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Exploring the Continuous Use of ChatGPT for Travel-Related Services: A Pleasure–Arousal–Dominance Perspective

Han Xu, Xi Li, Jonathon C. Lovett and Lewis T.O. Cheung

Abstract

Purpose: This paper investigates human-AI interaction by exploring user emotional response, continuous use and word-of-mouth behaviour when utilising ChatGPT for travel-related services. The study applies the pleasure-arousal-dominance (PAD) theory to identify a mechanism through which users' emotional engagement with ChatGPT drives their continued adoption of ChatGPT.

Design/methodology/approach: This study obtained reliable data from 428 Chinese respondents who used ChatGPT for travel-related purposes. Structural equation modelling was utilized to test a series of hypotheses based on the PAD framework.

Findings: The findings indicate that three key features of human-AI interaction have a significant impact on users' emotional responses: service ubiquity; entertainment; and anthropomorphism. Dominance and arousal contribute to the emotional experience and lead to continued adoption and positive word-of-mouth recommendation. The results confirm users' perceived pleasure from interacting with ChatGPT has the strongest effect.

Originality/value:

This study examines the emerging trend of tourists' continuous adoption of ChatGPT for travel-related services. The results highlight how different emotions in human-AI interaction influence long-term use of AI-powered tool for travel-related services.

Keywords: ChatGPT, Pleasure–arousal–dominance model, Customer behaviour, Continuance usage intention, Word-of-mouth

1.Introduction

Artificial intelligence (AI) is revolutionizing the travel and tourism industry by changing how travellers access travel information, which in turn affects their interactions with service providers (Law et al., 2024). ChatGPT, developed by OpenAI and based on a large language model (LLM), has attracted attention for its innovative impact on travel-related services (Gursoy et al., 2023). With the ability to respond to real-time information enquiries, offer customized suggestions, and provide autonomous guided tours, ChatGPT has the potential to revolutionize the way tourists plan and experience travel (Carvalho and Ivanov, 2024, Wong et al., 2023).

The quality of travellers' destination experiences depends on the availability and reliable tourism data and information (Park and Eves, 2023). Prior to the use of ChatGPT, tourists mainly relied on official destination websites, social media, short video platforms, and other public sources to gather travel information. In reality, sifting through these sources for relevant and accurate information often lead to information and choice overload for tourists (Liu et al., 2024). ChatGPT's LLM processing capabilities allow it to provide context-specific travel information in a conversational question-and-answer format (Carvalho and Ivanov, 2024, Shin and Kang, 2023). In this regard, AI disrupts the conventional information search experience by providing a more efficient and personalized interaction (Shi et al., 2024, Carvalho and Ivanov, 2024). As AI-driven technologies like ChatGPT continue to advance, a new field of study is emerging to research and comprehend the factors driving user engagement and adoption behaviour of these tools for travel-related services.

Several scholars have recently examined acceptance of ChatGPT by tourists for travel-related services, however they primarily focus on functional attributes such as usefulness (Solomovich and Abraham, 2024), trust (Kim et al., 2024), efficiency (Sökmen et al., 2024) and communication speed (Pham et al., 2024). Despite the importance of these factors for initial user experience and acceptance, they may not fully explain long-term adoption patterns, especially as similar LLMs become increasingly prevalent. Consequently, the ways in which tourists' long-term engagement and continued willingness to adopt ChatGPT in various tourism-related services remain underexplored.This highlights a critical gap in the tourism literature.

ChatGPT's evolving capabilities have expanded user interaction from text-based to voice- and image-based communication. This has the potential to evoke unique emotional responses from users, particularly in the tourism and travel context. For

example, voice-based interactions transform ChatGPT into a virtual tour guide, enabling it to provide historical and cultural background through role-playing voices tailored to different tourist needs (Xu et al., 2024). These customized voice interactions may enhance travel experiences by evoking emotions such as joy, curiosity, and excitement (Wong et al., 2023). Additionally, ChatGPT's image recognition feature enables users to identify specific locations and sort information from multiple photos. This visual exploration allows users to emotionally connect with potential destinations, enhancing feelings of anticipation and inspiration. aiding in destination discovery and stimulating emotional engagement through visual exploration of potential travel experiences (Shin and Kang, 2023, George and George, 2023). These emotionally driven interactions highlight the importance of understanding the role of emotional engagement in the adoption and sustained use of ChatGPT. Emotional engagement is crucial in shaping the user experience and driving long-term technology adoption (Soltani Nejad et al., 2022). Although advancements in human-AI interaction provide promising applications in tourism, the impact on users' emotional responses and subsequent behavioural intentions, particularly regarding the continued use of ChatGPT for travel-related purposes, remains understudied. Addressing this research gap necessitates a focused examination of how emotional engagement influences users' willingness to sustain their interaction with ChatGPT in the long term. Therefore, we aim to understand the following research question:

> **RQ1:** How do the relevant human-AI interaction factors influence users' emotional responses when interacting with ChatGPT for travel-related services?

