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AI-powered personalized recommendations and pricing: Moderating effects of ethical AI and consumer empowerment

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ABSTRACT

In today's digital landscape, AI-powered personalization is transforming consumers' interactions with online services. This paper investigates the impacts of AI-powered personalization at online travel agencies (OTAs) on consumers' trust and future engagement, focusing on potential ethical concerns related to perceived discrimination and privacy. Through four studies, this research explores how disclosing AI technology in personalization services influences consumers' reactions (Study 1) along with the mediating roles of perceived discrimination and privacy concerns (Study 2). Our findings reveal that ethical AI guidelines can reduce negative effects on perceived discrimination, thereby improving consumers' responses (Study 3). Consumer empowerment (i.e., allowing users to disenable personalization in this case) enhances engagement by addressing privacy concerns (Study 4). This research contributes to relevant literature by documenting how AI-powered personalization shapes consumers' reactions. It also offers managerial insights for developing ethical frameworks and empowering strategies that align AI applications with consumers' expectations and usage behavior.

1. Introduction

Artificial intelligence (AI) has emerged as a transformative tool in the digital age, reshaping how businesses engage with consumers. In online service contexts, such as online travel agencies (OTAs), AI can enhance consumer engagement through personalized interactions and tailored experiences (i.e., "AI-powered personalization"). In spring 2024, Expedia Group introduced Romie, the travel industry's first AI-powered assistant. Romie analyzes extensive consumer data (e.g., purchase histories, browsing behavior, search patterns, preferences, and demographics) to offer users tailored destination and hotel recommendations alongside personalized price promotions. The assistant's algorithms continuously evolve: learning from users' travel habits enables Romie to provide increasingly refined suggestions (Expedia Group, 2024). Similarly, Booking.com leverages users' personal data—including demographic information, preferences, and reviews—to return bespoke promotional offers and travel options (Booking.com, 2023).

AI-powered personalization could profoundly influence online service provision. Porwal (2024) stated that Expedia's AI-driven tool exemplifies a consumer-centric approach, setting a new standard in the travel and hospitality sector. This strategy can enhance marketing effectiveness by aligning promotional content with people's preferences. For instance, e-service platforms may craft hyper-targeted campaigns that resonate with specific audience segments (Raji et al., 2024). AI-powered personalization can also boost consumers' engagement, loyalty, conversion rates (Babatunde et al., 2024), and purchase intentions (Venkatesh et al., 2021).

Despite the enthusiasm over AI's prospective benefits, its adoption comes with substantial ethical concerns. Individuals are increasingly aware of how online platforms obtain, manage, and use personal data (Raji et al., 2024). Several ethical challenges have thus arisen, including that AI is effectively a 'black box': opaque processes obscure the rationale behind system output. This lack of transparency can lead to biased decision making and potentially unfair outcomes (Elliot, 2022). Additionally, AI systems often lack accountability for the content they produce, complicating efforts to uphold industry standards (Dwivedi et al., 2023). AI-generated content may inadvertently reinforce stereotypes or discriminate against certain demographics (e.g., on the basis of ethnicity, race, or gender) due to biases in training data and algorithms (Pazzanese, 2020). These issues can exacerbate societal disparities and raise further ethical concerns (Dogru et al., 2025).

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Research into AI technologies' ethical challenges has not kept pace with these tools' rapid adoption, creating a sizable gap in knowledge (Dwivedi et al., 2023). This void highlights the need for deeper investigation into AI's ethical implications, particularly regarding its design, deployment, and use. Establishing guidelines and best practices for responsible AI implementation is imperative. In light of this need, we empirically examine how AI-powered personalization (as guided by users' personal data and preferences) affects consumers' trust and future use of OTAs that share customized hotel recommendations and price promotions. Additionally, our research explores consumers' perceptions of discrimination and privacy concerns associated with AI-powered personalization. We specifically evaluate the potential success of two strategies, ethical AI practices and consumer empowerment, in mitigating these concerns. These two moderators were chosen because they address major ethical concerns in AI-powered personalization: fairness and privacy control. Ethical AI guidelines aim to reduce algorithmic bias and enhance transparency, which can alleviate issues related to perceived discrimination (Dogru et al., 2025; Lin et al., 2020). Meanwhile, consumer empowerment (i.e., allowing users to opt out or adjust personalization settings) can relieve privacy concerns by giving people more control over their data (Jain et al., 2024; Martin et al., 2017). For practitioners, our findings give insight into building ethical frameworks and guidelines that ensure AI applications are both effective and aligned with consumers' trust in digital booking platforms.

This research contributes to the literature on AI-powered personalization by considering this phenomenon's effects on consumers' trust, perceptions, and ethical concerns in the case of OTAs. While scholars have reported mixed findings on the roles of AI disclosure in service industries (e.g., Li et al., 2024; Xu et al., 2024; Yin et al., 2024; Zarkesh, 2023), little is known about how AI-powered personalization influences consumers' attitudes and behavior in tourism and hospitality. We therefore scrutinize the mediating roles of perceived discrimination and privacy concerns in shaping consumer trust and retention. Furthermore, our research appraises two practical strategies—ethical AI guidelines and consumer empowerment—that can temper the potential adverse effects of AI disclosure. By accounting for these moderating factors, our work extends existing models of technology acceptance and consumer behavior. It also yields insights into how tailored hotel recommendations and price promotions can feasibly maintain consumers' trust in and engagement with digital booking platforms.

2. Literature review

2.1. AI-powered tools and consumer responses

AI integration has transformed service delivery in travel and hospitality, particularly through AI-powered personalization; this practice leverages advanced algorithms and machine learning to tailor content and recommendations to users (Raji et al., 2024, p. 3). By analyzing consumer data (e.g., purchase behavior, browsing patterns, and demographics), this process delivers customized experiences (Fang et al., 2021; Yoon and Lee, 2021). Personalization applies to product and service recommendations, targeted promotions, and relevant content. Marketing strategies thus align with consumers' preferences to enhance engagement and effectiveness (Raji et al., 2024). By leveraging real-time insights, businesses can adapt marketing strategies to evolving consumer needs (Gupta et al., 2020). Providing people with meaningful experiences naturally enhances satisfaction as well as profitability (Bhuiyan, 2024). For instance, OTAs use AI to analyze users' travel histories, preferences, reviews, and demographics to generate tailored promotions and accommodation suggestions.

However, consumer reactions to AI-powered tools vary. Some studies have highlighted AI's role in improving service quality, user engagement, and satisfaction (Babatunde et al., 2024; Zalama et al., 2014); others have noted that reduced human interaction may cause feelings of isolation (Wu et al., 2014). Factors influencing AI adoption include its external characteristics (e.g., appearance and movement; Pan et al., 2015), devices' perceived intelligence and security (Tussyadiah and Park, 2018), and AI agents' performance efficiency alongside users' intrinsic motivations, social status, and emotional responses (Lin et al., 2020; Lu et al., 2019).

