Generative AI stickiness: A Conceptual Model Integrating AI Characteristics, Cognitive Dissonance, and Motivational Differences

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Abstract. User stickiness reflects users' sustained engagement with and reliance on a system, and is therefore central to the long-term viability of generative artificial intelligence (GenAI). Drawing on Cognitive Dissonance Theory, this study develops a conceptual understanding of how two core AI characteristics—perceived intelligence and perceived anthropomorphism—shape user stickiness through the regulation of cognitive dissonance, while considering motivational differences—specifically utilitarian and hedonic motivations—as important boundary conditions. In early interactions, GenAI may elicit cognitive dissonance when output deviations such as hallucinations or logical inconsistencies violate users' performance expectations. As interactions accumulate, improvements associated with perceived intelligence, including enhanced response quality and problem-solving capability, may facilitate cognitive reconciliation and alleviate psychological discomfort. Similarly, anthropomorphic cues may initially induce dissonance by fostering unrealistically high expectations, yet with repeated interaction, perceived anthropomorphism can enhance users' tolerance for AI imperfections and emotional adaptability by enabling human-like interaction and emotional connection. These regulatory processes may vary across users with different motivational orientations. Based on these arguments, this study proposes a conceptual model of "AI perceived characteristics → cognitive dissonance → user stickiness", in which motivational differences shape users' psychological responses to dissonance. By elucidating the dynamic and dual roles of perceived intelligence and anthropomorphism, the proposed framework extends cognitive dissonance theory to continuous human–AI interaction contexts and offers conceptual guidance for the design of interactive intelligent systems aimed at sustaining user stickiness.

Keywords: Generative artificial intelligence(GAI), Perceived intelligence, Perceived anthropomorphism, Cognitive dissonance, user motivation, User stickiness

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1 Introduction

In recent years, generative artificial intelligence (GenAI) technologies—such as ChatGPT and Tongyi Qianwen—have rapidly advanced and gained widespread adoption, becoming important drivers of the digital economy. With strong content-generation capabilities, multimodal interaction, and broad applicability, GenAI services are increasingly embedded in everyday work, education, and entertainment contexts. However, rapid diffusion does not guarantee sustained use. Beyond initial adoption, long-term retention—commonly conceptualized as user stickiness—has become critical to the sustainable development of AI-based services [1]. Despite their popularity, GenAI systems remain imperfect. Problems such as AI hallucinations and unmet expectations frequently induce negative emotions and cognitive dissonance, which may undermine continued use [2]. Yet, many users persist in engaging with GenAI despite these limitations. This paradox suggests that user retention cannot be explained by technical performance alone, but is also shaped by users' perceptions of AI characteristics and their psychological responses. Accordingly, understanding how perceived AI characteristics influence user stickiness through underlying psychological mechanisms represents a timely and important research agenda.

Prior research identifies perceived intelligence (PI) and perceived anthropomorphism (PA) as two core attributes shaping the quality of human–AI interaction [3]. PI reflects users' evaluations of an AI system's effectiveness, autonomy, and language processing and generation capabilities, whereas PA captures perceptions of human-like cues, such as conversational style and emotional responsiveness. The prevailing view suggests that both attributes enhance user experience: PI strengthens instrumental value and trust, while PA fosters engagement by providing social support, increasing enjoyment, and enabling emotional connection [3,4]. Despite these insights, existing studies offer limited understanding of how PI and PA help users manage psychological conflict—particularly cognitive dissonance arising from AI hallucinations or GenAI outputs that contradict users' expectations or beliefs.

Building on cognitive dissonance theory, this study examines how PI and PA influence user stickiness. Cognitive dissonance theory posits that individuals experience psychological discomfort when outcomes conflict with their expectations and are motivated to restore cognitive consistency [5]. In continuous generative AI interactions, users' experiences are inherently dynamic, making cognitive dissonance a particularly suitable lens. During early interactions, AI hallucinations, logical inconsistencies, or inaccurate outputs may violate performance expectations and trigger cognitive dissonance. Over time, however, improvements associated with PI—such as enhanced response quality and problem-solving capability—can help users cognitively reconcile these discrepancies, thereby alleviating discomfort. Similarly, PA may initially inflate expectations regarding AI competence or social engagement, and unmet expectations can induce dissonance [6]. Yet, through repeated interactions, anthropomorphic cues can foster emotional connection and relational engagement, increasing users' tolerance for imperfections and facilitating emotional adaptation. Through these dynamic regulatory processes, cognitive dissonance may gradually diminish rather than intensify, ultimately supporting sustained user stickiness.

