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Contents

Artificial Intelligence in Marketing and Consumer Behavior Research

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ABSTRACT

Examining the impact of technology on marketing has been an important research topic dating to the advent of radio, TV, and the Internet. Whereas each new technology had its own implications in the history of marketing research, it is becoming increasingly clear that the emergence of artificial intelligence (AI) is changing the marketing landscape in an unprecedented way. AI technology has been long out there, but recent breakthrough developments suggest we are entering a new technological zeitgeist with profound implications for both marketers and consumers. The current research provides a systematic review of academic AI research conducted in the domain of marketing and consumer psychology. The current review integrates previous research published in leading marketing and psychology journals between 2018 and 2023, during which behavioral research on AI has grown substantially. We synthesize the existing literature and provide guidance for behavioral researchers working in this area. This review concludes with a discussion on critical issues associated with AI and makes suggestions for future research directions.

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Introduction

Marketing practitioners and researchers have long been drawn to new technologies to improve business performance and consumer experience. In the early 20th century, the trajectory of future business growth was altered by advancements in early computer science, rooted in theoretical mathematics and driven by applications for military use, such as codebreaking during World War II. The invention of the modern-day computer, the Atanasoff Berry Computer, by researchers at Iowa State University in 1942 launched the digital age. In 1946, mathematician Alan Turing produced a design for a much more sophisticated computer known as the Automatic Computing Engine (ACE) based on earlier theoretical work described in a seminal 1936 paper detailing the specifications for modern-day computing known as the Turing machine. The ACE prototype was built and performed its first operations in 1950.

Turing also introduced the notion of the Turing test in 1950 by proposing that a key touchstone for computing technology would be a "thinking" machine capable of interacting with a human interlocutor such that the machine performs at a level indistinguishable from a human (Turing, 1950). Although philosophers, scientists and logicians had theorized the possibilities surrounding humanlike machines for centuries, the term artificial intelligence (AI) was coined by Dartmouth mathematician John McCarthy at a 1956 summer workshop held at Dartmouth University, and the new field was born.

Concomitant with early theoretical and technical work into building computing systems, applied researchers also began to see the promise of AI technology to address practical problems. Meehl (1954) somewhat controversially proposed that clinicians' tendency to combine intuition and experience with other analytical inputs resulted in sub-optimal decision-making as compared to the potential of algorithmic and actuarial models in predicting patient outcomes. This prediction flew in the face of conventional thinking and computational capabilities of the day, yet Meehl persisted in this belief. Subsequent research showed Meehl's intuition was accurate (Dawes *et al.*, 1989), and the idea that an algorithm can outperform a human decision-maker is certainly not controversial today.

In the past decade of marketing scholarship, researchers have begun to examine these issues through a consumer lens (Puntoni *et al.*, 2021). In the next section, we document the state of the art of behavioral consumer research involving AI-human interactions and divide the literature into two primary areas based on whether the reported effects are instantiations of consumers displaying a positive or negative response to encounters with AI.

It is our intention to contribute to the literature by focusing on the current state of behavioral AI-consumer research in marketing by synthesizing the existing research in this domain. We acknowledge the significant contributions made by prior research, including comprehensive reviews of the literature and conceptual papers on AI-consumer research in marketing (Belk *et al.*, 2023; Cukier, 2021; Davenport *et al.*, 2020; Hermann, 2022; Huang and Rust, 2021; Kim and Duhachek, 2022; Kozinets and Gretzel, 2021; Rahwan *et al.*, 2019; Van Doorn *et al.*, 2017; Wirtz *et al.*, 2023), and qualitative research in this domain (Belk, 2021; Novak and Hoffman, 2023). For instance, Davenport *et al.* (2020) proposed a conceptual framework for understanding the impact of AI by integrating existing knowledge about AI's level of intelligence, task types, and whether the AI is embedded in a robot that was empirically tested by Schepers *et al.* (2022). Hermann (2022) proposed a conceptual framework on AI ethics with a multi-stakeholder perspective and focus on levels of intelligence of the AI. Within the services marketing domain, prior conceptual frameworks have proposed the types of AI

