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Artificial Intelligence in Marketing and Consumer Behavior Research

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- Marketing Information Systems
- Market Response Models
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- Stochastic Model

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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.
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
Introduction

(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

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<td>Evaluation of AI-based conversational interfaces and its effect on consumer-brand</td>
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<td>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.</td>
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<td>Castelo et al.</td>
<td>Evaluation of bot-provided services</td>
<td>Lab and Field Experiments</td>
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<td>Consumers evaluate the services more negatively when they are served by the bots (vs. humans)</td>
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<td>Chen and</td>
<td>Evaluation of how highlight robots’ (vs. humans’) helping behavior in disaster</td>
<td>Lab and Online Experiments</td>
<td>Consumers’ prosociality</td>
<td>Consumers are less likely to engage in prosocial behaviors when robots’ (vs. humans’) helping behavior in disaster response is highlighted.</td>
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<td>Huang et al.</td>
<td>response effect consumers’ prosociality</td>
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<td>(2023), JCP</td>
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<td>de Bellis et al.</td>
<td>Evaluation of meaningfulness of manual labor to consumers and its effect on</td>
<td>Online and Field Experiments</td>
<td>Product valuation, adoption likelihood</td>
<td>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.</td>
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<td>(2023), JM</td>
<td>automated technology adoption</td>
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<td>Garvey et al.</td>
<td>Evaluation of marketing offers administered by AI vs. humans</td>
<td>Lab and Online Experiments</td>
<td>Willingness/likelihood to accept offers, customer satisfaction</td>
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<td>Han et al.</td>
<td>Evaluation of the impact of consumers’ mindset on their attitude towards</td>
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<td>Maar et al. (2023), JSM</td>
<td>Evaluation of how consumer, chatbot, and contextual characteristics shape consumers’ attitude related to chatbots</td>
<td>Online Experiments</td>
<td>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.</td>
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<td>Reich et al. (2023), JCP</td>
<td>Evaluation of why algorithm aversion occurs among consumers</td>
<td>Online Experiments</td>
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<td>Consumers avoid algorithmic recommendations assuming that the AI cannot learn from its mistakes.</td>
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<td>Crolic et al. (2022), JM</td>
<td>Evaluation of customer satisfaction with firm in a chatbot-led interaction</td>
<td>Secondary data analysis and lab experiments</td>
<td>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</td>
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<td>Holthöwer and van Doorn (2022), JAMS</td>
<td>Evaluation of consumers’ preference to interact with robot (vs. human) service providers in embarrassing product consumption contexts</td>
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<td>Kim et al. (2022c), JAMS</td>
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<td>Kim <em>et al.</em> (2022b), JMR</td>
<td>Evaluation of the extent to which AI assistance improves service provided by service employees</td>
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<td>Students’ test scores</td>
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<td>Longoni and Cian (2022), JM</td>
<td>Evaluation of utilitarian vs. hedonic recommendations made by AI vs. humans</td>
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<td>Longoni <em>et al.</em> (2022), JMR</td>
<td>Evaluation of consumers’ responses to service failures made by an algorithm vs. humans</td>
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<td>Consumers generalize algorithmic failures more broadly than human failures as algorithms are perceived to be more homogenous than humans</td>
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<td>Mozafari <em>et al.</em> (2022), JSM</td>
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<td>Consumers anticipate less embarrassment when interacting with service robots due to the robots’ perceived lack of agency</td>
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<td>Schepers et al.</td>
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<td>Uysal et al.</td>
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<td>Luo et al. (2021), JM</td>
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<td>Zhang et al. (2021), Marketing Science</td>
<td>The effect of smart-pricing algorithm on the racial disparity in daily revenue earned by Airbnb hosts</td>
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| Newman et al.  | Lab and field experiments | Evaluation of perceived procedural justice of using an algorithm in employee evaluation | Perceived fairness, organizational commitment                                         | Participants perceived performance reviews conducted by algorithms less fair than those conducted by human managers.  
Consumers are more likely to depend on AI to have domain expertise, even if the recommendation is inferior.  
Trust in algorithms increases for objective tasks.  
Framing tasks as more quantifiable increases trust in algorithms.  
Observing a robot conduct disaster relief acts is less inspiring for consumers as opposed to when the acts are performed by a human.  
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. |
| OBHDP          | Experiment               | Evaluation of perceived procedural justice of using an algorithm in employee evaluation | Perceived fairness, organizational commitment                                         | Participants perceived performance reviews conducted by algorithms less fair than those conducted by human managers.  
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| Banker and Khetani (2019), JPPM | Lab and Online Experiments | Overreliance on AI and Its Recommendations from AI | Consumer’s willingness to accept recommendations from AI | Consumers are more likely to depend on AI to have domain expertise, even if the recommendation is inferior.  
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| Castelo et al. (2019), JMR | Online lab, online field experiments | Romantic advice, financial advice, movie recommendation, disease prediction, disease treatment, recidivism, personality prediction, job performance, stock performance | Facebook ad clickthrough rates for ads featuring AI and human agents; trust in algorithms | Participants perceived performance reviews conducted by algorithms less fair than those conducted by human managers.  
Consumers are more likely to depend on AI to have domain expertise, even if the recommendation is inferior.  
Trust in algorithms increases for objective tasks.  
Framing tasks as more quantifiable increases trust in algorithms.  
Observing a robot conduct disaster relief acts is less inspiring for consumers as opposed to when the acts are performed by a human.  
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| Huang and Chen (2019), ACR Proceedings | Online lab, online field experiments | Evaluate if users would negatively perceive bots’ efficiencies upon disclosure of bot’s identity | Donation amount | Participants perceived performance reviews conducted by algorithms less fair than those conducted by human managers.  
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| Ishikawa-Oloko et al. (2019), Nature Machine Intelligence | Online experiment | Evaluate if users would negatively perceive bots’ efficiencies upon disclosure of bot’s identity | Cooperation in a prisoner’s dilemma game | Participants perceived performance reviews conducted by algorithms less fair than those conducted by human managers.  
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<tr>
<td>Dietvorst et al. (2018), Management Science</td>
<td>Forecasts with or without the assistance of an algorithm; forecasting student exam performance.</td>
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<td>Dietvorst et al. (2015), JEP: General</td>
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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.
References


References


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References