Importantly, users' psychological response pathways are not uniform but are shaped by their motivational orientation[1]. Users with strong utilitarian motivation prioritize outcome accuracy and task efficiency, making them more sensitive to dissonance arising from AI errors or inconsistencies. In contrast, users with strong hedonic motivation emphasize experiential enjoyment and interaction quality, and thus tend to exhibit greater tolerance for dissonance. Incorporating user motivation as a moderating variable therefore enables a clearer understanding of the boundary conditions under which perceived intelligence and anthropomorphism alleviate cognitive dissonance and enhance user stickiness across different usage contexts.

In summary, this study develops a conceptual model linking AI characteristics to user stickiness through cognitive dissonance, with utilitarian and hedonic motivations as key moderators. The study contributes to the literature by offering a theoretically grounded account of user retention in human–computer interaction and by extending cognitive dissonance theory to AI-enabled contexts. From a practical perspective, the findings may inform AI product design by highlighting how intelligence and anthropomorphic features can be strategically balanced and how engagement strategies can be tailored to users with different motivational orientations to support sustained use and the sustainable development of generative AI services.

2 Literature Review

2.1 Perceived Intelligence and Perceived Anthropomorphism in GenAI

Generative artificial intelligence (GenAI) refers to a class of deep learning–based technologies capable of producing human-like and seemingly original content across multiple modalities, including text, images, audio, and video [7]. By enabling creative content generation and interactive responses, GenAI supports diverse services such as information retrieval, task execution, knowledge creation, and emotional interaction. Despite these capabilities, GenAI systems entail notable risks, particularly AI hallucinations, whereby inaccurate or fabricated outputs are generated. Such errors create a mismatch between users' expectations and actual system performance, undermining perceived accuracy and reliability. Consequently, users may experience negative emotional responses—such as frustration, anxiety, and disappointment—thereby weakening user stickiness.

Perceived intelligence (PI) and perceived anthropomorphism (PA) are two central characteristics in human–AI interaction research. Prior studies generally show that higher PI enhances interaction quality and efficiency, strengthening users' emotional commitment and reducing interruption or discontinuance behaviors, while stronger PA fosters emotional connection and social presence, buffering the behavioral impact of negative experiences and adverse outputs[2]. However, existing work has primarily focused on how PI and PA promote positive attitudes and interaction outcomes, leaving their roles in mitigating the adverse effects of AI hallucinations—particularly in alleviating cognitive dissonance—underexplored. Building on this gap, we propose that PI reduces users' sensitivity to occasional hallucinated outputs by reinforcing confidence in AI reasoning and accuracy, while PA enhances tolerance for imperfect

responses by strengthening emotional connection, thereby attenuating psychological discomfort and reducing the likelihood of discontinuance.

2.2 Cognitive Dissonance Theory

Cognitive Dissonance Theory (CDT) posits that individuals strive to maintain cognitive consistency and experience psychological discomfort—cognitive dissonance—when confronted with conflicting beliefs, attitudes, or behaviors [5]. CDT has been widely used to explain attitude change and behavioral adjustment in response to contradictory information. With the rapid diffusion of generative artificial intelligence, this theory has become increasingly relevant for understanding users' reactions to inconsistencies and uncertainties in human–AI interaction. In practice, users frequently encounter dissonance-inducing situations when interacting with GenAI systems, such as output deviations, logical errors, and AI hallucinations. When AI-generated outputs conflict with users' knowledge, beliefs, or values, users may experience tension between reliance on AI and doubt about its reliability. Although GenAI offers functional benefits for decision support and knowledge acquisition, concerns over uncertainty and trust erosion can create psychological discomfort, characterized by doubt and anxiety [2]. When such dissonance persists, it undermines users' confidence in the system and reduces their stickiness.

