AI-Enhanced Personalization in the Turkish E-Commerce Market

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Abstract: This study explores the applications of artificial intelligence in e-commerce, focusing on platforms and consumer behavior and decision-making in Türkiye. The main purpose of the study is to investigate the effects of AI-driven tools integrated into e-commerce platforms, on users' psychological and behavioral engagement. The findings of this research demonstrate that effectively integrating AI-driven tools into e-commerce platforms positively affects users' interaction with those platforms and leads to the development of psychological and behavioral engagement attitudes towards them, which highlights the crucial role of technological tools in enhancing user experience and satisfaction. This research has significant implications for marketers, e-commerce stakeholders, and policymakers, as it provides evidence-based insights for developing a more engaging e-commerce environment in Türkiye.

1. Introduction

In today's era of technological advancements, AI stands at the forefront as a revolutionary force reshaping industries and businesses' interactions with their customers, with the e-commerce industry being one of its primary beneficiaries. The Turkish e-commerce market, known for its vibrant and growing digital marketplace, as well as its supportive governmental initiatives, fosters a conducive environment for digital transformation and innovation that has been extensively studied by various pieces of literature. However, the applications and integration of AI and their impact on consumers is a topic that has not been fully explored. This study aims to fill this gap by examining various AI-driven tools utilized in this market and investigating their impact on consumer engagement.

2. Literature Review
2.1. E-Commerce
E-commerce refers to the utilization of electronic media and the Internet for conducting business transactions, which includes the purchase and sale of goods and services (Jain et al., 2021). E-commerce utilizes technological tools, like electronic data interchange and Internet platforms, to facilitate trading goods and services between companies and their customers (Jain et al., 2021). This digital commerce model has allowed businesses to set up virtual shops and also provided shoppers the convenience of buying items through different payment options, including credit and debit cards, or electronic fund transfers (Jain et al., 2021).

Having experienced a rapid expansion in recent years, the e-commerce market worldwide is anticipated to continue growing at unprecedented rates. According to Baluch (2023), 20.8% of retail purchases worldwide were expected to occur online, reaching 24% by 2026. With more customers favoring online platforms for making their purchases from the comfort of their homes, it is no surprise that e-commerce sales are also expected to surge. Global e-commerce sales were expected to grow by 10.4% in 2023, and are further expected to expand by 28.6% by 2026, bringing the market to a total of 8.1 trillion USD (Baluch, 2023).

The Turkish e-commerce sector has emerged as one of the fastest-growing markets in the world. As reported by the Turkish Ministry of Trade, Türkiye's e-commerce market reached a total value of 1.85 trillion TL in 2023, which reflected a substantial growth of 115.15% from its 2022 size (T.C. Ticaret Bakanlığı, 2024). The remarkable high-paced expansion of Türkiye's e-commerce market, which witnessed 559,412 active businesses serving their customers through e-commerce marketplaces (T.C. Ticaret Bakanlığı, 2024), demonstrates its significance as a valuable market to study.

2.2. AI in E-Commerce
According to the McKinsey & Company 2024 survey, AI adoption has surged by 72% globally in 2024 alone, with 58% of respondents reporting witnessing an increase in revenue and 35% reporting cost reductions (Singla et al., 2024). Chevalier (2023) revealed that 70% of the executives believed that AI would help personalize their customers' experiences on their e-commerce platforms and 34% saw it as a tool for enhancing customer service.

Asante et al. (2023) emphasize the significance of AI applications in enhancing e-commerce businesses' performance and their growing importance as a technological priority. Cheng et al. (2023) highlight that AI-driven technologies represent a competitive advantage to e-commerce businesses. Nimbalkar and Berad (2021) stress the positive effects of AI technologies on the productivity and operational efficacy of e-commerce businesses that are centering their customer engagement strategies and investments around AI technologies to maintain their competitive edge. Khrais (2020) underscores the importance of AI further by describing it as an essential innovative tool in the e-commerce sector for personalizing customer experiences and products to meet their demands.