AI disclosure also yields mixed outcomes. Yin et al. (2024) found that emphasizing AI's presence may deter adoption, while Li et al. (2024) argued that transparency can foster positive reactions. Kirkby et al. (2023) observed no significant difference in consumer responses when AI was and was not disclosed. Xu et al. (2024) demonstrated that the effects of AI disclosure vary by service type. In hedonic services—where emotional engagement matters (e.g., personalized entertainment or dining recommendations; Ladera et al., 2023)—disclosure may reduce trust, perceived service quality, and usage intentions. However, these effects do not extend to utilitarian services focused on efficiency and functionality (e.g., AI-assisted check-ins or housekeeping; Rychalski and Hudson, 2017).

2.2. Impacts of AI-powered personalization on trust and retention

The commitment-trust theory (Morgan and Hunt, 1994) posits that trust arises from confidence in a provider's reliability and integrity. This assurance contributes to long-term consumer relationships (Kim et al., 2009). Individuals' trust in and attitudes toward a company are influenced by its perceived transparency in service delivery (Kang and Hustvedt, 2014). However, AI-powered personalization introduces algorithmic opacity, disrupting these trust-building mechanisms.

Consumers often struggle to understand how AI systems generate personalized recommendations and pricing decisions, leading to skepticism and perceived risk (Rai, 2020). The 'black box' nature of AI prevents people from verifying whether AI-driven suggestions genuinely align with their best interests or are optimized for corporate profit maximization (Elliot, 2022). When consumers cannot assess the motives or reasonableness of AI-based decisions, they may perceive the information as unreliable (Rai, 2020). Trust in the service provider is thus undermined. Luo et al. (2019) emphasized that algorithmic opacity can deter consumer engagement, as difficulty understanding AI-driven personalization often impedes one's trust in the technology.

Beyond transparency concerns, AI-driven personalization can elicit psychological resistance due to technophobia: fear, discomfort, or distrust toward technology. Mende et al. (2019) asserted that unfamiliarity with AI-driven decision making fosters unease and avoidance, amplifying perceived risk. Xu et al. (2024) noticed that AI-related fear and uncertainty reduce consumers' trust in hospitality settings. This phenomenon is especially relevant to OTAs, where trust in recommendations is essential for sustained consumer engagement.

As a result, consumers may become wary of AI-driven personalization, fearing that opaque algorithms manipulate prices or curate options in ways misaligned with one's best interests. If AI-powered recommendations are perceived as biased or unreliable, consumers will be less likely to continue using a platform. Retention rates will then decline. The following hypothesis is proposed thusly:

Hypothesis 1. AI-powered personalization negatively affects consumers' (a) trust and (b) retention intentions.

2.3. Mediating roles of perceived discrimination and privacy concerns

Travel and hospitality firms that employ AI-driven technologies face two prominent ethical challenges: perceived discrimination and privacy concerns (Dogru et al., 2025). Perceived discrimination refers to an individual's belief that they are being treated unfairly or differently due to belonging to a particular group (Banks et al., 2006). Consumers may feel that AI-driven recommendations and pricing decisions are influenced by attributes such as race, gender, age, or other demographic factors. Even though AI-generated content aims to enhance personalization, it may

inadvertently reinforce societal biases, leading to discriminatory outcomes for certain user segments. Such biases often stem from flawed training data and algorithmic design; skewed recommendations can disadvantage certain groups (Pazzanese, 2020). Furthermore, the 'black box' nature of AI complicates bias detection and mitigation efforts, raising the risk of discriminatory decision making (Elliot, 2022).

Fairness theory (Folger and Cropanzano, 2001) provides a lens to understand how perceived discrimination affects consumer trust and retention. This theory argues that people assess fairness based on two key dimensions. Distributive justice refers to the perceived fairness of outcome allocation, particularly how benefits and burdens are distributed among different groups (Greenberg, 1990). If AI-driven recommendations or pricing structures appear to systematically favor or disadvantage certain consumers, then corresponding perceptions of distributive injustice may evoke distrust and disengagement (Greenberg, 1987). Procedural justice concerns the perceived fairness of the decision-making process that produces those outcomes, emphasizing the equity of methods used to determine how rewards are assigned (Donner et al., 2015). AI-powered personalization systems often lack transparency; that is, many consumers struggle to understand why they are receiving certain recommendations or price offers. This opacity can fuel perceptions of procedural injustice, further eroding trust and prompting disengagement from AI-driven services (Greenberg, 1987). Research suggests that individuals respond negatively to perceived unfairness—even if penalizing unfair actors means forgoing personal benefits (Turillo et al., 2002). Given that AI-powered personalization systems may unintentionally produce biased outcomes, consumers who sense such discrimination are likely to move away from the service, reducing trust and retention rates. Perceived discrimination can hence act as a mediator between AI-powered personalization and consumer trust.

Privacy concerns manifest when consumers perceive a loss of control over their personal information and insufficient protection of their data (Dienlin, 2014). Privacy calculus theory (Culnan and Armstrong, 1999) explains how individuals weigh the benefits of sharing personal data against the risks associated with its disclosure. According to this theory, consumers are more willing to share their information if they perceive clear benefits and believe that their data will be used fairly and that adverse consequences will not ensue (Milne and Gordon, 1993). However, if they suspect their data could be misused or exploited, they may limit engagement with AI-driven services.

AI-powered personalization in OTAs relies on extensive data collection, including browsing history, location, and social media activity, to curate recommendations (Dogru et al., 2025). While this acquisition enhances the user experience, it also raises concerns about data misuse, financial fraud, identity theft, and unauthorized data sharing for purposes such as advertising, cyberbullying, or harassment (Dienlin and Trepte, 2015). If consumers find the risks of personal data disclosure to outweigh the anticipated benefits in OTAs, their trust diminishes, leading to lower engagement and retention. Therefore, privacy concerns serve as another potential mediator in the relationship between AI-powered personalization and consumer trust.

Together, fairness theory and privacy calculus theory provide a foundation for understanding how perceived discrimination and privacy concerns mediate the relationship between AI-powered personalization and consumer trust. A breach of trust, be it through perceived discrimination or privacy risks, can diminish consumer confidence in OTAs' AI-driven services, discouraging engagement. The following hypotheses hence apply:

Hypothesis 2. Perceived discrimination mediates the relationship between AI-powered personalization and consumers' (a) trust and (b) retention intentions.

Hypothesis 3. Perceived privacy concerns mediate the relationship between AI-powered personalization and consumers' (a) trust and (b) retention intentions.

2.4. Moderating roles of ethical AI guidelines

Information transparency is critical in shaping people's decision making during online transactions related to tourism and hospitality products (Lin et al., 2020). AI-powered personalization relies on analyzing consumer data but can inadvertently evoke feelings of exclusion or bias among consumers if not handled responsibly (Martin et al., 2017; Xu et al., 2024). By contrast, a website that displays clear ethical AI guidelines about data collection and management conveys its commitment to fairness, privacy, and conscientious data usage (Dogru et al., 2025; Wach et al., 2023). This information can alleviate consumers' worries about how AI-based personalization mechanisms are used and thus reduce perceptions of discriminatory practices and privacy invasion (Lin et al., 2020; Zarkesh, 2023). Conversely, when such guidelines are absent, consumers are likely to feel vulnerable: they may wonder if the website will misuse their data or employ AI in ways that unfairly target specific groups (Jain et al., 2024; Martin et al., 2017). Ethical AI guidelines therefore serve as a protective mechanism, assuaging potential dread among consumers who might not be knowledgeable about AI-driven personalization services (Dogru et al., 2025; Martin et al., 2017).