(e.g., mechanical, thinking and feeling) that could be better suited for different types of services (Huang and Rust, 2021), and the role of firms in ensuring Corporate Digital Responsibility (CDR) as firms implement digital service technologies with a key focus on ethics, fairness and privacy (Hunold *et al.*, 2020; Wirtz *et al.*, 2023). Belk *et al.* (2023) discusses the impact of the 4th industrial revolution powered by AI and how it is different than previous technological breakthroughs and the new opportunities to increase customer value. Recent conceptual frameworks have also focused on the social presence of AI and the role AI plays in customer experiences (Cukier, 2021; Heerink *et al.*, 2010; Van Doorn *et al.*, 2017). Additionally, it is important to note that AI has been extensively examined as a research topic in various fields of research outside of marketing and consumer psychology. To list a few, studies conducted within the realm of Human-Computer Interaction (HCI) and Computers are Social Actors (CASA) have established a myriad of frameworks and models revealing how humans interact with computers and apply social norms in their interactions (Gambino *et al.*, 2020; Nass *et al.*, 1994). Last, but not least, Vaid *et al.* (2023) recently examined how researchers have used AI techniques (e.g., deep learning) in consumer behavior research, and proposed a topic modeling approach to further study consumer-relevant topics by analyzing the abundance of consumer research data. Vaid *et al.* (2023) identify opportunities for marketing to engage in cross-disciplinary collaborations with disciplines that will effectively help in exploiting the AI techniques.

The current research aims to contribute to the literature by integrating the growing body of AI research in marketing and consumer psychology. In doing so, we differentiate our work from the aforementioned AI research by focusing on the burgeoning yet less examined behavioral studies conducted in marketing and consumer behavior. We also identify the theories and process mechanisms that explain the reported effects. Our inclusion criteria for the articles followed a search strategy using keywords such as "artificial intelligence," "algorithm," and "robots" to search online databases of leading marketing journals, including the *Journal of Marketing, Journal of Marketing Research, Journal of Consumer Research, Marketing Science, Journey of the Academy of Marketing Science, Journal of Consumer Psychology, Journal of Service*

Research, Journal of Service Management and *Management Science*. We restricted our search to articles published between 2018–2023 (until June 19, 2023) that empirically studied consumer-AI interactions primarily using experimental methods. Next, we also included several relevant articles published in leading social psychology journals, including *Psychological Science, Journal of Experimental Social Psychology, Emotion, Nature, Journal of Experimental Psychology (General), Organizational Behavior and Human Decision Processes, and Cognition*. These articles were selected based on their substantial contributions to the literature. The selected articles are listed in Table 1.

Table 1: Study details and DVs

Paper	Decision Context	Methodologies	Dependent Variables	Findings
Bergner *et al.* (2023), JCR	Evaluation of AI-based conversational interfaces and its effect on consumer-brand relationships	Online Experiments	Willingness to pay a premium, recommendation acceptance, brand advocacy and brand loyalty	AI-conversational interfaces that use turn-taking, turn-initiating and grounding between turns, promote brand intimacy and lead to positive downstream consequences for the brand.
Castelo *et al.* (2023), JCR	Evaluation of bot-provided services	Lab and Field Experiments	Consumers' evaluation of service	Consumers evaluate the services more negatively when they are served by the bots (vs. humans)
Chen and Huang (2023), JCP	Evaluation of how highlight robots' (vs. humans') helping behavior in disaster response effect consumers' prosociality	Lab and Online Experiments	Consumers' prosociality	Consumers are less likely to engage in prosocial behaviors when robots' (vs. humans') helping behavior in disaster response is highlighted.
de Bellis *et al.* (2023), JM	Evaluation of meaningfulness of manual labor to consumers and its effect on automated technology adoption.	Online and Field Experiments	Product valuation, adoption likelihood	Consumers who score high (vs. low) on the meaning of manual labor construct tend to evaluate autonomous products less favorably and adopt them less frequently.
Garvey *et al.* (2023), JM	Evaluation of marketing offers administered by AI vs. humans	Lab and Online Experiments	Willingness/likelihood to accept offers, customer satisfaction	Customers respond better to worse-than-expected offers when dealing with an AI agent (vs. human). Customers respond positively to better-than-expected offers when dealing with human agent (vs. AI agent)
Han *et al.* (2023), JSR	Evaluation of the impact of consumers' mindset on their attitude towards anthropomorphized AI in services	Online Experiments	Attitude toward the robot	Consumers with competitive (collaborative) mindset respond less (more) favorably to anthropomorphized (vs. non-anthropomorphized) AI

