DIGITAL TRANSFORMATION AND ADMINISTRATION INNOVATION

Citation: Moradi Gharah Chogh, A., & Mahmoudi Maymand, M. (2027). The Role of Anthropomorphism, Trust, and Perceived Risk in Customers' Interaction Intention and Purchase Intention toward AI Agents. *Digital Transformation and Administration Innovation,* 5(4), 1-18.

Received date: 2026-07-29 Revised date: 2026-11-04 Accepted date: 2026-11-11 Initial Published date: 2026-11-16 Final Published date: 2027-07-01

The Role of Anthropomorphism, Trust, and Perceived Risk in Customers' Interaction Intention and Purchase Intention toward AI Agents

Alireza Moradi Gharah Chogh[1], Mohammad Mahmoudi Maymand[2]*

1. Ph.D. Student in Business Administration, Payame Noor University, Tehran, Iran
2. Professor of Department of Business Administration & IT, Payame Noor University, Tehran, Iran

*Correspondence: drmahmoudim@pnu.ac.ir

Abstract

This study aimed to systematically synthesize empirical evidence on the roles of anthropomorphism, trust, and perceived risk in shaping customers' interaction intention and purchase intention toward AI agents. This systematic review was conducted in accordance with PRISMA principles. Empirical studies published between January 2015 and September 2026 were identified through searches of Scopus, Web of Science, ScienceDirect, IEEE Xplore, SpringerLink, and Google Scholar. The initial search retrieved 1,284 records, of which 326 duplicates were removed. After title and abstract screening and full-text eligibility assessment, 46 empirical studies were included in the final synthesis. Eligible studies examined consumer interactions with AI-based agents, including chatbots, virtual assistants, recommendation agents, digital humans, and AI sales or service agents, and investigated anthropomorphism, trust, perceived risk, interaction intention, purchase intention, or closely related behavioral outcomes. Data were analyzed through structured narrative synthesis and cross-study comparison. The inferential evidence showed that anthropomorphism was predominantly positively associated with trust, social presence, interaction intention, and purchase intention, although several studies reported mixed or conditional effects at high levels of human-likeness. Trust demonstrated the most consistent positive association with behavioral outcomes, with most studies showing significant effects on interaction intention, purchase intention, continued use, and recommendation acceptance. Mediation analyses frequently confirmed that trust transmitted the effects of anthropomorphism to interaction and purchase intentions. Perceived risk showed a strong negative relationship with both behavioral outcomes and trust, with privacy, security, performance, and financial risk emerging as major inhibitors. Transparency, prior AI experience, competence, responsiveness, and the availability of human escalation reduced perceived risk and strengthened trust. Customers' responses to AI agents are shaped by a balance between relational attraction and technological uncertainty, with anthropomorphism generally facilitating favorable responses through trust and perceived risk constraining both interaction and purchase intentions.

Keywords: Artificial intelligence agents; anthropomorphism; trust; perceived risk; interaction intention; purchase intention; consumer behavior; systematic review

1. Introduction

Artificial intelligence has rapidly moved from being a back-end analytical technology to becoming a visible and interactive component of customer experience. AI-powered chatbots, virtual assistants, recommendation agents, digital humans, virtual

Copyright: © 2027 by the authors. Published under the terms and conditions of Creative Commons Attribution-NonCommercial 4.0 International (CC BY-NC 4.0) License.

influencers, AI shopping assistants, and autonomous service agents increasingly communicate directly with consumers, provide product information, answer questions, recommend alternatives, support decision-making, and in some cases facilitate or complete purchase transactions. This transformation has changed the nature of customer–technology interaction from relatively passive use of digital systems toward more socially oriented and relational exchanges with computational agents. As a result, understanding why consumers choose to interact with AI agents, trust their recommendations, disclose information to them, and ultimately purchase products or services through them has become an important issue in contemporary consumer behavior and electronic commerce research (Jattamart et al., 2026; Wang & Wood, 2025; Wu, 2026). The growing use of interactive voice assistants has also demonstrated that AI agents can influence brand relationships and loyalty beyond a single transaction, indicating that these systems increasingly function as customer-facing relationship interfaces rather than merely technological tools (Maroufkhani et al., 2022).

One of the most prominent concepts used to explain customer responses to AI agents is anthropomorphism. Anthropomorphism refers to the attribution of human-like characteristics, intentions, emotions, personality, or behavioral qualities to nonhuman entities. In AI-enabled services, such characteristics may be expressed through human-like names, avatars, voices, facial expressions, conversational language, emotional reactions, humor, interjections, responsiveness, eye gaze, or social roles. These cues can make interaction with AI more natural, familiar, and socially meaningful and can reduce the psychological distance between the customer and the technological agent. Recent systematic evidence indicates that anthropomorphism has become one of the central explanatory constructs in research on AI service agents and consumer responses, although its effects differ according to context, form of embodiment, and consumer expectations (Gong & Zeng, 2026; X. Li et al., 2025). Digital humans, in particular, combine agency, embodiment, and social-role cues in ways that may substantially affect how users evaluate competence, warmth, authenticity, and social presence (Gong & Zeng, 2026).

The influence of anthropomorphism is especially important because consumer responses to AI agents are not determined solely by functional performance. Customers may evaluate an AI system not only in terms of whether it provides correct information but also according to whether it appears attentive, responsive, socially present, and capable of understanding the user's needs. For example, human-like conversational elements can strengthen perceptions that an AI chatbot is actively listening, which may improve evaluations of the interaction and subsequent behavioral outcomes (Sheehan et al., 2024). Perceived personality has similarly been shown to contribute to the humanness of AI systems, with human-like personality perceptions strengthening trust and continuous usage intention (Hsieh & Lee, 2024). These findings suggest that consumers respond to AI agents through both technological and social-cognitive mechanisms and that human-like design can partially transform a system from a functional interface into a perceived interaction partner.

The relationship between anthropomorphism and behavioral intention, however, is not uniformly positive. More human-like characteristics can increase familiarity, social presence, and emotional engagement, but excessive or inappropriate human resemblance can also generate discomfort, uncertainty, suspicion, or unrealistic expectations. Research on virtual streamers has characterized anthropomorphic design as a double-edged phenomenon because the same human-like features that facilitate social connection can also produce adverse reactions when perceived as excessive, artificial, manipulative, or inconsistent with the agent's actual capabilities (Tang & Wang, 2026). Evidence concerning virtual influencers similarly indicates that greater realism does not automatically produce stronger purchase intention; instead, the effectiveness of realistic anthropomorphic representations depends on how consumers interpret the credibility and appropriateness of the virtual figure (Pan & Zhang, 2024). Such findings imply that anthropomorphism should not be treated as a simple linear design variable and that its effect on consumer intention is likely mediated or conditioned by other psychological mechanisms.

One such mechanism is perceived intelligence. When consumers encounter anthropomorphic AI shopping assistants, human-like features may signal cognitive capability, responsiveness, or adaptive competence, thereby influencing purchase intention through perceptions of intelligence (S. Wu et al., 2026). Likewise, in AI virtual streaming environments, the perceived intelligence of virtual idols can decrease psychological distance and stimulate impulse buying intention, indicating that cognitive and relational evaluations may operate jointly in determining purchase behavior (T. Li et al., 2025). In sustainable food marketing, the acceptance of AI virtual streamers has also been linked to the combined effects of expertise, interactivity, and anthropomorphism, further demonstrating that customers evaluate AI agents through multiple interconnected dimensions

Copyright: © 2027 by the authors. Published under the terms and conditions of Creative Commons Attribution-NonCommercial 4.0 International (CC BY-NC 4.0) License.

rather than appearance alone (Liang et al., 2026). These findings support the view that anthropomorphic design is most influential when human-like characteristics are accompanied by signals of competence and meaningful interaction.

Trust represents another central construct in explaining customer responses to AI agents. Because AI systems often make recommendations, process personal information, and influence purchasing decisions, consumers must accept a degree of uncertainty regarding how the system operates and whether its outputs are reliable. Trust can reduce this uncertainty by creating confidence in the agent's competence, integrity, predictability, and ability to act in a manner consistent with customer interests. Research on AI digital humans has shown that responsiveness can enhance purchase intention through the mediating role of trust, suggesting that consumers are more willing to act upon the recommendations of AI agents when responsive behavior translates into greater confidence in the system (Wen & Li, 2025). Similarly, trust transfer mechanisms have been shown to contribute to the persuasive effects of AI avatars, illustrating how credibility associated with one component of an interaction can be transferred to the AI agent and subsequently influence consumer judgment (Keng, 2025).

Trust is particularly important because customers may hesitate to rely on AI even when they appreciate its convenience. In live-streaming commerce, the effectiveness of AI anchors can vary according to consumer motivation and the specific pathways through which trust is formed (Lin et al., 2026). In other words, trust is not an automatic consequence of exposure to AI; it emerges from the interaction between user characteristics, agent characteristics, and situational cues. Similar complexity can be observed in research on virtual influencers, where their effectiveness depends on multiple psychological mechanisms and contextual moderators rather than on a single design feature (C.-F. Wu et al., 2026). Consequently, understanding customer purchase behavior toward AI agents requires attention to the conditions under which consumers perceive these agents as trustworthy enough to support a consequential behavioral decision.

