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Perceived Value and User Features in Continuance Intention to Use Theme Park Apps

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Abstract

Background: *While the continuance intention of mobile apps has been extensively researched in tourism contexts, few studies have explored the continuance intention of mobile apps in the specific context of theme park apps from a configurational perspective. This study seeks to bridge this gap by exploring the different combinations of various perceived values and user features that lead to the continuance intention of theme park apps.*

Method: *The fuzzy-set qualitative comparative analysis (fsQCA) approach is used to examine the combined effect of perceived value (i.e., functional value, convenience value, hedonic value, and social value) and user features (i.e., travel frequency to theme parks and smartphone usage habit) on users' continuance intention of theme park apps. In addition, the perceived functional value includes five specific functions: real-time information, map navigation, virtual queue, online order, and recommended routes. The proposed conceptual model was tested with survey data gathered in China (N =347).*

Results: *The results revealed six distinct configurations of causal conditions leading to users' continuance intention, which were further classified into two first-order equifinality solutions. Specifically, the first solution highlights perceived online order and convenience value as core conditions, while the second solution suggests that the importance of different subtypes of perceived functional value varies depending on the presence of other conditions.*

Conclusion: *This study offers new insights into understanding the continuance intention of theme park apps from a configurational perspective, complementing traditional SEM-based IS behavioral intention research. Additionally, it provides a more nuanced understanding of the drivers of continuance intention by categorizing perceived value into four distinct dimensions and incorporating user features related to IS usage and travel habits. This study offers practical suggestions for the theme park operators to strengthen users' continued usage intention of the theme park app by providing value-added and personalized app services.*

Keywords: Continuance, Perceived Value, FsQCA, Theme Park App.

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Introduction

Mobile applications (apps), such as TripAdvisor and Booking, have greatly influenced tourism by enhancing travel experiences. Following this trend, an increasing number of theme park operators, including Legoland and Disney World, have embraced this technology by developing their dedicated theme park apps. Theme park apps refer to guest-facing apps specifically for visitors to a particular theme park or theme park chain (Fang et al., 2017; Li, 2021). Such apps can improve the visitor experience in parks by offering specific services for a more convenient and streamlined visit, such as in-park maps, ride wait times, and easy purchasing. Consequently, an increasing number of theme park visitors are depending on these apps to enhance their experience.

Despite this growing trend, theme park apps confront a notable challenge: sustaining users' long-term usage. A 2021 Statistics report revealed that only 20% of travel-related app users would continue their app use after the initial download (Statista, 2021). Furthermore, the average yearly retention rate for travel-related apps is a mere 6%, underscoring the difficulty in maintaining app usage over time (Statista, 2021). The continuance intention, which generally refers to users' intention to keep using an information system (IS), has been stated to be crucial for the sustainability of implementing an IS, since its long-term success relies on users' continued usage (Bhattacherjee, 2001). Moreover, retaining a long-term relationship with users can help theme park operators decrease costs and increase profitability (Bhattacherjee, 2001; Cao et al., 2018). Even if many visitors may only visit a theme park once, maintaining their app usage can benefit the operators. By encouraging ongoing app usage as a tool for communication and interaction, park operators can offer personalized promotions and exclusive content or rewards to not only enhance visitors' loyalty but also potentially increase the likelihood of their returning to the park. Therefore, understanding and fostering the factors that drive users to continue using theme park apps is vital to be studied.

Previous literature has extensively studied the mobile app's continued usage intention in various tourism contexts (e.g., museums and natural landscapes) from various theoretical angles (e.g., Choi et al., 2023; Foroughi et al., 2024). However, there exist several limitations. First, the specific context of theme parks, which generally refers to human-created, artificial-themed environments where fancy and wonderful experiences are provided to visitors, distinguished from our daily lives (Milman, 1988, 1991), has been largely ignored. Unlike other tourism contexts, theme parks have unique characteristics, such as densely populated places (Pan et al., 2022). The friction caused by the crowd in theme parks, such as long wait times, or missing out on activities, is more noticeable than in other tourism contexts (e.g., museums or natural landscapes). To alleviate the friction, the theme park apps are designed specifically with dedicated functions tailored to the park environment to satisfy visitors' specific needs, such as real-time park information, in-park map, online order, virtual queue, and recommended routes in parks (Omnico, 2019), while such unique services are not typically found in general travel apps. Considering the unique service orientation and focus of theme park apps, the identified motivators of continuance intention regarding other travel apps may not fully explain how theme park apps can retain their users effectively. Also, it remains unclear whether and how a theme park app's specific and dedicated functions can satisfy visitors' various needs and enhance their continuance intention.

Particularly, inconsistent findings have been reported regarding the predictors of continuance intention of travel apps. For instance, perceived value has been found to positively affect continuance intention regarding a specific type of travel app, such as an accommodation app (Kim, Bae, et al., 2019), but not significant in the context of general travel app (İlkan et al., 2023). Also, some studies demonstrated that perceived usefulness is an important predictor (Malik & Rao, 2019; Zhou et al., 2022), while some found it does not significantly affect continuance intention (Foroughi et al., 2024). These inconsistent findings may be explained by the different tourism contexts. Thus, investigating the motivators of users' continuance intention in the specific context of theme park apps is necessary.

Second, prior studies on the predictors of travel app continuance intention primarily focused on functional value (e.g., perceived usefulness and ease of use) and hedonic value (e.g., enjoyment) (Coves-Martínez et al., 2023; Zhou et al., 2022), but other types of value, such as convenience and social value, have been largely ignored. Indeed, theme park apps are designed to help visitors develop a more convenient, time-saving, and smooth visit. Meanwhile, these apps can service as a communication channel, allowing visitors to interact with other visitors or service advisors, further enriching their visit. However, it is still unknown whether and how these two types of value can predict a theme park app user's continuance intention. Thus, a further investigation is needed.

Third, user features have been largely ignored while studying motivators of continuance intention regarding travel apps. Visitors differ in their personal experiences regarding using an IS (Venkatesh et al., 2012) and travel frequency (Lu & Wei, 2019). Such variations may impact how they benefit from using a theme park app during their visits and their intention to sustain their app usage. For instance, tourists with more travel experience and app use experience may be often inclined to keep using the app to gain advantages like shorter wait times in

queues. But how these two user features influence continuance intention is unclear. Therefore, more examinations are required.

Fourth, prior studies on the continuance intention of mobile apps have predominantly used variance-based methods like regression analysis (RA) and structural equation modeling (SEM), which examine linear relationships between motivators and continuance intention (e.g., Ho et al., 2015; Malik & Singh, 2022). These studies typically focus on the individual impact of various predictors on continuance intention, overlooking the complexities of how multiple factors jointly influence this intention. The interactions between these predictors and continuance intention in theme park apps might not always be linear or symmetric. Different perceived values and user feature configurations could trigger the continuance intention. Therefore, a growing need exists to explore continuance intention using a configurational approach, such as fsQCA. Unlike SEM, which primarily focuses on linear relationships between independent variables (IVs) and dependent variables (DVs), fsQCA assumes asymmetrical relationships and allows for the examination of different combinations of IVs leading to the same DV (Liu et al., 2017; Pappas & Woodside, 2021). The fsQCA is particularly suited for exploring complex causal relationships between IVs and DVs, especially by considering the interdependencies among IVs, thereby, offering a more nuanced insight into the factors influencing individuals' behavioral intentions, which SEM might not capture effectively (Liu et al., 2017; Pappas & Woodside, 2021). Thus, this study applies the fsQCA to explore multiple causal models that can explain and predict users' intention to continue using the theme park app. This research does not aim to undermine the validity and usefulness of SEM. Instead, it builds upon the strong foundation laid by previous studies on continuance intention using SEM, allowing us to re-examine earlier work through a configurational perspective and supplement SEM-based IS behavioral intention research. Some recent studies have used the fsQCA in various contexts to do so, such as barriers to the adoption of online learning among female students (Mumu et al., 2022), and continuance of social media (Li et al., 2018).