Continued.

Table 1: Continued.

Paper	Decision Context	Methodologies	Dependent Variables	Findings
Maar *et al.* (2023), JSM	Evaluation of how consumer, chatbot, and contextual characteristics shape consumers' attitude related to chatbots	Online Experiments	Chatbot-related usage intention	Consumers belonging to GenZ have a more favorable attitude towards chatbots than consumers belonging to GenX. However, GenX consumers perceive chatbots with high social orientation as warmer.
Reich *et al.* (2023), JCP	Evaluation of why algorithm aversion occurs among consumers	Online Experiments	Trust	Consumers avoid algorithmic recommendations assuming that the AI cannot learn from its mistakes.
Crolic *et al.* (2022), JM	Evaluation of customer satisfaction with firm in a chatbot-led interaction	Secondary data analysis and lab experiments	Customer satisfaction, purchase intentions, evaluation of firm	Chatbot anthropomorphism negatively affects customers' satisfaction, firm evaluation and purchase intention, when customers enter chatbot-led interaction in an angry (vs. non-angry) state
Holthöwer and van Doorn (2022), JAMS	Evaluation of consumers' preference to interact with robot (vs. human) service providers in embarrassing product consumption contexts	Lab, online and field experiments	Choice of service provider (human vs. robot); Click Through Rate; Likelihood to accept recommendation from the service provider; Purchase intentions	Consumers feel less judged by a robot (vs. human) in embarrassing service encounters
Kim *et al.* (2022c), JAMS	Evaluation of consumers' likelihood to engage in unethical behavior when interacting with artificial intelligence/robots (vs. humans)	Lab and online experiments	Unethical behavior (e.g., clipping additional coupons; choose false reasons)	Engaging with AI/robots (vs. humans) increases tendency to engage in unethical behavior

Continued.

Table 1: Continued.

Paper	Decision Context	Methodologies	Dependent Variables	Findings
Kim *et al.* (2022b), JMR	Evaluation of the extent to which AI assistance improves service provided by service employees	Field experiment	Students' test scores	Providing AI-generated diagnoses to tutors (service employees) improves academic performance. Tutors' willingness to use AI's assistance depends on their level of AI aversion, and technology overload
Longoni and Cian (2022), JM	Evaluation of utilitarian vs. hedonic recommendations made by AI vs. humans	Field and lab experiments	Product choice referred by AI vs. human, Products' hedonic/utilitarian perceptions, Product usage intentions	Consumers prefer recommendations of utilitarian (hedonic) products made by AI (humans)
Longoni *et al.* (2022), JMR	Evaluation of consumers' responses to service failures made by an algorithm vs. humans	Online experiments	Propensity to trust the agent or use the service being provided by the agent	Consumers generalize algorithmic failures more broadly than human failures as algorithms are perceived to be more homogenous than humans
Mozafari *et al.* (2022), JSM	Evaluation of how the negative effects of chatbot disclosure on consumer retention can be prevented	Online Experiments	Customer retention	Consumers react negatively to chatbot disclosure for highly critical services due to reduced trust.
Pitardi *et al.* (2022), JSM	Evaluation of how customers respond to service robots in context of embarrassing service encounters	Interviews and Online Experiments	Customer embarrassment	Consumers anticipate less embarrassment when interacting with service robots due to the robots' perceived lack of agency

Continued.

