes of behavioral or psychological experiments . . . except with the informed consent of each user involved"). But the bill applies to only a handful of very large companies. If it became law, no doubt small third-parties could fill the void.

246. Some states have laws requiring individual consumer consent before a business can collect at least some forms of personal information. *See, e.g.*, The Illinois Biometric Information Privacy Act, 740 ILL. COMP. STAT. 14/15 (2009); TEX. BUS. & COM. CODE ANN. § 503.001(b)(2) (West 2019); WASH. REV. CODE § 19.375.020(1) (2017). Other state laws allow businesses to collect and retain adult personal information unless a consumer affirmatively opts out. *See* California Consumer Privacy Act, CAL. CIV. CODE § 1798.105(d) (West 2020) (giving consumers the right to demand that a business delete personal data the business has collected about them). But so long as collection is not flatly prohibited, businesses may be able to confuse and cajole many consumers into permitting their data to be collected and used. Lauren E. Willis, *Why Not Privacy by Default?*, 29 BERKELEY TECH. L.J. 61, 67 (2014).

247. *See* FED. TRADE COMM'N, POLICY STATEMENT ON UNFAIRNESS (1980), *reprinted in In re* Int'l. Harvester Co., 104 F.T.C. 949, 1070 (1984) ("The statute was deliberately framed in general terms since Congress recognized the impossibility of drafting a complete list of unfair trade practices that would not quickly become outdated or leave loopholes for easy evasion."). *See also* FTC v. Bunte Bros., 312 U.S. 349, 353 (1941) (noting that unfairness is a "flexible concept with evolving content").

248. *See, e.g.*, FLA. STAT. § 501.202 (2019) (providing that the Florida Deceptive and Unfair Trade Practices Act should be construed liberally to promote its purposes); TEX. BUS. & COM. CODE ANN. § 17.44 (West 2019) (providing same with respect to Texas law); CAL. CIV. CODE § 1760 (West 1970) (same with respect to California law).

the business that stands to benefit when customers have somehow come to have false beliefs about their transactions. Next, it turns to the purposes of the law's prohibition on deceptive trade practices and proposes a new route by which courts might vindicate those purposes: updating *unfairness* doctrine. This Part concludes by addressing the technological feasibility of business compliance.

A. Adopting a Presumption of Business Causation

Current law generally requires public agencies, private plaintiffs, and competitor businesses to either (a) demonstrate deceptive business intent or (b) pinpoint specific practices and demonstrate that those practices caused or are likely to cause consumers to have inaccurate material beliefs about the transaction. But micro-targeted algorithmic marketing will increasingly prevent plaintiffs with meritorious claims from doing either of these, for the reasons explained above. This situation calls for a legal presumption of causation when customers harbor false material beliefs that favor the defendant with which they have transacted. The following explains when the law favors presumptions, discusses deception cases that support the use of a presumption here, and tentatively sketches some of the mechanics of such a presumption.

Presumptions are employed pervasively in the law to deal with situations in which (1) the presumed fact is very probable, (2) one party is at a disadvantage in obtaining proof of the fact, and/or (3) public policy will be undermined without the presumption.[249] For all three of these reasons, when a "significant minority"[250] of customers harbors false beliefs about a fact material to their transactions and those beliefs favor the business, courts should presume that the business that benefits is responsible for creating those beliefs.

Regarding the first factor, the most probable explanation for false material customer beliefs that favor the business is that the business caused those false beliefs. Only the business that benefits has a motive to create a belief among consumers that its offerings are less expensive, less risky, or more beneficial than is true, or to deceive consumers into transactions they did not intend. The very concept of market

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249. *See, e.g.*, *Reasons Underlying Creation of Presumptions*, 1 JONES ON EVIDENCE §§ 4.5–4.8 (7th ed.); Lakin v. Watkins Associated Indus., 863 P.2d 179., 189–90 (Cal. 1993) (citing CAL. L. REV. COMM'N, EVIDENCE CODE WITH OFFICIAL COMMENTS, at 1079 (1966)) (holding that a court has discretion to shift the burden of proof as to a particular fact to the defendant if a plaintiff demonstrates that the following factors weigh in favor of doing so: (1) the knowledge of the parties, (2) the availability of evidence to the parties, (3) the result favored by public policy if the fact cannot be proven, and (4) the probability that the fact exists).

250. See *supra* notes 191–192, recounting the "significant minority" test used in deceptive trade practices and trademark cases.

competition implies that only the business that stands to benefit would have caused a significant incidence of materially false customer beliefs.[251] False customer beliefs favoring a business's product or service, or about the existence of a transaction, should be presumed to have arisen from customers' exposure to that business's deceptive conduct and communications.

This presumption is analogous to the doctrine of res ipsa loquitor. In negligence law, res ipsa loquitor applies when the plaintiff proves an injury that does not normally occur without negligence caused by something uniquely within the defendant's control.[252] Although all consumers are likely to be mistaken about some material fact in connection with some transaction at some point, it is improbable that a significant number of consumers who have engaged in the same transaction with the same business would hold the same materially false belief related to that transaction absent the business having engaged in deceptive practices.

The second factor courts consider in establishing presumptions — which party has better access to the necessary evidence — also favors the presumption.[253] Only the business has access to electronic records that would demonstrate which consumers were exposed to which digital communications an d conduct in which contexts. These records could be analyzed to assess, for example, whether the business's systems targeted known correlates of vulnerability to deception. Only the business could draw from these records a representative sample of the transactions at issue, experimentally reproduce those transactions in the field in a manner that has reasonable population and ecological validity, and then survey customers who transacted in the course of the experiment to assess whether they were deceived by the business's digital materials. In 2020, an expert for an online lender sued for deceptive conduct did just this. The Federal Trade Commission had argued that facial analysis was sufficient to establish that the phrase "no hidden fees" in the lender's marketing materials was deceptive, given that the lender charged an origination fee that was disclosed only in

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251. *Cf.* Basic Inc. v. Levinson, 485 U.S. 224, 243–46 (1988) (holding that when a company makes a materially misleading public statement, the law presumes that investors who buy or sell the company's stock soon thereafter did so in reliance on the misleading statement); Amgen Inc. v. Conn. Ret. Plans & Tr. Funds, 568 U.S. 455, 462 (2013) (explaining that the presumption of reliance "springs from the very concept of market efficiency," because "it is reasonable to presume that a [] public, material misrepresentation will be reflected in the security's price").