To bridge the above research gap, this study employs fsQCA to examine how users' different types of perceived value and their features influence their continuance intention of theme park apps, as formulated by the following research question:

> *RQ: How do users' different perceptions of value and their features impact their intention to continue using a theme park app?*

Based on the perceived value theory (Zeithaml, 1988), we argue that individuals' intention to continue using a theme park app can be influenced by their assessment of the perceived value they derive from using it. Indeed, users can obtain various types of value through using the apps, such as functional, convenience, hedonic, and social benefits, based on their first-time use experience. Additionally, two types of user features, including smartphone usage habits and travel frequency to theme parks, are assumed to influence continuance intention together with perceived value. The proposed model was examined via a fsQCA approach with research data collected by a survey (N=347) in China. In so doing, this study contributes to prior literature. First, this study applies fsQCA to investigate multiple causal models that can predict users' continuance intention to use theme park apps, offering an alternate avenue for explaining causal relationships between the predictors and continuance intention by considering the interdependencies among the predictors. Second, this study extends prior studies by unpacking perceived value into four dimensions (functional, hedonic, social, and convenience value) and user features into two dimensions (IS-usage-related and travel-related experiences). Specifically, functional value has been subdivided into five sub-types, including real-time information, map navigation, online order, virtual queue, and recommended routes, which are closely aligned with the theme park context. Recognizing the interactions and combinations of perceived value and user features will help practitioners identify patterns that promote continuance intention, allowing them to optimize app design and functionality that address values using such an app during their visit in a theme park.

The rest of this study proceeds as follows: The literature review of previous research on the continuance intention of travel apps and perceived value is provided in the next section. The conceptual model is proposed in section 3, and the research method is described in section 4. The research results and discussion are presented in sections 5 and 6, respectively. The 7th section offers theoretical implications, practical implications, and limitations. The last section provides a succinct conclusion on this study's valuable insights.

Literature Review

Continuance Intention of Travel Mobile Apps

Continuance intention refers to a user's behavioral intention that emerges only after the first-time usage of an IS and focuses on whether the user intends to keep using it over time (Bhattacherjee, 2001). Such intention has been demonstrated to be pivotal for the long-term success of the IS (Bhattacherjee, 2001). Various theoretical frameworks have been applied in numerous contexts to understand what motivates users' continuance intention of an IS, for instance, Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1977), Theory of Planned Behavior (TPB) (Ajzen, 1991), Technology Acceptance Model (TAM) (Davis, 1989), Expectation-Confirmation Theory (ECT) (Bhattacherjee, 2001), IS Success Model (DeLone & McLean, 1992), and Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003).

In the specific context of mobile travel apps, a considerable amount of research has utilized the theories mentioned above to examine the antecedents determining users' continuance intention of mobile travel apps. These studies have successfully identified various elements that influence the continuance intention of users in this domain (see Table 1). For example, based on the TPB, TAM, and motivation theory, Zhou et al. (2022) demonstrated that users' continuance intention of a travel app is affected by perceived usefulness, ease of use, and enjoyment. Likewise, Choi et al. (2019) found that users' intention to continue using a travel app is influenced by perceived functional benefits, financial benefits, ease of use, enjoyment, satisfaction, and trust from a perceived value perspective and via a qualitative approach. In the study of Choi et al. (2023), drawn on TAM, ECM, and privacy-trust-behavioral intention model, the identified motivators of continuance intention include expectation confirmation, security, trust, and satisfaction. Regarding a social-location-based app, satisfaction and information sharing have been identified as drivers of continuance intention (Ho et al., 2015). Focused on a restaurant app, satisfaction with the app and perceived usefulness have been found to affect continuance intention positively (Li et al., 2024).

In summary, prior studies on continuance intention of travel mobile apps have primarily focused on general travel apps, and few studies have examined a travel app designed for a specific scenario, for instance, a theme park. Unlike the general travel app, a dedicated and specialized mobile app for theme parks has unique features. Specifically, it is designed with park-specific functions tailored to the unique environment of theme parks to enhance visitor experience. It primarily focuses on minimizing the challenges typically encountered in theme parks, not other tourism contexts (e.g., museums or natural landscapes). For instance, it offers a virtual queue to help visitors avoid the long wait lines and human crowdedness in the theme park. However, how these specific functions affect users' continuance intention is still unknown.

Additionally, few studies have delved into the specific user features that may influence users' continuance intention, such as visitors' travel frequency to theme parks and smartphone usage habits. Experienced travelers and frequent app users might exhibit different behaviors compared to new travelers and app users, but the impact of these factors has not been examined extensively.

Furthermore, regarding the methodology, the majority of prior studies employed a quantitative approach, and the structural equation model (SEM) has been extensively employed to analyze the survey data. While SEM is a well-established and powerful method for examining linear relationships between motivators and continuance intention, it provides limited insight into whether these relationships are asymmetric. The fsQCA adopts a configurational approach to investigate such asymmetric relationships, supplementing prior SEM-based research. Hence, this study examines the combined effects of perceived value and user features on continuance intentions from a configurational perspective.

Table 1 – The Research Summary on Continuance Intention of Mobile Travel Apps

Research	App type	Theory	Method	Antecedents of continuance intention
Anand et al. (2022)	AR-based mobile travel app	IS Success Model	Survey (N= 204) PLS-SEM	Satisfaction (+)
Choi et al. (2023)	General mobile travel apps	Technology Acceptance model (TAM); Expectation-Confirmation Model (ECM); Privacy–Trust–Behavioral Intention Model	Survey (N = 509) AMOS Interview (N = 11)	Confirmation of expectation (+) Privacy protection (/) Security (+) Satisfaction (+) Trust (+)
Choi et al. (2019)	Travel related information-searching apps, Accommodation apps, airline apps, and destination specific apps	Perceived Value Theory	Interview (N = 22)	Perceived functional benefits Perceived ease of use Perceived enjoyment Perceived financial benefits Satisfaction Trust
Coves-Martínez et al. (2023)	General mobile travel apps	Unified Theory of Acceptance and Use of Technology 2	Survey (N =482) SEM	Satisfaction (+)
Foroughi et al. (2024)	General mobile travel apps	Technology Continuance Theory	Survey (N = 355) PLS-SEM	Perceived usefulness (/) Satisfaction (+) Attitude (+) Personal innovativeness (-) Attractiveness of alternatives (-)
Ho et al. (2015)	Social location-based services app	ECM	Survey (N = 464) SEM	Satisfaction (+) Information Sharing (+) Personalization (/)
İlkan et al. (2023)	Mobile apps in tourism	Uses and Gratifications Theory; Diffusion of Innovation Theory	Survey (N = 510) AMOS	Perceived value (/) Satisfaction (+)
Kamboj & Joshi (2021)	General mobile travel apps	UTAUT2	Survey (N =357) SEM	Smartphone app use (+)
Li et al. (2024)	Restaurant app	Post-Adoption Model of Information System Continuance	Survey (N = 245) PLS-SEM	Perceived usefulness (+) Satisfaction with app (+)
Liu et al. (2023)	General mobile travel apps	ECM; IS Success Model	Survey (N =480) PLS-SEM	Satisfaction (+) Perceived usefulness (+)
Malik & Rao (2019)	On-demand ride services/ride-hailing app	Extended ECM; Self-efficacy; Perceived Value	Survey (N = 1552) SEM	Perceived ease of use (+) Perceived usefulness (+) Perceived value (+) Self-efficacy (+) Satisfaction (+)
Shang et al. (2023)	General mobile travel apps	Technology Threat Avoidance Theory	Survey (N =1002) SEM	Perceived price fairness (+) Perceived deception (-) Threat appraisal (-) Avoidance intention (/) Emotion-focused coping (+)
Kim, Bae, et al. (2019)	Accommodation apps	Value-Based Adoption Model; ECM	Survey (N = 410) AMOS	Satisfaction (+) Perceived value (+)
Zhou et al. (2022)	General mobile travel apps	Theory of Planned Behavior (TPB); TAM	Survey (N =278) AMOS	Perceived usefulness (+) Perceived ease of use (+) Perceived enjoyment (+)