Table 1: Continued.

Paper	Decision Context	Methodologies	Dependent Variables	Findings
Schepers *et al.* (2022), JSR	Evaluation of consumers' emotional responses to different types of AI (mechanical, thinking and feeling AI)	Online Experiments and Field Study	Loyalty intentions, customer spending	As AI type becomes more sophisticated, the impact of AI type on positive emotions becomes stronger, leading to higher spending and loyalty intention.
Uysal *et al.* (2022), JAMS	The effect of consumers' anthropomorphism of AI on threats to consumer identity, perceived empowerment, privacy concerns and well-being	Interviews, Online Survey and Field Experiment	Consumers' satisfaction with AI, privacy concerns and well-being	AI anthropomorphism may threaten users' identity, which disempowers them, creates data privacy concerns and ultimately undermines their well-being
Xu and Mehta (2022), JAMS	The effect of AI designing luxury products on consumers' valuation of the product	Lab and online experiments	Brand Attitudes and Purchase Intentions	AI as design source reduces brand attitudes for luxury products
Yalcin *et al.* (2022), JMR	Evaluation of (un)favorable decisions made by algorithm vs. humans	Lab and online experiments	Attitude towards the organization	Consumers' reaction to a favorable decision by an algorithm (vs. a human) is less positive. The effect is mitigated for unfavorable decisions
Yu *et al.* (2022), JCP	Evaluation of consumers' evaluation of service experience upon rejection of requests from a robot (vs. human) agent	Online and Lab Experiments	Service evaluation	Consumers evaluate the service less negatively when their requests are rejected by a service robot (vs. human agent)
Zierau *et al.* (2022), JAMS	Evaluation of voice-based (vs. text-based) AI interfaces and its effect on consumers' flow-like experiences and service outcomes	Online Experiments	Contract renewal, customer sentiment, conversion rate	Voice-based (vs. text-based) interfaces promote flow-like experiences that enhance service outcomes.

Continued.

Table 1: Continued.

Paper	Decision Context	Methodologies	Dependent Variables	Findings
Choi *et al.* (2021), JSR	Evaluation of social perceptions of a service robot's warmth and competence and its influence on consumers' reaction to service failure recovery efforts by robots.	Online Experiments	Satisfaction, behavioral intentions	Consumers are most dissatisfied due to service failure caused by humanoid (vs. non-humanoid) robots, but humanoid robots can recover by offering sincere apology or an explanation that restores warmth. Human intervention can mitigate dissatisfaction when the service failure is caused by a non-humanoid robot.
Granulo *et al.* (2021), JCP	Evaluation of preference for human versus robotic labor in symbolic consumption	Lab experiments	Preference for product made by human versus robot and Likelihood to buy	Consumers prefer humans (vs. robots) for products with high (vs. low) symbolic value.
Hildebrand and Bergner (2021), JAMS	Evaluation of consumers' trust, firm's evaluation and financial decisions based on interaction with conversational (vs. non-conversational) algorithms	Lab and online experiments	Attribution of benevolence toward the financial services firm; Amount to invest and be managed by the algorithm; Acceptance of recommendation made by algorithm	Conversational (vs. non-conversational) algorithms increase consumer trust and willingness to accept recommendations from algorithm, and positively affect firm's evaluation
Luo *et al.* (2021), JM	Evaluation of an AI's effectiveness as a coach for sales agents	Field experiments	Sales calls successfully converted into loan renewal	Middle-ranked sales agents are more successful with an AI sales coach (vs. human coach) than low- and top-ranked sales agents.
McLeay *et al.* (2021), JSR	Evaluation of consumers' perceptions of Frontline Service Robots (FLSRs)	Online Experiments	Service experience, brand usage intent	Augmenting human employees with FLSRs has positive, whereas substituting human employees with FLSRs has negative consequences (irrespective of value creation model, AI type and service type).

Continued.

Table 1: Continued.