252. RESTATEMENT (SECOND) OF TORTS § 328D (AM. L. INST.1965). The doctrine sometimes acts to permit the inference of negligence and causation, and sometimes creates a presumption. *Id.*

253. The classic case here is *Summers v. Tice*, 199 P.2d 1 (Cal. 1948), in which the court placed the burden of proof of causation on the defendants where the plaintiff could not prove which of two hunters' shots had struck him.

small print. [254] The lender's expert was able to survey a random sample of the defendants' actual customers within days after they borrowed from the lender to demonstrate that they were not deceived by various permutations of the lender's marketing.[255]

These experiments could be costly, but it is the business alone that chooses whether to generate ten or ten thousand permutations of its digital materials, whether to micro-target those materials, and which data its machine learning system can use to develop and hone that micro-targeting. The business thus controls the difficulty of demonstrating whether it engaged in deceptive practices.[256]

The third factor that can lead to the use of a presumption is public policy. An example is the presumption in products liability cases that if an adequate warning had been given, the plaintiff would have read and heeded the warning. In effect, this places on the defendant the burden of demonstrating that the failure to warn did *not* cause the accident. This presumption does not rest on an argument that the presumed fact is very probable; people routinely fail to read or heed warnings. But without such a presumption it would be impossible for a plaintiff to prove that the absence of the warning caused the accident; a presumption is necessary to give manufacturers sufficient incentive to give adequate warnings.[257]

 In the case of digital deception, public policy similarly calls for placing the burden on the business of demonstrating another source of its customers' false beliefs. Without a presumption of causation, it will become impossible for a plaintiff to demonstrate that each of a business's multitude of micro-targeted designs caused consumers' false beliefs about their transactions with the business. Without potential liability, businesses lack sufficient incentive to program their algorithmic marketing systems *not* to deceive consumers. To encourage non-deceptive design, the law must rely on a presumption.

Deceptive business practices jurisprudence has not yet formally adopted this presumption of business causation, but the courts have

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254. FTC v. LendingClub Corp., No. 18-cv-02454, 2020 WL 2838827, at *7 (N.D. Cal. June 1, 2020)

255. *Id.* at *10–*14.

256. Analogously, where employee work assignments are a necessary element of a California state labor law claim, even where an employer has no independent legal obligation to maintain records of these assignments, that the employer cannot produce such records shifts the burden of proof as to the nature of those assignments to the employer. *See* Amaral v. Cintas Corp. No. 2, 78 Cal. Rptr. 3d 572, 596–97 (Cal. Ct. App. 2008) (explaining that the employer is in the best position to preserve records and know the information necessary to the plaintiffs' claim).

257. *See, e.g.*, Benjamin J. Jones, *Presumption or Inference, in Products Liability Action Based on Failure to Warn, that User of Product Would Have Heeded an Adequate Warning Had One Been Given*, 38 A.L.R.5th 683 (1996) (reviewing cases); Mark Geistfeld, *Inadequate Product Warnings and Causation*, 30 U. MICH. J.L. REFORM 309 (1997) (explaining public policy rationale).

inferred causation based on little more than customers' false material beliefs. Specifically, courts have recognized that, similar to micro-targeted digital marketing, unrecorded in-person sales cannot be directly analyzed or tested. The language, tone of voice, facial expressions, and gestures employed by salespeople cannot be fully replicated. Moreover, in-person sales are by their nature each unique; actions and speech are never identical from salesperson to salesperson, or even from transaction to transaction. Without reproduction of the transactions, the legal system cannot rely on judicial or expert facial analysis, copy tests, or survey experiments. Courts have addressed these situations by logically inferring misrepresentations and causation from customers' false beliefs.

One leading deceptive practices case, brought by a pharmaceutical company against a competitor, illustrates the courts' practice of relieving plaintiffs of the burden of pinpointing specific misleading statements when those statements are part of unrecorded conversations.[258] The plaintiff, a competitor, surveyed doctors who were pitched by the defendant's agents, asking the doctors for the main messages they received from the agents.[259] The court found these surveys admissible not to demonstrate what the agents said, but to demonstrate that the agents implied a false message (to wit, that the defendant's drug provided benefits it did not have).[260] The court emphasized that "the mental impressions with which an audience is left can be relevant, and sometimes even necessary, to establish what a defendant is implying."[261]

Also illustrative is an antitrust case in which evidence of false customer beliefs that disfavored competition was used to infer anti-competitive conduct by the defendant. A customer survey was found sufficient to demonstrate anti-competitive practices by the defendant when there was no reason to believe customers formed their inaccurate beliefs based on anything other than the defendant's communications; "Without evidence of an alternative cause, a reasonable jury could conclude that [the defendant's] marketing and sales techniques caused consumer confusion."[262]

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258. *See* Schering Corp. v. Pfizer Inc., 189 F.3d 218 (2d Cir. 1999), *as amended on reh'g* (Sept. 29, 1999).

259. *Id.* at 221–22.

260. *Id.*

261. *Id.* at 229. The doctors were treated as the relevant customers because consumers purchased the drug if their doctors prescribed it to them.

262. Davis v. S. Bell Tel. & Tel. Co., No. 89–2839–CIV, 1994 WL 912242, at *10 (S.D. Fla. 1994). A more recent antitrust case similarly held that evidence that "a large percentage of [the defendant's] customers would like to switch suppliers, but believe that they cannot" was relevant to demonstrate anti-competitive conduct by the defendant. BoDeans Cone Co. v. Norse Dairy Sys., L.L.C., 678 F. Supp. 2d 883, 902 (N.D. Iowa 2009).

The suggestion here is to go one step further and create a rebuttable presumption: where a plaintiff demonstrates that it is more likely than not that a significant minority of customers have false beliefs about facts material to their transactions, courts should presume that the communications or conduct of the business that benefitted caused the false beliefs.[263] The significant minority standard is already used in deceptive trade practices and misleading advertising cases; as noted above, quantitatively it means roughly fifteen percent.[264] This presumption would relieve plaintiffs in digital deception cases from the impossible burden of identifying the specific business materials that deceived each customer. It would also eliminate the need for judicial facial analysis, expert opinion, or a test or experiment to establish that those materials caused the customers' false beliefs. Instead, a survey of actual customers demonstrating the false, material beliefs would be sufficient to prove deception.[265]

The burden of making even this initial showing could be prohibitive, depending on the ease of locating defendant's customers and surveying them. Courts might require some preliminary showing of a non-negligible number of customers holding the same false beliefs and then order defendant businesses to facilitate expert surveys of their customers.[266]

The mechanics of the survey would be similar to any consumer survey used in evidence today.[267] In addition, survey and memory

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263. Without additional legislation, for deception claims under federal statutes the burden shifted would be one of production, not proof. FED. R. EVID. 301 ("[T]he party against whom a presumption is directed has the burden of producing evidence to rebut the presumption. But this rule does not shift the burden of persuasion[.]"). For state law misleading or deceptive business practices claims, that state's treatment of presumptions in civil cases would govern. *Compare* Chapman v. Harner, 339 P.3d 519, 526 (Colo. 1994) (holding that a presumption shifts the burden of production to the defendant but the burden of proof stays with the plaintiff) *with* UTAH R. EVID. 301 ("[U]nless a statute or these rules provide otherwise, the party against whom a presumption is directed has the burden of proving that the nonexistence of the presumed fact is more probable than its existence.").

