



Modeling Consumer Trust in Conversational AI: Cognitive and Affective Pathways

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Abstract

Conversational artificial intelligence (AI) has become a central feature of digital consumer interactions, yet its effectiveness depends largely on user trust. Unlike traditional interfaces, conversational AI operates as an interactive and adaptive agent, reshaping trust formation in AI-mediated exchanges. This study proposes a conceptual framework explaining how conversational AI influences consumer trust through perceived competence, social presence, transparency, and perceived autonomy. The framework distinguishes between cognitive and affective trust and examines their effects on purchase intention and willingness to disclose personal information. A survey-based research design and Structural Equation Modeling (SEM) are proposed to empirically test the relationships. This study contributes to consumer trust and AI literature by positioning conversational AI as an active trust-building agent and offers practical insights for designing trustworthy AI systems.

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1. Introduction

Conversational artificial intelligence (AI), including chatbots and virtual assistants, has become a defining feature of contemporary digital ecosystems. These systems are widely deployed across e-commerce platforms, healthcare portals, financial services, transportation systems, and customer support environments. By enabling real-time, natural language interaction, conversational AI promises efficiency, scalability, and personalization. However, its effectiveness depends largely on whether consumers trust these systems.

Trust is a foundational determinant of online consumer behavior, influencing adoption decisions, willingness to disclose personal information, compliance with recommendations, and purchase intentions (Gefen *et al.*, 2003)^[5]. In AI-mediated environments, trust assumes heightened importance due to algorithmic opacity, perceived autonomy, and persistent concerns over data privacy and misuse. Research on AI-enabled technologies demonstrates that user acceptance is driven not only by performance outcomes but also by perceptions of reliability, transparency, and ethical alignment (Shah *et al.*, 2026; Shah *et al.*, 2023)^[7, 11].

Despite the widespread deployment of conversational AI, scholarly understanding of how these systems specifically shape trust formation remains limited. Much of the existing e-commerce trust literature treats technology as a static intermediary rather than an interactive and adaptive agent. Conversational AI introduces a qualitatively different interaction paradigm—one that simulates human dialogue, adapts dynamically, and operates with varying degrees of autonomy. This paper addresses this gap by examining the mechanisms through which conversational AI influences trust formation among online consumers.

2. Literature Review

2.1. Consumer Trust and Technology

Consumer trust has been conceptualized as a psychological state reflecting an individual's willingness to accept vulnerability based on positive expectations of another party's competence, benevolence, and integrity (Gefen *et al.*, 2003) [5]. In online environments, trust mitigates perceived risk stemming from information asymmetry, physical distance, and uncertainty regarding outcomes.

Technology-mediated trust differs from interpersonal trust in that users evaluate both the technological artifact and the organization deploying it. Prior research shows that trust significantly influences online purchase behavior, customer loyalty, and willingness to share personal data (Aguirre *et al.*, 2015) [1]. Studies examining emerging technologies further indicate that trust functions as a critical bridge between innovation and market adoption (Shah *et al.*, 2026; Shah *et al.*, 2025) [7, 9].

2.2. Conversational AI Technologies

Conversational AI refers to automated systems capable of engaging users through natural language dialogue using machine learning and natural language processing techniques. Unlike traditional graphical interfaces, conversational agents can personalize responses, adapt to user inputs, and simulate social interaction (McLean & Osei-Frimpong, 2019) [6].

These capabilities create both opportunities and challenges. On one hand, conversational AI can enhance accessibility, efficiency, and user engagement. On the other hand, increased anthropomorphism may blur boundaries between human and machine interaction, potentially influencing user expectations and perceptions of responsibility. Pizzi *et al.* (2021) [8] argue that conversational AI alters the distribution of control within digital interactions, with important implications for trust.

2.3. Trust in AI-Mediated Exchange

Trust in AI systems has been examined across various domains, including healthcare, transportation, energy, and supply chain management. Research by Shah *et al.* (2023) [11] shows that AI-driven clinical decision support systems are more likely to be adopted when users perceive them as transparent, accurate, and supportive rather than authoritative. Similarly, studies on AI-enabled infrastructure and energy systems demonstrate that trust significantly affects public acceptance and long-term use (Shah *et al.*, 2024) [4].

In consumer-facing contexts, interface characteristics such as responsiveness, explainability, and social presence play a central role in trust formation. Conversational AI uniquely integrates these elements, positioning it as a powerful antecedent of both cognitive and affective trust.

3. Conceptual Framework

This paper proposes a conceptual framework in which conversational AI influences trust formation through four interrelated mechanisms:

3.1. Perceived Competence

Perceived competence refers to consumers' beliefs regarding the AI system's ability to provide accurate, relevant, and timely information. High perceived competence reduces uncertainty and signals technical reliability. Prior research

across AI-enabled systems consistently identifies competence as a primary driver of cognitive trust (Gefen *et al.*, 2003; Shah *et al.*, 2026) [5, 7].