Paper	Decision Context	Methodologies	Dependent Variables	Findings
Srinivasan and Sarial-Abi (2021), JM	Evaluation of consumers' reaction to brand harm caused by algorithm (vs. humans)	Lab and online experiments	Attitude towards the firm; Helpful behavior towards the firm and its causes;	Consumers react less negatively to a brand harm caused by an algorithm (vs. human)
Weihrauch and Huang (2021), JM	Evaluation of portraying humans as machines as means to promote healthy behavior	Field, lab and online experiments	Healthiness of food items chosen	Portraying humans-as-machines promotes healthier choices for those with high (vs. low) eating self-efficacy
Zhang *et al.* (2021), Marketing Science	The effect of smart-pricing algorithm on the racial disparity in daily revenue earned by Airbnb Hosts	Quasi-natural experiment	Average daily revenue of Airbnb hosts	Smart-pricing algorithm adoption decreased average nightly rates but increased average daily revenue. Smart-pricing adoption decreased the revenue gap between White and Black hosts
Belanche *et al.* (2020), JSM	Evaluation of customers' attribution of responsibility following a service failure/success	Online Experiments	Customer's attributions towards agent, firm and stability	Customers make strong attribution of responsibility towards human employees versus robots, especially in case of service failure, and by extension, attribute the blame to the firm. Customers also attribute greater performance stability to robots than to humans
Gill (2020), JCR	Evaluation of consumer morality in context of self versus autonomous vehicles protecting self vs. pedestrians	Lab experiments	Swerve (kill/injure self) vs. Stay (kill/injure pedestrians); Moral judgements of swerve vs. stay decision	Participants reported harming a pedestrian more permissible with an autonomous vehicle (vs. self)
Kim and Duhachek (2020), Psychological Science	Evaluation of persuasiveness of human versus AI agents	Lab experiments	Product usage intentions	Human (AI) agents are more persuasive when persuasive messages represent high- (low-) levels of construal

Continued.

Table 1: Continued.

Paper	Decision Context	Methodologies	Dependent Variables	Findings
Newman *et al.* (2020), OBHDP	Evaluation of perceived procedural justice of using an algorithm in employee evaluation	Lab and field experiments	Perceived fairness, organizational commitment	Participants perceived performance reviews conducted by algorithms less fair than those conducted by human managers
Banker and Khetani (2019), JPPM	Evaluation of consumers' overdependence on AI and its recommendations	Lab and Online Experiments	Consumers' willingness to accept recommendations from AI	Consumers are more likely to depend on AI recommendations when they perceive AI to have domain expertise, even if the recommendation is inferior.
Castelo *et al.* (2019), JMR	Romantic advice, financial advice, movie recommendation, performance prediction, disease treatment, recidivism, drive a car, disease diagnosis, predict personality, predict humor, stock performance	Online lab, online field experiments	Facebook ad clickthrough rates for ads featuring AI and human agents; trust in algorithms	Trust in algorithms increases for objective tasks. Framing tasks as more quantifiable increases trust in algorithms.
Huang and Chen (2019), ACR Proceedings	Donations to support disaster relief executed by humans versus robots	Lab and field experiments	Donation amount	Observing a robot conduct disaster relief acts is less inspiring for consumers as opposed to when the acts are performed by a human
Ishowo-Oloko *et al.* (2019), Nature Machine Intelligence	Evaluate if users would negatively perceive bots' efficiencies upon disclosure of bot's identity	Online Experiment	Cooperation in a prisoner's dilemma game	Bots were better than humans at eliciting cooperation, but only if they were allowed to pass as humans. As soon as their true nature was revealed, cooperation rates dropped and could no longer match typical levels of human–human cooperation.

Continued.

Table 1: Continued.