264. See *supra* notes 191–192, recounting the "significant minority" test.

265. Surveys asking customers to recount facts about a transaction are admissible not to prove the actual facts, but rather to establish the customers' beliefs about those facts. *Cf.* Schering Corp. v. Pfizer Inc., 189 F.3d 218, 222, 227 (2d Cir. 1999), *as amended on reh'g* (Sept. 29, 1999) (admitting survey responses as expressions of the declarant survey respondents' then-existing states of mind under FED. R. EVID. 803(3)); FTC v. John Beck Amazing Profits, 865 F. Supp. 2d 1052, 1061 n.30, 1062 (C.D. Cal. 2012) (noting that consumer testimony does not establish the content of a business's marketing materials; rather, the testimony is "relevant to show the consumer's understanding of the statements made in the [marketing] materials").

266. Under Federal Rule of Evidence 706, "Court-Appointed Expert Witnesses," a federal court can appoint its own expert to perform an independent survey.

267. Performing the survey on a random sample of customers would likely lead to results with high population validity. *See* Diamond, *supra* note 186, at 381. On the other hand, courts accept surveys of nonrandom samples, provided there is no reason to think the sample would not be roughly representative of the relevant population. *See, e.g.*, Nat'l Football League

experts would need to establish appropriate transaction period time frames from which to recruit survey respondents. The passage of time between the transaction and the survey creates space for influences that could bias false belief rates both upward and downward. Memories tend to degrade over time, biasing false belief rates upward if customers misremember facts material to the transaction that they understood at the time they engaged in the transaction. On the other hand, customers can learn more about a transaction after having engaged in it, biasing rates of false beliefs in surveys downward.[268]

No survey is perfect. But surveying actual customers of a business to determine whether they have inaccurate beliefs about their transactions with the business avoids problems that plague other methods of proof in the context of digital deception. In particular, a survey of a business's actual customers would produce results with high population and ecological validity. The subjects by definition come from the relevant population. No "reasonable" consumer needs to be conjured. Subjects need not be matched to the business materials with which they would have been targeted and test conditions need not reflect the context in which they would have been targeted, had they been targeted in the real world. Instead, customers answering survey questions about their understanding of facts material to transactions in which they engaged must necessarily base their answers on: (a) the specific permutation of the website, interface, or other materials with which the business targeted them and (b) their perception of those materials in whatever micro-moment they were targeted with the materials.

B. Updating Unfairness Doctrine

Another way for courts to avoid giving legal immunity to algorithmically micro-targeted deception is to recognize the exploitation of false consumer beliefs about facts material to a transaction as an unfair trade practice.[269] This is an appropriate move for courts to make for at least three reasons: first, exploiting these

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Props., Inc. v. N.J. Giants, Inc., 637 F. Supp. 507, 515 (D.N.J. 1986) (in a trademark case, admitting survey evidence of consumer confusion taken from a nonprobability sample).

268. Asking subjects to answer survey questions based only on what they knew at the time of the transaction is unlikely to help. *See, e.g.*, Daniel L. Schacter et al., *Retrieval without Recollection: An Experimental Analysis of Source Amnesi*a, 23 J. VERBAL LEARNING & VERBAL BEHAV. 593, 594–95 (1984) (reviewing research showing normal subjects have poor memory for the source of information they know); Richard E. Nisbett & Timothy D. Wilson, *Telling More than We Can Know: Verbal Reports on Mental Processes*, 84 PSYCH. REV. 231, 233 (1977) (showing that people have poor recollection of the source of their impressions).

269. The Lanham Act § 1, 15 U.S.C. § 1051, does not prohibit unfairness outside of misleading representations and omissions, meaning competitors cannot sue one another under an unfairness theory. The suggestion in this Article to update unfairness doctrine therefore applies only to claims brought by enforcement agencies and private plaintiffs.

beliefs fits comfortably within the existing definition of unfairness; second, doing so would deter deception even where causation is impossible to prove; and third, taking advantage of pre-existing false beliefs undermines the consumer welfare, consumer autonomy, and fair competition goals of consumer law.

Under the Federal Trade Commission Act, a practice is "unfair" if it "causes or is likely to cause substantial injury to consumers which is not reasonably avoidable by consumers themselves and not outweighed by countervailing benefits to consumers or to competition."[270] Many other state and federal statutes follow the same definition.[271] "Substantial injury" includes small harms inflicted on a large number of people.[272] "Reasonably avoidable" focuses on "whether the consumers had a free and informed choice"[273] and means that "consumers have reason to anticipate the impending harm and the means to avoid it."[274] Unfairness actions are designed "to halt some form of seller behavior that unreasonably creates *or takes advantage of* an obstacle to the free exercise of consumer decision making."[275]

Given this black-letter law, taking advantage of pre-existing false consumer beliefs qualifies as an unfair practice. Each consumer may only suffer a small unintended or misunderstood purchase, but many consumers are affected. Given the extremely widespread use of deceptive dark patterns by major retailers and app sellers, the only way for consumers to avoid such materials today would be to refrain from online commerce, which would be an unreasonable demand to place on consumers and would harm both consumers and competition.

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270. 15 U.S.C. § 45(n); *accord* FTC v. Sperry & Hutchinson Co., 405 U.S. 233, 244 n.5 (1972).

271. The Consumer Financial Protection Act, 12 U.S.C. § 5531(c)(1), uses the same definition, as do state statutes that follow the FTC Act, e.g., TENN. CODE ANN. § 47-18-115 (2020); FLA. STAT. § 501.202 (2019). In addition, the Consumer Financial Protection Act's prohibition on abusive practices explicitly prohibits taking "unreasonable advantage" of a consumer's "lack of understanding . . . of the material risks, costs, or conditions of the product" or a consumer's "inability . . . to protect [her own] interests . . . in selecting or using" the product, 12 U.S.C. § 5531(d), both of which would easily include transactions that consumers misunderstand or in which consumers do not even know they have engaged. *See* Lauren E. Willis, *The Consumer Financial Protection Bureau and the Quest for Consumer Comprehension*, 3 RUSSELL SAGE FOUND. J. SOC. SCIS. 74, 84–85 (2017). However, this provision applies only to consumer financial transactions; to expand the prohibition on abusive practices to all consumer transactions would require legislative action.

272. *See, e.g.*, FTC v. Commerce Planet, 878 F. Supp. 2d 1048, 1078 (C.D. Cal. 2012) (holding that a small monthly charge, when assessed on many misled consumers, can constitute "substantial injury" (citation omitted)).

273. FTC v. Neovi, Inc., 604 F.3d 1150, 1158 (9th Cir. 2010).

274. Consumer Fin. Prot. Bureau v. Navient Corp., No. 3:17-CV-101, 2017 WL 3380530, at *21 (M.D. Pa. 2017). Further, a court will not assume that consumers to whom a business made disclosures "understood the disclosures . . . so that they had 'reason to anticipate the impending harm and the means to avoid it.'" *Id.* (citations omitted).