Notes: +: positive relationship; -: negative relationship; /: not significant; SEM: Structural Equation Modeling; PLS: Partial Least Squares; AMOS: Analysis of Moment Structures.

Perceived Value in Theme Park App Use

The theory of perceived value, which is well-documented in the marketing field, explains how people perceive the value of a product or service based on their evaluations of benefits and costs (Zeithaml, 1988). Such evaluations reflect users' desirable end goals, influencing people to make decisions, such as purchase intention (Li & Hitt, 2010), adoption (Vijay et al., 2017), and continuance intention (Choi et al., 2019; Malik & Rao, 2019). Previous research conceptualized perceived value as a unidimensional concept that only represents the overall assessments of benefits (Baker et al., 2002), but recent studies are more likely to break down the value into multiple sub-dimensions from various perspectives. Specifically, in terms of users' motivation, utilitarian and hedonic values are two common sub-types of perceived value (Park & Park, 2009). From the perspective of goal orientation, perceived values are classified into intrinsic values (hedonic and altruistic values) and extrinsic values (economic and social values) (Holbrook, 2006). The IS researchers have also categorized perceived value into different types to fit the various IS contexts. For instance, in the study of Lee et al. (2014) on Facebook, perceived value was classified into four dimensions, namely, information, experiential, transaction, and social value. Regarding WeChat, Li et al. (2018) categorized perceived value into hedonic, information, technology, and social values, while Zhang et al. (2017) classified perceived values as social, information, emotional, and hedonic values.

In the context of travel apps, researchers have also adapted perceived value to study continuance intention. For example, from a unidimensional perspective, perceived value has been found to positively affect continuance intention of ride apps (Malik & Rao, 2019) and accommodation apps (Kim, Bae, et al., 2019). From a multi-dimensional perspective, four main types of perceived value on general travel apps were proposed in the study of Choi et al. (2019), including perceived functional and financial benefits, perceived ease of use, and perceived enjoyment. Additionally, all types of perceived values are considered core motivational factors in continuance intention (Choi et al., 2019).

The prior literature indicates that perceived value may be appropriate for examining continuance intention of theme park apps from the individual perspective. First, perceived value offers a multi-dimensional perspective that can capture the complex interplay of various factors influencing user behavior. This allows for a more nuanced analysis compared to the relatively narrower focus of alternative theories, such as IS Success Model, TAM, and UTAUT2, which primarily emphasize system-related and utilitarian factors. Perceived value can accommodate diverse user perceptions and be tailored to specific dimensions relevant to our research context (e.g., functional, hedonic, social, and other values). By addressing these multiple aspects of user perceptions, perceived value offers a comprehensive framework that other theories might overlook, offering new insights into the studied topic. Second, prior studies using SEM have shown that perceived value is a predictor of continuance intention of travel apps, whether viewed as a single-dimensional (Malik & Rao, 2019), or multi-dimensional concept (Choi et al., 2019), offering strong support for examining the combinations of perceived value sub-dimensions that can contribute to continuance intention from a configuration standpoint in this study.

Conceptual Model Development

Based on typology of perceived value conducted by Holbrook (2006), this study categorized perceived value of using theme park apps into two main types: extrinsic and intrinsic values. Extrinsic values refer to "*where a product or consumption experience serves instrumentally or functionally as a means to some further end*", and intrinsic values refer to "*where a consumption experience is appreciated for its own sake as a self-justifying end-in-itself*" (Holbrook, 2006, p. 715). Drawing on the value theory-based studies emphasizing goal-oriented aspects (Holbrook, 2006; Yang et al., 2018; Zhang et al., 2017), this study categorizes extrinsic values into three dimensions: perceived functional, convenience, and social values, while intrinsic values are characterized by a single dimension: hedonic value. Table 2 presents definitions of different dimensions of perceived value. We posit that using a theme park app serves various goals, encompassing extrinsic and intrinsic goals. Among these four dimensions of perceived values, functional, convenience, and social values are pursued to achieve extrinsic goals, such as problem-solving, time-saving, and social interaction. By contrast, hedonic values are motivated by intrinsic values, that is, using a theme park app per se is the goal and is not driven by any other enforcements. Additionally, these four dimensions are particularly pertinent to the context of theme park apps, as they comprehensively cover the main types of app usage in such context. For instance, Kirova and Thanh (2019) posit that types of smartphone use while traveling in a theme park can be grouped into three: utilitarian (i.e., navigation), hedonic (e.g., music), and relational (e.g., social interaction) uses. This study highlights convenience value specifically, as time management has been identified as a key factor in improving user experience in the context of theme park apps (Hu et al., 2020).

Table 2 – Definitions of Different Dimensions of Perceived Value		
Dimensions	Definition	Type
Functional value	User perceptions of how effectively the app's dedicated functions can help solve a specific problem (Choi et al., 2019)	Extrinsic
Social value	User perceptions of the benefits gained from using a theme park app as a social approach to interact with others (Li et al., 2018).	Extrinsic
Convenience value	User perceptions of how theme park apps contribute to time-saving during the park visit (Souiden et al., 2019).	Extrinsic
Hedonic value	User perceptions of enjoyment, fun, or even excitement were obtained from using a theme park app (Choi et al., 2019; Li et al., 2018).	Intrinsic

Specifically, functional value is derived from utilitarian benefits external to the individual, focusing on how well a theme park app performs its specific function to solve a practical problem (Choi et al., 2019; Holbrook, 2006). The perceived functional value includes five sub-types that are closely tied to the app's specific functions, namely, real-time information, map navigation, virtual queue, online order, and recommended routes. Prior studies have identified particular functions of a travel app, such as seven specific functions proposed by Kennedy-Eden and Gretzel (2012), including entertainment, information, mobile marketing, navigation, security, social engagement, and transactions. The appropriateness of various functions for a travel app has also been discussed; for instance, location-based navigation, informational guides, and recommendations are suggested to be suitable (Chen & Tsai, 2019; Ricci, 2010). A recent report on theme park apps revealed that the most desired features among visitors are online order, real-time information, virtual queue, map navigation, and recommendations (Omnico, 2019). Considering previous discussions, this study proposed that five specific functions (i.e., real-time information, map navigation, online order, virtual queue, and recommended routes) are particularly suitable for theme park apps, encapsulating the perceived functional value in their usage. Specifically, the value of real-time information means the benefits and advantages of offering up-to-date and useful information through the app, such as live updates about rides, events, and shows in parks. The value of map navigation refers to the benefits of navigating to destinations efficiently and within the park using a location-aware and interactive map offered by the app. The value of online order pertains to the benefits of purchasing tickets, food, drinks, or others in advance to save time. The value of a virtual queue focuses on the benefits of minimizing waiting in physical lines by using the app to queue for rides or shows, thereby avoiding crowds. The value of recommended routes involves the benefits of optimizing the park experience and reducing the stress of planning by following the most efficient or enjoyable paths recommended by the app.