The Pleasure-Arousal-Dominance (PAD) theory is a well-established framework in psychology and provides valuable insights into the emotional dimensions of individual experiences (Floyd, 1997). PAD model captures the complexity of emotional responses through its three distinct dimensions: pleasure, arousal, and dominance. This model provides a nuanced lens for analysing affective responses to AI-assisted travel services, offering advantages over cognitive-focused models such as the Technology Acceptance Model, which largely emphasize functional aspects.

Drawing on PAD theory, this research aims to explore the emotional mechanisms that drive user engagement and reliance on ChatGPT for travel-related services. This study focuses on users continued use and willingness to engage in word-of-mouth (WOM) promotion of ChatGPT for travel-related services, an area that remains underexplored. The focus on continuance and WOM is indicative of long-term adoption and sustaining the success of AI-based tools such as ChatGPT in travel-related service applications.

For both tourism service providers and AI developers, understanding these aspects is helpful for the improvement of user engagement and continuous adoption. To understand this phenomenon, the following research question is proposed:

RQ2: What is the impact of these emotional responses on continuing intention of ChatGPT use and their WOM recommendation in the context of travel services?

This study provides several theoretical and practical contributions to the literature. First, it is one of the earliest attempts to employ the PAD model to understanding tourists' continuous adoption of ChatGPT for travel-related service. Second, this study attempts to reveal the underlying emotional mechanisms that drive tourists' engagement with and reliance on AI-driven chatbots such as ChatGPT, thereby enhancing our comprehension of how emotional cues are influencing tourists' acceptance of ChatGPT in the travel and tourism sectors. Third, this study extends the scope of the PAD model to the context of AI-driven technologies, and so provides valuable insights for tourism service providers and destination managers, enabling them to maximize the benefits of ChatGPT within the travel and tourism industry.

2.Literature Review

2.1 Pleasure–arousal–dominance (PAD) model

The Pleasure–Arousal–Dominance (PAD) model was proposed by Mehrabian and Russell (1974) and is derived from environmental psychology. This model explains how people's emotions influence their responses and evaluation of consumption in different environmental contexts. User behaviours are influenced by the three fundamental emotional states in the PAD model (Mehrabian and Russell, 1974). Pleasure refers to the joy, happiness, or satisfaction an individual feels in a particular environment (Kumar et al., 2021). Arousal is defined as the degree of excitement, stimulation, or activity an individual experiences in a given situation. Individual dominance is determined by his or her ability to control or act in a particular situation (Yang et al., 2020). When these emotional states are triggered, user are more likely to exhibit behaviours within that environment (Cheng and Huang, 2022).

The PAD model has been widely used to study users' emotional responses in various fields, including in psychology, consumer behaviour and tourism research. For example, Cheng and Huang (2022) applied the PAD model to explore how cues affect users' emotions and their acceptance of virtual tourism. Additionally, Loureiro (2015)

4

examined the impact of website quality on tourists' emotions and their intentions to visit and recommend island destinations. In this study, we aim to apply the PAD model to understand how human-AI interactions affect tourists' emotions and to uncover the emotional factors that drive long-term adoption of AI-driven services in travel and tourism industry.

2.2 Application of the PAD model

The components of ubiquity, entertainment, and anthropomorphism were identified as shaping users' experiences with ChatGPT. These components potentially influence tourists' emotional responses to AI-human interactions. Specifically, ChatGPT's **ubiquity** is characterized by 24/7 and instant responses to inquiries at all stages of travel (Solomovich and Abraham, 2024, Wong et al., 2023). This constant accessibility enhances users' perception of **dominance**, as they can rely on ChatGPT to provide immediate assistance whenever needed (Carvalho and Ivanov, 2024). The ease of access travel-related information fosters a sense of control over their journey, which is central to the dominance dimension in the PAD model (Cheng and Huang, 2022).Furthermore, ChatGPT offers a highly **entertaining** and personalized experience by adjusting its language style and tone to suit the user's interests and needs throughout the chat session (George and George, 2023). This personalization enhances the enjoyment of the interaction, making the delivery of travel information more interesting and enjoyable, which directly contributes to the **pleasure** dimension (Sökmen et al., 2024). Lastly, ChatGPT's **anthropomorphic** qualities, friendly tone, and playful humour help create an emotional connection with users (Xu et al., 2024). This enhances user engagement and increases **arousal** levels. Therefore, this study identifies ubiquity, entertainment, and anthropomorphism as the three main characteristics of human-AI interactions when user use ChatGPT for travel- related services. These features collectively may enhance perceived control, pleasure, and arousal during tourist-ChatGPT interactions.