3.2. Social Presence

Social presence captures the extent to which an interaction feels personal, engaging, and human-like. Conversational AI systems capable of natural language fluency, contextual awareness, and empathetic responses enhance affective trust by fostering emotional comfort and relational warmth (Yoo *et al.*, 2018; McLean & Osei-Frimpong, 2019) [12, 6].

3.3. Transparency

Transparency refers to the clarity with which an AI system communicates its capabilities, limitations, and data usage practices. Transparency plays a central role in users' privacy calculus and trust judgments (Xu *et al.*, 2009) [10]. Empirical evidence across healthcare, safety, and decision-support applications indicates that transparent AI systems are perceived as more trustworthy and reliable (Shah *et al.*, 2023) [11].

3.4. Perceived Autonomy

Perceived autonomy reflects the extent to which consumers believe the AI system operates independently rather than following rigid scripts. While autonomy can enhance perceptions of intelligence and usefulness, excessive autonomy without adequate transparency may undermine trust. Thus, autonomy interacts dynamically with competence and transparency in shaping trust outcomes (Pizzi *et al.*, 2021) [8].

Together, these mechanisms influence two dimensions of trust: cognitive trust, grounded in beliefs about reliability and accuracy, and affective trust, rooted in emotional comfort and confidence.

Hypotheses Development

Based on the conceptual framework, the following hypotheses are proposed:

H1: Higher perceived competence of conversational AI positively influences consumers' cognitive trust in the system (Gefen *et al.*, 2003; Shah *et al.*, 2026) [5, 7].

H2: Greater social presence in conversational AI interactions positively influences consumers' affective trust (Yoo *et al.*, 2018) [12].

H3: Transparency regarding AI operations and data use strengthens both cognitive and affective trust (Xu *et al.*, 2009; Shah *et al.*, 2023) [10, 11].

H4: Perceived autonomy of conversational AI positively moderates the relationship between perceived competence and consumer trust, contingent on transparency (Pizzi *et al.*, 2021) [8].

H5: Higher levels of trust in conversational AI increase purchase intention and willingness to disclose personal information (Aguirre *et al.*, 2015; Shah *et al.*, 2026) [1, 7].

5. Methodology

5.1. Sample and Procedure

The proposed study will survey online consumers who have interacted with conversational AI in e-commerce, healthcare, or financial service contexts. Stratified sampling will ensure demographic diversity across age, income, education, and technology familiarity, consistent with prior large-scale consumer studies (Shah *et al.*, 2026) [7].

5.2. Measures

All constructs will be measured using validated scales:

Perceived competence: Gefen *et al.* (2003) ^[5]

Social presence: McLean & Osei-Frimpong (2019) ^[6]

Transparency: Xu *et al.* (2009) ^[10]

Perceived autonomy: Yoo *et al.* (2018) ^[12]

Trust, purchase intention, and disclosure willingness:
Established technology acceptance and consumer trust scales

5.3. Analysis

Structural Equation Modeling (SEM) will be used to test the proposed relationships and assess both direct and moderating effects.

6. Discussion

The proposed framework demonstrates how conversational AI influences trust through both rational and emotional pathways. Consistent with prior findings across AI-enabled domains, trust emerges as a multidimensional construct shaped by technical performance, ethical design, and interaction quality (Shah *et al.*, 2023; Shah *et al.*, 2026) ^[11, 7]. Conversational AI differs from traditional digital tools by actively participating in the trust-building process. Its ability to communicate, adapt, and personalize responses positions it as a quasi-social actor, reshaping how consumers evaluate credibility and reliability in digital environments.

7. Theoretical and Managerial Implications

7.1. Theoretical Implications

This study extends consumer trust theory by positioning conversational AI as an interactive technological agent rather than a passive interface. It complements prior research on AI trust in healthcare, infrastructure, and energy systems (Shah *et al.*, 2024; Shah *et al.*, 2023) ^[4, 11] by demonstrating how similar trust mechanisms operate in consumer-facing digital contexts.

7.2. Managerial Implications

For practitioners, the findings suggest that effective conversational AI design should prioritize accuracy, transparency, and social interaction quality. Trustworthy AI systems can enhance customer engagement, reduce service costs, and support long-term platform sustainability.

8. Limitations and Future Research

As a conceptual study, this paper requires empirical validation. Future research could examine longitudinal trust development, cross-cultural differences, and industry-specific applications. Comparative analyses between regulated sectors (e.g., healthcare, finance) and retail platforms would further enrich understanding of conversational AI trust dynamics.

9. Conclusion

Conversational AI significantly shapes trust formation in online consumer interactions through perceptions of competence, social presence, transparency, and autonomy. By influencing both cognitive and affective trust, conversational AI affects consumer engagement, information disclosure, and transaction behavior. As these systems continue to evolve, understanding trust mechanisms will remain essential for both researchers and practitioners seeking to design effective, responsible, and user-centered AI

technologies.

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