275. FTC v. I.F.C. Credit Corp., 543 F. Supp. 2d 925, 946 (N.D. Ill. 2008) (citing an FTC report to Congress, H.R. Rep. No. 156, pt. 1 (1983)) (emphasis added).

Confusion about a fact material to a transaction, such as whether a subscription is twelve or twenty-four months,[276] or whether clicking a green button will initiate an in-game purchase or take the consumer to the next level,[277] is an obstacle to the free exercise of decision making. A transaction that takes advantage of that confusion is, therefore, unfair.

However, the case law is not so clear. Most cases that find unfairness do so on the basis of many intersecting facts that all point toward unfairness. That is, most cases do not rest solely on taking advantage of pre-existing consumer confusion to find that a business engaged in unfair trade practices. For instance, a 2015 case held that directing students to expensive loans could be an unfair practice when "some students . . . did not even realize they took out the [loans] because of the rushed and automated manner in which [defendant] processed . . . students' paperwork."[278] But the court also referenced several other reasons that directing the students to these loans was unfair.[279] Other cases have held that when a single defendant both fosters false consumer beliefs and takes advantage of those beliefs, the former is deceptive and the latter is unfair.[280] But it does not appear that any case has squarely held that when the defendant is not, at least in part, responsible for a false belief, exploiting that false belief is an *unfair* trade practice.

Other authority is split as to whether exploiting existing false beliefs is *deceptive*, but these cases do not consider whether the practice is *unfair*. On the one hand, some cases have held that taking advantage of consumers' pre-existing beliefs so as to sell them something that will not conform to those pre-existing beliefs is deceptive.[281] That is, a

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276. *E.g.*, *supra* Figure 1.

277. *E.g.*, *supra* Figure 4.

278. Consumer Fin. Prot. Bureau v. ITT Educ. Servs., Inc., 219 F. Supp. 3d 878, 915 (S.D. Ind. 2015).

279. *See id*. (explaining that students likely feared they would be forced to drop out, losing all of their investment in their education, if they did not accept the high cost loans defendant offered, because students would not expect any other financing to be available).

280. *See, e.g.*, FTC v. Zamani, No. SACV 09–0977, 2011 WL 2222065, at *9 (C.D. Cal. June 6, 2011); State v. Vertrue, Inc., No. EQ 53486, 2010 WL 1652448, at *7 (Iowa Dist. Ct. Mar. 18, 2010).

281. *See, e.g.*, FTC v. USA Financial, 415 Fed. App'x. 970, 973 (11th Cir. 2011) (holding deceptive a practice of taking advantage of pre-existing consumer beliefs that credit cards can be used to buy from any merchant that accepts credit cards; defendant marketed credit cards without explicitly disclosing that those cards could only be used to buy products from defendant); *In re* Stouffer Foods Corp., 118 F.T.C. 746, 760 (1994) ("If an ad takes advantage of the reader's prior beliefs, the reader's perception of the ad may be attributed to the ad."); *id.* at 810 n.31 ("[I]t is established that respondents may be held liable for dissemination of ads that capitalize on preexisting consumer beliefs." (citation omitted)); Simeon Mgmt. Corp. v. FTC, 579 F.2d 1137, 1145 (9th Cir. 1978) ("Failure to disclose material information may cause an advertisement to be false or deceptive within the meaning of the F.T.C.A. even though the advertisement does not state false facts."); *id.* at 1146 ("That the [false consumer] belief is attributable in part to factors other than the advertisement itself does not preclude the

failure to disclose that the business's product does not meet common consumer background expectations has been found to be a deceptive omission.[282] Similarly, true but irrelevant representations have been held deceptive because consumers will view them through the lens of their background belief that businesses only advertise facts that are relevant to the transaction. For example, a defendant's representation that the metal strip on its razor blades was "six times smoother" than the strips on its competitor's blades was found deceptive where the assertion was true, but irrelevant to the operation of the razor.[283]

On the other hand, courts have held that a business's failure to correct false consumer beliefs about its supply chain is not a deceptive practice. To take one example, many consumers would not buy a product but for their belief that child labor and forced labor were not used in its production. Nonetheless, courts have held that a company that relies on a supply chain that engages in such labor practices does not engage in deception when it fails to correct its customers' false belief that the products were not produced with child or forced labor.[284] In these cases, taking advantage of consumers' pre-existing material false beliefs is not recognized as a deceptive practice.

Moreover, the Federal Judicial Center's *Reference Manual on Scientific Evidence* stresses the importance of using a control group in cases assessing consumer confusion or false beliefs, insisting that controlled survey experiments are the gold standard for deception cases.[285] In keeping with this manual, when deceptive or misleading business practices are alleged, courts may discount the results of consumer testing that does not control for pre-existing consumer

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advertisement from being deceptive."). *Cf.* FTC Policy Statement on Deception, *supra* note 175, at 179 (noting that in omissions cases, "the Commission examines the failure to disclose in light of expectations and understandings of the typical buyer regarding the claims made").

282. At one time, cases limited this holding to undisclosed product defects or safety hazards. *See, e.g.*, Wilson v. Hewlett-Packard Co., 668 F.3d 1136, 1141 (9th Cir. 2012) (noting that an omission is actionable only if it pertains to a product defect or safety hazard, or is contrary to an affirmative representation made by the defendant) (citation omitted)). But recent cases brought by the FTC in the privacy area have alleged that a failure to prominently disclose unexpected personal data collection is a deceptive trade practice. *See, e.g.,* FTC v. Vizio, Inc., No. 2:17-cv-00758, 2017 WL 7000553, at *9 (D.N.J. Feb. 13, 2017) (charging defendants with deceptive trade practices for having "failed to adequately disclose" that their televisions were collecting detailed information about customers and sharing that data with third parties); *In re* Sears Holdings Mgmt Corp., No. 082-3099, No. C-4264 (F.T.C. Sept. 9, 2009) (charging retail company Sears with deceptive practices for obtaining access to customers' private email and banking transactions in violation of consumer expectations, even though Sears had disclosed this in the fine print).

283. *See* Gillette Co. v. Wilkinson Sword, Inc., No. 89-CIV-3586, 1989 WL 82453, at *2 (S.D.N.Y. 1989). For discussion of this and similar cases, see Richard Craswell, *"Compared to What?" The Use of Control Ads in Deceptive Advertising Litigation*, 65 ANTITRUST L.J. 757, 786–87 (1997).

284. *See, e.g.*, Hodsdon v. Mars, Inc., 891 F.3d 857, 864 (9th Cir. 2018).

285. *See* Diamond, *supra* note 186, at 397–401.

beliefs.[286] Courts demand that plaintiffs produce controlled survey experiments so that the proportion of confused consumers in a control condition can be subtracted from the proportion of confused consumers in the group shown the defendant's communications. To insist that only such a "net confusion" measure can prove deceptive practices implicitly reflects a determination that exploiting pre-existing beliefs is not a prohibited deceptive trade practice.[287]

Given the inconsistency in the cases, it is helpful to return to first principles. The purpose of prohibitions on unfair and deceptive trade practices is to protect consumer autonomy and welfare and to promote substantive marketplace competition and efficiency. These purposes are undermined equally whether the business that transacted with a consumer holding false material beliefs caused those beliefs or simply benefitted from them. Recognizing transacting with consumers who harbor false beliefs material to the transaction as an unfair practice regardless of the provenance of those beliefs thus furthers the purposes of consumer law.