Studies have found that consumers perceive ubiquity to be a factor in dominance of the Internet-based technologies (Hsieh et al., 2021, Cheng and Huang, 2022). Ubiquity refers to the ease with which individuals can access information and services provided by artificial intelligence (AI) chatbots, enabling them to be involved anytime and anywhere (Camilleri et al., 2023). ChatGPT offers a user-friendly interface where users simply need to ask questions to receive information, without requiring any programming knowledge (Shi et al., 2024), thereby enhancing users' sense of control over their information-seeking process. This aligns with the PAD theory's assertion that

increased perceived control leads to higher dominance (Russell et al., 1981). Therefore, this study assumes that the ubiquity of ChatGPT is likely to increase perceived dominance and propose the following hypothesis:

H1: Perceived ubiquity positively influences perceived dominance.

Perceived entertainment describes how an individual recognizes entertainment value offered by AI-powered tool (Tan et al., 2023). Beyond providing information, ChatGPT emerge as a novel form of entertainment in itself by providing humour and interactive games (Carvalho and Ivanov, 2024, George and George, 2023). For example, ChatGPT may enhance user enjoyment by designing interactive travel-related games, such as guessing landmarks. These entertainment attributes significantly enhance the value of the AI chatbot, positively influencing users' attitudes and motivating continued engagement with ChatGPT (Shen et al., 2024). Consequently, the entertainment provided by ChatGPT acts as an atmospheric cue, inducing feelings of enjoyment and pleasure leading to the following hypothesis was developed:

H2: Entertainment positively influences perceived pleasure.

Anthropomorphism is "the tendency to attribute human characteristics to inanimate objects, animals, and others" (Duffy, 2003). This characteristic can be effective in influencing consumer perception and behaviour (Ding et al., 2022). ChatGPT's anthropomorphic qualities are reflected in its human-like social skills during interactions with users (Xu et al., 2024). For example, ChatGPT uses specific words and tones, such as "ah," and "certainly" to create a more natural and comforting interaction (Wang and Shao, 2022). The anthropomorphic nature of ChatGPT elicits a sense of emotional arousal in users. Therefore, the following hypothesis is proposed:

H3: Anthropomorphism positively influences perceived arousal.

2.3 Outcomes of perceived pleasure, arousal, and dominance

An individual's ability to control their environment is related to perceived dominance (Mehrabian and Russell, 1974). Studies on the acceptance of new technologies in tourism contexts, such as virtual reality and service robots, suggest that strong perceived dominance leads to a reduction in uncertainty about products and an increase in satisfaction and intention to continue using them (Liu et al., 2022, Cheng and Huang, 2022). When tourists find ChatGPT can consistently provide accurate, relevant, and helpful information, their sense of control and dominance is enhanced (Kim et al., 2024). Pleasure refers to the enjoyment or satisfaction derived from using a system or service

(Cheng and Huang, 2022). Researches have shown that positive emotions lead to a favourable attitude towards the continued use of novel technologies (Liu et al., 2023, Hung et al., 2021). Thus, we hypothesize that users who experience pleasure during their interactions with ChatGPT are more likely to continue using it. Arousal is often attributed to the excitement and novelty associated with using new technologies, such as ChatGPT (Zarouali et al., 2018). This arousal can enhance user engagement with technology (Liu and Huang, 2023). Several studies have highlighted the importance of arousal on both the initial adoption and continuous use of new technologies in the tourism sector (Wang et al., 2020, Cheng and Huang, 2022). This increased arousal from these interactions may motivate users to continue using ChatGPT for travel-related services. These three PAD components lead us to three interrelated outcome hypotheses:

H4a: Perceived dominance positively influences continuous usage intention.

H5a: Perceived pleasure positively influences continuous usage intention.

H6a: Arousal positively influences continuous usage intention.

Word of mouth refers to users sharing their experiences and opinions about a product or service with others Derbaix and Vanhamme (2003). When users feel dominant, pleasurable, and more engaged in their interactions with ChatGPT, they are more inclined to share their experiences through word of mouth. This can help spread positive information to a wider user-base, potentially influencing other travellers to consider using ChatGPT for their travel-related needs. Therefore, the following hypothesis are developed:

H4b: Perceived dominance positively influences WOM.

H5b: Perceived pleasure positively influences WOM.

H6b: Arousal positively influences WOM.

The proposed research framework is illustrated in **Figure 1**.

. Methodology

3.1 Participants and procedure

This study focuses on tourists who have used ChatGPT for travel-related services. To ensure accurate results and access to a diverse group of participants, we utilized

Wenjuanxing (www.wjx.cn), China's largest survey platform, for participant recruitment and data collection. Wenjuanxing has more than 2.6 million panel members and reaches approximately 300 million users monthly, with an average of 10 million daily survey respondents. This extensive reach increased the validity and representativeness of our sample, allowing us to effectively reach a wide range of Chinese ChatGPT users.

The questionnaire was distributed online from October to December 2023, using Wenjuanxing's commercial sampling service to reach potential respondents. To ensure validity and reliability, two screening questions were included at the beginning of the formal questionnaire: "Have you ever used ChatGPT?" and "Have you ever used ChatGPT for travel-related services?" Only respondents who answered 'Yes' to both questions were selected as target tourists. Additionally, we set a minimum response time of 700 seconds for completing questionnaires to be considered valid responses. In total, 450 questionnaires were distributed, and 428 were deemed valid for analysis (95.11%).

