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Understanding AI's Role in Shaping Consumer Choices

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Abstract

The rapid evolution of artificial intelligence (AI) has substantially transformed marketing and the way consumers make decisions. This study investigates the impact of transparency and perceived control on the acceptance of personalized recommendations made by AI systems. The research was conducted with 81 participants through online questionnaires collected between March and April 2024. The structural model used analyzed the relationships between transparency, perceived control, perception of AI, and consumers' purchasing decisions. The results reveal that transparency and perceived control act as critical mediators in the relationship between the perception of AI and acceptance of personalized recommendations, influencing consumer trust as well as their concerns about privacy and ethics in the use of data. The findings highlight that clear communication about how AI operates and offers recommendations can increase the perception of transparency, giving consumers a deeper understanding of the processes involved. At the same time, giving users more control over personalized preferences can lead to greater engagement and trust in AI-generated recommendations. Thus, companies looking to deploy personalized recommendation systems should focus on developing strategies that emphasize transparency and offer significant control to the user. The findings indicate that such approaches can significantly contribute to increasing the acceptance of personalized recommendations while addressing ethical and privacy concerns in the use of data.

Keywords: Artificial Intelligence; Transparency; Perceived Control; Digital Marketing; Consumer Decision.

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1. INTRODUCTION

The rapid evolution of artificial intelligence has significantly transformed the field of marketing and the way consumers make decisions. Current literature highlights an important gap: the limited understanding of the role of transparency and perceived control in the impact of artificial intelligence (AI) on consumer decision-making. This points to the need to explore transparency and control mechanisms, given that transparency, is recognized as a critical factor in establishing trust between consumers and AI systems. Despite this importance, there is a lack of clarity on how transparency and perceived control directly influence consumers' perception of personalized recommendations made by AI.

This identified gap leads to the following research questions (RQ) that could significantly contribute to the academic discourse on the relationship between transparency and perceived control of AI tools and the consumer's purchasing decision:

RQ1: *How does perceived transparency influence the acceptance of personalized recommendations by AI?*

RQ2: *How do different levels of perceived control impact consumer decision-making when interacting with AI systems?*

To answer these research questions, our study objective aims to investigate how transparency and perceived control of AI tools act as mediators in the relationship between the perception of AI and the consumer's purchasing decision.

By addressing these questions, this study aims to offer valuable insights for practitioners and researchers, contributing to a deeper understanding of the role of transparency and perceived control in consumers' interaction with AI systems in marketing. This objective allows us to i) analyze the influence of perceived transparency on consumer trust in AI systems; ii) assess how different levels of control affect the acceptance of personalized recommendations; iii) investigate how transparency and control mediate the relationship between consumers' perceptions and concerns about AI and their purchasing decisions.

To carry out this study, we used questionnaire surveys, where it was possible to obtain 81 participants over two months, from March to April 2024. The results obtained made it possible to test the structural model and carry out a path analysis that confirmed the hypotheses under study, as well as proving that the data fit the model.

This article consists of six main sections. After this introduction, the second section is dedicated to the literature review, which summarizes contributions on artificial intelligence in digital marketing, consumer perceptions and experiences, consumer decisions and their impact on purchasing decisions, transparency and control perceived by consumers, and consumer concerns about AI personalization. Subsequently, the third section presents the methodology of this study, the fourth section consists of the results obtained and the fifth section presents the discussion. The article ends with a conclusion, the main limitations, suggestions for future research, and practical and theoretical implications.

2. LITERATURE REVIEW

2.1. THE DOUBLE FACE OF ARTIFICIAL INTELLIGENCE IN MARKETING: ADVANCED PERSONALIZATION AND PRIVACY

The growing implementation of artificial intelligence (AI) in marketing has profoundly transformed business practices and interactions between companies and consumers. AI's ability to analyze large volumes of data allows for more precise and personalized communication, adjusting marketing strategies to consumers' individual needs in real-time (Liu et al., 2021). This level of personalization has shown the potential to significantly improve the consumer experience, increasing satisfaction and brand loyalty (Zhang & Qi, 2019).