This study identifies two key research gaps. First, prior research has primarily focused on external stimuli that trigger cognitive dissonance [2], while overlooking the continuous and iterative nature of users' interactions with generative AI. In such contexts, user experience is inherently dynamic, and AI characteristics may alleviate cognitive dissonance over time. For example, PI may initially trigger dissonance when AI hallucinations or logical inconsistencies occur, but iterative improvements in response quality and problem-solving capability can help users rationalize discrepancies and reduce psychological discomfort. Similarly, PA may initially inflate expectations and induce dissonance when unmet [6], yet repeated exposure to human-like cues and emotional engagement can enhance users' tolerance for AI imperfections and facilitate dissonance repair. To address this gap, the present study focuses on PI and PA to examine how AI characteristics simultaneously function as sources of cognitive dissonance and as intrinsic mechanisms for dissonance regulation in continuous GenAI interactions. In doing so, this study extends cognitive dissonance theory to the practical context of generative AI use and strengthens its explanatory power for understanding user stickiness.

Second, although prior research has examined individual differences among users, existing studies have primarily focused on relatively stable personality or cognitive traits, such as narcissism, brand familiarity, and technological literacy [8]. While these studies acknowledge user heterogeneity, they remain largely confined to static individual attributes and overlook differences in users' motivational states during AI interactions. User motivation represents a critical contextual mechanism that shapes attention allocation and value evaluation in AI-mediated interactions, thereby explaining why users may exhibit divergent continuance behaviors even when experiencing similar levels of cognitive dissonance. Users with predominantly utilitarian

motivations emphasize task effectiveness and performance outcomes; for these users, cognitive dissonance is more likely to undermine continued use. In contrast, users with predominantly hedonic motivations derive value from enjoyment and experiential novelty. For such users, unexpected outputs or AI hallucinations may be interpreted as interesting or entertaining rather than purely as errors, allowing them to cognitively reframe negative experiences and attenuate psychological discomfort. To address this gap, the present study incorporates utilitarian and hedonic motivations as key moderators, examining how the effect of cognitive dissonance on user stickiness varies across motivational orientations. In doing so, this study reveals the contingent role of user motivation in shaping the dissonance–stickiness relationship.

2.3 User Stickiness

User stickiness is a core indicator of users' sustained engagement and behavioral commitment toward a product, platform, or service. Early studies conceptualized stickiness mainly in terms of repeated visits and dwell time on websites or online communities [9]. With the deep integration of emerging technologies into digital services, the concept has evolved to encompass usage frequency, interaction duration, continuity of use, depth of engagement, and users' reluctance to switch to alternative services. Research on AI-related user stickiness has generally examined its antecedents from two perspectives: technical characteristics and user psychology. From a technical standpoint, AI system affordances, interface design, interaction efficiency, and service reliability have been shown to enhance user experience and promote stickiness [10,11]. As AI systems become more anthropomorphic, recent studies have increasingly emphasized psychological mechanisms, focusing on users' motivations, emotional responses, and perceived value. For instance, Cao and Liu (2023) find that AI stimuli can drive sustained use by enhancing perceived emotional and social value, highlighting the mediating role of psychological factors in supporting user stickiness [12].

A review of prior research reveals an imbalance in the user stickiness literature, which has largely emphasized positive drivers while overlooking the negative implications of biased or imperfect AI outputs. In real-world GenAI use, technical shortcomings—such as hallucinations and unstable output quality—are common and often trigger user disappointment and psychological conflict. Paradoxically, users frequently continue using these systems despite such negative experiences, a phenomenon that existing frameworks struggle to explain. To address this gap, this study adopts cognitive dissonance theory as a novel explanatory lens. From this perspective, PI and PA function as internal mechanisms of dissonance regulation. Through cognitive restructuring and emotional compensation, users alleviate psychological discomfort and sustain—or even reinforce—their stickiness to generative AI. This approach provides a theoretically grounded explanation for the coexistence of negative experiences and persistent AI usage.