AI applications and integration in e-commerce are utilized in a wide range of tools that affect all stages of operations and customer interactions, from initial contact through purchase and payment to after-sale support. Tools like chatbots utilize AI technologies like self-learning capabilities and natural language processing to interact with customers, offer them insights (Nimbalkar & Berad, 2021), and answer their inquiries (Cheng et al., 2023). Recommender systems employ AI big data collected by e-commerce platforms on customers' search and purchase history (Nimbalkar & Berad, 2021) to provide them with recommendations tailored to their needs and preferences (Cheng et al. 2023). Functionalities like visual search utilize AI to simplify the product search process and allow users to search for products using images (Asante et al., 2023), and systems like automated after-sales services deploy AI to automate feedback, facilitate exchange requests, resolve post-purchase issues, and provide transaction notifications (Asante et al., 2023).

The extensive literature on those tools and their integration into e-commerce platforms highlights their crucial role in creating value for businesses and customers. This study takes inspiration from Asante et al. (2023) and focuses on the impact of those AI-driven tools on consumers in the Turkish e-commerce market.

2.3. AI in E-Commerce and Consumer Engagement

Consumer engagement is a multilayered concept that has been conceptualized differently across various literature. In the context of e-commerce, its definition takes on added significance due to the importance of interaction in its platforms. Brodie et al. (2011) stress the importance of consumer engagement in a dynamic and interactive business environment in creating a positive customer experience and competitive advantage.

Bowden (2009) proposed that engagement is a psychological process that consumers move through in developing loyalty, commitment, and attachment. Hollebeek (2011) expanded on that work and defined it as the level of cognitive absorption, emotional resonance, and affective attachment toward a brand. Building upon these insights, Brodie et al. (2013) developed a working definition as a fluctuating psychological state that involves interactive experiences of cognitive and emotional aspects.

While multiple literature defines consumer engagement as an unobservable psychological state, others suggest another observable layer. Behavioral engagement, as defined by Van Doorn et al. (2010), is the behavioral manifestation of the motivational drivers of consumers toward a brand or firm beyond purchase or usage. It includes writing reviews, recommending to others, and engaging in positive word-of-mouth (Van Doorn et al., 2010).

Within the context of this study, consumer engagement represents the dynamic interaction between consumers and e-commerce platforms and encompasses the psychological and behavioral dimensions (Asante et al., 2023). AI-driven tools in Turkish e-commerce platforms play a pivotal role in shaping this engagement by personalizing consumers' online shopping experience (Hollebeek et al., 2014).

Consumer behavior models have always been an aid in exploring consumer behavior, and according to multiple literature, the Stimulus-Organism-Response (SOR) model presents a well-accepted framework (Asante et al., 2023). This model suggests that when an individual gets exposed to an external factor, a stimulus (S), a trigger in their inner state takes place, the organism (O), which leads to a resulting behavior, the response (R) (Mehrabian & Russel, 1974). Multiple studies that utilized the SOR model in the context of e-commerce have shown that platforms' features represent important stimuli that impact consumer behavior (Asante et al., 2023; Guo et al., 2021; Wei, 2023). In the context of this study, stimuli include consumers' interaction with AI-driven tools. The SOR model is employed to explain how those tools (S) impact the formation of consumer psychological (O) and behavioral (R) engagement.

This study also brings to light the role of consumers' attention to social comparison, which is the level of consumers' sensitivity to other consumers' opinions of their purchasing and consumption choices (Lennox & Wolfe, 1984), due to the ever-increasing influence of social factors on consumer engagement (Busalim et al., 2021).

3. Hypothesis Development

3.1. Chatbots and Consumer Engagement

Chatbots provide users with turn-by-turn conversations to address questions, inquiries, concerns, and issues. Their ability to handle user inquiries effectively and promptly is valuable in retail and consumer services and contributes to positive consumer sentiment (Tran et al., 2021), an enhanced experience (Asante et al., 2023; Nimbalkar & Berad, 2021), and an improved satisfaction level (Cheng et al., 2023).

Therefore, this study hypothesizes that:

Hypothesis 1a: Chatbot's efficiency in an e-commerce platform positively affects consumers' psychological engagement level.

Hypothesis 1b: Chatbot's efficiency in an e-commerce platform positively affects consumers' behavioral engagement level.

Hypothesis 1c: Consumers' psychological engagement level mediates the relationship between the chatbot's efficiency in an e-commerce platform and their behavioral engagement level positively.