Perceived convenience value is also extrinsic as it is about external factors that save a user's time and effort during the park visit (Holbrook, 2006; Souiden et al., 2019). Convenience has been confirmed to positively affect users' continued intention to use travel apps (Fakfare et al., 2023; Xu et al., 2019). Likewise, in the theme park app context, with the variety of functionalities designed to assist visitors, the apps can also facilitate a more convenient and efficient park experience by saving time for the visitors. Consequently, convenience is deemed a significant value in using a theme park app, and reasonable to be assumed to influence users' intent to continue using the app.

Hedonic value, as intrinsic value, is derived from users' own pleasure in personal experiences appreciated for their own sake as ends in themselves, such as enjoyment derived from appreciating beautiful artworks and landscapes, or engaging in leisure activities (Holbrook, 2006). This value is intrinsic because it relates to internal enjoyment and pleasure that the individual experiences (Holbrook, 2006; Yang et al., 2018). Hedonic value has been found to positively affect continuance intention of various IS, such as online shopping (Liu et al., 2020), hotel booking apps (Vayghan et al., 2023), and travel apps (Zhou et al., 2022). Hedonic value fits well into the studied context, as it can be derived from enjoyable content and elements in the apps, such as videos and photos featuring theme park characters or events. Therefore, this study assumes that hedonic value can facilitate users' continued intention to use theme park apps.

While social value is closely linked with hedonic value, as personal enjoyment can also arise from social interactions, there is a key difference between the two: social value is extrinsic, aimed at achieving external goals such as interpersonal connections and social consequences, whereas hedonic value is intrinsic, focusing on the individual's enjoyment and pleasure derived from the usage experience itself (Holbrook, 2006; Yang et al., 2018). Social value can be realized through cultivating and maintaining relationships, presenting themselves effectively, and even seeking social endorsement and support (Li et al., 2018). Prior studies have found that users assess a product and service not only by functional and hedonic values, but also by social value (Sweeney & Soutar, 2001). In the context of IS, social value has also been identified as an important predictor of continuance intention, such as microblogging services (Yang et al., 2018), social media (Li et al., 2018), and omnichannel (Chang & Geng, 2022). Social value fits well into the context of theme park apps, as the apps can offer communication tools (such as chat and discussion boards) for interaction with others, allow visitors to

share their location with friends, participate in group activities, and engage in interactive challenges that foster collaboration and social interaction. Furthermore, with social media integration, visitors can effortlessly share their experiences, photos, and videos with their social networks directly through the app, amplifying the social aspect of their visit. Collectively, these features can nurture a sense of social connectedness among park visitors. Therefore, this study proposes social value is another essential motivator.

Furthermore, user features have been discussed to influence the continuance of mobile apps. For example, Choi et al. (2019) found that users' travel purpose, experience, and familiarity with the app are moderators to affect the influences of perceived value on continuance intention when studying continuance intention of travel apps. Likewise, through the fsQCA approach, Li et al. (2018) discovered that use frequency and gender are important conditions combined with perceived value, leading to continuance intention of mobile apps. Thus, user features should be included when investigating the relationships between perceived value and continuance intention in theme park apps context. Two user features, namely user experience with using an IS (represented by smartphone use habit) and user travel experience (represented by travel frequency to a theme park), were selected to capture the two main types of user features that may influence continuance intention. Particularly, smartphone use habit encompasses the user's familiarity and engagement with a smartphone, which is crucial for interacting with the app (Venkatesh et al., 2003; Venkatesh et al., 2012). Travel frequency reflects individual expertise and preferences related to traveling in theme parks, which are directly relevant to app use needs (Eriksson, 2014).

Based on the above ground, this study assumes that the relationships between perceived value, user features, and continuance intention of theme park apps are asymmetric, and the fsQCA approach was employed to examine the combined causal conditions for the outcome of continuance intention from the joint effects of perceived value and user features (See Figure 1). Four dimensions of perceived value and two types of user features are included in this study as predictors of continuance intention.

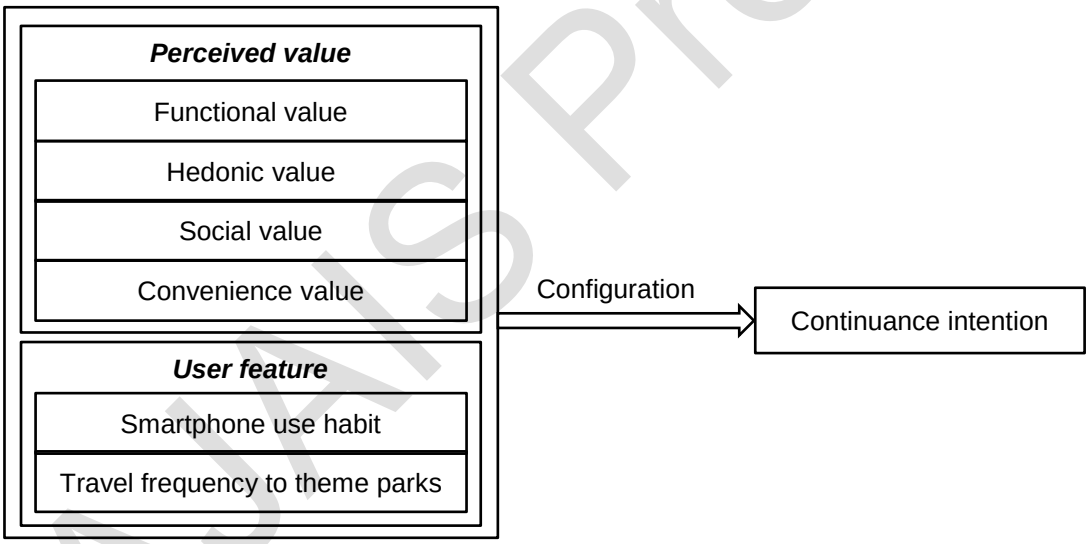

Figure 1 – The Conceptual Model

Method

Data Measures

The measured constructs were adopted from previous studies, which were well-established and effectively validated. All adapted constructs were measured by the seven-point Likert scale, ranging from "1 = strongly disagree" to "7 = strongly agree". All scales were further tailored to the context of theme park apps. Specifically, the scales for real-time information, map navigation, online order, virtual queue, and recommended routes, were referred to the scales by Cenfetelli et al. (2008) and Liu et al. (2020). The measures for continuance intention, convenience value, and smartphone use habit were adopted items from Bhattacherjee (2001), Souiden et al. (2019), and Venkatesh et al. (2012), respectively. The scales for hedonic value and social value were adapted from Kim, Lee, et al. (2019). All instruments are presented in the Appendix A.