Finally, in many if not most cases, the business's activities and not a specific pre-existing belief *will* be responsible for customers' false beliefs, even though the barriers to proving deceptive practices explained above will prevent a successful deceptive practices claim. If transactions based on false beliefs of unproven origin are not prohibited, businesses have an incentive to covertly deceive where profitable to do so. Deterring *deception* is perhaps the primary reason courts should treat profiting from false material consumer beliefs as an *unfair* trade practice. Unfairness doctrine would thus act as a prophylactic against deceptive trade practices.[288]

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286. *See, e.g.,* Procter & Gamble Co. v. Ultreo, Inc., 574 F. Supp. 2d. 339, 351–52 (S.D.N.Y. 2008) (holding survey unreliable because it failed to control for the effect of pre-existing beliefs); LG Elecs. U.S.A., Inc. v. Whirlpool Corp., 661 F.Supp.2d 940, 955 (N.D. Ill. 2009) ("The purpose of a control is to . . . reduce the impact of respondents' preexisting impressions on their answers." (citation omitted)). *But see In re* Telebrands Corp., 140 F.T.C. 278, 326 (2005) ("Where . . . an advertiser exploits preexisting beliefs by inviting consumers to recall the claims in other ads to help convey a message, it makes little sense to remove the influence of those other ads"); *id*. at 327 ("[I]t is unnecessary to control for preexisting beliefs that are due in part to the extensive prior advertising that respondents' ads invoke.").

287. Netting the difference between results from the treatment and control groups controls both for pre-existing consumer beliefs and for any survey artifacts that might skew confusion rates in both groups upwards. Survey artifacts can be addressed in other ways that do not discount pre-existing consumer confusion (e.g., by pre-testing the survey instrument and rewording questions as needed and through the use of attention checks and control questions).

288. This flips the better-known tendency of plaintiffs to use claims of peripheral and inconsequential deception to address business practices that are primarily objectionable due to their unfairness. *See* HOOFNAGLE, *supra* note 8, at 345–46 (noting that in privacy cases, the FTC uses deception claims when the real problem is unfair data practices). Ultimately, of course, deception is simply one type of unfair business practice.

C. Reprogramming the Algorithms

Facing courts considering adopting this Article's suggested presumption of business causation and its classification of transacting with consumers who harbor false beliefs material to the transaction as an unfair practice, businesses may protest that they cannot control their algorithms.[289] That is false; algorithms can be programmed to train themselves to optimize business metrics only within the constraints of legal prohibitions. Autonomous vehicles provide an example. The fastest way for a car to transport someone to the airport likely would involve violating many laws, but autonomous vehicles are programmed to minimize travel time within the limits of the law. Moreover, many ways short of fundamentally reprogramming algorithms can be used to reduce, if not eliminate, machine-generated deception.

The following provides an overview of steps businesses can take to limit the prevalence of false material beliefs among their customers. It explores (1) adding constraints to algorithmic optimization functions, (2) micro-targeting to prevent deception, and (3) limiting the scope of machine control over marketing and sales.

None of these specific suggestions should necessarily be legally mandated — some would have unintended consequences if not done correctly, most could be evaded by businesses, and mandating particular code or design can stifle good innovation along with bad innovation.[290] The examples here are merely to demonstrate first, that businesses can avoid imposition of the presumption of causation proposed above by taking actions that would produce widespread accuracy in customer beliefs about facts that the business knows, or should anticipate, are material to its customers' transactions. Second, businesses can refrain from taking advantage of pre-existing material consumer confusion and thus comply with the updated unfairness doctrine developed above.

1. Adding Constraints to the Optimization Function

Algorithms can be programmed to do more than ruthlessly maximize a single outcome. They can optimize within specified constraints. A recent article in the journal *Science* introduces a framework for designing machine learning systems that "provide their users with the ability to easily . . . place limits on the probability that

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289. *Cf.* Erin Griffith, *Facebook Can Absolutely Control Its Algorithm*, WIRED (Sept. 26, 2017, 3:14 PM), https://www.wired.com/story/facebook-can-absolutely-control-its-algorithm/ [https://perma.cc/9DTF-WKSU] (evaluating Facebook's argument that "it cannot be held fully responsible for the activity on its network" because it is "beholden to algorithms").

290. *See* Willis, *supra* note 10, at 1321–29.

the algorithm will produce any specified undesirable behavior" while otherwise optimizing the desired behavior.[291] Although reducing deceptive machine conduct might not be accomplished "easily," businesses do have a choice. They can optimize conversions without constraints, implicitly expressing indifference to the effects of that optimization on consumers, or they can program guardrails into the algorithm.[292]

The computer science literature has yet to recognize the general problem identified in this Article — machine-learned algorithmic deception of consumers by businesses. Instead, it has focused on specifically-identified deceptive practices, such as fake consumer reviews, websites selling bogus products, and well-known dark patterns. It is an ongoing arms race, but tools now exist to identify each of these so that businesses can either warn viewers about them or remove them.[293] For example, some dark patterns are created by an easily identifiable snippet of code. Researchers have crawled the web using automated tools that read website code to identify thousands of instances of websites that use these dark patterns.[294] Businesses might use similar processes to audit their own digital materials for deceptive dark patterns and then abort materials identified as containing these patterns. More efficiently, businesses could build a constraint into algorithmic marketing systems that prevents these systems from using the particular code associated with dark patterns.[295]

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291. Philip S. Thomas et al., *Preventing Undesirable Behavior of Intelligent Machines*, 366 SCI. 999, 1003 (2019); *see also, e.g.*, Ioannis Papantonis & Vaishak Belle, *On Constraint Definability in Tractable Probabilistic Models*, ARXIV, Jan. 29, 2020, https://arxiv.org/pdf/2001.11349.pdf [https://perma.cc/GVZ9-CUUR] (presenting a method for adding probabilistic constraints to a machine learning system that is optimizing for some other probability).

292. *Compare* Amodei, *supra* note 151, at 4 ("[A]n objective function that focuses on only one aspect of the environment may implicitly express indifference over other aspects of the environment.") *with* Ari Ezra Waldman, *When We Outsource Privacy Compliance, We May Undermine Privacy Protection*, PROMARKET (Apr. 15, 2019) https://promarket.org/2019/04/15/when-we-outsource-privacy-compliance-we-may-undermine-privacy-protection/ [https://perma.cc/8NG2-QY52] (showing how engineers code their interpretations of legal requirements into technological tools).

293. *Cf.* Faux, *supra* note 146 (describing Facebook's recently increased use of artificial intelligence to weed out advertisers of scam products).