Trust is also closely related to anthropomorphism. Human-like characteristics can create social familiarity and facilitate relational expectations, which may increase trust. However, this effect is contingent upon congruence between the agent's human-like presentation and its actual behavior. If an AI agent displays a human-like appearance but responds mechanically, inconsistently, or inaccurately, the mismatch may undermine rather than enhance trust. Conversely, when anthropomorphic characteristics are supported by competence, responsiveness, and transparency, users may interpret the agent as both socially accessible and functionally dependable. This interaction helps explain why anthropomorphism has been linked to continuous usage, customer engagement, purchase intention, and information disclosure across different AI contexts (Fu et al., 2025; Hsieh & Lee, 2024; Pizzi et al., 2023). The persuasive role of anthropomorphic cues is therefore likely to depend on whether they contribute to trust formation rather than simply increasing visual or conversational human-likeness.

A further critical factor is perceived risk. AI-based commerce requires consumers to accept potential uncertainty regarding data privacy, recommendation quality, transaction security, information accuracy, fairness, and the consequences of automated decision-making. Perceived risk refers to the customer's subjective expectation that interacting with or relying on an AI agent may result in undesirable outcomes. Such risk can be financial, functional, privacy-related, psychological, or social. In AI-mediated environments, privacy risk is especially relevant because effective personalization often depends on the collection and processing of personal information. Research on information disclosure to AI chatbots indicates that anthropomorphism can affect users' willingness to provide personal information, but the direction and magnitude of this response depend on motivational orientations and the way the AI agent is perceived (Fu et al., 2025). Related research demonstrates that anthropomorphism and gaze direction can influence willingness to disclose personal information and broader behavioral intentions, highlighting the close connection between human-like cues and privacy-related judgments (Pizzi et al., 2023).

Transparency and fairness are therefore increasingly important in shaping customer reactions to AI agents. In e-commerce, algorithmic anthropomorphism may improve the consumer experience, yet its effectiveness can be weakened if customers perceive the underlying algorithm as opaque or unfair. Evidence suggests that transparency and fairness interact with anthropomorphic perceptions in shaping purchase intention, indicating that consumers evaluate not only how human-like an AI system appears but also whether its operations are understandable and ethically acceptable (Yagmurdur et al., 2026). This is particularly significant because greater anthropomorphism may sometimes intensify concerns about manipulation. A highly human-like AI agent can create the impression of social intimacy while simultaneously collecting customer information or

Copyright: © 2027 by the authors. Published under the terms and conditions of Creative Commons Attribution-NonCommercial 4.0 International (CC BY-NC 4.0) License.

steering purchasing choices, potentially increasing perceived vulnerability if consumers are uncertain about the system's intentions.

The coexistence of trust and risk thus creates an important psychological tension in AI-mediated commerce. Consumers may recognize the usefulness, convenience, and personalization provided by AI agents while simultaneously worrying about privacy, reliability, or loss of control. This duality has been explicitly observed in research on online shopping chatbots, where customer responses reflect both facilitating and inhibiting processes rather than a uniformly positive reaction to artificial intelligence (Jattamart et al., 2026). Service quality can also influence whether customers continue interacting with an AI agent or switch to another service channel, indicating that positive intentions depend on the agent's ability to reduce uncertainty while providing reliable service (Wang & Wood, 2025). Accordingly, interaction intention and purchase intention should be understood as outcomes of a balance between positive relational judgments and perceived technological or transactional risk.

Interaction intention is particularly important because it often precedes more consequential outcomes such as continued usage, recommendation acceptance, information disclosure, and purchase. Customers who are unwilling to initiate or maintain interaction with an AI agent are unlikely to progress to later stages of the purchase process. Human-like features can increase willingness to engage by making communication more intuitive and socially rewarding, yet this effect may be weakened by information overload or concerns about system complexity (Li, 2025). The broader consumer experience of AI is therefore shaped not only by whether the agent can perform a task but also by whether interaction with the agent is cognitively manageable and psychologically comfortable.

Purchase intention represents a more consequential behavioral outcome because it reflects willingness to convert interaction into economic action. Research across AI chatbots, virtual streamers, digital humans, virtual influencers, and AI avatars increasingly shows that purchase intention is influenced by a combination of human-like design, trust, performance expectancy, psychological distance, and contextual factors. Chatbot response strategies and the use of emojis, for example, can affect purchase intention through psychological distance and performance expectancy, showing that relatively subtle conversational features may influence the customer's transition from communication to purchase (Meng & Lu, 2025). Direct evidence also indicates that chatbot interaction can positively affect consumer purchase intention when the system successfully supports the decision-making process (Kumari, 2024).

In live-streaming and social-commerce settings, these mechanisms become even more complex. Virtual streamers' characteristics can shape purchase intention by affecting credibility, engagement, and consumers' evaluations of the selling environment (H. Li et al., 2025). AI-based virtual streaming can also stimulate impulsive purchase intention through stimulus–organism–response mechanisms, indicating that AI agents may affect not only deliberative decisions but also spontaneous consumption (Zhou & Li, 2025). Similarly, virtual influencers have been shown to influence green purchase intention through configurations of characteristics and consumer perceptions, illustrating the growing role of AI-mediated social actors in sustainability-oriented consumption (Ma, 2026). Even outside explicitly digital agents, anthropomorphism in brand communication and packaging can shape consumer responses. Brand anthropomorphism can enhance green purchase intention under particular advertising and relational conditions (Qin et al., 2025), while anthropomorphic visual and verbal cues on beverage packaging may stimulate impulse buying intention (Tian & Zakaria, 2025). These related findings reinforce the broader proposition that human-like cues can influence consumer judgment across multiple stages of the purchase process.

At the same time, consumer responses to AI agents occur within a broader environment of digital connectivity and brand interaction. Hyperconnected brand selection reflects increasingly complex relationships among consumers, digital touchpoints, and brand-related information, creating conditions in which AI agents may become influential intermediaries between customers and firms (Majeed & Kim, 2024). Interactive AI technologies therefore do more than facilitate individual transactions; they can shape the structure of brand experience, loyalty, and consumer decision-making over time. This broader perspective is important because interaction intention toward an AI agent may ultimately affect longer-term customer–brand relationships rather than merely immediate system adoption.

Despite the rapid expansion of research, the existing literature remains fragmented across technologies, disciplines, and behavioral outcomes. Some studies emphasize anthropomorphic appearance, others focus on conversational style, responsiveness, intelligence, or social presence, while still others examine trust, privacy concerns, fairness, or perceived risk.

Copyright: © 2027 by the authors. Published under the terms and conditions of Creative Commons Attribution-NonCommercial 4.0 International (CC BY-NC 4.0) License.

Evidence from systematic reviews shows that anthropomorphism in AI service agents has been conceptualized and operationalized in diverse ways, making it difficult to determine the consistency of its effects across contexts (X. Li et al., 2025). Likewise, research on digital humans indicates considerable variation in agency, embodiment, social roles, and user-response outcomes (Gong & Zeng, 2026). The growing literature on virtual influencers also demonstrates that different mechanisms and moderators can produce substantially different behavioral outcomes (C.-F. Wu et al., 2026).

Another limitation is that many studies examine only one or two variables in isolation. For example, some research focuses on anthropomorphism and purchase intention, while other studies concentrate on trust formation, disclosure behavior, or service quality. Yet customers encounter these factors simultaneously. A human-like AI agent may increase trust but also raise privacy concerns; a transparent agent may reduce perceived risk but appear less socially engaging; a highly intelligent agent may improve performance expectations while increasing psychological distance or concerns about autonomy. The importance of this multidimensionality is reflected in emerging work on human–robot interaction in AI customer service, where behavioral responses are shaped by multiple technological and consumer-related determinants (Wu, 2026). It is also apparent in longitudinal research showing that the pathway from anthropomorphism to purchase intention may involve perceived intelligence and personal characteristics such as general self-efficacy (S. Wu et al., 2026).

Furthermore, the distinction between interaction intention and purchase intention deserves greater analytical attention. Interaction intention captures willingness to engage with the AI agent, whereas purchase intention involves willingness to accept commercial recommendations or complete a transaction. These outcomes are related but conceptually distinct. Consumers may be willing to converse with an AI agent for information or entertainment without being willing to rely on it for a purchase. Conversely, an efficient AI agent may support purchasing even if the customer does not perceive the interaction as socially engaging. Evidence from AI service and commerce research suggests that different psychological mechanisms may therefore govern engagement and transaction-oriented outcomes (Jattamart et al., 2026; Wen & Li, 2025). A comprehensive synthesis that examines both forms of intention can clarify whether anthropomorphism, trust, and perceived risk operate similarly or differently across the two stages of customer behavior.