2.4 Hedonic Motivation and Utilitarian Motivation

Motivation reflects the internal drive that shapes how users allocate attention and evaluate value during technology interactions. Drawing on Self-Determination Theory, user motivation in human–computer interaction is commonly classified into utilitarian and hedonic orientations [13]. In the context of GenAI use, these motivations not only influence users' attitudes and behaviors but also serve as key boundary conditions that regulate psychological responses to output flaws or service deviations [1]. Utilitarian motivation is task-oriented and instrumentally rational, reflecting users' desire to accomplish goals, solve problems, or obtain information efficiently. Utilitarian users thus evaluate GenAI primarily based on functional performance and output effectiveness. In contrast, hedonic motivation is experience-oriented, emphasizing enjoyment, curiosity, and emotional gratification. Hedonic users tend to view GenAI interactions as exploratory or entertaining experiences, placing greater value on engagement and pleasure derived from the interaction process.

These two motivational orientations shape not only users' initial expectations but also their attentional focus, tolerance thresholds, and evaluative criteria when encountering deviations in AI outputs. Prior studies show that utilitarian users are more sensitive to information quality, whereas hedonic users place greater emphasis on system-related and experiential qualities [14]. Similarly, utilitarian users exhibit higher tolerance for limited emotional warmth in AI services, prioritizing task completion over affective interaction [15]. Despite these insights, prior research has primarily examined the effects of utilitarian and hedonic motivations on satisfaction or usage intention, paying limited attention to their contextual roles in the cognitive dissonance process. To address this gap, the present study incorporates utilitarian and hedonic motivations as moderators of the relationship between cognitive dissonance and user stickiness, clarifying how motivational orientations condition users' tolerance of dissonance in GenAI interactions.

3 Research Model and Research Hypotheses

The research model is presented in Figure 1.

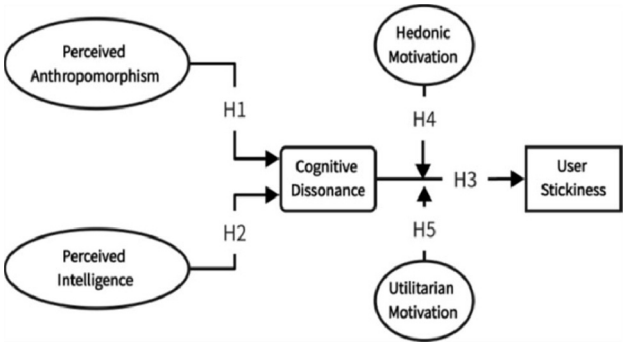

Fig. 1. Conceptual Research Model of User Stickiness in Generative AI Interaction

3.1 Perceived Intelligence and Cognitive Dissonance

Perceived intelligence reflects users' subjective evaluation of an AI system's cognitive capabilities, such as understanding, reasoning, and adaptive problem solving. When AI outputs deviate from users' expectations, cognitive dissonance may arise due to the inconsistency between users' prior beliefs about the system and their actual interaction experience. Importantly, in generative AI contexts, users are not limited to one-shot interactions but can engage in repeated exchanges with the system. An AI system with high PI is able to progressively learn from these interactions, better understand users' underlying needs, and generate increasingly tailored and contextually appropriate responses. This adaptive interaction process enables users to reinterpret initial inconsistencies as temporary or correctable, thereby facilitating cognitive adjustment and reducing psychological discomfort. In contrast, when perceived intelligence is low, repeated interactions are less likely to improve response quality, which reinforces perceived inconsistency and amplifies cognitive dissonance. Accordingly, PI is expected to be negatively associated with cognitive dissonance. Therefore, the following hypothesis is proposed:

H1: Perceived intelligence is negatively related to cognitive dissonance.