Furthermore, ethical AI guidelines greatly influence people's interactions with websites with respect to views on AI-powered personalization. Many individuals approach AI-driven technology cautiously, fearing manipulation or surveillance (Dogru et al., 2025; Zarkesh, 2023). Websites that present ethical AI policies show that they have considered the possible negative implications of AI use and have put safeguards in place to address them (Dogru et al., 2025; Martin et al., 2017). In essence, ethical AI guidelines serve to soften immediate perceptions of discrimination and privacy concerns. Consumers' trust in and long-term engagement with such websites increase in these instances (Zarkesh, 2023). Transparent, ethical AI guidelines signal a website's effort to ensure that AI-based personalization is accountably trained and implemented while respecting personal rights and fostering inclusivity. This honesty can lessen the perceived risks associated with AI personalization and diminish possible harm to consumer trust and retention (Dogru et al., 2025; Lin et al., 2020; Wach et al., 2023). The following hypotheses are put forth:

Hypothesis 4. Ethical AI guidelines moderate the relationships between AI-powered personalization and consumers' perceived (a) discrimination and (b) privacy concerns; that is, these relationships are weaker when ethical AI guidelines are provided on a website compared to when they are not provided.

Hypothesis 5. Ethical AI guidelines moderate the indirect relationships between AI-powered personalization and consumers' (a) trust toward the website and (b) retention intentions through perceptions; that is, these indirect relationships are weaker when ethical AI guidelines are provided on a website compared to when they are not provided.

2.5. Moderating role of consumer empowerment

The notion of empowerment stems from the organizational behavior literature, where it refers to employees' increased control and autonomy that promote staff members' self-efficacy and engagement in the workplace (Honold, 1997). Consumer empowerment is similarly characterized by the authority that people perceive when given choices and independence in their decision making. This sense of agency elevates consumers' satisfaction and engagement by granting individuals "more freedom, capacity, or control" (Kozinets et al., 2021, p. 429) when interacting with service providers (Füller et al., 2009; Kim & Chen, 2023).

Consumer empowerment is instrumental in shaping perceived discrimination and privacy concerns associated with websites' use of AI-powered personalization services (Dogru et al., 2025; Jain et al., 2024). Consumers who can control AI-driven services are less apt to see

AI-generated suggestions as intrusive or biased. This enhanced control makes people feel more secure and reduces concerns about potential bias or invasions of privacy (Füller et al., 2009; Martin et al., 2017). By having the ability to opt out of AI-powered personalization, consumers experience a stronger sense of autonomy, which reduces feelings of vulnerability and enhances trust in a website's use of AI for personalized experiences. On the contrary, when consumers cannot disenable AI-based personalization services, they may feel their preferences and privacy are being disregarded (Dogru et al., 2025; Morey et al., 2015; Zarkesh, 2023). Thus, consumer empowerment can mitigate the negative associations between AI-powered personalization, perceived discrimination, and privacy concerns.

Consumers who may opt out of AI-powered personalization may also view the website as respectful of their rights and preferences (Dogru et al., 2025; Morey et al., 2015). This strategy can prevent websites from appearing involved in reckless data collection, with consumers being subjected to algorithmic decisions for customized marketing. Websites that do not force visitors to submit to AI-powered personalization instead demonstrate respect for consumers' autonomy and boundaries (Morey et al., 2015; Wach et al., 2023; Zarkesh, 2023). We argue that this notable change in consumers' perceptual processes may reduce initial skepticism and distrust toward AI personalization. This consumer-centric practice can further promote trust in websites and heighten one's likelihood of sustained website engagement (Füller et al., 2009; Kim & Chen, 2023). Stated formally:

Hypothesis 6. Consumer empowerment moderates the relationships between AI-powered personalization and consumers' perceived (a) discrimination and (b) privacy concerns; that is, these relationships are weaker when consumers can disenable personalization services compared to when they cannot.

Hypothesis 7. Consumer empowerment moderates the indirect relationships between AI-powered personalization and consumers' (a) trust toward the website and (b) retention intentions through perceptions; that is, these indirect relationships are weaker when consumers can disenable the personalization services compared to when they cannot.

3. Method

Studies 1 and 2 involved two-cell between-subjects designs in which AI-powered personalization messaging was manipulated. Study 1 examined the differential impacts of using a hotel booking website that generates a list of suggested hotels and room rates for consumers versus a website that explicitly indicates the use of AI for personalization services on individuals' responses (i.e., the roles of AI-powered personalization messaging in consumers' trust and retention intentions). Study 2 investigated the mechanisms driving the effects observed in Study 1 by exploring the mediating roles of perceived discrimination and privacy concerns.

Study 3 employed a 2 (AI-powered personalization: absent vs. present) × 2 (ethical AI guidelines: absent vs. present) between-subjects design to propose a feasible solution for easing the consequences of AI-powered personalization messaging on individuals' responses. Study 4 used a 2 (AI-powered personalization: absent vs. present) × 2 (consumer empowerment: low vs. high) experimental design to explore another potential remedy for hotel booking websites implementing AI-powered personalization services.

To enhance the experimental procedures' ecological validity, this study's visual stimuli were carefully designed based on a leading OTA, Booking.com (Rita et al., 2022). Visual details (e.g., the "Help Center" and the "Preferences" settings within user accounts) were directly sourced from the platform and modified slightly to fit the experimental conditions. This approach was intended to ensure that the presented stimuli closely resembled actual consumer interactions with AI-driven services.

3.1. Common research designs: Studies 1–4

Study participants were first asked to read the following prompt, presented alongside an image of a hotel booking website's homepage (Fig. 1): "Imagine you are planning a vacation during your work break. You visit and log into a booking website to search for hotel options at your desired destination. This website generates a list of hotels and their room rates for you."

In Studies 1 and 2, half of the participants were randomly assigned to an experimental condition in which a pop-up window indicated that an AI-powered personalization service was active (Fig. 2). This stimulus was developed based on work by Kim et al. (2019) and Song et al. (2022). Studies 3 and 4 featured a similar procedure; however, a subset of these participants (25 % of the total sample) encountered a modified version of the pop-up that contained a clickable prompt at the bottom of the window: "Want to learn more about AI-powered personalization services?" (Study 3) and "Want to disenable AI-powered personalization services?" (Study 4).

3.1.1. Study 3

Once the standard study design components had been introduced, participants were presented with a scenario and corresponding visual stimuli (Fig. 3). The experimental conditions were implemented based on the suggestions of Kim et al. (2019), Martin et al. (2017), and Morey (2015).

"You become curious and concerned about [*absence of AI information*] the list of hotels and room rates suggested by this website (vs. [*presence of AI information*] about the AI-powered personalization services on this website). You check back on the website and notice that you [*absence of ethical AI guidelines*] cannot (vs. [*presence of ethical AI guidelines*] can) find information about the policies of [*absence of AI information*] the suggestion services (vs. [*presence of AI information*] AI-powered personalization services) in the Help Center."