To collect data in China, the original English questionnaire was translated into Chinese by the first author, who was fluent in English and Chinese. Then, both the English and Chinese versions of the questionnaires were double-checked by two bilingual (English and Chinese) IS researchers to ensure the translation quality and consistency. Additionally, 30 Chinese theme park app users were invited to participate in a pilot study to enhance the quality of the questionnaire. Based on their feedback, a few wording questions and statements have been revised to improve the final version of the questionnaire.

Data Collection

The target population in this study was current users of theme park apps. Specifically, this study collected survey data via Wenjuanxing, China's most popular survey platform, and has been widely used to recruit participants. The survey link was shared in online communities of theme parks on different social media platforms, such as Weibo and WeChat. Then, participants were asked to share the link with other users they knew. To ensure that the participants have had certain usage experience of theme park apps, two screening questions were implemented to record respondents' prior usage experiences: "Have you used a theme park app when you visited a theme park before," and if so, "what is the name of the app." Additionally, the website's techniques, such as Internet Protocol (IP) restrictions and time limits, were adopted to eliminate duplicate responses and rapid answers. Finally, to express gratitude for their participation, every respondent who completed the questionnaire was rewarded with a "red pocket" containing random money ranging from 0.1 to 2 RMB.

This online survey was structured into four distinct parts. It began with informed consent, outlining the study's purpose, methodology, data storage, privacy safeguards, and researchers' contact details. Participation in the survey was contingent upon the respondents' agreement to this consent. The second section consisted of filtering questions to verify respondents' experience using theme park apps. The third section gathered personal background information, such as age, gender, education level, and travel frequency of theme park visits. Regarding the final section, participants were requested to report their impressions and feelings about using theme park apps based on their experience.

The survey was carried out for two weeks in December 2021, and 361 completed questionnaires were obtained. Among these questionnaires, 14 submissions were invalid as the same answer was selected for all questions. Thus, 347 valid responses were used in this research. Among the 347 respondents, 52.4% were female, 98.8% were aged 45 and below, and 75.5% held a bachelor degree or above. Finally, all respondents had experience in using theme park apps, of which 78.1% visited a theme park 1 or 2 times annually, and 19.6% visited a park 3 times or more each year, closely aligning with a study that reported 77% of participants visit a theme park 1 or 2 times annually, and 23% of participants visit a theme park three times or more a year (Hashim & Said, 2013). This similarity of visit frequency suggests our sample reasonably reflects user behavior patterns of theme park apps. Table 3 outlines the basic demographic details of the respondents.

Table 3 – The Demographics of the Respondents

Measures	Items	Frequency	Percentage (%)
Age	18-25	86	24.8
	26-35	190	54.8
	36-45	67	19.3
	46-55	4	1.2
Gender	Male	163	47.0
	Female	182	52.4
	Unwilling to disclose	2	0.6
Education	High school or below	35	10.1
	Associate	50	14.4
	Bachelor	211	60.8
	Master or above	51	14.7
Travel frequency to a theme park annually	Less than once	8	2.3
	Once	132	38.0
	Twice	139	40.1
	Three times or above	68	19.6

The Common Method Bias, Reliability, and Validity Analysis

This study used multiple methods to check the common method bias (CMB) of the data. First, the Harmon one-factor test was employed, and the results show that the first factor accounted for 42.54% of the variance, lower than the 50% threshold, as Podsakoff et al. (2003) suggested. Second, following unmeasured latent marker

construct proposed by Liang et al. (2007), the results show that the average substantively explained variance of the indicators is 0.629, while the average method-based variance is 0.049, and the ratio of substantive variance to method variance is about 13:1. And the method factor loadings are not significant. Third, the full collinearity test suggested by Kock and Lynn (2012) was used, and the results presented the values of variance inflation factors (VIFs) vary between 1.413 and 3.244, all of which are below the recommended threshold of 3.3 (Kock & Lynn, 2012). Finally, blue attitude was employed as a survey marker variable. Following the technique recommended by Williams et al. (2010), which involves running five models (i.e., baseline model, model CFA, model C, model U, and model R) and a model comparison between superior model U and model R. The data showed no significant difference between the two models (difference in $\Delta\chi^2 = 35$, $p > 0.05$), therefore, indicating that common method bias is not a serious concern in this research.

Before employing the fsQCA method, the constructs' reliability, validity, and discriminant validity of the measurement items were tested by the Partial Least Squares (PLS) algorithm. Specifically, five items (SV3, SV4, MN1, VQ3, and SH2) were removed due to the fact that factor loadings were lower than 0.7. Table 4 illustrates that the factor loading values of the remaining items were greater than 0.7. The values for Cronbach's alpha (CA) and Composite Reliability (CR) exceeded the threshold of 0.7, confirming the reliability of this study (Fornell & Larcker, 1981). Additionally, the average variance extracted (AVE) results exceeded 0.5, demonstrating that convergent validity was good in this study (Fornell & Larcker, 1981). Regarding the discriminant validity, the square root of the AVEs for each construct was greater than the correlations between the latent variable and the other variables (Chin, 1998) (see Table 5); the item loadings were greater on their intended construct than on other constructs (see Table 6); and the heterotrait–monotrait ratio (HTMT) values were below 0.90, which is a threshold considered acceptable for discriminant validity (Henseler et al., 2015) (see Table 7). Hence, the discriminant validity was established in this research.

Table 4 – Reliability and Convergent Validity

Constructs	Items	Loadings	CA	CR	AVE
Continuance intention (CI)	CI1	0.894	0.875	0.875	0.800
	CI2	0.875			
	CI3	0.914			
Convenience value (CV)	CV1	0.761	0.892	0.893	0.650
	CV2	0.762			
	CV3	0.843			
	CV4	0.808			
	CV5	0.823			
	CV6	0.834			
Hedonic value (HV)	HV1	0.857	0.869	0.876	0.792
	HV2	0.897			
	HV3	0.915			
Social value (SV)	SV1	0.944	0.891	0.898	0.902
	SV2	0.955			
Real-time information (RI)	RI1	0.803	0.839	0.845	0.675
	RI2	0.786			
	RI3	0.851			
	RI4	0.844			
Map navigation (MA)	MN2	0.849	0.702	0.723	0.769
	MN3	0.904			
Online order (OO)	OO1	0.906	0.901	0.901	0.835
	OO2	0.910			
	OO3	0.925			
Virtual queue (VQ)	VQ1	0.959	0.908	0.910	0.916
	VQ2	0.954			
Recommended routes (RR)	RR1	0.878	0.855	0.863	0.776
	RR2	0.842			
	RR3	0.922			
Smartphone use habit (SH)	SH1	0.887	0.709	0.711	0.775
	SH3	0.874			

Table 5 – Discriminant Validity: Fornell–Larcker Criterion

	CI	CV	HV	SV	RI	MN	OO	VQ	RR	SH
CI	0.894									
CV	0.719	0.806								
HV	0.709	0.757	0.890							
SV	0.501	0.524	0.678	0.950						
RI	0.540	0.649	0.627	0.405	0.822					
MN	0.577	0.685	0.627	0.415	0.668	0.877				
OO	0.524	0.634	0.594	0.538	0.420	0.517	0.914			
VQ	0.498	0.555	0.592	0.613	0.400	0.525	0.727	0.957		
RR	0.600	0.728	0.632	0.556	0.529	0.579	0.767	0.667	0.881	
SH	0.260	0.321	0.259	0.014	0.361	0.255	0.154	0.022	0.184	0.880