3.2 Measurement items

The measurement items in this study were developed using validated scales from previous studies. Minor adjustments were made to fit the current context of ChatGPT usage in tourism. A 5-point Likert scale was used to record responses. The scale ranged from 1 (strongly disagree) to 5 (strongly agree).

Figure 1. Research Model
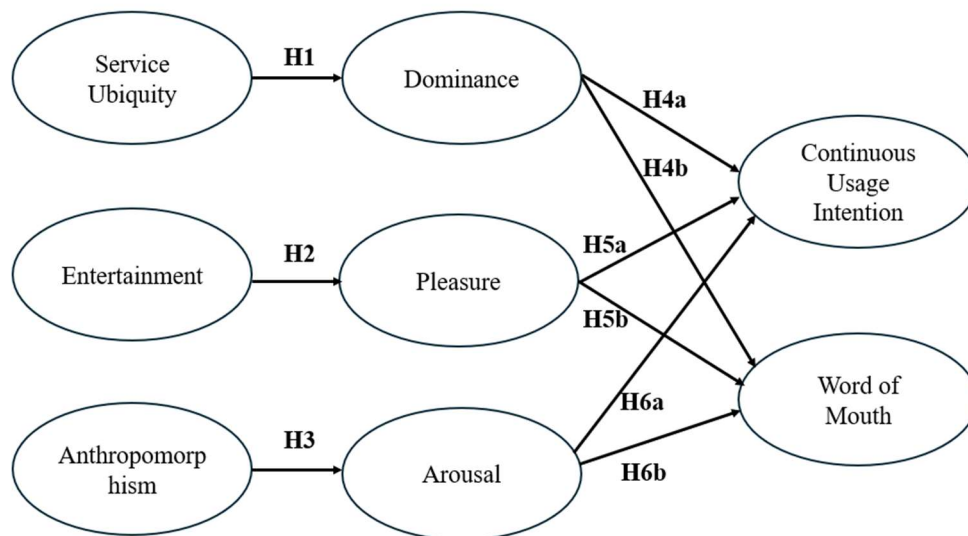
To measure the ubiquity of ChatGPT services, we used three items drawn from Hsieh et al. (2021). Entertainment was assessed using three items derived from Tsang et al. (2004). To evaluate anthropomorphism, we employed a five-item scale adapted from Li and Wang (2022).The constructs of dominance, pleasure, and arousal were measured using the scale from Cheng and Huang (2022). WOM were assessed using a three-item scale adapted from Shahzad et al. (2024),while continuous usage intention was measured with a three-item scale derived from Ku and Chen (2024), with minor wording changes to fit the context of ChatGPT services for tourism purposes.

4. Results

4.1 Respondents' demographic information

Among the 428 respondents, 55.61% were male, and 44.39% were female (**Table 1**). A majority of respondents (56.07%) were between 31 and 40 years old, followed by 41.59% between 18 and 30, indicating that ChatGPT users are likely be predominantly young to middle-aged individuals. There were 83.65% of respondents who reported having a bachelor's degree, indicating a well-educated user base. In terms of occupation, managerial positions made up the majority (55.14%). Concerning family monthly household income, 21.50% of respondents reported family monthly household income exceeding 30,001 RMB, followed by 19.16% earning 15,001–20,000 RMB and 18.22% earning 10,001–15,000 RMB. The relatively even income distribution suggests that ChatGPT appeals to a broad range of income groups, indicating that financial background is not a significant barrier to its adoption.

Table 1. Profile of survey respondents (n=428)

Variables	n	%	Variables	n	%
Gender			**Occupation**		
Male	238	55.61	Student	16	3.74
Female	190	44.39	Professional	112	26.16
Age			Managerial	236	55.14
18-30	178	41.59	Sales	62	14.49
31-40	240	56.07	Other	2	0.47
41-50	8	1.87	**Monthly household income (RMB)**		
51 and above	2	0.47	5,000 or less	12	2.80
Education Level			5,001–10,000	54	12.62
Less than high school	4	0.93	10,001–15,000	78	18.22
High school graduate	8	1.87	15,001–20,000	82	19.16

Professional training	24	5.61	20,001–25,000	62	14.49
Bachelor's degree	358	83.65	25,001–30,000	48	11.21
Master's degree and above	34	7.94	30,001 or more	92	21.50

4.2 Data analysis

The partial least squares structural equation modelling (PLS-SEM) was employed for this study due to its suitability for exploratory research, ability to estimate both measurement and structural models simultaneously, and strong predictive capability (Hair et al., 2019). These attributes are in line with the study's focus on the continuous adoption of ChatGPT by tourists in travel and tourism contexts. PLS-SEM offers additional advantages for analysing real-world datasets, including emphasis on practical relevance, adaptability in handling multicollinearity, and flexibility regarding data distribution (Henseler et al., 2016). Although PLS-SEM is robust to non-normal data, we confirmed the normality assumption for this study. Following the guidelines by Kline (2011), skewness and kurtosis values were expected to fall within the acceptable cutoff value range (skewness < 3.0, kurtosis < 10). The analysis showed that the skewness values ranged from -1.234 to -1.366, and the kurtosis values ranged from -0.944 to 4.268, indicating satisfactory levels.