294. *See, e.g.*, Mathur, *supra* note 16.

295. A similar solution is being developed to prevent algorithmic violation of intellectual property rights. *See, e.g.*, *Artificial Intelligence and Intellectual Property: An Interview with Francis Gurry*, WIPO MAG., Sept. 2018, https://www.wipo.int/wipo_magazine/en/2018/05/article_0001.html [https://perma.cc/VU79-SCDV] ("WIPO has developed an AI-empowered image search tool for trademarks . . . . It delivers results in a second and is highly accurate."). *See also* Clifford Chance, *Can AI Systems Infringe Copyright?*, TALKINGTECH (Nov. 27, 2017), https://talkingtech.cliffordchance.com/en/ip/copyright/ai-and-ip--copyright-infringement-by-ai-systems--uk-law-.html [https://perma.cc/MM26-WXXX] ("[D]evelopers should look to control the risk by embedding the recognition of intellectual property rights within the

However, some deceptive conduct is not easily specified in code. Moreover, for a sufficiently powerful artificial intelligence system, a programmed constraint preventing use of particular snippets of code will not be effective because the system will discover how to obtain the same deceptive "conversion" without violating the constraint.

Although controlling deceptive designs outside of specifically identified deceptive practices has not yet been explored in the literature, burgeoning work on three issues with a similar structure demonstrates that digital deception is not impossible to address. First, computer scientists are discovering a host of ways to program machine learning systems to optimize a selected parameter within the constraint of avoiding race, sex, and other types of prohibited discrimination.[296] Second, automated methods are being developed to prevent algorithms from placing marketing materials in proximity to content with which a business does not want to be associated (e.g., racist, terrorist, or pornographic content), even when that placement might optimize measured conversions.[297] Third, apps can now use "artificial intelligence, including natural language processing, machine learning and computer vision" to identify and block "toxic" content, such as cyberbullying messages or child abuse videos, even when the system would meet its optimization goal by displaying the toxic content.[298]

[artificial intelligence]'s code itself. Developers of [artificial intelligence] will need to teach their software to respect the rights of third parties.").

296. *See, e.g.*, Benjamin Paaßen et al., *Dynamic Fairness — Breaking Vicious Cycles in Automatic Decision Making*, 27TH EUR. SYMP. ON ARTIFICIAL NEURAL NETWORKS, COMPUTATIONAL INTEL. & MACH. LEARNING 477, 478 (2019), https://www.elen.ucl.ac.be/Proceedings/esann/esannpdf/es2019-134.pdf [https://perma.cc/GSY8-5GAS] (demonstrating that "demographic parity, which enforces equal rates of positive decisions across groups, avoids [discriminatory outcomes] and establishes a virtuous cycle, which leads to perfectly accurate and fair classification in the long term"); Harini Suresh & John V. Guttag, *A Framework for Understanding Unintended Consequences of Machine Learning*, ARXIV, Feb. 17, 2020, https://arxiv.org/pdf/1901.10002.pdf [https://perma.cc/X3WL-ZPUK] (creating a taxonomy of sources of discriminatory bias at different stages of the machine learning process and solutions that can be applied to address each source).

297. *See, e.g.*, L. Gordon Crovitz, Opinion, *How Amazon, Geico and Walmart Fund Propaganda*, N.Y. TIMES (Jan. 21, 2020) https://nyti.ms/36iVzqa [https://perma.cc/8TSQ-SSPS] (reporting that businesses can avoid associating with problematic websites by placing limits on the algorithmic placement of their ads online, and identifying third-party providers that can perform this guardrail function); Rebecca Stewart, *P&G, Google, Lego & More Unveil Plan to Suffocate 'Harmful' Content*, THE DRUM, (Jan. 22, 2020, 8:00 AM), https://www.thedrum.com/news/2020/01/22/pg-google-lego-more-unveil-plan-suffocate-harmful-content?utm_campaign [https://perma.cc/8GK4-SDLF] (reporting on initiative of major brands to develop tools to prevent their marketing from appearing alongside harmful online content).

298. Josh Constine, *Antitoxin Sells Safetytech to Clean Up Poisoned Platforms*, TECH CRUNCH, (June 5, 2019, 8:05 AM), https://techcrunch.com/2019/06/05/antitoxin-technologies/ [https://perma.cc/8BAN-2VXT]; *see also* Adam Zewe, *Using AI Technology to Prevent Cyberbullying*, PHYSORG (June 13, 2019), https://phys.org/news/2019-06-ai-technology-cyberbullying.html [https://perma.cc/XJA7-LFXA].

Taking a lesson from these domains, businesses could use continually updated data analysis to determine which features of digital materials are associated with consumer complaints, chargebacks, or other indicia of deception. A constraint could be built into algorithms to prevent each of these features from being part of the design of online communications and content. For example, if displaying price information in blue font or "below the fold" is associated with indicia of consumer misunderstanding of prices, the constraint would preclude digital materials from displaying price information this way.

A parallel possibility is to use big data to determine when consumers are in persistent or context-induced vulnerable states, such as when they are suffering from cognitive decline or anxiety and thus more easily misled about facts material to a transaction. Where a sufficient probability of vulnerability is detected, an automated guardrail could inhibit delivery of an advertisement, website, or app with a micro-targeted design to that consumer; the system could show only generic, human-designed digital materials to that consumer.

2. Micro-targeting for Good

Going further, businesses might engage in micro-targeting for good.[299] One variant of this would be to not only refrain from directing materials optimized for sales to consumers whose demographics or behaviors indicate persistent or transitory impairment, but also to target these consumers with safety features that reduce confusion and errors. For example, faced with a consumer whose real-time data points suggest likely intoxication, a business could replace a single-click purchasing process with a more cumbersome process. A business could even program its marketing system to impose a cognitive impairment test before the transaction could be completed, analogous to a virtual breathalyzer.[300]

Recent work with impulsive consumers has demonstrated that they want self-control tools for their digital devices to, for example, encourage deliberation, enforce postponement, increase checkout effort, and make costs more salient.[301] Requiring each consumer to

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299. *Cf.* Jon Kleinberg, Jens Ludwig, Sendhil Mullainathan & Cass R Sunstein, *Discrimination in the Age of Algorithms*, 10 J. LEGAL ANALYSIS 113, 154 (2019) (suggesting how algorithms might be used to promote equity rather than discrimination).

300. *Cf.* NAT'L HIGHWAY TRAFFIC SAFETY ADMIN., U.S. DEP'T OF TRANSP., IGNITION INTERLOCKS — WHAT YOU NEED TO KNOW (2d ed. 2019), https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/ignitioninterlocks_811883_112619.pdf [https://perma.cc/J25Q-V2VS] (describing the mechanism by which ignition interlocks prevent alcohol-impaired drivers from starting their vehicles).