Fig. 3 (left) was displayed to participants in two of the four conditions (2 × 2 experimental design) where no ethical AI guidelines were provided, irrespective of the presence of AI-powered personalization messaging. Fig. 3 (middle) was shown exclusively to participants in the condition where both the AI-powered personalization messaging and the ethical AI guidelines were presented. Lastly, Fig. 3 (right) was only shown to participants in the condition where the AI-powered personalization messaging was absent, but general ethical policies concerning suggestion services were accessible.

3.1.2. Study 4

Similar to Study 3, participants were instructed to read a scenario and accompanying visual stimuli (Fig. 4). The experimental conditions were designed based on ideas from Kozinets et al. (2021), Martin et al. (2017), and Morey (2015).

"You become curious and concerned about [*absence of AI information*] the list of hotels and room rates suggested by this website (vs. [*presence of AI information*] about the AI-powered personalization services on this website). You check back on the website and notice that you [*low consumer empowerment*] cannot (vs. [*high consumer empowerment*] can) manage [ab*sence of AI information*] the suggestion services (vs. [*presence of AI information*] AI-powered personalization services) in your Account Settings."

Fig. 4 (left) was shown to participants in two of the four conditions (2 × 2 experimental design) where the option to disenable suggestion services was unavailable, regardless of whether AI-powered personalization messaging appeared. Fig. 4 (right) was shown only to participants in the condition where both the AI-powered personalization messaging and the option to disenable AI-powered suggestion services were included. Participants in the condition where the AI-powered personalization messaging was not present but the option to disenable suggestion services was available were shown a modified stimulus of Fig. 4: "Hotel suggestion service" was used instead of "AI-powered

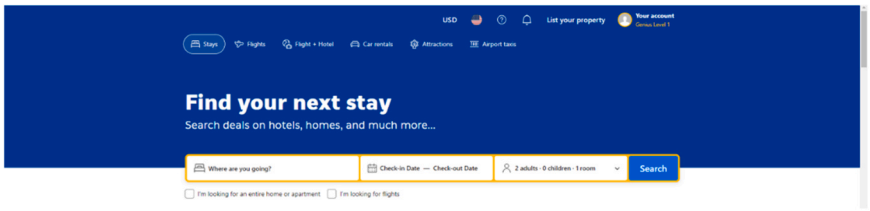

Fig. 1. Sample home page of a hotel booking website.

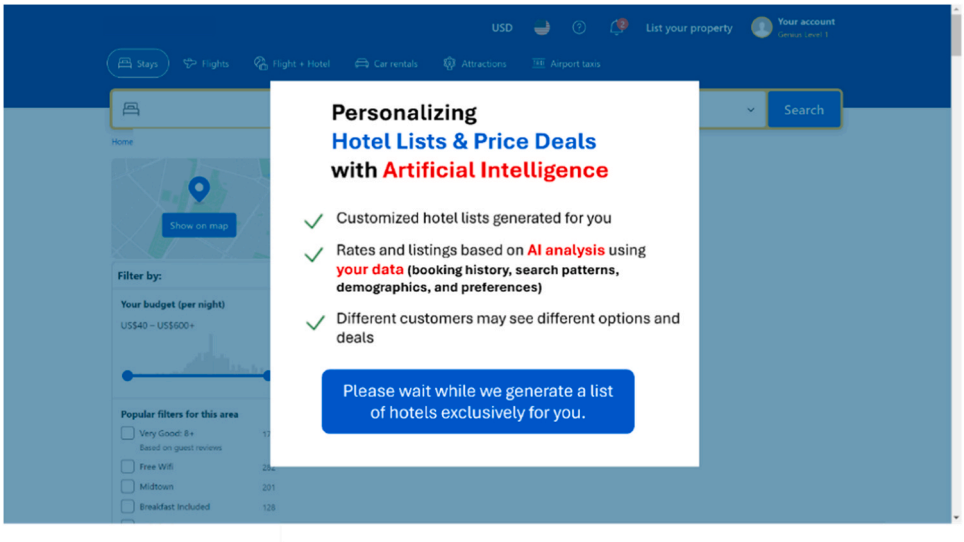

Fig. 2. Image of an AI-powered personalization messaging.

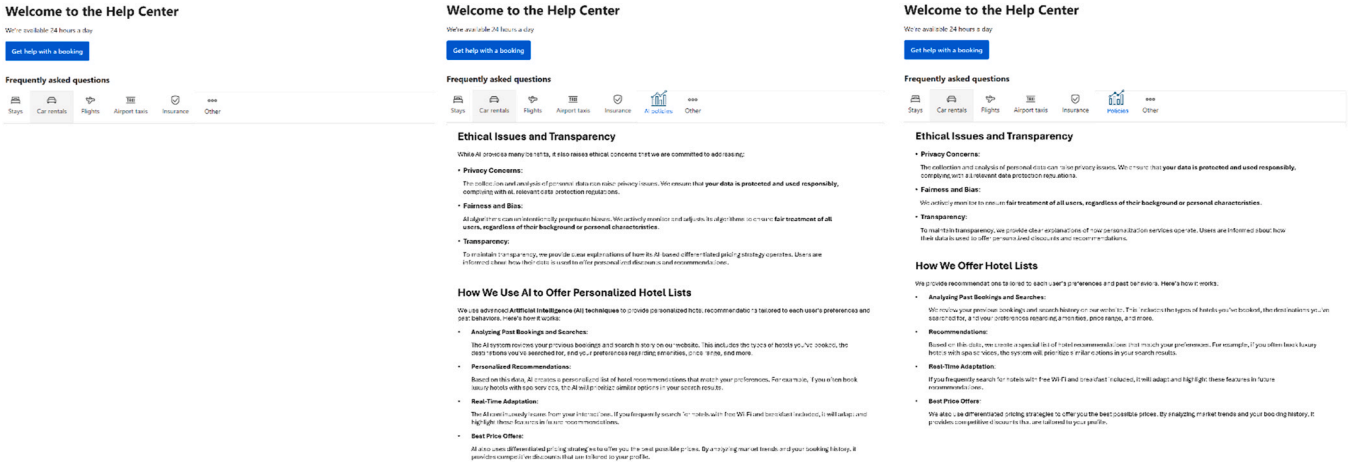

Fig. 3. Website pages showing the absence (left) and presence (middle) of ethical AI guidelines and the presence (right) of general ethical guidelines.

personalization service."

3.2. Measures

Following the scenario presentation, participants in Studies 1–4 were asked to respond to a slider-type manipulation check for an independent variable (0 = *none at all*, 100 = *a great deal*). This item gauged the extent to which they believed AI-powered technology to be involved in their hotel search on the booking website. For Studies 3 and 4, an additional Likert-type manipulation check (1 = *none at all*, 5 = *a great deal*) was implemented to evaluate the effectiveness of our moderator manipulation. In brief, Study 3 assessed the presence of ethical guidelines by soliciting participants' views of how clearly the website explained its services and data usage. Study 4 evaluated consumer empowerment by determining the degree to which participants felt capable of managing their accounts on the website.