However, this growing reliance on AI also raises significant concerns, especially concerning privacy and the ethical use of data. AI's ability to collect, store, and process personal information has highlighted the need for stricter regulations to protect consumers (Lavelle-Hill et al., 2020). Consumer expectations regarding transparency and control over their data are becoming increasingly demanding, forcing companies to adapt

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their policies and practices to fulfill these requirements (Kumar et al., 2019). In addition, the impact of AI on consumer purchasing behavior is remarkable, especially about impulse purchases. AI can identify behavioral and emotional patterns that predict when a consumer is more inclined to make an unplanned purchase (Wang et al., 2022). This knowledge allows companies to optimize their marketing strategies to present products at the most opportune moment, increasing impulse sales.

On the other hand, AI also has the potential to positively influence more conscious and ethical purchasing behavior. For example, AI systems can highlight fair trade or ecologically sustainable products, encouraging consumers to make choices that are in line with their personal values and social concerns (De Pelsmacker & Janssens, 2007). Thus, AI not only facilitates more efficient commercial transactions but can also contribute to greater social awareness and responsibility among consumers and companies (Oke et al., 2023). The following hypothesis is therefore proposed:

H 1: Consumers' perceptions and experiences lead them to develop concerns about AI personalization.

AI in marketing is therefore reshaping interactions between companies and consumers in complex and multifaceted ways. While it offers significant improvements in personalization and marketing effectiveness, it also raises ethical questions and privacy challenges that cannot be ignored (Davenport et al., 2020). Companies wishing to take advantage of AI must therefore consider these factors carefully and ethically, ensuring that the technology is used in a way that respects and enriches the consumer experience (Du & Xie, 2021). In this sense, he will formulate the following hypothesis:

H 1.1: Concerns about AI personalization mediate the relationship between consumers' concerns and experiences and their consumption decisions.

2.2. Consumer Decision-Making Influenced by AI Transparency and Perceived Control

Consumer decision-making is intrinsically linked to their perceptions and experiences. Previous studies (Kim et al., 2021; Korsunova et al., 2023; Maggioni et al., 2019; Qin et al., 2021; Zhang & Doucette, 2019) highlight that factors such as safety, convenience, well-being, and ease of use shape the consumer experience and, consequently, influence their choices. These perceptions, mediated by sensory and emotional experience, determine patterns of behavior in the purchase of products and services, highlighting the importance of an in-depth understanding of consumer needs and desires to guide effective marketing and product development strategies. The following hypothesis is therefore proposed:

H 2: Consumers' perceptions and experiences drive their decision-making.

The growing integration of AI in marketing makes it crucial to understand how these technologies shape consumer perception and experience. Transparency in AI systems is essential to establishing trust. Clarity about how recommendations are made and the presentation of understandable information about decision-making processes improves consumer trust in these systems, leading to greater acceptance of suggestions provided by AI (Li et al., 2019).

Transparency also influences the consumer's perception of fairness, who becomes more receptive to decisions when they perceive that AI acts fairly (Simonson & Sela, 2011).

Consumers' perceived control over interactions with AI systems is also crucial, as the ability to adjust and modify the recommendations provided by AI results in more positive experiences (Yan et al., 2017). For example, the ability to customize search filters or recommendation preferences increases consumer engagement with the technology.

Positive consumer perceptions and experiences of AI depend largely on the degree of transparency and control provided. AI systems that enable personalization and provide clear information on decision-making create a more satisfying experience for the consumer (Ferreira, Rei, and Moreira). In this sense, AI can help consumers achieve their goals, but only when they perceive that the technology is aligned with their objectives and offers direct control over their decisions (Gollwitzer & Sheeran, 2009).

In this sense, he will formulate the following hypothesis:

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H 3: Consumer perceptions and experiences are directly related to transparency and perceived control over tools and AI.

H 3.1: Transparency and perceived control over tools and AI mediate the relationship between consumer perceptions and experiences and consumer decision-making.