Table 6 – Discriminant Validity: Cross Loadings

	CI	CV	HV	SV	RI	MN	OO	VQ	RR	SH
CI1	**0.894**	0.637	0.638	0.451	0.493	0.445	0.462	0.436	0.532	0.244
CI2	**0.875**	0.633	0.623	0.469	0.477	0.533	0.459	0.465	0.538	0.185
CI3	**0.914**	0.658	0.641	0.425	0.479	0.569	0.485	0.435	0.54	0.269
CV1	0.567	**0.761**	0.559	0.354	0.507	0.488	0.557	0.437	0.599	0.321
CV2	0.538	**0.762**	0.586	0.411	0.520	0.566	0.458	0.359	0.555	0.254
CV3	0.589	**0.843**	0.651	0.471	0.552	0.576	0.522	0.484	0.567	0.281
CV4	0.576	**0.808**	0.607	0.374	0.534	0.550	0.449	0.424	0.582	0.289
CV5	0.608	**0.823**	0.618	0.442	0.547	0.522	0.501	0.486	0.600	0.215
CV6	0.594	**0.834**	0.638	0.476	0.481	0.611	0.574	0.486	0.613	0.196
HV1	0.565	0.590	**0.857**	0.657	0.511	0.461	0.518	0.582	0.523	0.161
HV2	0.655	0.715	**0.897**	0.558	0.581	0.618	0.527	0.513	0.573	0.266
HV3	0.666	0.708	**0.915**	0.605	0.579	0.583	0.541	0.497	0.588	0.255
SV1	0.450	0.471	0.630	**0.944**	0.365	0.373	0.503	0.570	0.526	0.007
SV2	0.498	0.522	0.657	**0.955**	0.403	0.413	0.518	0.593	0.529	0.031
RI1	0.402	0.484	0.499	0.317	**0.803**	0.461	0.315	0.311	0.368	0.314
RI2	0.417	0.515	0.483	0.245	**0.786**	0.528	0.329	0.300	0.395	0.342
RI3	0.462	0.573	0.527	0.329	**0.851**	0.613	0.399	0.356	0.478	0.284
RI4	0.485	0.556	0.549	0.427	**0.844**	0.581	0.335	0.345	0.487	0.256
MN2	0.449	0.550	0.485	0.288	0.587	**0.849**	0.372	0.397	0.415	0.242
MN3	0.554	0.644	0.604	0.427	0.587	**0.904**	0.522	0.515	0.585	0.209
OO1	0.484	0.575	0.546	0.517	0.363	0.411	**0.906**	0.668	0.731	0.143
OO2	0.485	0.582	0.532	0.462	0.423	0.516	**0.910**	0.656	0.699	0.146
OO3	0.467	0.579	0.550	0.495	0.366	0.491	**0.925**	0.668	0.671	0.132
VQ1	0.490	0.552	0.572	0.576	0.408	0.497	0.696	**0.959**	0.661	0.043
VQ2	0.463	0.510	0.562	0.598	0.357	0.509	0.695	**0.954**	0.615	0.003
RR1	0.509	0.624	0.558	0.487	0.465	0.431	0.676	0.570	**0.878**	0.181
RR2	0.495	0.628	0.534	0.470	0.457	0.519	0.613	0.550	**0.842**	0.152
RR3	0.578	0.670	0.577	0.511	0.478	0.575	0.733	0.640	**0.922**	0.156
SH1	0.235	0.288	0.230	0.011	0.350	0.220	0.139	0.015	0.181	**0.887**
SH3	0.223	0.277	0.225	0.013	0.283	0.229	0.132	0.023	0.143	**0.874**

Table 7 – Discriminant Validity: Heterotrait–Monotrait Ratio (HTMT)

	CI	CV	HV	SV	RI	MN	OO	VQ	RR	SH
CI										
CV	0.814									
HV	0.810	0.856								
SV	0.566	0.586	0.774							
RI	0.628	0.749	0.731	0.463						
MN	0.729	0.861	0.789	0.514	0.867					
OO	0.590	0.707	0.672	0.600	0.482	0.64				
VQ	0.559	0.615	0.671	0.681	0.456	0.650	0.803			
RR	0.692	0.833	0.732	0.636	0.621	0.733	0.871	0.755		
SH	0.330	0.405	0.325	0.029	0.470	0.364	0.192	0.039	0.236	

Data Analysis

The data calibration process was the first step to performing fsQCA. The original constructs (theme park app values, smartphone use habit, and continuance intention) were measured with multiple items; thus, we computed the mean of the items and took the mean as the value for every construct. Next, we chose three thresholds to calibrate the data: full set membership, intermediate membership, and full set non-membership. In this study, a percentile method was used to complete the calibration procedure because this method allowed the calibration of any data type (including Likert Scales). The percentile 95% was used as the full-set membership breakpoint, 50% as the cross-cover breakpoint, and 5% as the full-set non-membership breakpoint. Table 8 indicates the calibration points of each conditional variable. With the algorithm of fsQCA 3.0 software, each value of conditional variables was converted into a fuzzy score from 0 to 1. Additionally, to ensure no cases were removed from the fuzzy set, an extra 0.001 was added to each case whose membership value was 0.5 after the calibration had been performed (Fiss, 2011).

Table 8 – Results and Calibration Points of Each Conditional Variable

Constructs	Full membership	Crossover	Full non-membership
Real-time information	7	6	4.75
Map navigation	7	6	4.5
Virtual queue	7	6	2.5
Online order	7	6	4
Recommended routes	7	6	4
Convenience value	7	6	4.667
Hedonic value	7	6	4
Social value	7	6	2.5
Travel frequency to theme parks	4	3	2
Smartphone use habit	7	6.5	5
Continuance intention	7	6	4

After the data calibration process, the fsQCA 3.0 software was applied to analyze the necessary conditions of the fuzzy sets. The users' continuance intention was considered as the outcome variable, and the perceived functional (real-time information, map navigation, online order, virtual queue, and recommended routes), convenience, social, and hedonic values, travel frequency to theme parks, and smartphone use habits were considered as antecedents affecting the users' continuance intention combinedly. We tried to identify whether any of the theme park app values and user features were necessary for users' continuance intention of theme park app and analyzed the presence and absence of all the antecedents' conditions. According to the output, when the outcome variable was users' continuance intention, the range for causal variable necessary consistency analysis varied from 0.472 to 0.873. When the outcome variable was non-continuance intention, the range was from 0.461 to 0.835. These findings reveal that no necessary condition for continuance intention exists, as Ragin (2009) established 0.9 as the threshold for necessary consistency. Consistency scores at or below 0.9 suggest that no single condition alone can significantly affect the outcome variables. Rather, conditions may impact outcomes when they interact or combine with other factors.