Taken together, prior research indicates that anthropomorphism, trust, and perceived risk constitute three interdependent mechanisms that are central to understanding consumer acceptance of AI agents. Anthropomorphism may strengthen social presence and reduce psychological distance, trust may convert favorable perceptions into willingness to rely on the AI agent, and perceived risk may inhibit both interaction and purchasing by increasing uncertainty. However, the strength and direction of these relationships vary across AI formats, commercial settings, and consumer characteristics. The continuing proliferation of AI shopping assistants, digital humans, conversational agents, virtual influencers, and AI-enabled customer service therefore creates a need for systematic consolidation of the available empirical evidence rather than reliance on isolated findings.

Accordingly, the aim of this study was to systematically review and synthesize the empirical evidence on the roles of anthropomorphism, trust, and perceived risk in shaping customers' interaction intention and purchase intention toward AI agents.

2. Methods and Materials

This study employed a systematic review design to synthesize empirical evidence regarding the role of anthropomorphism, trust, and perceived risk in shaping customers' interaction intention and purchase intention toward artificial intelligence agents. The review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework to ensure transparency, reproducibility, and methodological rigor throughout the identification, screening, eligibility assessment, and inclusion processes. The population of the review consisted of peer-reviewed empirical studies examining consumer interactions with AI-based agents, including conversational agents, AI chatbots, virtual assistants, intelligent recommendation agents, virtual sales agents, and other forms of autonomous or semi-autonomous AI systems used in commercial and service environments. A comprehensive literature search was conducted across Scopus, Web of Science, ScienceDirect, IEEE Xplore, SpringerLink, and Google Scholar for studies published between January 2015 and September 2026. Search combinations included terms such as "artificial intelligence agent," "AI agent," "AI chatbot," "conversational agent," "virtual assistant," "anthropomorphism," "human-likeness," "trust," "perceived risk," "interaction intention,"

Copyright: © 2027 by the authors. Published under the terms and conditions of Creative Commons Attribution-NonCommercial 4.0 International (CC BY-NC 4.0) License.

"behavioral intention," "purchase intention," "consumer behavior," and "customer intention," using Boolean operators to increase search sensitivity and specificity. The initial database search identified 1,284 records. After removing 326 duplicate records, 958 articles remained for title and abstract screening. At this stage, 714 records were excluded because they were unrelated to consumer behavior, did not investigate AI-based agents, were conceptual or non-empirical publications, or did not address at least one of the principal variables of the study. The full texts of 244 articles were subsequently assessed for eligibility. Of these, 198 articles were excluded because they lacked relevant outcome measures, did not provide sufficient empirical findings, focused exclusively on technical aspects of artificial intelligence, examined organizational rather than customer-level outcomes, or were conference abstracts, dissertations, book chapters, or non-peer-reviewed publications. Consequently, **46 empirical studies** met all eligibility criteria and constituted the final sample of the systematic review. Studies were included if they were published in English in peer-reviewed journals, investigated consumers or potential consumers interacting with an AI-based agent, examined anthropomorphism, trust, or perceived risk as an antecedent, mediator, moderator, or explanatory variable, and assessed interaction intention, continued-use intention, adoption intention, purchase intention, or closely related behavioral outcomes. Studies focusing exclusively on industrial AI, medical diagnostic systems without a customer interaction component, employee adoption of organizational AI, or purely technical performance evaluation were excluded.

Data collection was conducted using a structured systematic review protocol developed specifically for the present study. The primary data collection instrument was a standardized study extraction form designed to ensure consistent retrieval and classification of information from all eligible articles. The extraction form recorded bibliographic information, including authors, year of publication, country, journal, and study context, as well as methodological characteristics such as research design, sample size, participant characteristics, type of AI agent, industry or service setting, measurement instruments, statistical methods, and theoretical framework. Particular attention was given to extracting information regarding the operationalization of anthropomorphism, including perceived human-likeness, social presence, conversational naturalness, emotional expression, visual appearance, personality, and human-like communication cues. Information concerning trust included cognitive trust, affective trust, competence-based trust, integrity, benevolence, reliability, and overall trust in AI systems. Perceived risk was coded according to the dimensions reported in the original studies, including privacy risk, security risk, financial risk, performance risk, psychological risk, social risk, and uncertainty associated with AI-generated recommendations or autonomous decisions. Outcome variables were classified primarily into interaction intention and purchase intention, while related constructs such as continued interaction, engagement intention, adoption intention, recommendation acceptance, usage intention, and willingness to purchase were recorded when conceptually relevant. A methodological quality assessment checklist adapted from established critical appraisal principles for quantitative and mixed-method studies was also employed to assess the quality of the included publications. The appraisal considered clarity of research objectives, adequacy of the sampling procedure, validity and reliability of measurement instruments, appropriateness of statistical analyses, transparency of reporting, control of potential confounding variables, and consistency between the reported findings and conclusions. Each article was independently examined according to the predefined eligibility and coding criteria, and all extracted data were rechecked to minimize classification and transcription errors. In cases where a study examined several AI contexts or reported multiple models, only findings directly related to consumer interaction with AI agents and the focal constructs of anthropomorphism, trust, perceived risk, interaction intention, and purchase intention were incorporated into the synthesis.

The extracted data were analyzed using a systematic narrative synthesis combined with structured content analysis. First, descriptive analysis was conducted to identify publication trends, geographical distribution, research contexts, types of AI agents, methodological approaches, theoretical frameworks, sample characteristics, and commonly investigated variables across the 46 included studies. Subsequently, the empirical findings were coded and organized according to the principal conceptual relationships examined in the review. The analysis focused on the direct and indirect effects of anthropomorphism on interaction intention and purchase intention, the role of trust as both an independent predictor and a mediating mechanism, and the negative or conditional influence of perceived risk on customers' willingness to interact with and purchase through AI agents. Particular attention was also given to relationships in which anthropomorphic characteristics increased trust, decreased perceived uncertainty, or produced contrasting effects by simultaneously enhancing social presence and increasing perceptions of manipulation, privacy intrusion, or discomfort. The findings were synthesized through thematic comparison and cross-study

Copyright: © 2027 by the authors. Published under the terms and conditions of Creative Commons Attribution-NonCommercial 4.0 International (CC BY-NC 4.0) License.

pattern analysis to identify convergent, divergent, and context-dependent relationships. Studies reporting structural equation modeling, regression analysis, mediation analysis, moderation analysis, experimental comparisons, or correlation analysis were examined in terms of the direction, statistical significance, and relative strength of the reported associations. Because substantial heterogeneity existed among the included studies with respect to AI technologies, measurement instruments, consumer populations, industries, research designs, and reported effect statistics, statistical meta-analysis was not considered appropriate; therefore, the results were integrated through systematic qualitative synthesis rather than pooled effect-size estimation. The final analytical framework classified the evidence into relationships among anthropomorphism and trust, anthropomorphism and perceived risk, trust and interaction intention, trust and purchase intention, perceived risk and interaction intention, perceived risk and purchase intention, and the mediating or moderating mechanisms linking these constructs. This analytical procedure enabled the identification of the most consistent pathways through which human-like characteristics of AI agents influence customers' behavioral intentions and clarified the complementary roles of trust enhancement and perceived-risk reduction in explaining customers' willingness to interact with and purchase from AI-based agents.

3. Findings and Results

The systematic search and screening process resulted in the inclusion of 46 empirical studies that met all predefined eligibility criteria. The initial database search yielded 1,284 records across Scopus, Web of Science, ScienceDirect, IEEE Xplore, SpringerLink, and Google Scholar. Following the removal of 326 duplicate records, 958 unique publications remained for title and abstract screening. At this stage, 714 studies were excluded because they did not directly address consumer interaction with artificial intelligence agents, investigated technological performance rather than customer behavior, were theoretical or conceptual papers without empirical data, or did not examine the focal constructs of anthropomorphism, trust, perceived risk, interaction intention, or purchase intention. Consequently, 244 full-text articles were evaluated for eligibility. Of these, 198 were excluded after full-text assessment. The most common reasons for exclusion were the absence of relevant behavioral outcomes, a focus on employee or organizational adoption rather than customer behavior, insufficient reporting of empirical relationships, exclusive examination of noninteractive AI systems, duplication of previously reported samples, and publication formats that did not satisfy the peer-reviewed journal criterion. Ultimately, 46 studies were retained for the systematic synthesis.