301. *See* Carol Moser et al., *Impulse Buying: Design Practices and Consumer Needs,* CHI '19: PROC. 2019 CHI CONF. ON HUM. FACTORS COMPUTING SYS. 1 (2019), http://www.carolmoser.com/wp-content/uploads/2019/02/Moser_Impulse-Buying-CHI19.pdf [https://perma.cc/33MG-42TZ].

obtain and maintain third-party software to protect themselves is likely to trigger a deception arms race between that software and businesses' machine-learning systems. A more efficient and effective approach would be for businesses to add these measures to their own interface and transaction designs whenever a sufficient probability of vulnerability to deception can reasonably be forecast.

Ian Ayres has developed a useful typology of error-reducing "altering rules" — various ways to ensure that a contracting party intends to alter a default position. These include rules that force parties to think first, that increase the probability that parties will read and understand information first, that require parties to pass a test first, and that make parties' decisions to opt out of the default position easily reversible.[302] Translating these to the consumer transaction context, where the default is no transaction, businesses could design sales interfaces to:

(1)   ensure that consumers cannot blindly agree to transactions, such as by requiring consumers to confirm agreement in a manner that cannot be done mindlessly;

(2)   interpose warnings about costs and risks consumers will face if they engage in the transaction;

(3)   force consumers to remain on a screen long enough to read, listen to, or watch a clear and accurate explanation of the costs, risks, and limitations on benefits of the transaction before consumers can engage in the transaction;

(4)   require consumers to pass a test demonstrating understanding of facts that are material to the transaction before consumers can engage in the transaction; or

(5)   give consumers an easy way to reverse transactions after the fact.

In an ideal world, these safety features would be personalized. Not every consumer in every situation is deceived — or protected — by the same digital design. For example, different visual elements that reduce deceptiveness (e.g., larger font, higher contrast font, more centralized placement of information) could be deployed in digital materials delivered to older consumers. Design features preventing mindless agreement could be incorporated into materials directed at distracted consumers. Intoxicated consumers might be forced to wait to complete an online transaction or actively offered an opportunity to reverse the transaction the next day. A similar approach is being developed for

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302. *See* Ian Ayres, *Regulating Opt-Out: An Economic Theory of Altering Rules*, 121 YALE L.J. 2032, 2068–80, 2083–84 (2012).

internet users with disabilities; websites, apps, and other electronic interfaces are being programmed to adapt automatically in real time based on user actions and sensors that reveal individual user needs, limitations, and abilities.[303]

Specific anti-deception design features should not be mandated by regulation — it is too easy for businesses to technically comply with such rules while evading their intent. Instead, businesses could experiment with these types of design elements in their digital materials to determine how best to prevent false customer beliefs about facts material to those customers' transactions with the business.

3. Limiting the Scope of Machine Control

Apart from reprogramming marketing and sales algorithms, perhaps the most straightforward way to reduce the incidence of deceptive design is to stop using algorithms that are found to deceive consumers.[304] Less drastically, businesses could remove key aspects of their digital communications and conduct from algorithmic control. For example, businesses could choose not to use algorithms in the design of digital sales interfaces. Instead, humans would design sales interfaces and test them with consumers to ensure that they are not deceptive. Algorithms might continue to micro-target marketing materials, but at the actual purchase stage a single, simple, intuitive interface would be presented to the consumer to engage in the transaction itself.

Businesses could also limit the ambit of creative artificial intelligence in generating marketing materials. One possibility is for humans to design each permutation of digitally-delivered business materials, pre-testing each with a diverse set of potential customers to ensure no permutation conveys a false message that is material to the transaction. An algorithm optimized for conversions could then micro-target these materials, but the computer system would not be given the ability to change the content of a permutation. That is, the content would be hard-coded in the system. Alternatively, human designers could create atomic content options for online materials (again, pre-testing them for deceptiveness), and an algorithm could then mix and

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303. *See, e.g.*, Sergio Firmenich et al., *User Interface Adaptation for Accessibility*, *in* WEB ACCESSIBILITY 547 (Y. Yesilada & S. Harper, eds. 2019) (providing an overview of the field); Jamil Hussain et al., *Model-Based Adaptive User Interface Based on Context and User Experience Evaluation*, 12 J. MULTIMODAL USER INTERFACES 1 (2018) (describing a system for adaptive interface design).

304. *Cf*. Jordan Weissmann, *Amazon Created a Hiring Tool Using A.I. It Immediately Started Discriminating Against Women*, SLATE, (Oct. 10, 2018, 4:52 PM), https://slate.com/business/2018/10/amazon-artificial-intelligence-hiring-discrimination-women.html [https://perma.cc/FD83-QR5Z] (reporting that when a hiring algorithm discriminated against female applicants, Amazon abandoned it).

match content options using a conversion optimization function, but could not create new content.[305]

Particularly for sales interfaces, standards could be developed that businesses could program their artificial intelligence systems to follow.[306] Widespread adoption of standardized user interfaces generally, and for e-commerce checkout processes in particular, would undoubtedly reduce unintended purchases.[307] Another possibility is to hard code the safety features described above (e.g., designing interfaces so that consumers cannot blindly agree to transactions) into all consumer transactions, not just those involving consumers in a permanent or transitory state of susceptibility to deceptive design.

<p style="text-align:center">*   *   *   *   *</p>

Businesses would need to test the effectiveness of any of these approaches in preventing their customers from entering transactions under false beliefs about facts material to those transactions. Adding particular constraints to a marketing algorithm's optimization function might have unintended negative consequences, such as a harmful racial or gendered disparate impact. Specific safety features designed into sales interfaces could become less effective over time as consumers develop habitual responses that nullify those safety features' effectiveness. Limiting the scope of machine control might be more effective for some types of digital materials than for others. By experimenting with different approaches and auditing them for effectiveness over time, businesses facing a presumption of business causation of false consumer beliefs when the beliefs help the business or an updated unfairness doctrine that counts exploitation of pre-existing false beliefs as unfair will, no doubt, manage to comply with the law.

V. CONCLUSION: FAIR MARKETING BY DESIGN

The proliferation of unique variations of digital marketing and sales materials designed and targeted by artificial intelligence in real time poses a looming threat to consumer protection and fair competition. Unchecked, algorithmic marketing simultaneously makes the deception of consumers inevitable and renders impotent the

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305. *See* Pemberton, *supra* note 69 (discussing the use of atomic content in online marketing).

306. These standardized designs could be developed either by the International Organization for Standardization or by the World Wide Web Consortium.

307. *See, e.g.*, Windows Developer Design Guide, MICROSOFT (May 31, 2018), https://docs.microsoft.com/en-us/windows/win32/uxguide/mess-confirm [https://perma.cc/3A57-LGRU]; NIELSEN NORMAN GRP., SHOPPING CARTS, CHECKOUT, AND REGISTRATION (4th ed. 2018).

traditional methods by which deceptive trade practices claims are proven in our legal system. Business intent evidence is disappearing, the distinction between the reasonable consumer and the actual consumer is collapsing, and the results of facial analyses and consumer subject testing for deceptiveness have weak population and ecological validity. Further, as a practical matter, the volume of permutations of a business's digital materials overwhelms the capacity of courts to review or experts to test even a representative sample. Courts must modernize consumer protection and fair competition law to rearm the legal system against the deception that unrestrained artificial intelligence will otherwise inevitably produce.