3.2 Perceived Anthropomorphism and Cognitive Dissonance

Perceived anthropomorphism refers to the extent to which users perceive an AI system as possessing human-like characteristics, such as social presence, empathy, and relational responsiveness. When users encounter inconsistent or unsatisfactory AI outputs, cognitive dissonance may arise because the system's behavior deviates from users' expectations. In generative AI contexts, however, anthropomorphic cues enable users to interpret the AI not merely as a technical tool but as a quasi-social interaction partner. An AI system with high PA can convey understanding, responsiveness, and emotional sensitivity during repeated interactions, allowing users to attribute initial failures to situational factors rather than to fundamental system inadequacy. This social and emotional framing facilitates users' emotional compensation and cognitive justification, thereby alleviating psychological discomfort and reducing cognitive dissonance. Conversely, when PA is low, users are more likely to interpret inconsistencies as mechanical errors, which limits emotional buffering and intensifies cognitive conflict. Therefore, PA is expected to be negatively associated with cognitive dissonance. Therefore, the following hypothesis is proposed:

H2: Perceived anthropomorphism is negatively related to cognitive dissonance.

3.3 Cognitive Dissonance and User Stickiness

In this study, cognitive dissonance refers to the psychological discomfort that arises when users' expectations of generative AI are inconsistent with actual usage outcomes. Such dissonance prompts negative evaluations of the experience and reduces users' willingness to continue interacting with the system. When users encounter persistent inconsistencies—such as unreliable outputs, unmet expectations, or contra-

dictory responses—they are motivated to alleviate discomfort by adjusting their beliefs or modifying their behaviors. In human–AI interactions, unresolved dissonance undermines confidence in the system's reliability and predictability, weakening trust and satisfaction. As psychological discomfort accumulates across repeated interactions, continued use becomes increasingly costly both cognitively and emotionally. To restore cognitive balance, users may reduce usage frequency, shorten interaction duration, or abandon the system altogether. Consequently, higher levels of cognitive dissonance weaken users' behavioral commitment and reduce user stickiness. Therefore, the following hypothesis is proposed:

H3: Cognitive dissonance is negatively correlated with user stickiness.

3.4 The Moderating Effect of the Hedonic Motivation Towards AI

Users driven by hedonic motivation place greater emphasis on enjoyment, novelty, and emotional experience during the usage process. Such users tend to view interactions with AI as a form of entertainment or exploration rather than purely as task execution. When AI hallucinations or errors occur and trigger cognitive dissonance, hedonic-oriented users are more likely to reinterpret these inconsistencies as playful surprises or opportunities for exploration rather than as serious functional failures. This experiential focus facilitates emotional reappraisal and reduces the salience of psychological discomfort. Consequently, the negative effect of cognitive dissonance on user stickiness is weakened for users with higher levels of hedonic motivation, allowing them to remain engaged despite experiencing cognitive dissonance. Accordingly, the following hypothesis is proposed:

H4: Hedonic motivation negatively moderates the negative relationship between cognitive dissonance and user stickiness.

3.5 The Moderating Effect of the Utilitarian Motivation Towards AI

Users driven by utilitarian motivation primarily emphasize efficiency, accuracy, and the practical value of task outcomes. For these users, AI systems are viewed mainly as instrumental tools for accomplishing specific tasks, resulting in low tolerance for performance deviations or output errors. When cognitive dissonance arises, it directly undermines users' goal attainment and task effectiveness, making the associated psychological discomfort more salient. As a result, cognitive dissonance is more likely to be translated into negative evaluations of the system and a stronger inclination to discontinue use. In this sense, utilitarian motivation amplifies the disruptive effect of cognitive dissonance on user stickiness. Therefore, the following hypothesis is proposed:

H5: Utilitarian motivation positively moderates the negative relationship between cognitive dissonance and user stickiness.