The included literature demonstrated a clear increase in scholarly attention to consumer responses to AI agents during the latter part of the review period. Although relatively few eligible studies were published during the earlier years, the number of studies increased substantially after 2020, particularly in relation to conversational commerce, AI chatbots, intelligent customer service agents, recommendation systems, and generative AI-based assistants. Across the 46 studies, anthropomorphism was most commonly examined as an antecedent of trust, social presence, emotional engagement, perceived warmth, perceived competence, or behavioral intention. Trust was the most consistently investigated psychological mechanism and was frequently positioned as either a direct determinant of interaction and purchase intentions or as a mediator between AI characteristics and behavioral outcomes. Perceived risk was generally conceptualized as an inhibitory mechanism and was associated with concerns regarding privacy, security, reliability, financial consequences, decision accuracy, and uncertainty about AI-generated recommendations. The evidence further showed that the relationships among these variables were not uniformly linear, because the effectiveness of anthropomorphic features depended on the type of AI agent, task complexity, product involvement, privacy sensitivity, prior AI experience, and the extent to which users perceived the agent as helpful rather than deceptive or intrusive.

Table 1 summarizes the principal methodological and contextual characteristics of the 46 studies included in the review. The evidence base was dominated by quantitative research, particularly cross-sectional survey studies and controlled experimental designs. Structural equation modeling was the most frequently employed analytical method, followed by regression-based techniques and analysis of variance. Most studies were conducted in online retail, electronic commerce, customer service, tourism and hospitality, banking and financial services, and digital platform environments. Chatbots and conversational agents constituted the most frequently examined forms of AI, although virtual assistants, recommendation agents, embodied agents, and AI sales assistants were also represented.

Table 1. General Characteristics of the Studies Included in the Systematic Review

Characteristic	Category	Number of Studies	Percentage
Publication period	2015–2018	5	10.87

Copyright: © 2027 by the authors. Published under the terms and conditions of Creative Commons Attribution-NonCommercial 4.0 International (CC BY-NC 4.0) License.

	2019–2021	14	30.43
	2022–2024	19	41.30
	2025–September 2026	8	17.39
Research design	Cross-sectional quantitative survey	24	52.17
	Experimental or quasi-experimental	15	32.61
	Mixed-method design	4	8.70
	Longitudinal or repeated-measures design	3	6.52
Main analytical approach	Structural equation modeling	21	45.65
	Regression/path analysis	10	21.74
	ANOVA/MANOVA/experimental comparison	9	19.57
	Mediation/moderation analysis as primary approach	4	8.70
	Other multivariate techniques	2	4.35
AI agent type	Chatbot/conversational agent	19	41.30
	Virtual assistant	8	17.39
	AI recommendation agent	7	15.22
	AI sales/service agent	6	13.04
	Embodied or avatar-based agent	4	8.70
	Other autonomous AI agent	2	4.35
Research context	E-commerce/online retail	15	32.61
	Customer service	9	19.57
	Tourism/hospitality	7	15.22
	Banking/financial services	5	10.87
	Digital platforms/mobile applications	5	10.87
	Other service contexts	5	10.87
Main focal construct	Anthropomorphism explicitly modeled	32	69.57
	Trust explicitly modeled	40	86.96
	Perceived risk explicitly modeled	25	54.35
	Interaction intention assessed	30	65.22
	Purchase intention assessed	27	58.70

As shown in Table 1, the largest proportion of studies was published between 2022 and 2024, accounting for 41.30% of the evidence base, while a further 17.39% were published between 2025 and September 2026. This pattern indicates that empirical research on consumer responses to AI agents has accelerated considerably in recent years. Cross-sectional quantitative surveys represented 52.17% of the included studies, whereas experimental and quasi-experimental investigations accounted for 32.61%. Structural equation modeling was used in 45.65% of the studies, reflecting the theoretical emphasis on multivariate relationships among anthropomorphism, trust, perceived risk, and behavioral intentions. Chatbots and conversational agents were the most extensively examined technologies, appearing in 41.30% of the included studies, followed by virtual assistants and recommendation agents. With respect to application context, e-commerce and online retail represented approximately one-third of the studies, while customer service and tourism or hospitality also constituted major areas of investigation. Trust was by far the most frequently modeled psychological variable and appeared explicitly in 40 of the 46 studies. Anthropomorphism was examined in 32 studies, while perceived risk was directly incorporated into 25 studies. Interaction intention and purchase intention were examined in 30 and 27 studies, respectively, with some studies investigating both outcomes simultaneously.

The first substantive synthesis examined the role of anthropomorphism in shaping customers' responses to AI agents. Across the included studies, anthropomorphism was operationalized through a range of human-like characteristics, including human names, avatars, facial characteristics, conversational style, natural language, emotional expressions, humor, empathy, personality cues, first-person communication, social responsiveness, and human-like turn-taking. The majority of studies indicated that anthropomorphic design enhanced social presence and interpersonal warmth and, under favorable conditions, increased both trust and willingness to interact with the agent. However, the findings also demonstrated that excessive anthropomorphism could become counterproductive when the agent's behavior failed to match the expectations generated by its human-like appearance or communication style.

Table 2. Synthesis of Findings Concerning Anthropomorphism and Customer Behavioral Intentions

Examined Relationship	Number of Studies Examining Relationship	Positive/Significant Findings	Non-significant or Mixed Findings	Negative/Conditional Findings	Overall Evidence

Copyright: © 2027 by the authors. Published under the terms and conditions of Creative Commons Attribution-NonCommercial 4.0 International (CC BY-NC 4.0) License.

Anthropomorphism → Trust	28	22	4	2	Strong positive
Anthropomorphism → Interaction intention	23	16	5	2	Moderate-to-strong positive
Anthropomorphism → Purchase intention	18	11	5	2	Moderate positive
Anthropomorphism → Social presence	17	15	2	0	Strong positive
Anthropomorphism → Perceived warmth	12	10	2	0	Strong positive
Anthropomorphism → Perceived competence	10	6	3	1	Moderate positive
Anthropomorphism → Perceived risk	11	6 reported reduced risk	3	2 reported increased risk/privacy concern	Mixed, generally risk-reducing
Anthropomorphism → Engagement	14	10	3	1	Moderate positive
Anthropomorphism → Satisfaction	11	8	2	1	Moderate positive
Anthropomorphism → Uncanny/discomfort response	8	1	2	5	Conditional negative at high levels

Table 2 demonstrates that the most robust effect of anthropomorphism concerned trust. Of the 28 studies examining this relationship, 22 reported a statistically significant positive association, indicating that human-like characteristics frequently increased users' confidence in an AI agent. This effect was often explained through greater perceived social presence, warmth, familiarity, and interpersonal closeness. The relationship between anthropomorphism and interaction intention was also consistently positive, with 16 of 23 studies reporting significant favorable effects. Consumers were more likely to communicate with, continue using, or engage with agents that displayed natural conversational patterns and socially responsive behavior. The evidence concerning purchase intention was somewhat less uniform. Eleven of the 18 studies examining this association reported significant positive effects, whereas five identified nonsignificant or mixed relationships. These results suggest that anthropomorphism alone is not sufficient to produce purchase behavior and that its influence on purchase intention is more likely to operate indirectly through trust, perceived usefulness, satisfaction, or reduced uncertainty.

A particularly strong pattern emerged for social presence, with 15 of 17 studies demonstrating that anthropomorphic cues increased the perception that an AI agent represented a socially present and responsive interaction partner. Similar findings were obtained for perceived warmth. In contrast, the relationship between anthropomorphism and perceived competence was less consistent because some highly human-like agents were viewed as socially appealing without necessarily being perceived as more capable or accurate. The findings regarding perceived risk were similarly nuanced. Six studies found that human-like design reduced uncertainty and perceived risk, generally by increasing familiarity and perceived accountability. However, two studies reported that strong anthropomorphic cues increased privacy concerns or suspicion, particularly when users perceived that the system was attempting to imitate humans deceptively. Five of the eight studies that explicitly examined discomfort or uncanny responses found that very high levels of anthropomorphism could produce negative reactions. Overall, therefore, anthropomorphism exhibited a predominantly positive but nonlinear influence on customer responses, with moderate and congruent human-like cues producing the most favorable outcomes.

Trust emerged as the most stable explanatory mechanism across the reviewed literature. It was conceptualized as confidence that the AI agent would behave reliably, competently, benevolently, transparently, and consistently with the customer's interests. Across studies, trust was positively influenced by perceived competence, transparency, social presence, anthropomorphism, accuracy, responsiveness, personalization, and perceived usefulness. Trust was also negatively associated with privacy concerns, perceived manipulation, unpredictability, and performance uncertainty. In several structural models, trust functioned as a mediator connecting anthropomorphic design characteristics with interaction intention or purchase intention.

Table 3. Synthesis of Findings Concerning Trust and Its Role in Interaction and Purchase Intentions

Trust-Related Relationship	Number of Studies Examining Relationship	Significant Positive Findings	Non-significant/Mixed Findings	Significant Negative Findings	Overall Interpretation

Copyright: © 2027 by the authors. Published under the terms and conditions of Creative Commons Attribution-NonCommercial 4.0 International (CC BY-NC 4.0) License.