Studies 1–4 each used various scale formats (i.e., 5- and 7-point Likert and slider scales and anchors [Likert-type: *negative*–*positive*, *unlikely*–*likely*, *disagree*–*agree*; slider-type: −100–100, 0–100]) when measuring variables to alleviate concerns related to common method bias (Podsakoff et al., 2003). Two attention-check questions were integrated as filler items between measures, with multiple page breaks to create psychological separation between survey sections. This approach aimed to further reduce response bias and to enhance our identification

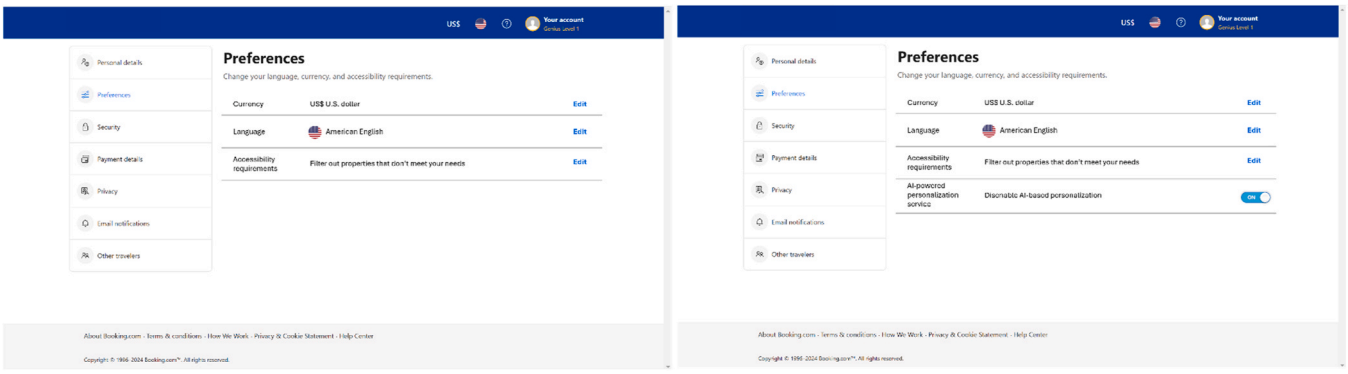

Fig. 4. Website pages without (left) and with (right) the option to disenable AI personalization services.

of inattentive respondents (Podsakoff et al., 2003). In studies where Likert-type measures were included, participants' trust in the website (Cronbach's $\alpha_{avg\ [Studies\ 1\ and\ 4]}$ =.88) and willingness to use the website in the future (Cronbach's $\alpha_{avg\ [Studies\ 2\ and\ 3]}$ =.95) were determined with 3-item scales from Pavlou (2003). Perceived discrimination (Cronbach's $\alpha_{avg\ [Studies\ 2\ and\ 4]}$ =.84) and privacy concerns (Cronbach's $\alpha_{avg\ [Studies\ 2\ and\ 4]}$ =.91) were evaluated using 3-item measures adapted from Schmitt et al. (2002) and Buchanan et al. (2007), respectively.

Several covariates, measured using single-item scales, were incorporated to eliminate potential alternative explanations. First, price sensitivity was controlled, as it affects consumers' perceptions and purchase behavior (Campbell et al., 2014). Second, the frequency of consumers' hotel stays or travel experiences may influence their attitudes and decision making when booking hotels (Nieto-García et al., 2020). Participants' travel frequency thus served as a covariate in the analysis. Third, consumers' familiarity with AI can inform their opinions and behavior (Gonzalez-Jimenez & Costa Pinto, 2024) and was therefore controlled. Demographic attributes (e.g., gender, ethnicity, and income), which could shape participants' attitudes toward AI technology and their hotel booking experiences, were also considered (Alawi et al., 2023; Lim and Ok, 2022).

3.3. Study participants

Participants in Studies 1–4 were recruited from the United States via the research platform Prolific. Only data from individuals who passed both attention checks were retained for analysis. Specifically, for Study 1, 83 U.S. participants (M_{age} = 32.9, 57.8 % women) were recruited, all of whom passed the attention checks. In Study 2, one person out of 80 failed to correctly answer an attention-check question, leaving 79 valid surveys (M_{age} = 31.5, 53.8 % women). In Study 3, one participant out of 170 did not pass an attention check, resulting in 169 eligible responses (M_{age} = 35.9, 58.6 % women). Lastly, in Study 4, one participant out of 169 did not meet the attention-check criteria, resulting in 168 valid surveys (M_{age} = 35.6, 58.3 % women).

4. Results

4.1. Study 1: Direct effects of AI-powered personalization on consumers' responses

An independent sample *t* test showed a significant mean difference in the two groups' answers to a question regarding the extent to which AI-powered technology was involved in their hotel search [$M_{absence\ of\ AI}$ = 50.74, $M_{presence\ of\ AI}$ = 77.30; $t(81)$ = -5.09, $p < .001$]. The experimental manipulation thus possessed convergent validity.

Regression analyses including covariates revealed that AI-powered personalization negatively affected consumers' trust (B = −.51, SE =.18, t = -2.94, $p < .01$) and willingness to use this website (B = −43.43, SE = 11.11, t = -3.91, $p < .001$). These outcomes suggest that participants were less trusting of the website that explicitly highlighted AI-powered personalization and were less likely to use the website in the future.

4.2. Study 2: Indirect effects through perceived discrimination and privacy concerns

A significant difference emerged in participants' perceptions of technology involvement in hotel searches across the experimental conditions [$M_{absence\ of\ AI}$ = 50.43, $M_{presence\ of\ AI}$ = 71.79; $t(77)$ = -3.89, $p < .001$]. This trend indicates that the experimental manipulations were perceived as intended, thereby confirming the independent variable's effectiveness.

PROCESS Model 4 (Hayes, 2015) was used to test the indirect effect of AI-powered personalization on consumers' responses (i.e., trust and willingness to use the website) through the proposed mediators (i.e., perceived discrimination and privacy concerns). AI-powered personalization had positive and significant impacts on perceived discrimination (B =.97, SE =.20, t = 4.85, $p < .001$) and perceived privacy concerns (B =.69, SE =.25, t = 2.75, $p < .01$). The impacts of these mediators on participants' trust (perceived discrimination: B = −21.33, SE = 5.06, t = -4.22, $p < .001$; perceived privacy concerns: B = −12.95, SE = 4.01, t = -3.23, $p < .01$) and willingness to use the website (perceived discrimination: B = −.55, SE =.18, t = -3.05, $p < .01$; perceived privacy concerns: B = −.57, SE =.14, t = -4.01, $p < .001$) were each significant. Conversely, the direct effect of AI-powered personalization on consumers' reactions was not significant (trust: B = −10.91, SE = 9.29, t = -1.17, p = .25; willingness to use this website: B = −.12, SE =.33, t = -.36, p = .71). The indirect effects of AI-powered personalization on trust through the mediators were significant and negative (perceived discrimination: B = −20.62, SE = 7.54, 95 % confidence interval [CI]: [-37.12, −7.94]; perceived privacy concerns: B = −8.95, SE = 4.98, 95 % CI: [-20.56, −1.49]); those on willingness to use this website through the mediators were significant and negative as well (perceived discrimination: B = −.53, SE =.21, 95 % CI: [-1.01, −.17]; perceived privacy concerns: B = −.40, SE =.18, 95 % CI: [-.81, −.10]). In summary, participants exposed to AI-powered personalization tended to perceive more discrimination and privacy concerns than those not exposed to it, making the website seem less trustworthy and decreasing the likelihood of future use.