H 3.1: Transparency and perceived control over tools and AI are directly related to concerns about AI personalization.

Figure 1 shows the causal relationships between the previously presented research hypotheses.

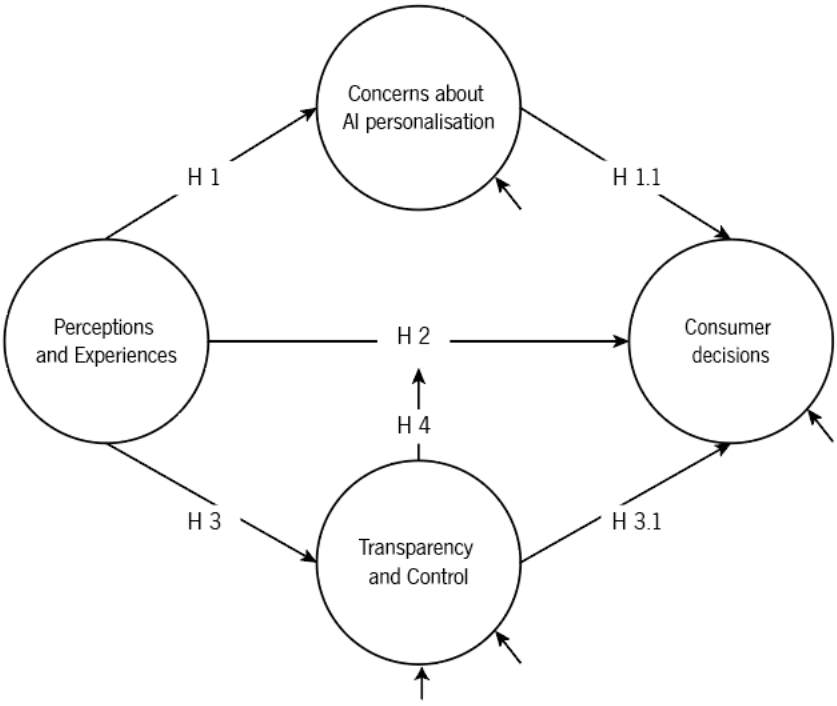

Figure 1 - Proposed Structural Model

Source: Developed by the author

3. METHODOLOGY

To fill the existing gap in the literature, which consists of the limited understanding of the role of transparency and perceived control in the impact of artificial intelligence (AI) on consumer decision-making, this study addresses research questions that can significantly enrich the academic discourse on the relationship between transparency, perceived control, and consumer purchasing decision. The research questions (RQs) are as follows:

RQ1: *How does perceived transparency influence the acceptance of personalized recommendations by AI?*

RQ2: *How do different levels of perceived control impact consumer decision-making when interacting with AI systems?*

By answering these questions, this study seeks to provide valuable insights for both practitioners and researchers, contributing to a deeper understanding of the role of transparency and perceived control in the interaction between consumers and AI systems in marketing.

The main objective of this research is to understand how transparency and perceived control of AI tools influence the relationship between consumers' perception of AI and their purchasing decisions. To achieve this objective, the following specific points have been defined: i) analyze the effect of perceived transparency on consumer trust in AI systems; ii) evaluate how different levels of perceived control affect the acceptance of

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personalized recommendations; iii) investigate how transparency and perceived control act as mediators between consumers' perceptions and concerns about AI and their purchasing decisions.

To gain these insights, the research was conducted online, using a non-probability convenience sample, over two months, from March to April 2024.

Initially, participants were asked to give their informed consent, which detailed various aspects of the research project including its objectives and the confidentiality safeguards in place. They were then asked to respond to several questionnaires concerning different aspects of digital marketing and artificial intelligence. These questionnaires covered topics such as general perceptions of AI, consumer experiences, the impact of these technologies on purchasing decisions, and specific concerns and expectations felt by consumers. The survey concluded with a socio-demographic questionnaire that collected personal information from the participants. This thorough methodology was designed to collect significant insights into current consumer attitudes towards AI and digital marketing.