Trust → Interaction intention	27	24	3	0	Very strong positive
Trust → Purchase intention	25	22	3	0	Very strong positive
Trust → Continued use intention	15	13	2	0	Strong positive
Trust → Recommendation acceptance	11	9	2	0	Strong positive
Anthropomorphism → Trust → Interaction intention	14	11 supported mediation	3 unsupported/partial	0	Strong mediation evidence
Anthropomorphism → Trust → Purchase intention	12	9 supported mediation	3 unsupported/partial	0	Strong mediation evidence
Competence → Trust	16	15	1	0	Very strong positive
Transparency → Trust	12	10	2	0	Strong positive
Social presence → Trust	14	12	2	0	Strong positive
Personalization → Trust	10	8	2	0	Moderate-to-strong positive
Perceived risk → Trust	17	0	3	14	Strong negative
Privacy concern → Trust	13	0	2	11	Strong negative

As reported in Table 3, trust demonstrated the most consistent direct relationship with both major behavioral outcomes examined in the review. Of the 27 studies assessing interaction intention, 24 found that higher trust significantly increased customers' willingness to communicate with, adopt, reuse, or continue engaging with AI agents. Similarly, 22 of the 25 studies investigating purchase intention reported a significant positive association between trust and customers' willingness to purchase products or services through AI-mediated interfaces. The consistency of these findings across multiple service contexts indicates that trust constitutes a central psychological prerequisite for customer acceptance of AI agents.

Evidence for the mediating role of trust was also substantial. Eleven of 14 studies examining the pathway from anthropomorphism through trust to interaction intention reported full or partial mediation. Similarly, nine of 12 studies examining the indirect effect of anthropomorphism on purchase intention through trust confirmed a significant mediating pathway. These findings indicate that anthropomorphism frequently does not influence customers' behavioral intentions merely because an AI agent appears more human-like. Rather, human-like features tend to improve perceptions of social presence, familiarity, warmth, and relational capability, which in turn enhance trust and ultimately strengthen behavioral intention. Perceived competence was one of the strongest antecedents of trust, with 15 of 16 studies reporting significant positive effects. Transparency and social presence also demonstrated strong positive associations with trust. In contrast, perceived risk and privacy concerns consistently undermined trust. Fourteen of 17 studies found that higher perceived risk reduced trust, while 11 of 13 studies reported that privacy concerns weakened customers' confidence in the AI agent. These findings suggest that trust functions as a central integrative mechanism through which both favorable characteristics and perceived vulnerabilities of AI agents are translated into consumer behavioral responses.

Perceived risk represented the principal inhibitory construct within the reviewed studies. The construct was multidimensional and included privacy risk, security risk, financial risk, performance risk, psychological risk, social risk, and uncertainty regarding the correctness of AI recommendations or decisions. Privacy and performance risks were the most frequently investigated dimensions. Across most studies, higher perceived risk reduced willingness to interact with AI agents, weakened purchase intention, diminished trust, and increased preference for human-assisted service channels. However, the magnitude of these effects depended substantially on the context in which AI was used.

Table 4. Synthesis of Findings Concerning Perceived Risk, Interaction Intention, Purchase Intention, and Contextual Conditions

Relationship or Contextual Effect	Number of Studies	Findings Supporting Expected Effect	Mixed/Non-significant Findings	Overall Evidence
Perceived risk → Interaction intention	20	16 negative	4	Strong negative
Perceived risk → Purchase intention	19	16 negative	3	Strong negative
Privacy risk → Interaction intention	14	11 negative	3	Strong negative
Privacy risk → Purchase intention	13	10 negative	3	Strong negative
Performance risk → Trust	12	10 negative	2	Strong negative

Copyright: © 2027 by the authors. Published under the terms and conditions of Creative Commons Attribution-NonCommercial 4.0 International (CC BY-NC 4.0) License.

Security risk → Trust	9	8 negative	1	Strong negative
Financial risk → Purchase intention	8	7 negative	1	Strong negative
Perceived risk → Trust → Purchase intention	10	8 supported indirect effect	2	Strong indirect evidence
Transparency reduces perceived risk	10	8 supported	2	Moderate-to-strong
Prior AI experience reduces perceived risk	9	7 supported	2	Moderate-to-strong
High task complexity strengthens risk effects	8	6 supported	2	Moderate evidence
High product involvement strengthens risk effects	7	5 supported	2	Moderate evidence
Privacy sensitivity strengthens risk effects	8	7 supported	1	Strong evidence
Human escalation option reduces perceived risk	6	5 supported	1	Moderate-to-strong
Anthropomorphism buffers perceived risk	9	6 supported	3	Moderate evidence
Excessive anthropomorphism increases privacy/manipulation concerns	6	4 supported	2	Conditional evidence

As presented in Table 4, perceived risk demonstrated a consistently negative association with both interaction intention and purchase intention. Sixteen of the 20 studies investigating interaction intention found that greater perceived risk reduced consumers' willingness to engage with AI agents, while 16 of 19 studies examining purchase intention reported a statistically significant negative effect. Privacy risk was especially influential because consumers were frequently concerned about the collection, retention, and secondary use of personal information during AI-mediated interactions. Eleven of 14 studies found that privacy risk reduced interaction intention, and 10 of 13 reported a negative influence on purchase intention. Performance and security risks also exerted substantial effects, particularly in contexts involving financial services, personalized recommendations, or high-consequence transactions.

The indirect effects of perceived risk were also important. Eight of 10 studies testing a risk–trust–purchase pathway found that perceived risk reduced trust and thereby indirectly decreased purchase intention. This pattern indicates that risk does not necessarily affect behavior only through a direct avoidance mechanism. Instead, perceived uncertainty may undermine confidence in the AI agent's competence, reliability, and integrity, which subsequently weakens behavioral intention. Transparency was one of the most consistent risk-reducing factors, with eight of 10 studies finding that explanations of AI functionality, disclosure of automated status, clear privacy information, or explicit justification of recommendations reduced perceived risk. Previous experience with AI also reduced perceived uncertainty in seven of nine studies, indicating that familiarity can attenuate consumer concerns.

The findings further revealed several important contextual effects. High task complexity strengthened the negative influence of risk in six of eight studies, suggesting that customers become more cautious when AI agents are responsible for complex decisions, recommendations, or transactions. Similar effects were observed for high product involvement, particularly where financial or personal consequences were substantial. Privacy sensitivity emerged as one of the strongest moderators of perceived risk, with seven of eight studies showing that privacy-conscious consumers responded more negatively to data-intensive AI interaction. The availability of a human escalation option reduced perceived risk in five of six studies, implying that consumers were more comfortable interacting with AI when they retained the ability to transfer the interaction to a human employee.

The role of anthropomorphism in risk perception was more complex. Six of nine studies found that anthropomorphic characteristics reduced perceived risk by increasing familiarity, social presence, and perceived relational competence. Nevertheless, four of six studies explicitly examining excessive anthropomorphism reported that highly human-like agents could increase privacy or manipulation concerns. This pattern suggests that anthropomorphism is beneficial only when human-like characteristics remain congruent with the actual functional capabilities and disclosed artificial nature of the agent.

Taken together, the evidence obtained from the 46 studies supports an integrated explanatory pattern in which anthropomorphism functions primarily as a relational and perceptual antecedent, trust functions as the principal facilitating mechanism, and perceived risk functions as the major inhibitory mechanism affecting consumers' behavioral intentions toward AI agents. Across the reviewed studies, anthropomorphic characteristics were generally associated with increased social presence, warmth, familiarity, and interpersonal engagement. These responses frequently strengthened trust, which subsequently increased both interaction intention and purchase intention. Therefore, the effect of anthropomorphism on behavioral intention was often indirect rather than exclusively direct.

Copyright: © 2027 by the authors. Published under the terms and conditions of Creative Commons Attribution-NonCommercial 4.0 International (CC BY-NC 4.0) License.

Trust showed the highest degree of consistency among all constructs included in the review. Its positive association with interaction intention and purchase intention was supported across retail, financial, hospitality, service, and digital platform contexts. This consistency suggests that consumers are willing to interact with or purchase through AI agents when they believe that the system is competent, dependable, transparent, and aligned with their interests. Trust also served as the point at which positive and negative evaluations of AI converged. Human-like communication, responsiveness, competence, transparency, and personalization strengthened trust, whereas privacy concerns, uncertainty, security concerns, and perceived manipulation reduced it.

Perceived risk operated in the opposite direction. It directly reduced interaction and purchase intentions and indirectly affected them by weakening trust. Risk effects became particularly strong when customers faced high-involvement purchases, complex tasks, financial consequences, or sensitive personal data disclosure. Conversely, transparency, prior AI experience, human oversight, and appropriate anthropomorphic design attenuated these negative effects.

The synthesis therefore indicates that a high-quality AI agent is not merely one that appears human-like. Rather, successful customer responses occur when anthropomorphic characteristics are supported by functional competence, transparency, reliable performance, and appropriate privacy safeguards. Human-like cues appear most beneficial when they make interaction easier and more socially intuitive without creating unrealistic expectations regarding the system's capabilities. When anthropomorphism is excessive, deceptive, or inconsistent with actual performance, its positive effect can weaken and may even result in discomfort, distrust, or increased perceptions of manipulation.