4 Conclusion: What is Next

In summary, this study investigates user stickiness in generative AI contexts by examining how perceived intelligence and perceived anthropomorphism influence cognitive dissonance during continuous AI interactions, and how this dissonance subsequently affects user stickiness. The analysis further accounts for differences in utilitarian and hedonic motivations, showing that users' motivational orientations condition the relationship between cognitive dissonance and sustained AI use. In the next stage of this study, data will be collected through an online questionnaire to examine users' continuous use of generative artificial intelligence. The target sample will consist of individuals with prior GenAI experience, as actual interaction is essential for accurately assessing perceived intelligence, perceived anthropomorphism, cognitive dissonance, and user stickiness. Measurement items will be adapted from established scales in the literature and refined through a rigorous back-translation process to ensure linguistic and conceptual equivalence between the Chinese and English versions. Data collection will be conducted via Credamo, a widely used paid survey platform that enforces a one-response-per-IP policy to minimize duplicate submissions and response bias. The platform also allows random sampling from a large and diverse respondent pool, helping to mitigate the limitations of convenience sampling. Structural equation modeling (SEM) will be employed to evaluate measurement reliability and validity, as well as to test the proposed model and hypotheses, thereby providing robust empirical support for the conceptual framework and insights into user stickiness in generative AI contexts

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References

1. PANG, H., HU, Z., & WANG, L. (2025). How Perceived Motivations Influence User Stickiness and Sustainable Engagement with AI-Powered Chatbots—Unveiling the Pivotal Function of User Attitude. *Journal of Theoretical and Applied Electronic Commerce Research*, *20*, 228–249.
2. ZHOU, T., & ZHANG, C. (2025). Examining Generative AI User Intermittent Discontinuance from a C-A-C Perspective. *International Journal of Human–Computer Interaction*, *41*(10), 6377–6387.
3. LIN, R. R., & LEE, J. C. (2024). The supports provided by artificial intelligence to continuous usage intention of mobile banking: evidence from China. *Aslib Journal of Information Management*, *76*(2), 293–310.
4. ZHOU, T., & ZHANG, C. (2024). Examining generative AI user addiction from a C-A-C perspective. *Technology in Society*, *78*, 102653.

5. Festinger, L., & Carlsmith, J. M. (1959). Cognitive consequences of forced compliance. *The Journal of Abnormal and Social Psychology*, *58*(2), 203–210.
6. LEE, J. C., JIANG, S., & TANG, Y. (2025). Examining the impacts of artificial intelligence characteristics on user resistance to financial robot-advisors. *Information Technology & People*.
7. SUSARLA, A., GOPAL, R., THATCHER, J. B., & others. (2023). The Janus Effect of Generative AI: Charting the Path for Responsible Conduct of Scholarly Activities in Information Systems. *Information Systems Research*, *34*(2), 399–408.
8. Waqas, M., & Qadri, U. A. (2025). When Consumer Autonomy is Compromised: Adopting a Dual-Type View to Understand AI-Driven Marketing and Its Impact on Young Consumers' Ethical Behavior. Journal of Business Ethics. https://doi.org/10.1007/s10551-025-06155-x
9. LIN, J. C. C. (2007). Online stickiness: its antecedents and effect on purchasing intention. Behavior and Information Technology, 26(6), 507–516.
10. Ashfaq, M., Makkar, M., Hoang, A. P., Dang-Pham, D., Do, M. H. T., & Nguyen, A. T. (2025). Exploring customer stickiness during "smart" experiences: a study on AI chatbot affinity in online customer services. Journal of Research in Interactive Marketing.
11. Liu, T., Guo, Y., Liu, S., Dong, P., & Chen, J. (2025). How Does User Experience Affect User Stickiness. International Journal of Electronic Government Research, 21(1), 1–23. https://doi.org/10.4018/ijegr.368252
12. CAO, P., & LIU, S. (2023). The Impact of Artificial Intelligence Technology Stimuli on Sustainable Consumption Behavior: Evidence from Ant Forest Users in China. *Behavioral Sciences*, *13*(7), 604.
13. DINH, C. M., & PARK, S. (2024). How to increase consumer intention to use Chatbots? An empirical analysis of hedonic and utilitarian motivations on social presence and the moderating effects of fear across generations. *Electronic Commerce Research*, *24*, 2427–2467.
14. ZHU, Y., SHI, H., HASHMI, H. B. A., & WU, Q. (2023). Bridging artificial intelligence-based services and online impulse buying in E-retailing context. *Electronic Commerce Research and Applications*, *62*, 101333.
15. LV, X., YANG, Y., QIN, D., & LIU, X. (2025). AI service may backfire: Reduced service warmth due to service provider transformation. *Journal of Retailing and Consumer Services*, 104282.