

Empowering Consumers in the Age of AI: Exploring the Role of Perceived Autonomy in AI-Assisted Purchase Decisions

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Abstract

As artificial intelligence (AI) becomes increasingly embedded in online shopping and recommendation platforms, understanding how AI influences consumer decision-making has become essential. While AI enhances efficiency and personalization, its over-involvement may undermine consumers' perceived autonomy—a key psychological factor in decision satisfaction and trust. This research investigates how AI-assisted purchase systems affect consumer autonomy, examining psychological, behavioral, and technological perspectives. We propose a conceptual model integrating Self-Determination Theory (SDT) with Human-Computer Interaction (HCI) frameworks to explore this dynamic. Our findings suggest that perceived autonomy significantly mediates trust, satisfaction, and likelihood of repurchase in AI-facilitated settings. Recommendations for AI system design that balances assistance with user control are discussed.

1. Introduction

1.1 Background

Artificial intelligence has become an integral part of modern commerce. From personalized recommendations on Amazon and Netflix to automated customer service via chatbots, AI technologies are transforming how consumers interact with businesses. One of the most promising developments is **AI-assisted purchasing**, where intelligent algorithms help users select products, optimize choices, and simplify decision-making.

While these systems offer clear benefits—convenience, personalization, and efficiency—there is growing concern that they may inadvertently diminish the user's sense of **autonomy**, a core element of intrinsic motivation and well-being. The more AI "decides" for users, the less involved consumers might feel in their own purchasing decisions.

1.2 Research Problem

Despite the growing application of AI in e-commerce, little attention has been paid to the psychological implications of AI's involvement, particularly the **perceived sense of autonomy**. Consumers who feel manipulated or overly guided by AI might resist its suggestions or experience regret, even if the outcome is favorable.

This paper aims to fill that gap by:

- Investigating how AI-assisted systems influence consumer autonomy.
- Analyzing the role of perceived autonomy in shaping trust, satisfaction, and future intent.
- Offering a model and design principles for autonomy-supportive AI systems.

2. Literature Review

2.1 AI in Consumer Decision-Making

AI systems in commerce typically leverage machine learning to analyze user data and offer personalized choices. These systems can:

- Narrow product options (e.g., filtering search results).
- Predict preferences (e.g., collaborative filtering).
- Automate repetitive tasks (e.g., auto-refill subscriptions).

While these functions improve efficiency, they also shift some cognitive control from the user to the algorithm.

2.2 Autonomy in Decision Psychology

In psychological literature, **autonomy** refers to the sense of volition and agency over one's actions. According to **Self-Determination Theory (Deci & Ryan, 1985)**, autonomy is one of the three basic psychological needs (alongside competence and relatedness). When autonomy is undermined, motivation and satisfaction decline—even when outcomes are favorable.

2.3 Human-AI Interaction and Perceived Control

Recent studies in Human-Computer Interaction suggest that overreliance on AI can trigger "algorithm aversion" if users feel the system is opaque or overstepping. However, other studies indicate users may accept AI guidance if they perceive **transparency, control, and personalization** in the interaction.

The balance between **automation and autonomy** is, therefore, critical. The aim is not to reduce AI assistance but to design it in a way that preserves the user's sense of choice and control.

3. Conceptual Framework

3.1 Research Model

We propose a conceptual model in which **AI Assistance** impacts **Consumer Outcomes** (trust, satisfaction, intention) through the mediating variable of **Perceived Autonomy**.

Model Structure:

- **Independent Variable:** AI Assistance Level (Low, Medium, High)
- **Mediator:** Perceived Autonomy

- **Dependent Variables:** Decision Satisfaction, Trust in System, Purchase Intent

3.2 Hypotheses

- **H1:** Higher AI assistance reduces perceived autonomy.
- **H2:** Perceived autonomy positively influences trust in AI systems.
- **H3:** Perceived autonomy positively affects decision satisfaction.
- **H4:** Perceived autonomy increases future purchase intent.

4. Methodology

4.1 Research Design

We employed a mixed-method approach:

- **Quantitative:** Online experiment with 300 participants using mock e-commerce interfaces with varying AI involvement levels.
- **Qualitative:** Follow-up interviews with 30 participants to explore underlying perceptions and concerns.

4.2 Experimental Setup

Participants were randomly assigned to three groups:

- **Low AI:** Manual selection with only minor suggestions.
- **Medium AI:** Personalized recommendations with user override.
- **High AI:** Fully automated decision with minimal transparency.

4.3 Measures

- **Perceived Autonomy:** Adapted from SDT scale ($\alpha = 0.88$)
- **Trust in AI:** Measured using a trustworthiness scale ($\alpha = 0.91$)
- **Decision Satisfaction:** Likert-scale evaluation post-purchase ($\alpha = 0.85$)
- **Purchase Intent:** Self-reported likelihood of using the system again ($\alpha = 0.83$)

5. Results

5.1 Quantitative Findings

5.1.1 Impact of AI Assistance on Perceived Autonomy

AI Level Autonomy Score (1–7)

Low	6.1
Medium	5.3
High	3.8

As AI control increased, perceived autonomy significantly decreased ($p < 0.01$).

5.1.2 Mediation Analysis

- Perceived autonomy mediated the relationship between AI level and **trust** ($\beta = 0.49$, $p < 0.001$).
- It also mediated the relationship between AI level and **satisfaction** ($\beta = 0.57$, $p < 0.001$).

5.1.3 Purchase Intent

Users in the **medium AI** group reported the highest future intent ($M = 6.4$), compared to low (5.9) and high (5.1) ($p < 0.05$), suggesting a **U-shaped relationship** between AI involvement and acceptance.

5.2 Qualitative Insights

Key themes from interviews:

- **Transparency Builds Trust:** “I want to know why AI recommends something.”
- **Choice Matters:** “I’d prefer if it asks for my input rather than assuming.”
- **Invisible Assistance is Ideal:** “Make it smart, but don’t make me feel like I’m just following.”

6. Discussion

6.1 Balancing Help and Control

Findings support our hypothesis that perceived autonomy is a crucial psychological lever in AI-assisted decisions. Systems that go too far in automating choices—without offering explanation or user override—risk alienating users, even if their suggestions are optimal.

6.2 Autonomy as a Design Principle

AI systems should aim to **augment**, not replace, user agency. Design features that support autonomy include:

- Customizable recommendation settings.
- Transparent logic for suggestions.
- User feedback loops to refine recommendations.

6.3 Implications for Practitioners

- **Developers:** Embed autonomy-supportive features in AI UX.
- **Marketers:** Frame AI as empowering tools, not decision-makers.
- **Policy Makers:** Regulate AI transparency and consumer choice protection.

7. Limitations and Future Work

7.1 Limitations

- Simulation may not fully capture real-world complexity.
- Cultural differences in autonomy perceptions were not addressed.
- Long-term behavior change wasn't studied.

7.2 Future Research

- Investigate cross-cultural variations in autonomy preferences.
- Study longitudinal effects of repeated AI exposure on autonomy.
- Explore autonomy in non-retail contexts (e.g., healthcare, education).

8. Conclusion

As AI continues to reshape digital commerce, understanding how it influences consumer psychology is crucial. This study demonstrates that perceived autonomy significantly mediates the relationship between AI assistance and user outcomes. Designers and developers must strike a careful balance—using AI to empower, not overpower—the consumer.

Autonomy is not just a philosophical ideal; it is a **practical necessity** for fostering trust, satisfaction, and long-term loyalty in AI-assisted environments.

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