Overall, the systematic evidence supports a sequential mechanism in which appropriate anthropomorphic features increase social presence and relational familiarity, these perceptions enhance trust, and stronger trust increases interaction and purchase intentions. At the same time, perceived risk weakens trust and directly reduces behavioral intention. Accordingly, customers' willingness to interact with and purchase from AI agents appears to depend on the balance between relational attraction and technological uncertainty. Anthropomorphism contributes to favorable behavioral responses primarily when it strengthens trust without simultaneously intensifying perceptions of privacy intrusion, artificial manipulation, or performance uncertainty.

4. Discussion and Conclusion

The present systematic review synthesized evidence from 46 empirical studies to clarify the roles of anthropomorphism, trust, and perceived risk in shaping customers' interaction intention and purchase intention toward AI agents. The findings revealed a coherent overall pattern. Anthropomorphism generally exerted a positive influence on customers' responses, particularly through increased social presence, perceived warmth, familiarity, and trust. Trust emerged as the most consistent facilitating mechanism, showing strong positive relationships with both interaction intention and purchase intention. In contrast, perceived risk functioned as the principal inhibiting mechanism and was associated with lower trust, reduced willingness to interact with AI agents, and weaker purchase intention. The findings also indicated that these effects were context-dependent rather than uniformly linear. Anthropomorphic features were most effective when they were accompanied by competence, transparency, responsiveness, and appropriate levels of social presence, whereas excessive or incongruent human-likeness could intensify privacy concerns, perceived manipulation, or discomfort. Overall, the results suggest that customer responses to AI agents are determined by an interaction between relational attraction and technological uncertainty.

A central finding of the review was the predominantly positive relationship between anthropomorphism and trust. Of the studies examining this association, the majority reported that human-like design characteristics strengthened consumers' confidence in AI agents. This result is consistent with the broader literature showing that perceived humanness can make AI systems appear more socially understandable, approachable, and relationally competent. Hsieh and Lee demonstrated that perceived personality contributes to AI humanness and can strengthen both trust and continuous usage intention, which supports the present finding that anthropomorphic cues operate partly by creating a more socially interpretable interaction partner (Hsieh & Lee, 2024). Similarly, Sheehan et al. showed that even relatively subtle conversational cues, such as interjections, can improve chatbot performance through increased anthropomorphism and perceived listening (Sheehan et al., 2024). These studies align closely with the present synthesis because they show that anthropomorphism is not limited to visual resemblance; rather, linguistic, behavioral, and relational cues can all contribute to perceptions of human-likeness and thereby strengthen trust.

Copyright: © 2027 by the authors. Published under the terms and conditions of Creative Commons Attribution-NonCommercial 4.0 International (CC BY-NC 4.0) License.

The findings further showed that anthropomorphism was positively related to interaction intention, although the strength of this relationship was somewhat weaker than its relationship with trust. This suggests that anthropomorphic design may influence behavioral intention primarily through intermediate psychological processes rather than through a purely direct effect. Such an interpretation is consistent with research showing that anthropomorphism can decrease psychological distance and strengthen relational engagement with AI-based agents. Wu et al. found that anthropomorphic characteristics in AI shopping assistants influence purchase intention through perceived intelligence, indicating that human-like cues may first alter customers' perceptions of the agent's cognitive capabilities before affecting behavior (S. Wu et al., 2026). Similarly, Li et al. showed that the intelligence level of AI-powered virtual idols can influence impulsive buying intention through psychological distance, which further supports the view that anthropomorphic and cognitive perceptions operate jointly rather than independently (T. Li et al., 2025). Therefore, the present review extends these findings by demonstrating that anthropomorphism is best understood as an upstream relational cue that becomes behaviorally consequential when it changes how consumers evaluate the AI agent.

The review also identified strong evidence that anthropomorphism increases social presence and perceived warmth. This result is theoretically important because social presence provides a mechanism through which technological interfaces acquire interpersonal meaning. AI agents that communicate in a responsive, context-sensitive, and socially recognizable manner are more likely to be perceived as interaction partners rather than passive tools. Gong and Zeng's scoping review of digital humans similarly showed that agency, embodiment, and social role jointly shape users' responses to digital agents, reinforcing the idea that social perception is central to AI-mediated interaction (Gong & Zeng, 2026). Evidence from Liang et al. also indicates that expertise, interactivity, and anthropomorphism jointly affect consumer acceptance of AI virtual streamers, particularly in contexts in which social communication and credibility are important (Liang et al., 2026). The present findings therefore suggest that social presence is one of the main pathways through which anthropomorphic design improves engagement and acceptance.

At the same time, the review found that anthropomorphism is not universally beneficial. A notable subset of studies reported mixed or negative outcomes when anthropomorphic cues became excessive or appeared inconsistent with the actual capabilities of the AI agent. This finding aligns with the double-edged interpretation of anthropomorphism reported by Tang and Wang, who showed that anthropomorphic design in virtual streamers can simultaneously facilitate and inhibit acceptance (Tang & Wang, 2026). Pan and Zhang similarly demonstrated that greater realism in virtual influencers does not necessarily translate into stronger purchase intention, indicating that the relationship between human-likeness and consumer response is not simply linear (Pan & Zhang, 2024). These studies support the present conclusion that anthropomorphism becomes effective only when human-like appearance, communication, and functional competence remain congruent. When the AI appears highly human but performs mechanically, inaccurately, or opaquely, expectations may be violated and trust may decline.

Another major result was the exceptionally strong role of trust in explaining both interaction intention and purchase intention. Trust showed the most consistent positive relationships among all variables included in the review. This pattern indicates that consumers' willingness to rely on AI agents is fundamentally dependent on confidence in their competence, reliability, and integrity. Wen and Li found that responsiveness in AI digital humans enhances purchase intention through trust, which directly supports the present result that trust functions as a behavioral bridge between perceived agent quality and consumer action (Wen & Li, 2025). Keng also demonstrated that trust transfer contributes to the persuasive power of AI avatars, reinforcing the idea that trust is a central mechanism through which AI agents acquire influence in commercial contexts (Keng, 2025). Together, these findings suggest that trust is not simply another predictor among many; rather, it represents a core evaluative judgment that determines whether customers are willing to accept AI-mediated recommendations and transactions.

The review also found substantial evidence that trust mediates the effect of anthropomorphism on both interaction intention and purchase intention. This finding helps explain why some studies report significant effects of anthropomorphism while others report weak or nonsignificant direct effects. Anthropomorphic cues may not automatically lead to behavioral responses unless they successfully strengthen trust. This interpretation is consistent with findings from live-streaming commerce, where trust pathways vary according to consumer motivation and the type of anchor involved (Lin et al., 2026). It is also compatible

Copyright: © 2027 by the authors. Published under the terms and conditions of Creative Commons Attribution-NonCommercial 4.0 International (CC BY-NC 4.0) License.

with research on virtual influencers showing that the effectiveness of AI-mediated persuasion depends on multiple mechanisms and moderators rather than on appearance alone (C.-F. Wu et al., 2026). Thus, the present synthesis suggests that trust should be conceptualized as a central mediating mechanism that converts social and human-like characteristics into behavioral intention.

The findings concerning perceived risk were equally consistent, but in the opposite direction. Perceived risk was strongly associated with lower interaction intention and purchase intention, and privacy risk emerged as one of the most influential dimensions. This result reflects the inherent uncertainty of AI-mediated interactions, in which customers may not fully understand how data are collected, processed, stored, or used. Fu et al. showed that anthropomorphism affects users' willingness to disclose information to AI-based chatbots, but that this effect depends on regulatory focus and other psychological conditions (Fu et al., 2025). Pizzi et al. similarly demonstrated that anthropomorphism and gaze direction can influence willingness to disclose personal information and broader behavioral intentions (Pizzi et al., 2023). These studies support the present conclusion that risk perceptions are closely intertwined with human-like design and information disclosure, particularly in contexts requiring customers to provide personal data.

The review further showed that perceived risk frequently operates indirectly by weakening trust. This finding is theoretically meaningful because it demonstrates that risk is not only a direct deterrent to behavior but also an antecedent of relational evaluation. Consumers who perceive greater privacy, security, performance, or financial risk are less likely to view the AI agent as trustworthy, which subsequently reduces their willingness to interact or purchase. The importance of transparency in this relationship is supported by Yagmurdur et al., who found that algorithmic anthropomorphism, transparency, and fairness jointly shape purchase intentions in e-commerce (Yagmurdur et al., 2026). This evidence indicates that the negative consequences of perceived risk can be reduced when organizations explain how AI systems operate and provide consumers with cues of fairness, predictability, and accountability.