4.3 Common method bias

The problem of common method bias (CMB) is a significant consideration in studies that reply on self-reported questionnaires (Jordan and Troth, 2020). In this study, Harman's one-factor test was used for a confirmatory factor analysis (CFA) to assess the eight potential variables in the model for CMB evaluation (Fuller et al., 2016). The results revealed that the largest factor accounted for only 23.03% of the variance, which is below the threshold of 50% (Min et al., 2016), indicating that common method bias was not a significant issue.

4.4 Measurement model

Table 2 presents the wording of question items as well as construct reliability and validity of these items. Validity and reliability of this study were assessed using Fornell and Larcker (1981) three criteria. One item each from entertainment, dominance and pleasure constructs was deleted due to their factor loadings below the recommended threshold of 0.5 (Shrestha, 2021). After the deletion, all the other item factor loadings were higher than 0.5, indicating acceptable reliability of these items (Shrestha, 2021). All composite reliability (CR) and Cronbach's alpha values approached or exceeded 0.70, indicating satisfactory construct reliability (Hair et al., 2017). The average

variance extracted (AVE) values of service ubiquity, dominance and WOM were slightly below 0.50, while the AVE values for the other variables exceed the 0.50 threshold, indicating acceptable convergent validity (Hair et al., 2017). Fornell and Larcker (1981) emphasise that an AVE above 0.5 is generally considered ideal for establishing convergent validity. However, composite reliability (CR) is equally important. Later studies (e.g., Lam, 2012; Muhamad Safiih and Azreen, 2016) suggest that a CR above 0.7 can help mitigate the impact of an AVE below 0.5, thus supporting acceptable construct reliability. The square root of each latent variable's AVE value was greater than the correlation between the constructs (See **Table 3**). Based on these results, all constructs exhibit satisfactory validity and reliability for further analysis.

4.5 Structural model and hypotheses testing

The structural correlations were assessed using path coefficients (β), t-statistics (t), and significance (p). Analysis using PLS-SEM (**Figure 2 and Table 4**) reveals a strong positive impact of service ubiquity on dominance (β = 0.423, t = 8.558, $p < 0.001$), supporting H1. Entertainment positively affects pleasure (β = 0.610, t = 14.667, $p < 0.001$), supporting H2. Similarly, anthropomorphism positively affects arousal (β = 0.193, t = 4.810, $p < 0.001$), supporting H3. Furthermore, user continuous usage intention is directly and positively influenced by dominance (β = 0.307, t = 5.405, $p < 0.001$) and pleasure (β = 0.269, t = 3.976, $p < 0.001$), but not by arousal (β = 0.097, t = 1.542, $p > 0.05$), supporting H4a and H5a, while rejecting H6a. Word-of-mouth (WOM) is positively influenced by dominance (β = 0.145, t = 2.629, $p < 0.01$), pleasure (β = 0.304, t = 5.524, $p < 0.001$) and arousal (β = 0.183, t = 3.199, $p < 0.01$), supporting H4b, H5b and H6b.

Table 2. Reliability and validity indicators, and scale items of the model.

Variables Scale Items		Factor Loading	AVE	Composite reliability (CR)	Cronbach's Alpha
Service Ubiquity			**0.465**	**0.719**	**0.691**
SU1	I can access ChatGPT for travel services at any time.	0.620			
SU2	I can access ChatGPT for travel services from anywhere.	0.810			
SU3	I can access ChatGPT for travel services when needed.	0.595			
Entertainment			**0.547**	**0.783**	**0.769**
EN1	Using ChatGPT this kind of conversational artificial intelligence would be entertaining.	0.750			
EN2	Using ChatGPT this kind of conversational artificial intelligence would be enjoyable.	0.653			
EN3	Using ChatGPT this kind of conversational artificial intelligence would be pleasant.	0.809			
Anthropomorphism					
AN1	The ChatGPT appears to have a mind of its own.	0.786	**0.712**	**0.925**	**0.911**
AN2	The ChatGPT appears to have intentions.	0.858			
AN3	The ChatGPT had "free will".	0.890			
AN4	The ChatGPT appears to have consciousness.	0.891			
AN5	The ChatGPT appears to have the ability to experience emotions.	0.788			
Dominance			**0.487**	**0.739**	**0.725**
DO1	I felt that I had a lot of control over my usage experience when talking with ChatGPT.	0.763			
DO2	When talking with ChatGPT, I could choose freely what I wanted to ask and accept.	0.683			
DO3	While chatting with ChatGPT, I controlled what happened in my online information searches.	0.641			
Pleasure			**0.563**	**0.793**	**0.727**
PL1	I felt happy during using ChatGPT.	0.844			