3.2. Visual Search and Consumer Engagement

Visual search is fast and intuitive and allows user search to transcend linguistic or expressive restrictions (Dagan et al., 2023). They can enhance personalization and user experience (Cheng et al., 2023), and help users save time on browsing, and improve their search result satisfaction (Asante et al., 2023).

Therefore, this study hypothesizes that:

Hypothesis 2a: Visual search efficiency in an e-commerce platform positively affects consumers' psychological engagement level.

Hypothesis 2b: Visual search efficiency in an e-commerce platform positively affects consumers' behavioral engagement level.

Hypothesis 2c: Consumers' psychological engagement level mediates the relationship between the visual search efficiency in an e-commerce platform and their behavioral engagement level positively.

3.3. Recommender Systems and Consumer Engagement

Recommender systems provide customers with a better shopping experience through personalization (Huang et al., 2022). They can also increase customer satisfaction, conversion (Nimbalkar & Berad, 2021), retention, and sales (Cheng et al., 2023). According

to Maslowska et al. (2022), these systems' effectiveness has a significant impact on users' engagement with the platform.

Therefore, this study hypothesizes that:

Hypothesis 3a: Recommender system's efficiency in an e-commerce platform positively affects consumers' psychological engagement level.

Hypothesis 3b: Recommender system's efficiency in an e-commerce platform positively affects consumers' behavioral engagement level.

Hypothesis 3c: Consumers' psychological engagement level mediates the relationship between the recommender system's efficiency in an e-commerce platform and their behavioral engagement level positively.

3.4. Automated After-Sales Services and Consumer Engagement

Automated after-sales services can enhance customer satisfaction by facilitating all their post-sale requests and offering them a personalized experience (Asante et al., 2023). Nasir et al. (2021) emphasize the significant role of those services in engaging customers, enhancing their shopping experience, generating positive word-of-mouth, and driving their repurchase intentions.

Therefore, this study hypothesizes that:

Hypothesis 4a: Automated after-sales services efficiency in an e-commerce platform positively affects Turkish consumers' psychological engagement level.

Hypothesis 4b: Automated after-sales services efficiency in an e-commerce platform positively affects Turkish consumers' behavioral engagement level.

Hypothesis 4c: Turkish consumers' psychological engagement level mediates the relationship between the automated after-sales service's efficiency in an e-commerce platform and their behavioral engagement level positively.

3.5. Psychological Engagement and Behavioral Engagement

Behavioral engagement is described as a dimension of consumer engagement (Van Doorn et al., 2010), which is defined in other pieces of literature as a psychological state (Bowden, 2009; Brodie et al., 2013; Hollebeek, 2011) that involves interactive experiences comprising cognitive and emotional aspects. As such, this study views behavioral engagement as a by-product of customers' psychological engagement with AI-driven tools.

Therefore, this study hypothesizes that:

Hypothesis 5: Consumers' psychological engagement level affects their behavioral engagement level positively.

3.6. Attention to Social Comparison and Consumer Engagement

Lennox and Wolfe (1984) emphasize that consumers who are highly sensitive to negative evaluations of their consumption choices and habits present a higher level of adherence to social cues and norms and that consumers with lower self-esteem present a higher level of conformity to social pressure and norms (Lennox & Wolfe, 1984).

Therefore, this study hypothesizes that:

Hypothesis 6: Consumers' attention to social comparison moderates the effect of their psychological engagement level on their behavioral engagement level negatively.