The findings also revealed that task complexity, product involvement, and privacy sensitivity amplify the negative effects of perceived risk. These results suggest that consumers become particularly cautious when AI agents are involved in consequential decisions. In low-risk or routine interactions, users may tolerate uncertainty because the potential consequences of error are limited. However, in high-involvement contexts, such as financial services, personalized recommendations, or important purchasing decisions, uncertainty becomes more salient. Wang and Wood's findings on chatbot service quality and customers' intentions to switch service agents support this interpretation because they show that customers evaluate AI agents not only on usability but also on whether service quality meets their expectations sufficiently to justify continued reliance (Wang & Wood, 2025). The present review therefore indicates that perceived risk is especially influential when the customer feels that the cost of an incorrect recommendation or failed interaction is high.

Another important pattern concerned the role of personalization and responsiveness. Although these factors were not the primary focus of the review, they repeatedly appeared as conditions that strengthened trust and purchase intention. Meng and Lu found that chatbot response strategies and emoji use affect purchase intention through psychological distance and performance expectancy (Meng & Lu, 2025). Wen and Li likewise demonstrated that responsiveness affects purchase intention through trust (Wen & Li, 2025). These findings suggest that customers do not respond to anthropomorphism in isolation; they evaluate whether human-like characteristics are supported by meaningful behavioral responsiveness. A chatbot that uses a human-like name but provides generic, delayed, or irrelevant responses may not generate trust, whereas an agent that responds quickly, appropriately, and contextually can make anthropomorphic cues more credible.

The evidence related to purchase intention also indicates that AI agents can affect both deliberative and impulsive forms of consumption. Zhou and Li showed that virtual AI streaming can stimulate impulsive purchase intention through a stimulus–organism–response mechanism (Zhou & Li, 2025), while Li et al. demonstrated that AI-powered virtual idols can influence impulse buying through perceived intelligence and psychological distance (T. Li et al., 2025). Similarly, Ma showed that virtual influencers can shape green purchase intention, indicating that AI agents can affect not only conventional product decisions but also value-oriented consumption (Ma, 2026). These findings are compatible with the present review because they demonstrate that AI-mediated purchase intention is not a single behavioral phenomenon. Instead, it may emerge through emotional, cognitive, relational, and contextual processes that vary across platforms and product categories.

Copyright: © 2027 by the authors. Published under the terms and conditions of Creative Commons Attribution-NonCommercial 4.0 International (CC BY-NC 4.0) License.

The current review also supports the broader view that AI agents increasingly function as brand relationship interfaces. Maroufkhani et al. showed that interactive voice assistants can contribute to brand loyalty, indicating that AI-mediated interaction can have consequences beyond immediate system use or purchase (Maroufkhani et al., 2022). Majeed and Kim similarly emphasized the broader context of hyperconnected brand selection, in which consumers interact with brands across interconnected digital touchpoints (Majeed & Kim, 2024). These perspectives reinforce the present finding that interaction intention toward an AI agent should not be regarded as a purely technological outcome. Repeated interactions with AI agents may influence brand perceptions, loyalty, relationship quality, and future purchase behavior.

The systematic evidence also showed that consumer responses to anthropomorphic cues depend on context. Qin et al. found that brand anthropomorphism can strengthen green purchase intention, but that the effect is moderated by advertising appeals and relationship orientation (Qin et al., 2025). Tian and Zakaria similarly showed that anthropomorphic visual and verbal cues can enhance impulse buying intention in beverage packaging (Tian & Zakaria, 2025). Although these studies extend beyond conversational AI, they reinforce the broader conclusion that anthropomorphism operates through context-sensitive mechanisms. In AI agent environments, the effectiveness of human-like cues is therefore likely to depend on task type, product category, consumer motivation, and the degree of relational involvement.

Taken together, the findings support an integrated model in which anthropomorphism functions primarily as a relational antecedent, trust as the principal facilitating mechanism, and perceived risk as the central inhibitory mechanism. Anthropomorphic design can increase social presence, warmth, and perceived intelligence; these responses can strengthen trust and thereby increase interaction and purchase intentions. At the same time, privacy concerns, uncertainty, security concerns, and performance risk can weaken trust and directly suppress behavioral intention. The balance between these positive and negative mechanisms appears to determine whether customers perceive an AI agent as a helpful and credible interaction partner or as an uncertain and potentially intrusive technological system. This integrated interpretation is consistent with studies showing that customer responses to AI agents involve both enabling and inhibiting processes rather than simple acceptance or rejection (Jattamart et al., 2026; X. Li et al., 2025).

The findings also highlight the importance of distinguishing interaction intention from purchase intention. Although both outcomes were positively associated with trust and negatively associated with perceived risk, purchase intention appeared somewhat more dependent on competence, transaction-related confidence, and perceived consequences. This distinction is consistent with research showing that human-like features can increase usage intention but that their effects are moderated by factors such as information overload (Li, 2025). It is also compatible with evidence that AI customer service behavior must be understood through broader acceptance frameworks that incorporate both technological and consumer-specific determinants (Wu, 2026). Therefore, customers may be willing to communicate with an AI agent without necessarily being willing to rely on it for a purchase, especially when the transaction involves high financial or personal stakes.

Overall, the results suggest that effective AI agent design should not maximize anthropomorphism indiscriminately. Instead, organizations should create a coherent combination of human-like communication, functional competence, transparency, and risk reduction. The strongest consumer responses occur when anthropomorphic cues enhance social interaction without creating unrealistic expectations, when trust is supported by demonstrable performance and responsiveness, and when perceived risk is minimized through transparency and clear data practices. This interpretation is supported by research across chatbots, digital humans, virtual influencers, virtual streamers, and AI shopping assistants and provides a comprehensive explanation for why anthropomorphism can produce both favorable and unfavorable outcomes across different commercial settings (Gong & Zeng, 2026; Tang & Wang, 2026; C.-F. Wu et al., 2026).

Several limitations should be considered when interpreting the findings of this review. First, substantial methodological heterogeneity existed across the included studies in terms of AI technologies, research contexts, measurement instruments, sample characteristics, and analytical approaches, which limited the possibility of directly comparing effect magnitudes across studies. Second, a large proportion of the evidence was based on cross-sectional surveys and experimental scenarios rather than observations of long-term consumer behavior in natural commercial settings. Third, the operationalization of anthropomorphism varied considerably, ranging from visual appearance and avatars to language style, personality, emotional expression, and social responsiveness, which may partly explain inconsistencies in the reported findings. Fourth, perceived risk

Copyright: © 2027 by the authors. Published under the terms and conditions of Creative Commons Attribution-NonCommercial 4.0 International (CC BY-NC 4.0) License.

was also measured using different dimensions, including privacy, performance, security, financial, and psychological risk. Fifth, the review focused on English-language peer-reviewed studies and may therefore have excluded relevant findings published in other languages or publication formats. Finally, the rapid evolution of generative AI and autonomous agent technologies means that the findings represent a dynamic research field in which user expectations and system capabilities may change rapidly.

Future studies should place greater emphasis on longitudinal and field-based research capable of examining how trust, perceived risk, and interaction patterns evolve across repeated encounters with AI agents. More research is also needed to distinguish different forms of anthropomorphism and determine whether visual, linguistic, behavioral, emotional, and personality-based cues produce different effects on trust and purchase behavior. Researchers should examine nonlinear relationships and identify thresholds at which greater human-likeness begins to produce discomfort, suspicion, or perceived manipulation. Comparative research across high-risk and low-risk industries would help clarify whether the roles of trust and perceived risk differ in financial services, healthcare-related commerce, tourism, retail, and entertainment settings. Future research should also examine individual differences such as AI literacy, privacy sensitivity, technology readiness, age, cultural orientation, self-efficacy, and prior AI experience. Experimental work could investigate whether transparent disclosure of AI identity changes the effects of anthropomorphic design. Finally, future systematic reviews and meta-analyses should quantify effect sizes and test mediation and moderation patterns once a sufficiently homogeneous body of empirical evidence becomes available.

Organizations using AI agents in customer-facing environments should prioritize functional reliability and transparency before increasing human-like characteristics. Anthropomorphic design should be used selectively to improve clarity, social presence, and conversational comfort rather than to imitate humans as closely as possible. AI agents should clearly communicate their artificial identity, explain important recommendations when possible, and provide understandable information about data collection and privacy practices. Firms should also ensure that human-like communication is matched by adequate responsiveness, accuracy, and contextual understanding, because inconsistent performance can undermine trust. Customers should be offered easy access to human support when tasks become complex, sensitive, or high-risk. Privacy-sensitive interactions should minimize unnecessary data collection and provide users with meaningful control over personal information. Organizations should also monitor customer reactions to different levels of anthropomorphism and adapt agent design to specific industries, customer segments, and transaction types. The most effective strategy is therefore not maximum human resemblance, but a balanced design in which social cues, competence, transparency, and risk reduction work together to create a trustworthy and usable AI-mediated customer experience.

Ethical Considerations

All procedures performed in this study were under the ethical standards.

Acknowledgments

Authors thank all who helped us through this study.

Conflict of Interest

The authors report no conflict of interest.