|					
PL2	I was satisfied with the ChatGPT.	0.698			
PL3	I felt hopeful during using ChatGPT.	0.700			
Arousal			**0.511**	**0.805**	**0.793**
AR1	When using ChatGPT, I feel excited.	0.804			
AR2	When using ChatGPT, I feel enthusiastic.	0.731			
AR3	When using ChatGPT, I feel active.	0.568			
AR4	When using ChatGPT, I feel warmth.	0.735			
Continuous usage intention			**0.590**	**0.812**	**0.756**
CUI1	I intend to continue using ChatGPT for travel purposes.	0.801			
CUI2	I intend to continue using ChatGPT more for travel-related service.	0.700			
CUI3	I think that more and more people will continuously use ChatGPT travel purposes.	0.800			
Word of mouth			**0.463**	**0.719**	**0.701**
WOM1	I would recommend ChatGPT to others.	0.580			
WOM2	I usually say positive things about ChatGPT to others.	0.678			
WOM3	I will tell my friends and relatives to try ChatGPT.	0.770			

Table 3. Discriminant validity.

	SU	EN	AN	DO	PL	AR	CUI	WOM
Service Ubiquity (SU)	**0.682**							
Entertainment (EN)	0.451	**0.740**						
Anthropomorphism (AN)	0.135	0.223	**0.844**					
Dominance (DO)	0.423	0.477	0.183	**0.698**				
Pleasure (PL)	0.460	0.610	0.243	0.455	**0.750**			
Arousal (AR)	0.419	0.651	0.193	0.523	0.614	**0.750**		
Continuous Usage Intention (CUI)	0.427	0.453	0.004	0.480	0.468	0.423	**0.768**	
Word of Mouth (WOM)	0.388	0.479	0.142	0.379	0.483	0.446	0.536	**0.680**

Note: The triangular matrix presents the Fornell-Larcker criterion. Values on the bolded diagonal are square root of the AVE.

Figure 2. Study Results

Note: * p < 0.05, : * * p < 0.01, * * * p < 0.001
⟶ Support
------▸ Reject
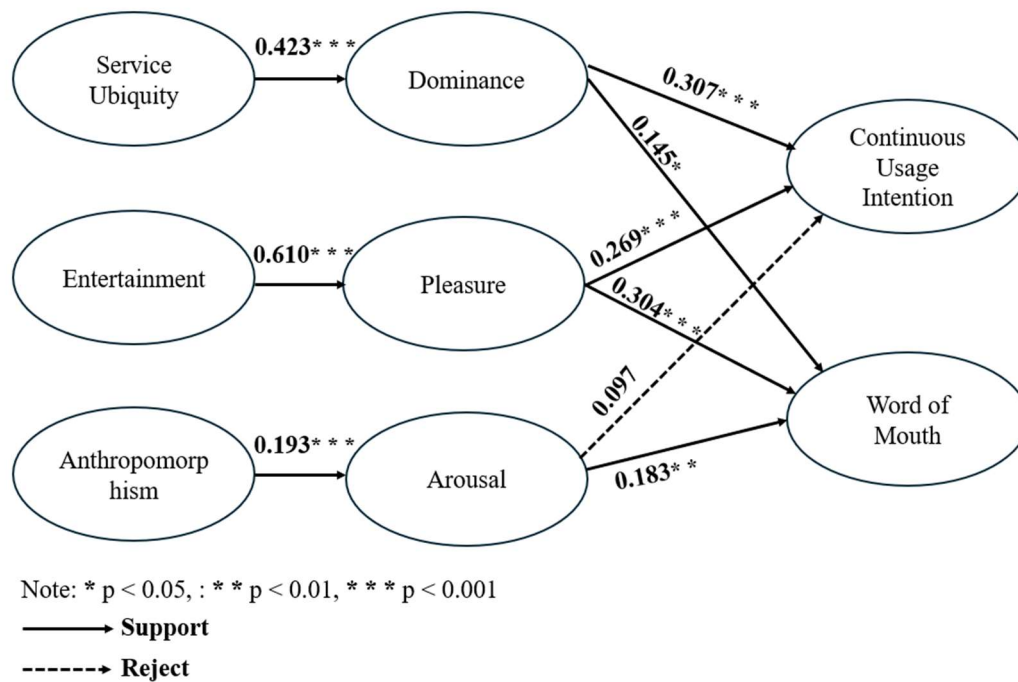
Table 4. Path estimates and hypothesis testing.