Not long ago, the world became aware that machine-learning systems can generate discriminatory output and promote extremist digital content, both without their creators' intent. Today, with impetus from negative publicity, litigation, and threats of new restrictive legislation,[308] computer scientists are helping businesses mitigate these problems.[309] The time has come for a similar realization about the production of deception by machine-learning algorithms. Courts must give businesses, marketers, and computer scientists sufficient incentive to address the problem of algorithmic deception of consumers.

Courts may feel uncomfortable declaring that a business has engaged in deceptive trade practices when the court does not understand *how* the deception worked. Even looking at the screen shots of digital interfaces shown in Part III, above, a court might have difficulty seeing how a reasonable consumer could have been deceived, given that a careful and thorough read of all the text in these screen

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308. *See, e.g.*, Julia Angwin & Ariana Tobin, *Fair Housing Groups Sue Facebook for Allowing Discrimination in Housing Ads*, PROPUBLICA, (Mar. 27, 2018, 10:00 PM), https://www.propublica.org/article/facebook-fair-housing-lawsuit-ad-discrimination [https://perma.cc/8EUR-HU5U]; Makena Kelly & Julia Alexander, *Congress Is Taking on YouTube's Pedophilia Problem*, THE VERGE (June 7, 2019, 11:49 AM), https://www.theverge.com/2019/6/7/18656516/youtube-kids-pedophilia-congress-lawmakers-predator-comments-hawley-blumenthal-blackurn [https://perma.cc/UN9U-7NCV].

309. *See, e.g.*, Sorelle A. Friedler et al., *A Comparative Study of Fairness-Enhancing Interventions in Machine Learning*, FAT* '19: PROC. CONF. ON FAIRNESS, ACCOUNTABILITY, & TRANSPARENCY 329, 329 (2019); Rachel K. E. Bellamy, et al., *AI Fairness 360: An Extensible Toolkit for Detecting, Understanding, and Mitigating Unwanted Algorithmic Bias*, 63 IBM J. RSCH. & DEV. 4:1 (2019), https://arxiv.org/pdf/1810.01943.pdf [https://perma.cc/V86W-YXJB]; L. Elisa Celis et al., *Classification with Fairness Constraints: A Meta-Algorithm with Provable Guarantees*, FAT* '19: PROC. CONF. ON FAIRNESS, ACCOUNTABILITY & TRANSPARENCY 319 (2019); *A Country in Crisis: How Disinformation Online Is Dividing the Nation: Hearing Before the H. Comm. on Energy & Com.*, 116th Cong. (2020) (statement by Hany Farid), https://docs.house.gov/meetings/IF/IF17/20200624/110832/HHRG-116-IF17-Wstate-FaridH-20200624.pdf [https://perma.cc/2JFF-PAKH] (discussing study finding that "despite previous claims to the contrary, YouTube was able to reduce the prevalence of [extremist] content by adjusting their recommendation algorithms.") .

shots discloses the material facts about which consumers have claimed to be confused. Businesses might make a due process argument that the specific business materials that deceived consumers must be identified or the business will not know what to do differently to avoid impermissible transactions.[310] Moreover, that an algorithm is targeting otherwise reasonable consumers when they are at their most vulnerable to deception may not be readily demonstrable in court.

The law wants to be able to tell a story about what happened — how the violation took place, and not merely that the violation took place. Despite its lengthy pedigree, res ipsa loquitur remains a discomfiting doctrine.[311] So too the modern disparate impact standard.[312] But as machines take over more marketing, sales, pricing, and product design processes, we must be willing to accept what was probably true all along — we truly do not know how consumers come to have false beliefs that are material to their commercial transactions, and the stories we tell are only probable, and not accurate within traditionally accepted scientific bounds for determining causation.

Businesses using artificial-intelligence-driven machines to design and target digital interactions also often do not know what their machines did to cause a sale to take place, or what it was about the combination of the consumer who was targeted, the micro-moment in which the consumer was targeted, or the design of the materials delivered to the consumer that caused the conversion.[313] One could devise explanations for why consumers who post deeply saturated, warm-hued photos online or write long, grammatically-incorrect emails

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310. *Compare In re* NJOY, Inc. Consumer Class Action Litig., No. CV 14-00428, 2014 WL 12586074, at *10 (C.D. Cal. Oct. 20, 2014) (applying heightened pleading standard of FED. R. CIV. P. 9 and dismissing state law deception claims: "[P]laintiffs do not state which 'material, deceptive marketing claims' they saw . . . . Absent such factual allegations, [defendant] is not on notice of 'what' misrepresentation plaintiffs are challenging — as each advertisement and communications medium contained different purportedly misleading and/or deceiving representations."), *with* FTC v. Johnson, 96 F. Supp. 3d 1110, 1118, 1142 (D. Nev. 2015) (rejecting defendants' argument that, "as a matter of due process, they should have been provided with fair notice that the form of their disclosures was prohibited," in case in which defendants used multivariate testing to produce thousands of different versions of their website).

311. *See, e.g.*, RESTATEMENT (THIRD) OF TORTS: LIAB. FOR PHYS. & EMOTIONAL HARM § 17 cmt. a (AM. L. INST. 2010) ("[R]es ipsa loquitur does produce an element of discomfort, inasmuch as the defendant can be found negligent without any evidence as to the nature or circumstances of the defendant's actual conduct. This discomfort leads to some circumspection in the application of res ipsa loquitur.").

312. *See, e.g.*, Girardeau A. Spann, *Disparate Impact*, 98 GEO. L.J. 1133, 1143–49 (2010) (discussing judicial hostility to disparate impact claims, particularly in cases of race discrimination); Michael Ashley Stein & Michael E. Waterstone, *Disability, Disparate Impact, and Class Actions*, 56 DUKE L. J. 861, 885-93 (2006) (same with respect to disparate impact claims under the Americans with Disabilities Act).

313. *Cf.* Calo, *supra* note 2, at 1010–12 (explaining that firms can use big data correlations to identify and exploit consumer vulnerabilities without understanding why the correlations exist).

are likely to agree to a two-year telecom contract under the misimpression that the monthly price displayed in large font would remain stable for the length of the contract. And one could just as easily devise reasons for why these particular types of photographers and email writers are less likely to be deceived.

We must accept that we will not always understand how a consumer was deceived. For the law to demand evidence of which materials deceived and how they did so adds unnecessary costs to the legal system. Worse, it places an impossible burden of proof on enforcement agencies, private plaintiffs, and competitor businesses challenging machine-created, micro-targeted digital deception, effectively exempting digital design from consumer protection and fair competition laws. These laws are written broadly so that courts can respond to new unfair and deceptive practices as they appear. All that remains is for courts to do so.