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The Influence of Conversational AI on Consumer Behavior and Counterfactual Thinking: A Systematic Review

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Abstract

This document evaluates the development and importance of conversational AI, chatbots, and virtual assistants in human behavior and the process of making decisions. Designed to investigate the impact of AI on the personalization of user experiences, the study maps how the automation of decision-making and the alteration of cognitive processes like thinking in the counterfactual mode and regret are affected. The main idea is that while conversational AI service might improve the user experience and be more efficient, problems with transparency, personalization overdone and emotive manipulation might emerge. The conclusion of the research is that it is necessary to operate in a balanced way in order for the trust to be established, to be transparent, and to be authentic, thus reinforcing the transformative impact of conversational AI in e-commerce and consumer engagement in the future.

Keywords: Conversational AI, consumer behavior, personalization, counterfactual thinking, e-commerce

Introduction

AI chat systems or conversational AI, such as bots, AI assistants, or AI agents, are currently a critical innovation of all industries. The technology operates by natural language processing to interact with consumers, reply to

their questions, and induce sales activities through high value-added recommendation and sales mechanisms.

The integration of conversational AI into digital platforms has revolutionized brand-consumer interactions, and thereby streamlining decision-making and enhancing brand interactions (Iskef, 2022). This convenience raises the question of its impact on the psychoanalysis of consumers and decision-making which is an important issue, specifically on its capability to refashion the cognitive processes as counterfactual thinking (Arora et al., 2013; Celuch et al., 2015).

The objective of this systematic review is to establish a connection between these different domains by summarizing the literature currently available relating to the application of conversational AI in consumer behavior and counterfactual thinking. The research is to bring out primary dimensions by which the study will analyze the balance between efficient, authentic, and ethical e-commerce.

Theoretical Framework

This cognitive process is especially relevant in e-commerce, where the consumer's compare several choices and are also supplied with GMH to improve the customer's shopping experience (Hu et al., 2023; Sharma & Shafiq, 2022). When people reflect on the choices they have made, contrary to the satisfaction, they might feel frustration due to their remorse over the missed opportunities. Conversational AI can be used to enhance this mitigation technique by providing the customer with a greater number of personalized proposals. For one, a chatbot offering multiple alternative products before purchase may unwittingly lead someone to question their original choice and thereby, make them feel regret or uncertainty(Fung, 2019; Mustafa Ayobami Raji et al., 2024).

By the same token, the acceptance of AI to analyze and summarize large amounts of consumer data has emerged as a new aspect of personalization. Awareness of consumer interests and behavior through this medium opens doors to specific suggestions that the AI makes. This, while personalizing the content for the user also helps in simplifying the task by lowering the individual's working load, may also lead to decision fatigue due to excessive choices because of over-personalization. Furthermore, the structural dilemma is never taken into account even though AI-generated conversations are yet not authentic to the human way of interaction, hence, trust and friendliness can hardly be replicated by such systems (Ma & Sun, 2020; Mustafa Ayobami Raji et al., 2024).

AI systems becoming emotional beings are a completely new experience that could change e-commerce as we know it because of their capability to understand and respond to the emotions of the consumers in

real-time. These systems can enhance consumer decision-making, reduce post-purchase regret and building satisfaction on a positive emotional plane. However, such a transformation also poses a significant risk of utilizing the prevailing vulnerabilities in consumer lives, notably through uber-personalization and emotional triggers (Rajkumar & Agarwal, 2014).

To wrap up, conversational AI presents a transformative approach to reorganize customer judgment, in our days, still, it must be applied to the e-commerce with a refined understanding of the psychological, cultural, and ethical dimensions (Hu et al., 2023). On the one hand, counterfactual thinking, a decision paradox, and AI-generated recommendation interaction pose the potential as a focal point of later research that will concentrate on the long-term effects of the technologies on customer satisfaction, brand loyalty, and market trust(Jain et al., 2024; Xu et al., 2024).

Research Objectives and Methodology

The literature was then thoroughly analyzed to find 23 credible articles that were published between 2014 and 2024. These documents were obtained from the Web of Science database, using searches such as “conversational AI,” “counterfactual thinking,” “consumer behavior,” and “online decision-making” (table1). Inclusion criteria were strictly defined to focus on studies examining the role of conversational AI in e-commerce contexts, with particular attention to its psychological and behavioral implications. Exclusion criteria eliminated articles unrelated to AI or those addressing offline consumer behavior without an explicit connection to counterfactual thinking.

Search Method

A structured method was used to carry out this systematic literature review in order to find relevant studies that examine conversational AI and its impact on consumer behavior, counterfactual thinking, and purchase decisions. The PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines were used to make sure the review proceeded in a rigorous manner (figure1).