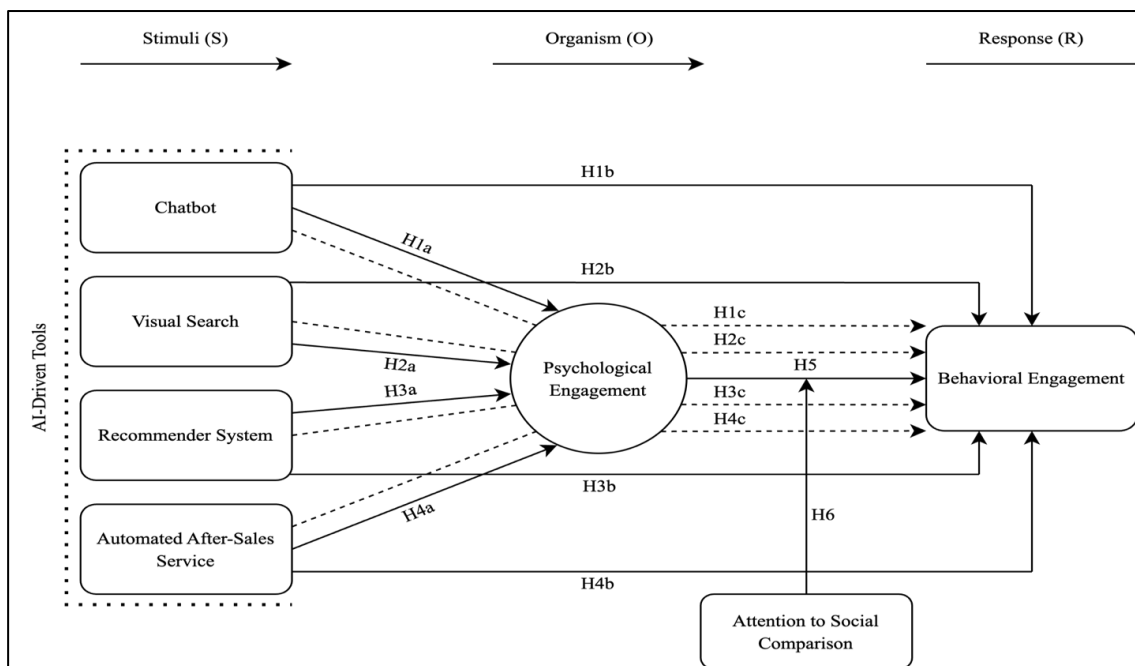### 3.7. Theoretical Framework

Figure 1. Theoretical Framework Adapted from Asante et al. (2023)

4. Methodology

This study employs a quantitative methodology as it is the most suitable for hypothesis testing and facilitates quantifying the effects of AI-driven tools on user

engagement. The research design adopted was cross-sectional as the primary data were collected from a sample of e-commerce platform users at a specific point in time using a structured survey, which allows for the generalizability of findings to the broader population of e-commerce platform users in Türkiye.

The target population of this study was users of e-commerce platforms in Türkiye. According to Kemp (2023), internet penetration in Türkiye at the beginning of 2023 was at 83.4%, with 71.38 million internet users, and according to Sarıçiçek et al. (2022), 75% of internet users in Türkiye shop online and 68.5% of those users shop via e-commerce platforms. As such, the estimated target population of this study is 36.7 million users. With a confidence level of 95% and a margin of error of 8%, the sample size was set at 151.

Table 1. Variables Operationalization

Variable	Conceptualization	Operationalization
Independent Variables		
Chatbot Efficiency (CB)	The efficiency of the software mimicking conversations with human users over the internet (Tran et al., 2021)	Asante et al.'s four items measurement scale (2023)
Visual Search Efficiency (VS)	The efficiency of the function allowing users to use images as search queries to retrieve a list of visually similar results (Dagan et al., 2023)	Asante et al.'s four items measurement scale (2023)
Recommender System Efficiency (RS)	The efficiency of the tool providing users with suggestions of items relevant to their interests and preferences (Maslowska et al., 2022)	Asante et al.'s four items measurement scale (2023)
Automated After-Sales Service Efficiency (AS)	The efficiency of the feature automating after-sales support, from handling customer feedback to product replacement and return (Asante et al., 2023)	Asante et al.'s four items measurement scale (2023)
Dependent and Mediating Variable		
Psychological Engagement Level (PE)	The level of positive state of mind experienced by users as a result of their interaction with AI-driven tools (Asante et al., 2023)	Asante et al.'s three items measurement scale (2023)
Dependent Variable		
Behavioral Engagement Level (BE)	The level of continued interaction displayed by users as a result of their interaction with AI-driven tools and its resulting positive state of mind (Asante et al., 2023)	Asante et al.'s four items measurement scale (2023)
Moderating Variable		
Attention to Social Comparison Level (ASC)	The level of sensitivity of e-commerce platform users to society's judgment of their purchase choices (Lennox & Wolfe, 1984)	Asante et al.'s four items measurement scale (2023)

The study utilized Google Forms as an online survey tool to reach a wider audience, strengthen the response rate, and ensure the data's representativeness. The online survey was disseminated, and participants were recruited through contacts and social media platforms. The participants were instructed to fill out the survey anonymously, which served as a motivation and strategy to minimize response bias and increase the response rate.