Table 9 – Necessary Analysis of the Research Constructs				
	Outcome variable: FZCI		Outcome variable: ~FZCI	
Constructs	Consistency	Coverage	Consistency	Coverage
FZRI	0.838	0.855	0.622	0.471
~FZRI	0.482	0.632	0.809	0.788
FZMA	0.833	0.827	0.646	0.476
~FZMA	0.472	0.643	0.765	0.773
FZVQ	0.846	0.848	0.647	0.482
~FZVQ	0.483	0.648	0.796	0.794
FZOO	0.863	0.875	0.630	0.474
~FZOO	0.482	0.637	0.834	0.819
FZRR	0.857	0.887	0.628	0.482
~FZRR	0.500	0.644	0.853	0.816
FZCV	0.846	0.894	0.588	0.461
~FZCV	0.490	0.615	0.865	0.807
FZHV	0.873	0.895	0.621	0.473
~FZHV	0.486	0.633	0.862	0.835
FZSV	0.773	0.897	0.587	0.505
~FZSV	0.574	0.651	0.880	0.742
FZTF	0.547	0.774	0.528	0.554
~FZTF	0.685	0.661	0.784	0.563
FZSH	0.684	0.777	0.576	0.486
~FZSH	0.547	0.635	0.735	0.633

Notes: FZCI: Fuzzy-set continuance intention, FZRI: Fuzzy-set real-time information, FZMA: Fuzzy-set map navigation, FZVQ: Fuzzy-set virtual queue, FZOO: Fuzzy-set online order, FZRR: Fuzzy-set recommended routes, FZCV: Fuzzy-set convenience value, FZHV: Fuzzy-set hedonic value, FZSV: Fuzzy-set social value, FZTF: Fuzzy-set travel frequency to theme parks, FZSH: Fuzzy-set smartphone use habit; "~" means absence of the condition.

Following the necessary condition analysis, we conducted a sufficiency conditions analysis to examine the configurations that could have combined impacts on users' continuance intention of theme parks. The procedure of sufficient condition analysis produced a truth table. The truth table was constructed with a list of all possible combinations of conditions for the same outcome of the continuance intention of a theme park app. If the number of conditions is k, there will be $2^{\wedge k}$ configurations. Our research had ten causal conditions; the truth table contained 1024 possible combinations. After we obtained the truth table, we needed to refine it based on the frequency, raw consistency, and proportional reduction in inconsistency (PRI) consistency. Firstly, we had to set the frequency cut-off value to obtain enough empirical observations to assess the relationship. Because we had 347 valid responses, greater than 50, our sample size is considered large, thus we set 3 as the frequency cut-off threshold, though it would reduce the sample portion, which was explained by the retained configurations (Pappas & Woodside, 2021). Secondly, we set 0.8 as the raw consistency threshold, higher than the recommended minimum value 0.75 (Doherty & Terry, 2009), because a low raw consistency threshold might lead to more necessary conditions, increasing type I errors (Pappas & Woodside, 2021). Thirdly, we set 0.75 (this value should be near the raw consistency threshold and over 0.5) as the PRI consistency threshold to avoid concurrent subset relations of configurations in both outcome and absence of outcome situations. After applying the Quine-McCluskey algorithm, three solutions were provided: complex, parsimonious, and intermediate. In this research, the parsimonious and intermediate solutions were used to explain the combined effects of the configurations in enhancing users' continuance intention of theme park apps.

Results

Solutions of FsQCA

As shown in Table 10, the results reveal six sufficient configurations that will produce a high user continuance intention of theme park app. The overall solution coverage is 0.636, and the overall solution consistency is 0.970, disclosing that these six solutions account for about 63.6% of the membership and 97% consistency in the high users' continuance intention. This shows that the solution formula has a satisfied explanatory and high consistency power. Based on the equifinality of different core conditions (Fiss, 2011; Pappas & Woodside, 2021), we further identified two first-order equifinality solutions (i.e., S1 and S2) and their second-order solutions (e.g., S1a, S1b, S1c; S2a, S2b, and S2c).

Table 10 – Solutions of FsQCA Approach

Configuration	Solutions					
	S1			S2		
	S1a	S1b	S1c	S2a	S2b	S2c
Functional value						
Real-time information	●	●	●	●	●	
Map navigation	●	●	●	●	●	●
Virtual queue	●	●	●	●	●	●
Online order	⬤	⬤	⬤	⬤		⬤
Recommended routes	●	●	●		●	●
Convenience value	⬤	⬤	⬤	⬤	●	⬤
Social value		●	⊗	●	●	●
Hedonic value	●	●		●	●	●
Travel frequency to theme parks	⊗		●	●	●	●
Smartphone use habit			●	●	●	●
Raw coverage	0.446	0.589	0.207	0.329	0.332	0.336
Unique coverage	0.021	0.071	0.010	0.001	0.004	0.008
Consistency	0.974	0.980	0.978	0.985	0.990	0.990
Overall solution coverage	0.636					
Overall solution consistency	0.970					

Notes: black circles (●) indicate the presence of a condition, the large circle means a core condition, the small circle means a peripheral condition; the circles with "×" (⊗) indicate the absence of a condition; the small circle means peripheral condition; the blank spaces indicate "do not care" situation.

Regarding Solution 1, it contains three sub-configurations, S1a, S1b, and S1c, which share the same core and peripheral perceived functional value conditions and core perceived convenience value conditions. To be more specific, online order and perceived convenience value play as core conditions, and other functional value (e.g., real-time information, map navigation, virtual queue, and recommended routes) act as peripheral conditions in Solution 1. S1a reveals that in the case of high perceived functional, convenience, and hedonic value, with low travel frequency to theme parks can lead to high users' continuance intention of theme park apps. The presence or absence of perceived social value and smartphone use habit does not impact this configuration. This solution shows very high consistency and significant raw coverage (consistency =0.974 and raw coverage =0.446). S1b demonstrates that high users' continued usage intention of theme park apps occurs when theme park apps have high perceived values, including functional, convenience, hedonic, and social value. The presence or absence of user features (travel frequency to theme parks and smartphone use habit) does not matter in achieving the high continued usage intention of the theme park app. It indicates that users' personal theme park travel experience and smartphone use performance will not be key factors influencing users' continuance intention when the theme park app provides multiple values to their users. This configuration is the best solution for high users' continuance intention, which has a high level of consistency (0.980) and explains 58.9% of the fuzzy data set. S1c reveals that high perceived functional value, high perceived convenience value, high user features, and low perceived social value serve as the basis for achieving high users' continuance intention regardless of the presence or absence of hedonic value. This configuration also shows high consistency and significant raw coverage (consistency =0.978 and raw coverage =0.207).

Regarding Solution 2, it consists of three sub-configurations as well, S2a, S2b, and S2c, which share the same peripheral social value, hedonic value, and user features (travel frequency to theme parks and smartphone use habit) conditions. The high users' continuance attention could be attained by the presence of three perceived values (convenience value, social value, hedonic value), and two user features (travel frequency to theme parks and smartphone use habit). S2a indicates that high users' continuance intention could be obtained by combining high perceived functional (except recommended routes), convenience, social, and hedonic value; and high user features, in which online order, and perceived convenience value are core conditions, recommended routes, present or absent from the solution is not a matter. This configuration shows high consistency and significant raw coverage (consistency =0.985 and raw coverage =0.329). S2b demonstrates that a high degree of theme park app values (except online order) can result in high users' continuance intention when users have high travel frequency to theme parks and smartphone use habits. All the factors present in this situation are peripheral conditions and the presence or absence of online order does not matter because of the high continuance intention. This configuration has a high consistency (0.990) and explains 33.2% of cases in the total fuzzy data set. S2c shows that the combination of a high level of all factors except real-time information could produce a high-level users' continuance intention, and perceived online order functional value and perceived convenience value are the core conditions. This solution shows very high consistency (0.990) and has a significant raw coverage (0.336) as well.