3.1. CHARACTERIZATION OF THE PARTICIPANTS

The sample has 81 participants, 39 (48.1%) men, and 42 (51.9%) women. The age of the participants is between 35 and 67 years, with an average age of 51.36 years (SD= 7.95%), all are of Portuguese nationality.

This study was characterized by the regional and academic heterogeneity of its participants, as illustrated in Table 1. Data analysis revealed a preponderance of respondents from the Centre region, making up 63% of the sample, followed by a substantial representation from the North with 24.7%. The metropolitan areas of Lisbon, the Alentejo, and the Algarve showed more modest participation, each contributing less than 10% of the participants.

Table 1 - Distribution of participants per region

Region	**Number of participants**
North	20 (24.7%)
Center	51 (63%)
Lisbon Metropolitan Area	8 (9.9%)
Alentejo	1 (1.2%)
Algarve	1 (1.2%)
Undergraduate	4 (4.9%)
Postgraduate	1 (1.2%)
Masters	14 (17.3%)
Doctorate	55 (67.9%)
Post-Doctorate	6 (7.4%)
Aggregation	1 (1.2%)

Source: Developed by the author

Furthermore, the educational profile of the respondents proved to be remarkably inclined towards advanced stages of academic training, with an overwhelming majority of 67.9% holding a doctorate. Master's degree

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holders accounted for 17.3%, while participants with post-doctoral training accounted for 7.4%. Undergraduate and postgraduate training levels had a minimal presence in the sample.

3.2. INSTRUMENTS

Table 2 provides a comprehensive overview of consumer perceptions and experiences concerning the personalization promoted by Artificial Intelligence (AI) in online marketing.

Table 2 - Consumer perceptions of AI personalization in online marketing

	M	SD
Perceptions and Experiences (α = .79)		
AI significantly improves the relevance of the adverts I see online.	3.14	.787
Personalized shopping experiences created by AI make my online browsing more efficient.	3.11	.873
My negative experiences with personalized marketing by AI have been minimal or non-existent.	3.01	.783
Consumer Decisions (α = .58)		
I value personalized product/service recommendations made by AI systems.	2.80	. 993
Personalized AI recommendations often influence my online purchasing decisions.	2.27	1.08
I prefer direct interactions with humans to AI-automated interactions during the purchase process.	1.77	.978
Transparency and Control (α=.68)		
I would like to have more control over how my data is used for personalization by AI.	4.51	.654
Transparency from companies about the use of AI in marketing is fundamental to my trust.	4.40	.736
Concerns about AI Personalisation (α=0.70)		
Excessive personalization by AI in marketing makes me feel uncomfortable. (inverted)	4.14	.833
Adverts that seem to 'know too much' about my personal interests cause concern. (inverted)	4.21	.832

Source: Developed by the author

To assess perceptions and consumer experiences, a three-dimensional scale was developed (e.g., 'AI significantly improves the relevance of the adverts I see online."). This scale showed an acceptable level of internal consistency with a Cronbach's alpha of .79, which is in line with the parameters established by Gliem & Gliem (2003). Participants showed a moderately positive perception of the relevance of personalized ads and the efficiency of shopping experiences promoted by AI, with averages of 3.14 and 3.11 respectively. In addition, consumers reported minimal or no negative experiences with personalized marketing (M = 3.01). However, the relatively high standard deviations suggest considerable variation in individual perceptions.

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About the evaluation of consumer decisions and their impact on purchasing decisions, another three-dimensional scale was developed (e.g., 'I value personalized product/service recommendations made by AI systems.'), where it registered an internal consistency index considered poor (α=.58). This dimension revealed that although consumers value personalized recommendations (M=2.80), their influence on purchasing decisions is still limited (M=2.27). Furthermore, consumers prefer direct interactions with humans over automated interactions by AI during the purchasing process (M=1.77).