4.3. Study 3: Conditional indirect effects based on ethical guidelines

Two independent sample *t* tests verified the experimental manipulations' success [AI-powered personalization: $M_{absence\ of\ AI}$ = 54.58, $M_{presence\ of\ AI}$ = 66.32; $t(167)$ = -2.81, $p < .01$; ethical guidelines: $M_{absence\ of\ ethical\ guidelines}$ = 1.71, $M_{presence\ of\ ethical\ guidelines}$ = 3.42; $t(167)$ = -11.50, $p < .001$].

PROCESS Model 7 (Hayes, 2015) was employed to determine whether the indirect effects of AI-powered personalization on consumers' responses (i.e., trust and willingness to use the website) via mediators (i.e., perceived discrimination and privacy concerns) varied across conditions in which the website did and did not display ethical guidelines. As in Study 2, AI-powered personalization had significant and positive impacts on mediators: perceived discrimination (B = 1.73, SE =.52, $t = 3.34$, $p < .01$) and perceived privacy concerns (B = 1.33, SE =.52, $t = 2.57$, $p < .05$). The interaction effects of AI-powered personalization and the presence of ethical guidelines on perceived discrimination were significant and negative (B = −.98, SE =.33, t = -2.96, $p < .01$), but the impact on perceived privacy concerns was not significant (B = −.49, SE =.33, t = -1.49, $p = .14$); see Table 1 and Fig. 5).

Moderated mediation analyses also demonstrated that the conditional indirect effects on dependent variables (i.e., trust and willingness to use the website) through perceived discrimination varied significantly across the two scenarios involving ethical policies (trust: index = 12.19, SE = 6.08, 95 % CI: [.90, 24.67]; willingness to use this website: index =.43, SE =.18, 95 % CI: [.13,.82]). Specifically, the indirect impact of AI-powered personalization on consumers' reactions via perceived discrimination was negative and significant when an ethical policy was not presented (trust: B = −7.78, SE = 3.48, 95 % CI: [-15.28, −1.79]; willingness to use this website: B = −.33, SE =.13, 95 % CI: [-.62, −.11]) but not when the website shared its policy (trust: B = 2.33, SE = 2.65, 95 % CI: [-2.76, 8.02]; willingness to use this website: B =.10, SE =.11, 95 % CI: [-.11,.32]). This trend implies that participants exposed to AI-powered personalization perceived less discrimination when an ethical policy was provided on the website compared to when it was not. Consequently, the website was deemed more trustworthy, leading to higher retention intention.

4.4. Study 4: Conditional indirect effect based on consumer empowerment

Independent sample t tests were performed to check whether our experimental manipulations were successful. They were indeed effective [AI-powered personalization: $M_{\text{absence of AI}} = 57.4$, $M_{\text{presence of AI}} = 77.67$; $t(166) = -5.89$, $p < .001$; consumer empowerment: $M_{\text{low}} = 2.31$, $M_{\text{high}} = 3.24$; $t(166) = -5.93$, $p < .001$].

Consistent with the findings from Studies 2 and 3, AI-powered personalization significantly and positively influenced the mediators: perceived discrimination (B = 1.01, SE =.49, $t = 2.05$, $p < .05$) and perceived privacy concerns (B = 1.53, SE =.50, $t = 3.06$, $p < .01$). The interaction between AI-powered personalization and consumer empowerment was significant and negative for perceived privacy concerns (B = −.64, SE =.32, t = -2.00, $p < .05$). However, it was not significant for perceived discrimination (B = −.25, SE =.31, t = -1.79, $p = .43$; see Table 2 and Fig. 5).

The conditional indirect effects on dependent variables (i.e., trust and willingness to use the website) via perceived privacy concerns varied significantly by the level of consumer empowerment (trust: index =.12, SE =.08, 95 % CI: [.01,.30]; willingness to use this website: index =.25, SE =.14, 95 % CI: [.02,.55]). Specifically, when consumer empowerment was low, the indirect impact of AI-powered personalization on consumers' responses through perceived privacy concerns was negative and significant (trust: B = −.16, SE =.07, 95 % CI: [-.32, −.04]; willingness to use this website: B = −10.48, SE = 3.97, 95 % CI: [-19.41, −.3.74]). On the contrary, when consumer empowerment was high, these effects were not significant (trust: B = −.04, SE =.05, 95 % CI: [–.15,.04]; willingness to use this website: B = −3.04, SE = 3.11, 95 % CI: [-9.92, 2.61]). These results suggest that participants encountering AI-powered personalization perceived fewer privacy concerns when they could enable or disenable the personalization services. This empowerment led to higher trust in the website and a greater willingness to use it in the future. Fig. 6 collectively depicts the findings from Studies 1–4.

5. Discussion and implications

This research, comprising four studies, examined the potential drawbacks of revealing the implementation of AI technology in personalized recommendations and pricing services in hotel booking settings. Study 1 showed that a message indicating that personalization services were powered by AI negatively influenced consumers' reactions to booking websites, particularly in terms of trust and retention intention. This finding is consistent with Xu et al.'s (2024) research that revealed the negative effects of disclosing AI technology in hotel service delivery. However, it contrasts with Zarkesh's (2023) work, which focused on banking services. These mixed results suggest that, regardless of the service industry, consumers' interactions with service providers and their views of service products might be context specific (Jain et al., 2024).

Study 2 identified underlying mechanisms by proposing perceived discrimination and privacy concerns as mediators of the negative relationships between AI-powered personalization and consumers' reactions. These findings align with theoretical propositions based on industry observations by Dogru et al. (2025), Wach et al. (2023), and Zerkesh (2023) in relation to discrimination and privacy issues.

Studies 3 and 4 shed light on how ethical AI guidelines and consumer empowerment contribute to the negative relationship between AI-powered personalization and consumers' responses. Study 3 found the presence of ethical AI guidelines, which thoroughly convey how OTA websites collect, use, and manage consumer data, to reduce the impact of AI-powered personalization on perceived discrimination. Consumers' trust in the website and their retention were consequently affected. Broader online transaction contexts have offered additional support for these outcomes, underlining the importance of transparency (Kim et al., 2019; Lin et al., 2020; Martin et al., 2017). However, ethical AI guidelines did not alleviate perceived privacy concerns associated with AI-powered personalization.

Study 4 built on Study 3 by taking consumer empowerment as a

Table 1
Results of moderated mediation analyses (Study 3).