We searched for the studies in the Web of Science database by the help of a specified keyword list and a set of search strings. An open source tool, “Rayyan”, was employed in conducting a data exploration, where the management and filtering of the dataset took place through this platform efficiently.

Table1: Search criteria table

Keyword	Conversational AI	Consumer Behavior and Counterfactual Thinking	Counterfactual Thinking
Synonyms	Chatbots", "Virtual Assistants", "AI Agents", "Digital Assistants", "Smart Assistants"	"Purchase Decisions", "Buying Behavior", "Online Purchase Behavior", "Consumer Purchase Patterns"	"Counterfactuals", "Consumer Regret", "Alternative Scenarios", "What-If Thinking"

The sequence used for the search was pre-created and then adapted to each database; in specific, the tools were utilized to carry out separate searches. Below you will find the displayed piece of the search query:

"Conversational AI" OR "Chatbots" OR "Virtual Assistants" OR "AI Agents") AND ("Consumer Counterfactual Thinking" OR "Counterfactuals" OR "Consumer Regret" OR "Consumer Decision-Making") AND ("Purchase Decisions" OR "Consumer Behavior" OR "Buying Behavior" OR "Online Purchase Behavior")

Inclusion and Exclusion Criteria

To ensure relevance and rigor, the following inclusion and exclusion criteria were applied:

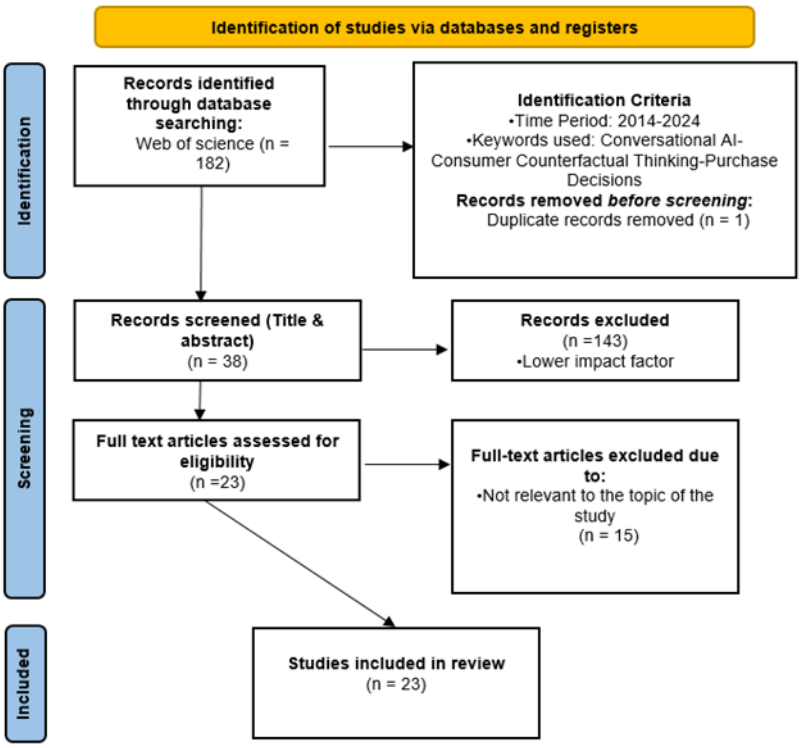
Inclusion Criteria	Studies published between 2014 and 2024. Studies focusing on conversational AI's role in consumer decision-making.
Exclusion Criteria	Non-English language publications. Studies unrelated to e-commerce or consumer behavior. Articles lacking empirical evidence or theoretical relevance.

Selection Process

For PRISMA compliance, figure 1 shows the flow diagram outlining the identification process.

- **Initial Screening**: The metadata of all studies retrieved (n=182) was reviewed, and duplicates were removed. Studies irrelevant to the topic were excluded based on titles and abstracts.
- **Abstract and Title Screening**: Using “Rayyan.ai”, studies were filtered further, reducing the total to 143 articles.
- **Full-Text Review**: The remaining studies were downloaded and reviewed in detail. Articles without sufficient focus on conversational AI in the context of counterfactual thinking or purchase decisions were excluded.
- **Final Selection**: After applying all criteria, 23 studies were selected for the systematic review.

Figure 1: Flow diagram of PRISMA process



Findings and Discussion

Methodological Distribution in Conversational AI Studies

Table 2: Overview of search and study type

Study Type	Number of Studies
Experimental Studies	8
Qualitative Interviews	5
Surveys	7
Case Studies	3

The Table 2 delineates the methodologies used in the 23 studies that were reviewed. The research was experimental (8), and it was the most commonly occurring type of research, hence, a study of causal relationships. It followed by the surveys (7) and qualitative interviews (5), which demonstrates a combination of quantitative and qualitative methodologies. Finally, case studies (3) gave detailed, situation-specific insights.