Hypothesis	Hypothesis path	Path coefficients (β)	t-Value	P value	Support
H1	Service Ubiquity -> Dominance	0.423	8.558	0.000	Yes
H2	Entertainment -> Pleasure	0.610	14.667	0.000	Yes
H3	Anthropomorphism -> Arousal	0.193	4.810	0.000	Yes
H4a	Dominance -> Continuous Usage Intention	0.307	5.405	0.000	Yes
H4b	Dominance -> Word of Mouth	0.145	2.629	0.009	Yes
H5a	Pleasure -> Continuous Usage Intention	0.269	3.976	0.000	Yes
H5b	Pleasure -> Word of Mouth	0.304	5.524	0.000	Yes
H6a	Arousal -> Continuous Usage Intention	0.097	1.542	0.123	No
H6b	Arousal -> Word of Mouth	0.183	3.199	0.001	Yes

5.Discussion and conclusion

5.1 Conclusions

The current study employed the PAD theory to investigate the effects of user emotions and subsequent behaviours induced by human-AI interaction elements on users' willingness to continue using ChatGPT for travel-related services.

First, the results reveal that service ubiquity positively affects perceived dominance, entertainment positively affect perceived pleasure, and anthropomorphism positively affect perceived arousal. These findings indicate that ubiquity, entertainment, and anthropomorphism are significant factors influencing users' emotional responses during their interactions with ChatGPT, which is consistent with previous studies that highlighted these elements for shaping emotional responses during human-AI interaction (Cheng and Huang, 2022, Chi et al., 2022). When inquiring with ChatGPT, tourists can receive timely assistance and enjoy a more engaging experience while searching for travel information (Solomovich and Abraham, 2024), thereby increasing

their sense of control and enjoyment when exploring tourism attractions and destinations. Moreover, when ChatGPT exhibits more human-like traits, such as more polite way or personalized responses, users are more likely to experience heightened arousal.

Second, the findings revealed that perceived dominance and perceived pleasure were significantly contribute to continuous usage intention, while perceived arousal did not significantly influence this intention. The results indicate that users feel empowered and experience pleasure during their interactions, they are more inclined to continue using the AI-powered chatbot for travel-related services. However, these findings partially contradict previous studies (Cheng and Huang, 2022), which revealed that dominance, pleasure and arousal positively affects continuous usage intention in virtual tourism and offline travel fairs contexts (Cheng and Huang, 2022, Sihvonen and Turunen, 2022). The discrepancy can be attributed to the unique nature of ChatGPT interactions with travel-related services. In contrast to immersive and virtual tourism experiences, ChatGPT engages tourists primarily through cognitive interaction such as itinerary planning and virtual tour guiding. This is consistent with self-determination theory (Deci and Ryan, 2000), which suggests that using ChatGPT satisfies needs for competence and autonomy (dominance) and relatedness (pleasure), fostering intrinsic motivation more than emotional arousal does. Moreover, as users become familiar with AI tools such as ChatGPT, the initial arousal may diminish, while the value derived from effective use persists. This finding suggests that in AI-assisted travel planning, which often involves deliberative processes, dominance and pleasure may be more crucial for continued engagement than arousal.

Interestingly, the findings related to WOM behaviour revealed a different result. The findings indicate that perceived dominance, perceived pleasure and perceived arousal positively impacted users' willingness to engage in WOM promotion of ChatGPT. The results align with Shrestha (2021) study on online games, which found that dominance, pleasure and arousal are positively affect WOM intentions. Furthermore, the findings of this study reveal dominance, pleasure and arousal have different influence impacts, with pleasure ($\beta = 0.304$, $p < 0.001$) having a greater effect than arousal ($\beta = 0.183$, $p < 0.01$) and dominance ($\beta = 0.145$, $p < 0.05$). This phenomenon can be explained by social exchange theory, which emphasizes that users engage in WOM based on perceived benefits (Cropanzano and Mitchell, 2005). Pleasure contributes to perceived benefits because sharing enjoyable experiences can enhance the sharer's social

relationships (Cheng and Huang, 2022). Arousal also provides perceived benefits, as sharing exciting and stimulating experiences can make the sharer appear more engaging to their social circle, thereby increasing their likelihood to engage in WOM (Feitosa and Barbosa, 2020). However, dominance is a more individualistic experience and has relatively lesser chances of translating into social value, hence its lower impact on WOM. Users feeling empowered and in control of their interactions with ChatGPT is still important because when engaged in promotion activities, it might contribute to reducing new users' anxiety (Hohenberger et al., 2017).

5.2 Theoretical implications

The application of ChatGPT in travel and tourism services has gained increasing attention, yet a comprehensive framework describing emotional factors affecting consumers' continuous usage intention and WOM behaviour remains underexplored. This study draws upon the PAD theory and contributes significantly to the theoretical understanding user interactions with AI-powered technologies.