Paper	Decision Context	Methodologies	Dependent Variables	Findings
Jörling *et al.* (2019), JAMS	Evaluation of technology autonomy and consumers' attribution of responsibility on outcomes	Interviews and online experiments	Outcome responsibility	Technology's autonomy decreases perceived behavioral control and subsequently decreases perceived responsibility for positive, but not for negative, outcomes
Logg *et al.* (2019), OBHDP	The evaluation of when people prefer to use algorithms (algorithm appreciation)	Lab and online experiments	Utilization of algorithm's advice (weight on advice)	People prefer advice from algorithm over human unless they are choosing between algorithm and self estimates, or when they have expertise in the domain.
Longoni *et al.* (2019), JCR	Receptivity to healthcare provided by AI versus humans	Lab and online experiments	Healthcare utilization, reservation prices, and utility	Lower preference for AI than human in healthcare context driven by perceived "uniqueness" neglect byf AI
Luo *et al.* (2019), Marketing Science	The effect of AI chatbot disclosure on customer purchases	Field experiment	Customers' decision to renew the loan	Undisclosed chatbots are as effective as human agents, and more effective than inexperienced human agents. Disclosing chatbot identity before interaction reduces purchase rates by more than 79.7%
Mende *et al.* (2019), JMR	The effect of humanoid service robots on consumers' compensatory consumption behavior	Lab experiments	Consumption of food item; social affiliation seeking; purchasing status products	Humanoid service robots (vs. humans) elicit greater levels of discomfort among consumers leading to higher compensatory consumption
Awad *et al.* (2018), Nature	Autonomous vehicle moral decision making	Online survey (variety of correlational techniques e.g., PCA)	Choosing (not choosing) preferred option	Moral tendency clusters identified for Western, Eastern, and Southern participants reflect differences among measured dimensions.

Continued.

Table 1: Continued.

Paper	Decision Context	Methodologies	Dependent Variables	Findings
Dietvorst *et al.* (2018), Management Science	Forecasts with or without the assistance of an algorithm; forecasting student exam performance.	Online survey administered in laboratory	Choice of algorithm for making forecasts, satisfaction with choice, satisfaction with forecasting process, belief algorithm is superior	Users prefer algorithms that they are able to even slightly modify.
Dietvorst *et al.* (2015), JEP: General	Evaluation of AI versus human forecaster in domains of MBA student performance, airline passenger trends,	Online survey administered in laboratory environment	Accuracy of forecasts, confidence in model versus human, perceived accuracy of model versus human	Participants who saw the algorithm perform were less confident in it, and less likely to choose it over an inferior human forecaster.
Waytz *et al.* (2014), JESP	Driving simulator involving completion of two courses	Lab experiment	Perceived anthropomorphism, liking, trust, heart rate change, "startle" response, blame for vehicle, distraction	Anthropomorphism of an autonomous car predicts trust in that car and affects attributions of responsibility and punishment.
Waytz and Norton (2014), Emotion	Evaluation of when people will prefer botsourcing	Lab and online experiments	Comfort with botsourcing; Comfort with outsourcing	People are more comfortable in botsourcing tasks that require cognition (vs. emotion) unless the robots appear to convey more emotion
Gray and Wegner (2012), Cognition	Evaluation of why people experience the uncanny valley phenomenon when interacting with humanlike robots	Lab and online experiments	Feeling uncanny	People perceived humanlike (vs. machine-like) robots as uncanny because of attributions of experience/mind to the robots. There was no difference in attributions of agency between the robot types

Continued.

In the following, we present the sections that consist of the rest of this review:

- Section 1: History of AI Research in Marketing.
- Section 2: AI Decision Contexts and Main Effects. This section reviews and categorizes the decision contexts explored to date in this literature, while identifying the key theoretical constructs explored in these contexts.
- Section 3: Moderators of Behavioral AI Effects in Consumer Research. This section provides an overview of moderators that have been demonstrated to alter the effects of AI-related consumption.
- Section 4: Process Mechanisms of Behavioral AI Effects in Consumer Research. This section examines psychological processes that underlie consumer responses to and decisions involving AI.
- Section 5: Artificial Intelligence Agent Stimuli and Manipulations. This section provides the stimuli and manipulations employed in this research to date, while also suggesting a taxonomy of AI agents to guide future research designs.
- Section 6: Future Research Directions for Behavioral AI Research in Marketing.

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