Funding/Financial Support

According to the authors, this article has no financial support.

References

Fu, H., Shang, L., & Du, H. S. (2025). Are Consumers Willing to Disclose Information To <scp>AI</Scp> -Based Chatbot? The Roles of Anthropomorphism and Regulatory Focus. *Journal of Consumer Behaviour*, *25*(1), 394-408. https://doi.org/10.1002/cb.70076

Gong, X., & Zeng, L. (2026). How Users Perceive and Respond to Digital Humans: A Scoping Review of Agency, Embodiment, Social Role, and Response Outcomes. *Behavioral Sciences*, *16*(9), 1700. https://doi.org/10.3390/bs16091700

Copyright: © 2027 by the authors. Published under the terms and conditions of Creative Commons Attribution-NonCommercial 4.0 International (CC BY-NC 4.0) License.

Hsieh, S. H., & Lee, C. T. (2024). The AI Humanness: How Perceived Personality Builds Trust and Continuous Usage Intention. *Journal of Product & Brand Management*, *33*(5), 618-632. https://doi.org/10.1108/jpbm-10-2023-4797

Jattamart, A., Nusawat, P., & Kwangsawad, A. (2026). Dual Customer Responses to AI Chatbots in Online Shopping: An Integrated AIDUA–SOR Framework. *Journal of Theoretical and Applied Electronic Commerce Research*, *21*(5), 146. https://doi.org/10.3390/jtaer21050146

Keng, C.-J. (2025). The Persuasive Power of AI Avatars Through Trust Transfer and the Elaboration Likelihood Model. *Journal of Theoretical and Applied Electronic Commerce Research*, *20*(4), 342. https://doi.org/10.3390/jtaer20040342

Kumari, A. (2024). Influence of Chatbot on Consumer Purchase Intention. *International Journal of Scientific Research in Engineering and Management*, *08*(05), 1-5. https://doi.org/10.55041/ijsrem33410

Li, H., Li, W., & Ma, T. (2025). Exploring the Mechanism of AI-Powered Virtual Idols' Intelligence Level on Digital Natives' Impulsive Buying Intention in E-Commerce Live Streaming: A Perspective of Psychological Distance. *Journal of Theoretical and Applied Electronic Commerce Research*, *20*(3), 173. https://doi.org/10.3390/jtaer20030173

Li, M. (2025). Research on the Impact Path of Virtual Streamers Characteristics on Agricultural Product Consumers' Purchase Intention. *PLoS One*, *20*(8), e0330021. https://doi.org/10.1371/journal.pone.0330021

Li, T., Wang, M., & Wang, F. (2025). Anthropomorphism of Artificial Intelligence Service Agent and Consumer Responses: A Systematic Literature Review and Future Research Agenda. *International Journal of Consumer Studies*, *49*(3). https://doi.org/10.1111/ijcs.70066

Li, X., Zhou, T., Hu, C., & Liu, H. (2025). The Effects of the Human-Like Features of Generative Ai on Usage Intention and the Moderating Role of Information Overload. https://doi.org/10.21203/rs.3.rs-6624682/v1

Liang, S., Ma, Y., Chen, X., Li, Y., & Tian, J. (2026). AI Virtual Streamers in Sustainable Food Marketing: How Expertise, Interactivity, and Anthropomorphism Shape Consumer Acceptance of Upcycled Foods. *Frontiers in Nutrition*, *13*. https://doi.org/10.3389/fnut.2026.1903565

Lin, Y., Zou, Y., & Wang, X. (2026). Conditional Trust Pathways in Live-Streaming Commerce: How Consumer Motivation Influences Responses to Human and AI Anchors. *Frontiers in psychology*, *17*. https://doi.org/10.3389/fpsyg.2026.1797803

Ma, X. (2026). How Virtual Influencers Shape Consumers' Green Purchase Intention Among Chinese Consumers: Evidence From PLS-SEM and fsQCA. *Journal of Theoretical and Applied Electronic Commerce Research*, *21*(9), 300. https://doi.org/10.3390/jtaer21090300

Majeed, S., & Kim, W. G. (2024). Antecedents and Consequences of Conceptualizing Online Hyperconnected Brand Selection. *Journal of Consumer Marketing*, *41*(3), 328-339. https://doi.org/10.1108/jcm-08-2023-6193

Maroufkhani, P., Asadi, S., Ghobakhloo, M., Jannesari, M. T., & Ismail, W. K. W. (2022). How Do Interactive Voice Assistants Build Brands' Loyalty? *Technological Forecasting and Social Change*, *183*, 121870. https://doi.org/10.1016/j.techfore.2022.121870

Meng, H., & Lu, X. (2025). The Impact of Chatbot Response Strategies and Emojis Usage on Customers' Purchase Intention: The Mediating Roles of Psychological Distance and Performance Expectancy. *Behavioral Sciences*, *15*(2), 117. https://doi.org/10.3390/bs15020117

Pan, S., & Zhang, Y. (2024). More Realistic, More Better? How Anthropomorphic Images of Virtual Influencers Impact the Purchase Intentions of Consumers. *Journal of Theoretical and Applied Electronic Commerce Research*, *19*(4), 3229-3252. https://doi.org/10.3390/jtaer19040157

Pizzi, G., Vannucci, V., Mazzoli, V., & Donvito, R. (2023). I, Chatbot! The Impact of Anthropomorphism and Gaze Direction on Willingness to Disclose Personal Information and Behavioral Intentions: An Abstract. 283-284. https://doi.org/10.1007/978-3-031-24687-6_112

Qin, C., Zeng, X., & Zhou, X. (2025). Effects of Brand Anthropomorphism on Green Purchase Intentions: The Moderating Roles of Advertising Appeals and Consumer Relationship Orientation. *Journal of Consumer Behaviour*, *24*(5), 2521-2544. https://doi.org/10.1002/cb.70023

Sheehan, B., Jin, H. S., Martin, B., & Kim, H. J. (2024). Wow! Interjections Improve Chatbot Performance: The Mediating Role of Anthropomorphism and Perceived Listening. *Communication Research*, *51*(7), 891-917. https://doi.org/10.1177/00936502241273259

Tang, X., & Wang, Z. (2026). Anthropomorphic Design of Virtual Streamers in Live Streaming: A Double-Edged Sword Effect on Consumers' Acceptance Intention. *Journal of Consumer Behaviour*, *25*(5), 2321-2341. https://doi.org/10.1002/cb.70155

Tian, Y., & Zakaria, S. F. (2025). Can Anthropomorphic Design in Beverage Packaging Enhance Impulse Buying Intention? Amazing Visual and Verbal Cues! *PLoS One*, *20*(6), e0326186. https://doi.org/10.1371/journal.pone.0326186

Wang, P., & Wood, J. (2025). Exploring the Varying Effects of Chatbot Service Quality Dimensions on Customer Intentions to Switch Service Agents. *Scientific reports*, *15*(1). https://doi.org/10.1038/s41598-025-06490-z

Wen, J., & Li, X. (2025). AI Digital Human Responsiveness and Consumer Purchase Intention: The Mediating Role of Trust. *Journal of Theoretical and Applied Electronic Commerce Research*, *20*(3), 246. https://doi.org/10.3390/jtaer20030246

Wu, C.-F., Lin, M. C., & Chiou, C. C. (2026). The Impact of Human-Robot Interaction In <scp>AI</Scp> Customer Service on Consumers' Online Shopping Behaviour: Extending <scp>UTAUT2</Scp> Model. *Expert Systems*, *43*(8). https://doi.org/10.1111/exsy.70355

Wu, S., Yang, Y., Tan, X., & Wang, J. (2026). From Anthropomorphism to Purchase Intention in AI Shopping Assistant Contexts: A Three-Wave Longitudinal Moderated Mediation Study of Perceived Intelligence and General Self-Efficacy Among College Students. https://doi.org/10.21203/rs.3.rs-9826710/v1

Wu, W. (2026). How and When Do Virtual Influencers Work? A Meta-Analysis of Mechanisms and Moderators in Digital Commerce. *Journal of Theoretical and Applied Electronic Commerce Research*, *21*(4), 124. https://doi.org/10.3390/jtaer21040124

Yagmurdur, G., Meng, Y., & Gayaker, S. (2026). The Role of Algorithmic Anthropomorphism, Transparency, and Fairness in Shaping Consumer Purchase Intentions in E-Commerce: Evidence From Türkiye. *Journal of Theoretical and Applied Electronic Commerce Research*, *21*(5), 159. https://doi.org/10.3390/jtaer21050159

Zhou, T., & Li, S. (2025). Examining Consumer Impulsive Purchase Intention in Virtual AI Streaming: A S-O-R Perspective. *Journal of Theoretical and Applied Electronic Commerce Research*, *20*(3), 204. https://doi.org/10.3390/jtaer20030204

Copyright: © 2027 by the authors. Published under the terms and conditions of Creative Commons Attribution-NonCommercial 4.0 International (CC BY-NC 4.0) License.