Regarding transparency and control perceived by consumers, a two-dimensional scale was created (e.g., 'I would like to have more control over how my data is used for personalization by AI.'). This scale obtained a questionable internal consistency index (α=.68). The dimension showed strong consumer concerns about transparency and control in the use of their data for personalization. The average of 4.51 for 'desire for greater control over data' and 4.40 for 'transparency fundamental to trust' indicates that consumers want greater participation and understanding of how their data is used.

Finally, to probe consumers' concerns about AI personalization, a two-dimensional scale was established (e.g., 'Excessive personalization by AI in marketing makes me feel uncomfortable.'), which showed an acceptable internal consistency index (α=0.70). Consumers showed significant discomfort with excessive personalization, expressing concerns about ads that seem to know too much about their personal interests (M=4.21) and discomfort with excessive personalization (M=4.14).

All the scales were answered on a Likert-type response scale, ranging from 1 (totally disagree) to 5 (totally agree), thus enabling a quantitative ranking of the respondents' attitudes and perceptions.

4. RESULTS

Statistical analyses were performed using the Statistical Package for the Social Science (IBM SPSS), version 29.0 for Mac, and the Analysis of Moment Structures (AMOS), version 29.0 for Windows.

Table 3 shows the correlations between the variables analyzed, as well as the internal consistency indices of the structural model variables for the total sample (n=81). The magnitude of the correlations shows the presence of moderate (.30 < r < .50) and strong (r > .50) relationships (Cohen, 1988) between the variables, with no signs of multicollinearity. In addition, most of the correlations are statistically significant (p < .10), meeting the assumption of linearity.

Table 3 - Correlations between study variables

	Perceptions and Experiences	**Consumer Decisions**	**Transparency and Control**
Perceptions and Experiences	.	.	.
Consumer Decisions	.510***	.	.
Transparency and Control	.072	-.185*	.
Concerns about AI Personalisation	. 124	-373***	.529***

Note: * p < 0.10; ** p < 0.05; *** p < 0.01.

Source: Developed by the author

Path analysis was carried out to assess the suitability of the structural model to the data and check whether the hypotheses previously formulated were confirmed, thus validating the existence of the proposed relationships between the constructs.

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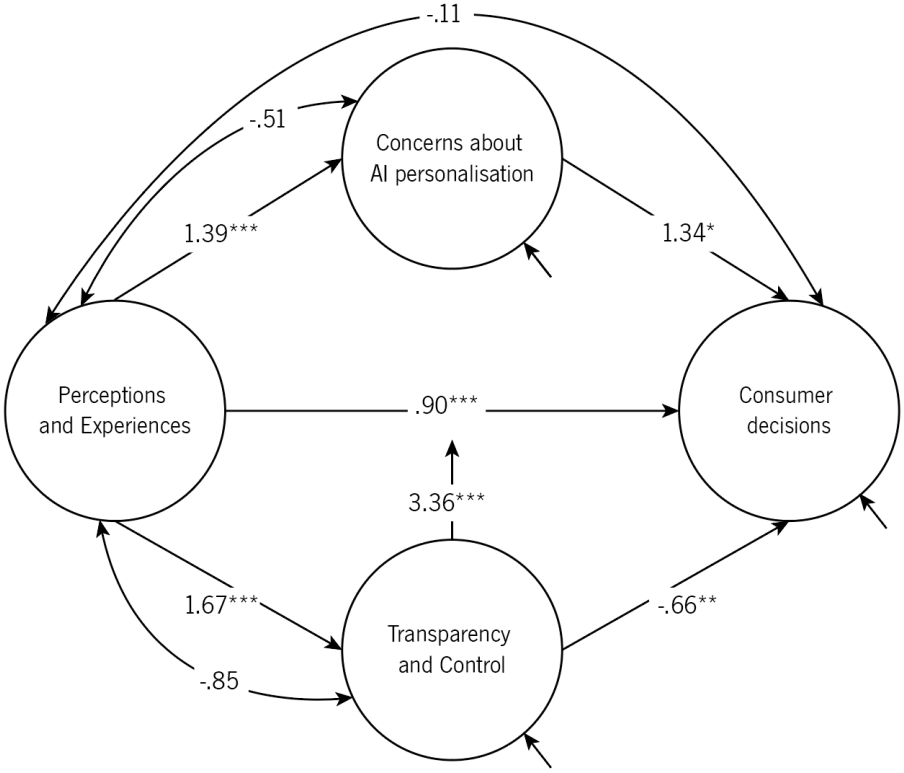
The final structural model showed a very good CFI value (≥.95; for the present sample 1), a very good GFI value (≥.95; for the present sample 1), an unacceptable RMSEA value (.05>RMSEA<.10; for the present sample .35) and an AIC value of 20.00.