Applications of Conversational AI across Key Categories

Table 3: Overview of search by categories

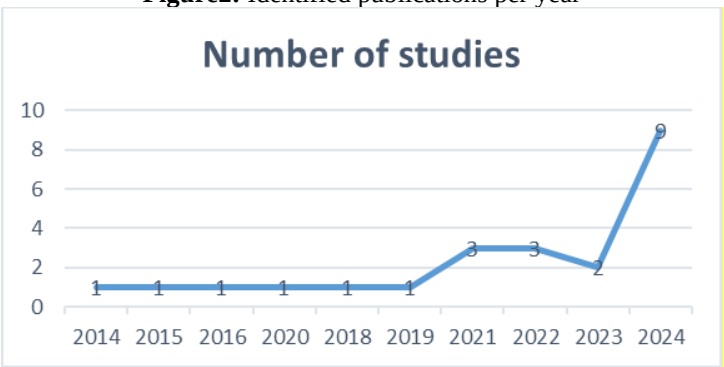
Categories	Percentage
AI in Consumer Behavior	23,3%
AI in Marketing	26,7%
AI in E-Commerce	16,7%
AI in Emotion Detection	20%
AI in Decision Making	12,3%

The adoption of Conversational AIs has been one of the most significant applications of AI technologies, with the aim of involving clients and even making decisions. In marketing (26.7%), AI tools have been instrumental in making advertising campaigns more relevant to target audiences by personalizing user experiences and fostering customer loyalty through tailored recommendations. Researches in consumer behavior (23.3%) highlights how conversational AI builds trust and satisfaction by offering personalized solutions, indirectly influencing purchase decisions (M. Huang & Rust, 2021; Luo, 2002; Seva et al., 2007).

Emotion detection (20%) emphasizes AI's ability to interpret and respond to user moods, creating engaging and human-like interactions (Gerlich et al., 2023). Instead, in e-commerce (16.7%), conversational AI streamlines shopping processes, minimizes decision-making fatigue, and enhances the overall user experience, showcasing its transformative potential in online retail. Meanwhile, decision-making research (12.3%) delves into the subject of how conversational AI in different scenarios is able to offer suggestions that are well-structured, thereby making it easier for people to go through the whole process, and consequently, the decisions are often right. These applications of the greatest diversity are a sign of an emergent technological shift (Celuch et al., 2015; Galiano-Coronil et al., 2023).

Temporal Trends in AI Research

Figure2: Identified publications per year



The conversational AI field shows a constant increase in research with massive bulks in the latest years. Between 2014 and 2020, research primarily focused on foundational aspects, with only one study published annually. The direction changed in 2021 and 2022, with three studies per year, which explored the aspect of the emotional and personal comment, the so-called advanced themes. This trend surged in 2024, with nine studies exploring how conversational AI influences consumer behavior and decision-making. (Bai, 2022).

Table 4: Studies included in the systematic review

ID	Title	Authors	Year
1	Machine learning and AI in marketing – Connecting computing power	Liye Maa, Baohong Sun	2020
2	The Impact of Personalization Algorithms on Consumer Engagement and Purchase Behaviour in AI-Enhanced Virtual Shopping Assistants	Ruhi Rachna,Misra	2024
3	Analysis of the change of artificial intelligence to online consumption patterns and consumption concepts	Bai, LY	2022
4	Application of Mobile Big Data and Artificial Intelligence in the Efficiency of E-Commerce Industry	Cui, HK And Xiao, LN And Zhang, XH	2021
5	Augmentation through Generative AI: Exploring the Effects of Human-AI Interaction and Explainable AI on Service Performance	Philipp Reinhard	2024
6	Artificial intelligence as toolset for analysis of public opinion and social interaction in marketing: identification of micro and nano influencers	Gerlich, M And Elsayed, W And Sokolovskiy, K	2023
7	Chatbot interactions: How consumption values and disruptive situations influence customers' willingness to interact	Marco Meier,Tim Weitze,Christian Maier, Jason B. Thatcher	2024
8	The Role of Counterfactual Thinking in Narrative Persuasion: Its Impact on Patients' Adherence to Treatment Regimen	Timothy K F Fung	2019
9	E-commerce and consumer behavior: A review of AI-powered personalization and market trends	Mustafa Ayobami Raji, Hameedat Bukola Olodo…	2024
10	Counterfactual Thinking: What Theories in Design	Oulasvirta, A And Hornbæk, K	2022
11	A Framework for Collaborative Artificial Intelligence in Marketing.	Ming-Hui Huanga, Roland T. Rust	2022
12	Design principles for artificial intelligence-augmented decision making: An action design research study	Pathirannehelage, SH And Shrestha, YR And Von Krogh, G	2024
13	Developing trustworthy artificial intelligence: insights from research on interpersonal, human-automation, and human-AI trust	Li, YG And Wu, BZ And Huang, YQ And Luan, SH	2024
14	A Survey of Contrastive and Counterfactual Explanation Generation Methods for Explainable Artificial Intelligence	Ilia Stepin, Jose M. Alonso ,Alejandro Catala, And Martín Pereira-Fariña	2021
15	Expectation-based consumer purchase decisions: behavioral modeling and observations	Jia, J And Li, J And Liu, WX	2023
16	Should We Collaborate with AI to Conduct Literature Reviews? Changing Epistemic Values in a Flattening World	Ojelanki Ngwenyama, Frantz Rowe	2024
17	Improving the Performance of an Artificial Intelligence Recommendation Engine with Deep Learning Neural Nets	Guha, R And IEEE	2021
18	Marketing Decision Model and Consumer Behavior Prediction With	Xu, AF And Li, Y And	2024