	Mediators			Dependent variables	
	DISC	PRI		Trust	Retention intention
	B (SE)	B (SE)		B (SE)	B (SE)
AI	1.73 (.52)* *	1.33 (.52)*	**AI**	8.63 (6.77)$^{n.s.}$	.28 (.23)$^{n.s.}$
EG	1.26 (.52)* .	.48 (.52)$^{n.s.}$	**DISC**	−10.34 (3.32)* *	−.44 (.11)* *
AI × EG[a]	−.98 (.33)* *	−.49 (.33)$^{n.s.}$	**PRI**	−14.83 (3.40)* **	−.23 (.12)*
	R^2 =.13	R^2 =.12		R^2 =.24	R^2 =.20
	$F(10, 158) = 2.39$ *	$F(10, 158) = 2.08$ *		$F(10, 158) = 5.07$ * **	$F(13, 158) = 3.93$ * *

Note: ^{ns} not significant, * $p < .05$, * * $p < .01$, * ** $p < .001$.
Covariates: age, gender, ethnicity, income, AI familiarity, price sensitivity, travel frequency
[a] Interaction term of AI-powered personalization and ethical policy
AI = AI-powered personalization, EG = ethical guidelines, DISC = perceived discrimination, PRI = perceived privacy concerns.

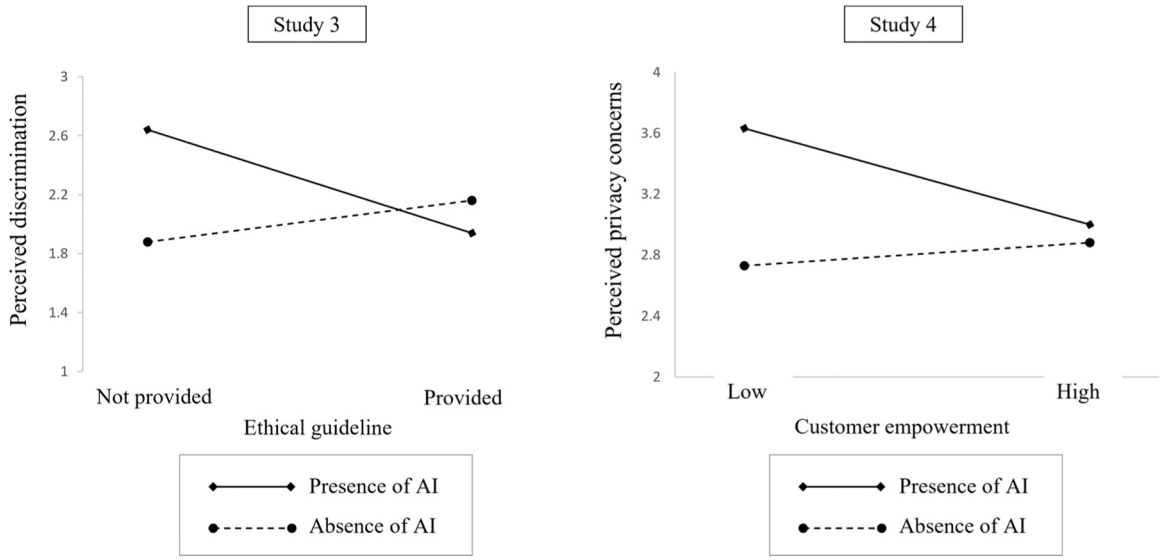

Fig. 5. Graphs of interaction effects.

Table 2
Results of moderated mediation analyses (Study 4).

	Mediators			Dependent variables	
	DISC	PRI		Trust	Retention intention
	B (SE)	B (SE)		B (SE)	B (SE)
AI	1.01 (.49)*	1.53 (.51)* *	**AI**	−.01 (.12)$^{n.s.}$	.45 (6.91)$^{n.s.}$
CEM	−.31 (.50)$^{n.s.}$	.73 (.50)$^{n.s.}$	**DISC**	−.29 (.06)* **	−21.80 (3.27)* **
AI × EP[a]	−.25 (.31)$^{n.s.}$	−.64 (.32)*	**PRI**	−.18 (.06)* *	−11.70 (3.39)* **
	R^2 =.20	R^2 =.17		R^2 =.44	R^2 =.42
	$F(10, 157) = 3.86$ * **	$F(10, 157) = 3.26$ * **		$F(10, 157) = 12.41^{***}$	$F(13, 157) = 11.25$ * **

Note: ^{ns} not significant, * $p < .05$, * * $p < .01$, * ** $p < .001$.
Covariates: age, gender, ethnicity, income, AI familiarity, price sensitivity, travel frequency
[a] Interaction term of AI-powered personalization and ethical policy
AI = AI-powered personalization, CEM = consumer empowerment, DISC = perceived discrimination, PRI = perceived privacy concerns.

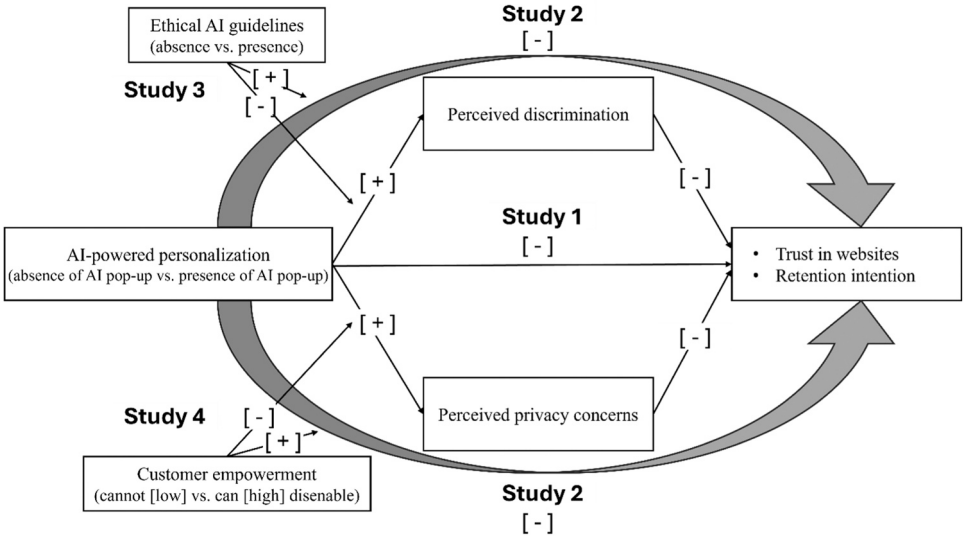

Fig. 6. Integrated findings of Studies 1–4.

moderator. Enabling hotel guests to disenable personalization services in their account settings could relieve privacy concerns tied to AI-powered personalization, ultimately influencing consumers' engagement with OTA websites. This result echoes previous findings in general online environments (Füller et al., 2009; Kim & Chen, 2003; Martin et al., 2017).

5.1. Theoretical contributions

This research offers several theoretical contributions. First, despite scholars having tested the effects of disclosing AI use in various service industries, findings remain inconclusive. Some research has indicated that explicitly labeling AI may deter consumer adoption (e.g., Xu et al., 2024; Yin et al., 2024). Others have pointed out the positive impacts of AI disclosure, such as better consumer reactions and engagement (e.g., Li et al., 2024; Zarkesh, 2023). Comparatively limited attention has been given to how AI disclosure influences consumers' attitudes and behavior in tourism and hospitality. Our research contributes to this area of literature by bridging that gap.