Figure 2 shows the standardized estimates between the constructs of the final structural model. These estimates were evaluated and normalized to provide an accurate and academically rigorous representation of the relationships between these key components.



Note: * p < 0.10; ** p < 0.05; *** p < 0.01.

Figure 2 - Final Structural Model

Source: Developed by the author

Based on these findings, all the initially proposed hypotheses can be validated.

5. DISCUSSION

The coefficient of 1.39 (***), indicating a strong positive relationship between 'Perceptions and Experiences' and 'Concerns about AI Personalisation', suggests that consumer perceptions and experiences play a crucial role in shaping concerns about AI personalization. However, the direct relationship between perceptions/experiences and concerns can vary considerably between different consumer segments. Younger consumers, for example, may be more accustomed to personalization systems and therefore less concerned about privacy compared to older consumers (Liu et al., 2021). The sample used in the study is predominantly made up of highly educated individuals, possibly biasing the results towards a more critical view.

A coefficient of 0.90 (***) reveals a direct relationship between consumers' perceptions/experiences and their purchasing decisions. Zhang & Qi (2019) and Zhang & Doucette (2019) also suggest that positive perceptions of AI influence favorable decisions, improving the consumer experience. However, the positive influence can be mediated by other factors not considered in the model, such as brand trust or previous experiences with online shopping, as consumer perceptions can be affected by previous experiences with personalized recommendations (Kim et al., 2021). The 'Consumer Decisions' variable is assessed using a scale with a

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relatively low internal consistency index (α = .58), suggesting that it may not capture the full complexity of the decision-making process.

With a coefficient of 1.67 (***), there is a strong link between consumer perceptions and the importance of transparency and control over data. This confirms the studies by Kumar et al. (2019) and Lavelle-Hill et al. (2020), which emphasize the growing consumer demand for transparency in AI personalization processes. However, transparency and control are complex concepts. How each consumer understands and values them can differ substantially, especially between those who are familiar with AI systems (Lavelle-Hill et al., 2020). In addition, Yan et al. (2017) point out that the types of control (active/passive) can significantly influence consumer perception, limiting understanding of the mediating effect between perceptions and decisions.

The significant relationship between transparency/control and concerns about AI personalization (β=.3.36***) is consistent with previous research. Simonson & Sela (2011) reinforce that consumers who perceive a lack of transparency tend to have greater concerns about personalization. However, the simplified approach to the concept of transparency does not consider the different forms of communication (visual, textual, etc.) and how these impact consumers' understanding of AI personalization (Du & Xie, 2021). Furthermore, there is a lack of information on how different levels of transparency and control (e.g. full, partial) affect consumer concerns.

The relationship between transparency/control and consumption decisions (β= -0.66**) suggests that greater transparency can reduce impulsive consumption decisions, as indicated by Maggioni et al. (2019). However, this relationship may be more complex than shown, as excessive transparency can overwhelm consumers with irrelevant information, making the decision-making process more difficult (Kim et al., 2021; Davenport et al., 2020). The negative relationship may depend heavily on the cultural context, which is not explored in this study. Yan et al. (2017) point out that consumers' perceptions of control can vary significantly between different cultures, influencing how transparency and control impact their decisions.