	Deep Learning	Donta, PK	
19	Online Decision-Making in General Combinatorial Spaces	Rajkumar, A And Agarwal, S	2014
20	Should Have I Bought the Other One?" Experiencing Regret in Global Versus Local Brand Purchase Decisions	Davvetas, V And Diamantopoulos, A	2018
21	The Influence of Counterfactual Thinking and Regret on Ethical Decision Making	Celuch, K And Saxby, C And Oeding, J	2015
22	A survey on the impact of AI-based recommenders on human behaviours: methodologies, outcomes and future directions	Pappalardo,Luca,Ferragina, Emanuele Citraro…	2024
23	The Role of Anticipated Emotions in Purchase Intentions	Bagozzi, RP And Belanche, D And Casaló…	2016

***Key** Themes Identified in the Literature*

Theme	Insights	Implications
Conversational AI in Engagement	Enhances consumer engagement by offering personalized, real-time interactions through chatbots.	Optimizes the sales process, improves consumer satisfaction, and fosters trust in AI-driven systems.
Trust in AI Recommendations	Consumers trust AI-generated suggestions, especially when framed as tailored options.	Leads to higher purchase rates and loyalty when transparency and relevance are maintained.
Counterfactual Thinking	Prompts consumers to imagine alternative choices and evaluate their decisions.	May increase satisfaction if the choice feels validated or induce regret if alternatives seem better.
Decision Fatigue Mitigation	Reduces cognitive overload by narrowing choices to relevant options.	Enhances user experience and supports confident decision-making.
Cultural and Ethical Concerns	Trust and adoption vary across cultural contexts; ethical transparency is critical.	Requires localized approaches and clear communication about AI-driven recommendations.
Broader E-Commerce Impact	AI's global scalability improves efficiency across operations, marketing, and support.	Drives business growth while adapting to diverse consumer needs and behaviors.

This synthesis illustrates the conversion of e-commerce with conversational AI driving its potential to attract, engage, bond and make the consumer's decision-making process leaner. Although it implies worldwide scalability and operational efficiency, the positive influence of conversational AI is subtle due to psychological and cultural variables. Companies need to balance personalization with simplicity to avoid decision fatigue and ensure that they are maintaining ethical transparency which in turn would help them to build consumer trust. For the last two strategies, they need to consider the cultural complexities and to get the most out of AI,

show responsible behavior by creating mutual advantage that is stable with both consumers and businesses.

Practical Implications

The outcomes of this study can be very beneficial not only for e-commerce platforms but also for the AI developers. To optimize the impact of conversational AI on consumer decision-making, businesses must determine the systems that best represent a compromise between people's likes and ease. While over-personalization may initially seem beneficial, it risks overwhelming consumers and leading to regret. Contrarily, AI systems must concentrate on suggesting clear, brief, and context-specific advice that will aid consumers without overwhelming them with the excessive number of options available.

Conversely, the synergy of emotional intelligence for conversational AI empowers consumer satisfaction. AI systems can deal with the consumer's emotions directly and immediately by virtually duplicating the natural abilities of human tenderness and intelligence, thus reducing regret and strengthening positive decision-making experiences. From the cultural perspective, the formulation of the AI models for diverse local markets is the cornerstone of the whole thing. For example, AI systems can incorporate familiar language, humor, and cultural references, making them more relevant and trustworthy for local consumers.

Conclusion and Future Directions

This review highlights the transformative potential of conversational AI in reshaping consumer decision-making processes. However, the psychological and cultural nuances of consumer behavior demand a more balanced and ethical approach to AI implementation. Future research should prioritize longitudinal studies to assess how conversational AI impacts consumer satisfaction, loyalty, and counterfactual thinking over time, particularly across different e-commerce sectors. Additionally, cross-cultural investigations are necessary to understand the diverse ways in which consumers across different markets interact with and perceive AI systems. Addressing these gaps will not only advance academic knowledge but also provide actionable insights for businesses seeking to harness the power of AI in e-commerce.

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