Constructs from a previously published academic study were adopted to ensure the construct validity of the measurement scales. This research adopted the constructs and measurement scales from Asante et al. (2023), which investigated the same relationships in the Chinese e-commerce market.

5. Data Analysis

5.1. Descriptive Analysis

A descriptive analysis was conducted to summarize and describe the main features of the data collected from participants, including the means, standard deviations, and variances of all variables observed.

Table 2. Descriptive Statistics

Variable	N	Mean	Standard Deviation	Variance
CB	151	4.4983	1.38097	1.907
VS	151	4.2798	1.69998	2.89
RS	151	5.2169	1.25122	1.566
AS	151	4.9768	1.29626	1.68
PE	151	5.0068	1.36981	1.876
BE	151	4.957	1.2812	1.641
ASC	151	4.8907	1.33247	1.775

The descriptive statistics suggest a positive perception of AI-driven tools amongst e-commerce platform users in Türkiye, with recommender systems rated highest (5.2169). Recommender systems also possess the highest level of consensus amongst users with the lowest standard deviation (1.25122) and variance (1.566). Psychological and Behavioral engagement received mean values higher than 4.9, which indicates that participants are engaged psychologically and behaviorally by those platforms.

5.2. Reliability Analysis

To ensure the reliability and internal consistency of the constructs and their measurement scales, a reliability analysis was conducted by assessing the variables' Cronbach's alphas.

Table 3. Reliability Test Coefficients

Variable	Number of Scale Items	Cronbach's Alpha Coefficient
CB	4	0.808
VS	4	0.936
RS	4	0.875
AS	4	0.848
PE	3	0.71
BE	4	0.787
ASC	4	0.826

The Cronbach alpha coefficients of all variables indicate a good to excellent reliability and internal consistency level of the measurement scale items, with the values of the coefficients ranging from 0.71 for psychological engagement to 0.936 for visual search.

5.3. Correlation Analysis

A correlation analysis was conducted to gain insight into the relationships between the AI-driven tools and consumer engagement variables. The Pearson correlation matrix exhibits the strength and direction of those relationships.

Table 4. Correlation Test Matrix

		CB	VS	RS	AS	PE	BE	ASC
CB	Pearson Correlation	1	.446**	.537**	.531**	.524**	.556**	.330**
	Sig. (2-tailed)		0	0	0	0	0	0
VS	Pearson Correlation	.446**	1	.569**	.457**	.538**	.518**	.444**
	Sig. (2-tailed)	0		0	0	0	0	0
RS	Pearson Correlation	.537**	.569**	1	.680**	.588**	.666**	.470**
	Sig. (2-tailed)	0	0		0	0	0	0
AS	Pearson Correlation	.531**	.457**	.680**	1	.559**	.665**	.299**
	Sig. (2-tailed)	0	0	0		0	0	0
PE	Pearson Correlation	.524**	.538**	.588**	.559**	1	.713**	.429**
	Sig. (2-tailed)	0	0	0	0		0	0
BE	Pearson Correlation	.556**	.518**	.666**	.665**	.713**	1	.441**
	Sig. (2-tailed)	0	0	0	0	0		0
ASC	Pearson Correlation	.330**	.444**	.470**	.299**	.429**	.441**	1
	Sig. (2-tailed)	0	0	0	0	0	0	

The correlation coefficients indicate a significantly positive and moderate relationship between consumers' perceived efficiency of all AI-driven tools and their psychological and behavioral engagement levels with all values being positive and above 0.5. The results also indicate a significantly positive and strong relationship between consumers' psychological engagement with the platforms and their level of behavioral engagement (0.713).

5.4. Regression Analysis

A collinearity test was conducted before commencing hypothesis testing to ensure a reliable interpretation of the estimated regression coefficients. The results indicated that no significant collinearity affects any of this study's variables, with all VIF values below three and all tolerance values above 0.1 (Asante et al., 2023).