The positive influence (β=.1.34*) between concerns and decisions suggests that even concerns about AI do not necessarily prevent purchasing decisions. Consumers who have concerns about AI can still be influenced in their purchasing decisions, confirming the findings of Wang et al. (2022). However, concerns can lead to compensatory behaviors, such as actively seeking less invasive alternatives (Oke et al., 2023). The sample may not be representative of all consumer segments, and the effects of concerns may differ between different demographic groups.

The indirect influence of perceptions/experiences on consumption decisions through concerns is significant. However, it is unclear whether this indirect influence is consistent across different levels of AI perception, suggesting a possible moderation by familiarity with the technology (Lavelle-Hill et al., 2020). Mediation through transparency and control indicates that positive perceptions lead to better decisions when mediated by trust in AI systems. However, the lack of consideration of types of control (active/passive) limits understanding of the mediating effect (Yan et al., 2017). Davenport et al. (2020) highlight the need for a better understanding of the nuances between different levels of transparency and control to obtain a more complete view of consumer behavior in the context of AI.

6. CONCLUSIONS

The main findings show that the perception of transparency generates trust and significantly increases consumer acceptance of AI recommendations. Similarly, perceived control, through customizable filters and preferences, allows consumers to personalize recommendations, having a positive impact on their decision-making. Ultimately, it highlights the importance of designing AI systems that prioritize transparency and allow users to take control, promoting trust and a deeper connection with consumers.

The article achieves its aim through the structural model and hypotheses tested which confirm the importance of transparency and control in promoting trust and acceptance, leading to actionable strategies for marketers. The research enriches the understanding of both practitioners and academics by revealing the key drivers of consumer behavior when interacting with AI in marketing.

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In response to the first research question, it was found that consumers are more likely to accept personalized recommendations when companies clearly explain how AI generates them and maintain fair practices. Transparency positively influences consumers' perception of fairness, making them more receptive to personalized AI suggestions. In addition, perceived control plays a significant role. When users can adjust recommendations and customize search filters, it fosters a sense of control over their interactions with AI. This increases their acceptance of and engagement with personalized recommendations. Transparency and control thus act as mediators between AI perceptions and purchasing decisions.

In response to the second question: How do different levels of perceived control impact consumer decision-making when interacting with AI systems?

The research concluded that consumer decision-making is significantly affected by perceived control, which is related to their ability to personalize or modify recommendations. Transparency in AI recommendations creates trust, leading to greater acceptance. Consumers are more likely to interact positively with AI systems that enable personalization and control since they align with their goals. The results suggest that transparency and perceived control act as modifiers in shaping consumer perceptions, concerns, and decisions. Greater perceived control can improve consumer acceptance of AI recommendations, thus affecting purchasing behavior.

This study has some limitations that should be acknowledged. The relatively small and homogeneous sample of 81 participants limits the generalizability of its findings to wider populations. Future research could involve larger and more diverse samples to increase external validity. In addition, the cross-sectional design used in this study captured data at a single point in time, which limits insight into the impact of transparency and control on consumer acceptance of AI over time. Longitudinal studies would be valuable to provide deeper insights into this dynamic. In addition, reliance on self-reported measures can lead to social desirability bias, which could distort the results. Future studies could address this issue by supplementing surveys with behavioral data to obtain more objective information.

Theoretically, this study contributes to the field by advancing trust theory and highlighting how transparency and control are critical factors influencing consumer trust in AI systems. It also contributes to the understanding of consumer decision-making models, particularly in how transparency and perceived control mediate the acceptance of AI recommendations. Furthermore, the study enriches the literature on ethical AI by highlighting the importance of fairness, transparency, and control in the development of consumer-centric recommender systems.

In practice, marketers should consider designing AI systems with transparency and control features, such as providing customizable explanations and filters, to increase consumer acceptance.

By offering greater control, marketers can give consumers the chance to personalize their recommendations, increasing engagement and satisfaction. Furthermore, implementing transparent practices can help companies comply with data privacy regulations and align with consumer expectations regarding the ethical use of AI.

In summary, this study allows us to increase our understanding of the significant roles of transparency and perceived control in shaping consumer interactions with AI systems for personalized recommendations.

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