This research demonstrates that AI-powered recommendation services, while designed to enhance personalization and service excellence, can undermine consumer trust and retention. By identifying the underlying psychological mechanisms and exploring moderators, the findings help explain why negative reactions occur and how they might be mitigated. Different from prior research that predominantly focused on AI in relation to service robots or point-of-service encounters (e.g., Gonzalez-Jimenez & Costa Pinto, 2024; Ladera et al., 2023; Lin et al., 2020; Mende et al., 2019; Tussyadiah and Park, 2018), this research examines consumers' responses to AI-powered personalization in pre-service stages (e.g., recommendations and promotional messaging). Consumer–AI interaction during these stages has been relatively unexplored compared to during service consumption. This disparity suggests that our findings can expand on pertinent insights in hospitality management. The experimental design adopted here isolated causal effects and established foundational insights that can inform larger-scale or field-based studies.

Second, studies examining the consequences of AI disclosure on consumers' responses have primarily pondered the mechanisms behind these relationships (e.g., Xu et al., 2024; Yin et al., 2024). Interventions' practical effectiveness, as discussed in relevant papers (e.g., Dogru et al., 2025; Jain et al., 2024; Martin et al., 2017; Morey et al., 2015; Wach et al., 2023), in preventing adverse impacts remains quite limited. Scholars have begun to advocate for more research in this area (e.g., Helal and Saleh, 2024; Rasheed et al., 2024). Our work fills this gap by investigating practice-based moderators, such as ethical AI guidelines and consumer empowerment, which can help mitigate the negative effects of AI disclosure. This key theoretical contribution extends the current understanding of how practical interventions shape consumers' responses to AI technologies within service settings. By operationalizing these moderators, this research bridges theoretical inquiry and managerial action, contributing to implementable AI governance in hospitality settings.

Third, this research has documented how perceived discrimination mediates the relationship between AI-powered personalization and consumer trust and retention. Personalized hotel recommendations and price promotions can be seen as unfair, stoking distrust and disengagement. Our work extends fairness theory by spotlighting how AI systems may perpetuate biases and treat people differently. Findings emphasize the need for a twofold consideration: distributive justice, which focuses on outcome fairness (e.g., when AI systems provide less generous discounts to certain groups); and procedural justice, which addresses decision-making fairness (e.g., when AI-generated recommendations are opaque). Accounting for both will truly capture how AI-driven personalization affects trust and retention. Integrating algorithmic decision making in the fairness framework also adds nuance to the scholarly discourse on digital discrimination in AI-mediated services, advancing the conversation around equity in technology-driven customer experiences.

Lastly, our research enriches privacy calculus theory by showing that privacy concerns mediate the relationship between AI-powered personalization and consumer trust and retention. Individuals carry out cost-benefit analysis when deciding whether to share personal information with AI systems, such as those at OTAs. People weigh the perceived risks of data disclosure (e.g., potential misuse, identity theft, or a lack of transparency) against the anticipated benefits of customized services, including tailored recommendations and enhanced consumer experiences. This finding reinforces perceived control's dynamic role in AI adoption. Results also offer theoretical clarity on when and why consumers feel secure engaging with algorithmic platforms.

5.2. Practical implications

Trust is a critical factor in digital environments, especially as individuals become more cautious about sharing personal information and engaging with AI-driven services (Raji et al., 2024). Our work produces several insights for industry practitioners, particularly OTAs and other e-service platforms, regarding how AI-powered personalization affects consumer trust and retention.

First, explicitly highlighting AI-powered personalization can reduce consumer trust and discourage future use (Study 1), likely due to heightened concerns about discrimination and privacy (Study 2). Overtly emphasizing AI involvement in personalization may thus make consumers more wary than reassured. Businesses in the hospitality and e-commerce sectors are instead advised to refine how they present AI-driven personalization: instead of directly indicating AI involvement, they can accentuate its benefits such as enhanced relevance and convenience (e.g., stating "tailored recommendations for you" instead of "AI-generated suggestions"). This strategy can maintain consumer trust and encourage ongoing engagement. The approach aligns well with the elaboration likelihood model of persuasion (Petty and Cacioppo, 1986), which asserts that people are more likely to engage with a service when its message focuses on advantages (i.e., to appeal to the peripheral route of persuasion). Consumers then make decisions based on heuristics, such as perceived salience or expediency, rather than engaging in deeper, more effortful processing about AI's technical components.

Moreover, Study 3 showed that ethical AI policies (e.g., fairness assurances and transparency statements) can lessen perceived discrimination and thereby increase both trust and retention. Businesses can communicate their dedication to ethical AI use by introducing transparency statements that explain how personalization works, how consumers' personal data are used, and how fairness is ensured in recommendations. Providing visible declarations, such as "Our AI follows ethical guidelines to ensure fair and unbiased recommendations," can further ease users' concerns.

Finally, Study 4 demonstrated that allowing consumers to control AI-powered personalization (i.e., by enabling or disabling these features) reduces privacy concerns and strengthens trust and retention. These findings underscore the importance of consumer empowerment in AI-driven services. OTAs can offer opt-in/opt-out personalization settings, giving users greater autonomy over their data. Providing control mechanisms can elevate consumers' sense of security, ultimately fostering long-term engagement with AI-driven services. This outcome echoes self-determination theory's (Deci and Ryan, 2008) view of autonomy as a fundamental psychological need—especially for intrinsic motivation and sustained engagement. When consumers feel a sense of control over AI-driven interactions, they will be more apt to trust and actively engage with the service.

5.3. Limitations and future research agenda

This research has several limitations that warrant further investigation. First, the findings are based on AI-powered personalization services within the hotel booking context. Future studies should expand this scope by exploring the effects of similar personalization techniques across other sectors of hospitality and tourism, such as restaurants, travel agencies, and flight bookings. This broader view would offer a more comprehensive picture of how AI-driven personalization shapes consumers' behavior and trust in diverse service environments. Second, due to the opaque nature of AI personalization systems, we could not

access the OTA's AI engine directly. We instead relied on scenario-based experiments using simulated stimuli to mimic realistic consumer–AI interactions. Subsequent research could enhance our results' generalizability by replicating the studies with consumer data obtained from firms. Third, although we manipulated the presence of ethical AI guidelines in a binary format, future investigations could explore how the scope and level of such guidelines affect consumers' perceptions and behavior. We also took general psychological appraisals as mediators, which may not fully capture AI service–specific mechanisms that drive users' reactions to AI-powered personalization. Follow-up work could explore additional underlying mechanisms of AI services (e.g., transparency, algorithmic bias). Lastly, while this research controlled for key demographic factors (e.g., consumers' age, gender, ethnicity, income) to minimize potential confounding effects, the findings are based on a U.S. sample and may not apply to diverse cultural contexts. Scholars could extend these insights by exploring how AI-powered personalization is perceived in different geographical settings.

CRediT authorship contribution statement

Kim Minsun: Writing – review & editing, Writing – original draft, Validation, Supervision, Resources, Investigation, Funding acquisition, Conceptualization. **Lim SangGon (Edward):** Writing – review & editing, Writing – original draft, Visualization, Supervision, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization.

Declaration of Competing Interest

None.

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