5.4.1. Direct Effects

The results of the regression analysis conducted to test this study's hypothesis indicated a positive and direct effect of all AI-driven tools efficiency on users' psychological and behavioral engagement levels.

Table 5. Results of Hypothesized Direct Effects

	Relationship	Path Coefficient	t-statistic	Significance	Result
H1a	CB->PE	0.1980	2.6280	0.0100	Supported
H2a	VS->PE	0.2390	3.1760	0.0020	Supported
H3a	RS->PE	0.2070	2.2660	0.0250	Supported
H4a	AS->PE	0.2030	2.3730	0.0190	Supported
H1b	CB->BE	0.1760	2.5750	0.0110	Supported
H2b	VS->BE	0.1360	1.9970	0.0480	Supported
H3b	RS->BE	0.2760	3.3380	0.0010	Supported
H4b	AS->BE	0.3220	4.1650	0.0000	Supported
H5	PE->BE	0.7130	12.4150	0.0000	Supported

H1a to H4a: For a t-statistic of 2.6280 (CB->PE), 3.1760 (VS->PE), 2.2660 (RS->PE), 2.3730 (AS->PE), and p-values of 0.0100, 0.0020, 0.0250, 0.0190<0.05, respectively, the hypotheses on the effect of all the AI-driven tools on users' psychological engagement level were supported.

H1b to H4b: For a t-statistic of 2.5750 (CB->BE), 1.9970 (VS->BE), 3.3380 (RS->BE), 4.1650 (AS->BE), and p-values of 0.0110, 0.0480, 0.0010, 0.0000<0.05, respectively, the hypotheses on the effect of all the AI-driven tools on users' behavioral engagement level were supported.

H5: For a t-statistic of 12.4150 and a p-value of 0.0000<0.05, the hypothesis on the effect of users' psychological engagement on their behavioral engagement level was supported.

5.4.2. Mediating Effects

The results of the regression analysis also indicated a positive and indirect effect of all AI-driven tools on users' behavioral engagement through their psychological engagement.

Table 6. Results of Hypothesized Mediating Effects

	Relationship	Path Coefficient	BootSE	BootLLCI	BootULCI	Result
H1c	CB->PE->BE	0.2829	0.5040	0.1909	0.3903	Supported
H2c	VS->PE->BE	0.2479	0.0408	0.1705	0.3317	Supported
H3c	RS->PE->BE	0.2956	0.5600	0.1906	0.4082	Supported
H4c	AS->PE->BE	0.2742	0.0525	0.1786	0.3840	Supported

H1c to H4c: With 0 not falling between any of the BootLLCI and BootULCI ranges, the hypotheses suggesting that psychological engagement mediates the relationship between all AI-driven tools and users' behavioral engagement level were supported.

5.4.3. Moderating Effect

The results of the regression analysis revealed that users' attention to social comparison does not moderate the effect of their psychological engagement on their behavioral engagement.

Table 7. Result of Hypothesized Moderating Effect

	Relationship	Interaction Effect	t-statistic	Significance	Result
H6	Moderated PE->BE	−0.0450	−0.7970	0.4270	Not Supported

H6: With a t-statistic of −0.7970 and a p-value of 0.4270>0.05, the analysis did not support the moderating effect of attention to social comparison, suggesting that the influence of psychological engagement on behavioral engagement as a result of users' interaction with AI-driven tools does not vary significantly based on their level of attention to social comparison.

6. Discussion

6.1. Results Interpretation

The results reveal that AI-driven tools on e-commerce platforms in Türkiye positively affect consumer engagement. Chatbots impact psychological (0.1980) and behavioral (0.1760) engagement positively, demonstrating their crucial role in attracting positive user engagement attitudes. Visual search's positive influence on consumers' psychological (0.2390) and behavioral (0.1360) engagement also exhibits its importance in motivating engagement with the platform. Moreover, recommender systems and their positive effects on psychological (0.2070) and behavioral (0.2760) engagement emphasize their critical role in creating an engaging personalized experience. Furthermore, automated after-sales services positively impact psychological (0.2030) and behavioral (0.3220) engagement, highlighting its significant role in engaging consumers.