First, this study extends the application scope of PAD theory to AI-driven chatbot user adoption behaviour in travel-related services, bridging the gap between emotion theory and technology adoption studies. Specifically, it identifies three AI-human interaction elements (service ubiquity, entertainment, and anthropomorphism) and examines their influence on users' emotional responses, continuous use of ChatGPT, and WOM behaviour. By considering the emotional dimensions of the PAD model, the results of this study enhance existing technology adoption models that primarily emphasize functional utility, such as perceived usefulness and ease of use (Tavitiyaman et al., 2022, Filieri et al., 2021). This study highlights the importance of considering emotional factors in understanding user behaviour when they adopt more advancing technology behaviours within travel-related service contexts. Moreover, it confirms that PAD theory is effective in dissecting and understanding user interaction with AI in the travel and tourism sector.

Second, this study elucidates the mechanisms how the experiential elements of AI interactions shape emotional responses, which in turn influence post-adoption behaviours such as continued usage and WOM promotion. The results confirm that feelings of dominance and pleasure are the key drivers of continuous usage intentions. Pleasure and arousal have a stronger impact on user's promotion WOM behaviour than dominance. These findings provide a clear theoretical link between emotion states

induced by human-AI interactions and the underlying psychological process, and address a critical research gap by focusing the continuous use of ChatGPT in tourism and tourism service contexts. Furthermore, the application of the PAD model to human-AI interactions extends beyond traditional technology acceptance models that focus primarily on cognitive factors by integrating a comprehensive framework of emotional responses. By emphasizing the role of the factors that shape user behaviour, this approach offers a novel perspective on the affective dimensions that shape user behaviour and enriches the understanding of technology acceptance in tourism.

Third, this study enhances the understanding of technology adoption in tourism by examining the differential impact of PAD dimensions on post-adoption behaviours in AI-driven travel services. The findings indicate that while dominance and arousal contribute to the emotional experience, hedonic pleasure derived from engaging with ChatGPT, appear to be the predominant factor in driving post-adoption behaviour. This finding highlights the critical role of user enjoyment in shaping continued engagement with AI-driven tool, and offers a nuanced perspective on the dynamics of technology adoption in tourism.

5.3 Practical implications

First, the findings indicate that service ubiquity positively influences users' perceived dominance, subsequently impacting their continuous usage and WOM promotion of ChatGPT. This highlights the importance of ensuring readily accessible services. At the current stage, utilizing AI chatbots like ChatGPT requires an internet connection, limiting their availability in remote or wilderness destinations where tourists may seek travel-related assistance. As technology matures, developers should explore creating offline versions that can function without internet connectivity, allowing users to access ChatGPT's services in areas with limited or no internet access. Moreover, travel-related service providers could collaborate with companies like OpenAI to integrate their chatbots seamlessly across multiple travel company platforms or mobile apps. It can provide users with ubiquitous access to AI-powered assistance whenever and wherever they need it.

Second, the findings indicate that entertainment positively influences users' perceived pleasure, subsequently impacting their continuous usage of ChatGPT and WOM behaviour. This suggests tourism service providers should collaborate with AI

developers to integrate personalized and entertaining content for users. For example, many museums have implemented VR glasses for tourism interpretation (Litvak and Kuflik, 2020). It is recommended that ChatGPT's voice inquiry function be combined with VR glass technology to enhance the current VR glass interpretation experience by enabling interactive communication with users, addressing the lack of interactivity in traditional VR glass interpretations. Furthermore, it is suggested that AI-chatbot developers like ChatGPT should consider implementing personalized interfaces, allowing users to upload profile pictures as avatars and customize signatures, similar to Instagram and Facebook. This personalization feature would enhance users' sense of belonging and enjoyment, contributing to a more engaging user experience.

Third, the study confirms that anthropomorphism positively impacts user arousal and subsequent WOM behaviour. This finding highlights the importance of integrating human-like characteristics into AI-driven chatbots. Programmers can incorporate elements that allow chatbots to reply with pictorial emotions, similar to how people communicate using emojis and stickers in daily life. This feature could further encourage sharing positive experiences. Moreover, it is recommended to incorporate more human-like support and empathy into the current version of ChatGPT. Travel-related service providers, such as hotels, restaurants, and airports, can contribute professional responses to AI companies. For example, if a tourist expresses frustration with an airline delay, the chatbot could respond empathetically: "I'm so sorry to hear about your delay. Travel can be stressful, but let's see how we can make the rest of your trip as smooth as possible." Such human-like, professional responses can create a warmer interaction, especially for emergency queries.

5.4 Limitations and future research

There are several limitations to this study that need to be addressed. First, this study is based only on ChatGPT. As AI technology and large language models are rapidly advancing, future studies could include other newer AI-driven chatbots, such as Claude 3 Opus and Gemini. Second, data for this study were collected over a single period of time. A longitudinal design would account for changes in user behaviour and perceptions as they become more familiar with AI-driven chatbot evolving features. Third, this study employed the PAD model as a theoretical framework and focused solely on the dimensions of ubiquity, entertainment, and anthropomorphism to understand the emotions that arise during human-AI interactions. Future research could extend the PAD model by incorporating additional technological features and emotional

factors, such as personalization, trust, or well-being, to provide a more comprehensive understanding of users' emotional responses to AI-powered chatbots such as ChatGPT.

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