These results align with the findings of Asante et al. (2023), who found a significant relationship between AI-driven tools on Chinese e-commerce platforms and users' engagement. The results also align with additional studies, such as Tran et al. (2021) on chatbots, Dagan et al. (2023) on visual search, Maslowska et al. (2022) on recommender systems, and Nasir (2023) on after-sales services, all of which have linked those tools to fostering positive consumer sentiment, satisfaction, and engagement.

Additionally, the findings demonstrate a positive relationship between users' psychological and behavioral engagement (0.7130). These findings indicate that users who develop a positive state of mind as a result of their interaction with AI-driven tools are more likely to display engagement behaviors towards the platform.

Likewise, the findings on the indirect effects of AI-driven tools on consumer engagement support the mediating effect that psychological engagement has on the association between those tools and users' behavioral engagement, which suggests that users' active and observable engagement behaviors towards the platform can be enhanced by their psychological engagement.

6.2. Theoretical Implications

This study contributes to e-commerce, AI, and consumer engagement literature. First, this research expands the knowledge in the field of e-commerce in Türkiye by examining the applications of AI tools and their impact on consumer engagement.

While most of the literature mainly focuses on the technicalities of AI technologies, their adoption, and their impact on businesses, this study focuses on its significance within the context of consumer behavior, specifically Turkish consumers, by exploring their interaction with AI technologies utilized by leading e-commerce platforms.

In addition, inspired by the work of Asante et al. (2023), this study contributes to the understanding of the process of consumer engagement formation from unobservable attitudes and state of mind (psychological engagement), as a result of the interactions with external factors (AI-driven tools on e-commerce platforms), to observable actions and behaviors (behavioral engagement) by utilizing the SOR model and expanding its context. The findings further support the validity and effectiveness of this consumer behavior model in developing theoretical frameworks in the digital environment.

6.3. Practical Implications

The findings can provide actionable insights for marketers, e-commerce stakeholders, and policymakers as the results support the crucial role of integrating AI into e-commerce platforms to foster user psychological engagement and ascertain their behavioral engagement of continued use of the platform, providing referrals and good word-of-mouth, as well as writing reviews about their experiences.

First of all, the results suggest that automated after-sales services and recommender systems have the most significant impact on users' behavioral engagement level, which emphasizes the importance of dedicating e-commerce businesses' efforts to enhancing and tailoring those tools to the needs and preferences of Turkish consumers to attract more observable engagement behaviors from them. Secondly, E-commerce businesses can improve their platforms' interactivity through AI-driven tools by better tailoring them to provide users with a shopping experience that keeps them satisfied, enthused, and at ease. As suggested by the findings, garnering this positive state of mind from users would lead to more positive observable behaviors.

In addition, the findings can also provide valuable information for policymakers in Türkiye about the importance of supporting and facilitating the integration of AI, especially small to medium businesses. Implementing regulations and incentives that promote innovation in AI and its integration, while at the same time ensuring the protection of consumer rights, can have a substantial impact on developing this sector and the overall Turkish economy.

7. Conclusion

The findings provide evidence of the significant role of AI-driven tools in enhancing consumer engagement on e-commerce platforms in Türkiye and fostering positive relationships between businesses and their customers. The findings suggest that by creating a more personalized, satisfying, and efficient shopping experience, AI-driven tools on e-commerce platforms not only meet consumers' immediate needs but also attract and enhance their engagement.

Despite this study's theoretical and practical implications, it has its limitations. The first limitation is due to the small sample size and the demographic profile of the participants, which could limit the generalizability of the results. Future studies should consider a more extensive and diverse sample to enhance the representativeness of the results.

Another limitation was due to restrictions in the research design. First, a cross-sectional design does not account for changes over time. Future research could consider utilizing a longitudinal design to capture deeper insights into the long-term effects of AI-driven personalization as AI technologies and their adoption, and acceptance by businesses and consumers constantly evolve. Secondly, future research should consider a mixed methods approach that would provide deeper insights into consumers' attitudes and perceptions.

Finally, future research could explore the impact of other technological tools on Turkish consumers' behavior and engagement with e-commerce platforms, as the tools investigated are certainly not the only determinants.

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