In this research, S1b is the most satisfactory solution, which explains 58.9% of the high-level users' continuance intention by combining three different values. The unique coverage values range from 0.001 to 0.071, which indicates the unique contribution of each sufficient solution, and shows that S1b has the highest unique coverage value among these six configurations. Therefore, S1b could be the most satisfactory combination of all these factors to contribute to the high users' continuance intention.

Robustness Test

Referring to previous literature (Park et al., 2017; Xu et al., 2024), we conducted a robustness test on the fsQCA results through three dimensions: raw consistency thresholds, frequency thresholds, and PRI consistency thresholds. We set the raw consistency thresholds (0.8), frequency thresholds (3), and PRI consistency (0.75) of this study as the baseline and adjusted these thresholds, respectively (see Appendix B). First, referring to the study by Wang et al. (2024), we adjusted the raw consistency thresholds. The results remained unchanged whether the threshold was increased to 0.85 or decreased to 0.75. Next, we adjusted the frequency thresholds. When the frequency threshold was set to 4, the number of solutions became 3. The solution consistency increased to 0.972, higher than the baseline solution consistency, but the solution coverage decreased to 0.617. Among the three results, two were same to the baseline results S1b and S2b, while the third was similar to S1a and S1c, differing by one element. When the frequency threshold was set to 2, the number of solutions increased to 10. The solution consistency decreased to 0.965, but the solution coverage increased to 0.672. These results were logical supersets of the baseline solutions. Finally, we adjusted the PRI thresholds by referring to Park et al. (2017). The results remained consistent regardless of whether the PRI threshold was increased to 0.8 or decreased to 0.7. To sum up, only the adjustment of the frequency thresholds led to changes in the results. These changes either simplified or increased the number of solutions and adjusted the consistency and coverage. However, these solutions were logically very similar to the ones obtained in this study. Therefore, the evidence above indicates that the findings of this study are robust.

Discussion

This study discovered six combinations of causal conditions, suggesting that the combined influence of perceived value and user feature jointly fosters users' continuance intention. Specifically, online order as a sub-type of functional value, together with convenience value, are identified to be core conditions (S1) for the continuance intention of theme park apps, indicating that for an effective enhancement of continuance intention, the two must be presented together, integrated with other peripheral conditions. In other words, a high level of perceived functionality in online order and convenience value significantly boosts users' intention to continue using the app, together with satisfying their other needs. For instance, for users who do not frequently visit parks, in addition to online order and convenience, the app should also fulfill users' needs for real-time information, map navigation, virtual queuing, and recommended routes, as well as hedonic needs, regardless of their social needs and smartphone use experience (S1a). In a different scenario, where users perceive strong functional, convenience, hedonic, and social values, their tendency to maintain app usage is high, irrespective of their personal characteristics, such as experiences in terms of smartphone use and travel (S1b). Moreover, for those who are regular theme park goers and habitual smartphone users, a high perception of functional and convenience values can drive continued app usage, even in the absence of social value and regardless of hedonic value (S1c). These findings highlight the critical interconnection between functional and convenience values in the app, emphasizing the fulfillment of practical needs over social and hedonic ones.

Indeed, the primary challenges of visiting a theme park, such as dealing with crowds and long wait times, can be significant deterrents for visitors (Milman et al., 2020). If a theme park app effectively helps mitigate these issues by saving time, it is likely to be perceived as convenient, encouraging continued use of the app. Additionally, food and shopping are integral to the theme park experience (Milman et al., 2020). An app that enables visitors to purchase food, drinks, or souvenirs online adds to its utility, further motivating users to keep using it. Therefore, the perceived convenience and the online ordering feature are core conditions for encouraging users to continue using the app, especially when combined with other supporting factors.

In Solution 2, the importance of different subtypes of perceived functional value varied depending on the presence of other conditions. To be specific, for users who frequently visited parks and habitually used smartphones, when they perceived high levels of convenience, hedonic, and social values from the app, the significance of different functional values changed. For example, if real-time information was sufficient, the need for recommended routes became less critical (S2a), and vice versa (S2c). In S2b, no single core condition was identified. When users who are experienced park visitors and habitual on smartphones perceive high levels of convenience, hedonic, and social value alongside certain functional values (real-time information, map navigation, virtual queue, and recommended routes), they are more likely to maintain their app usage,

regardless of the online order feature. This pattern suggests that experienced theme park visitors and regular smartphone users adeptly utilize various app functions to enhance their visit, such as using updated information for decision-making rather than following a pre-set route (S2a), or preferring physical purchases over online ordering when crowds are smaller (S2b), or opting for recommended itineraries instead of constantly checking for updates (S2c). These solutions show a substitutable relationship among real-time information, online order, and recommended routes within users perceived functional value, indicating flexibility in achieving high continuance intention with the app. In essence, users with experience in travel and app usage can tailor their app usage strategies based on their expertise. If they perceive the app as providing convenience, hedonic, and social value, coupled with a mix of functional values, they are more likely to continue using the theme park app. These varied solutions demonstrate that users' strong intention to continue using theme park apps can be triggered by different combinations of perceived value and user features.

Implications

Theoretical Implications

Several theoretical implications can be inferred from this study. Firstly, while prior studies have extensively applied a symmetrical view to examine predictors of continuance intention of mobile apps using SEM or regression analysis methods, this study employs the fsQCA approach to analyze the combined effects of perceived value and user features within the unique setting of theme park apps from a configurational view. This study uncovers six distinct configurations leading to continuance intention, thus expanding upon the traditional variance-based understanding of the motivators behind continuance intention, and highlights the causal complexity by demonstrating that more than one antecedent condition contributes to continuance intention in the context of theme park apps.

Second, although prior research (Choi et al., 2019; Ho et al., 2021) has highlighted two types of perceived value: functional and hedonic, as key determinants of continuance intention of IS, it has largely overlooked other potential dimensions. This research broadens the existing knowledge of perceived value by introducing four distinct dimensions: perceived functional, convenience, hedonic, and social value. This study's results demonstrate that the four dimensions are relevant to continuance intention in the context examined. Moreover, this study further delineates functional value into five essential sub-categories: real-time information, map navigation, virtual queue, online order, and recommended routes. These sub-categories extend beyond the general functionalities found in prior research on travel apps, underscoring the importance of park-specific features in enhancing user continuance intention in theme park app settings.

Third, while previous studies have mainly investigated the influence of user features on continuance intention through the lens of IS usage experience (Venkatesh et al., 2003; Venkatesh et al., 2012), this study extends the existing body of knowledge on user features by incorporating a travel experience perspective (i.e., travel frequency). The findings in this study reveal that both IS-usage-related and travel-related features can affect the continuance intention, highlighting that the continuance intention for a theme park app is a multifaceted phenomenon where individuals' different personal characteristics do matter.

Practical Implications

This research provides recommendations for theme park operators aiming to boost the ongoing usage of their dedicated apps. First, this study found six combinations of perceived value and user features that drive their continuance intention. As a result, theme park operators could benefit from implementing a multifaceted strategy that simultaneously addresses various aspects of perceived value and user features, rather than focusing on a single change. For instance, online ordering, as one form of functional value, together with convenience value, are highlighted as core conditions (S1). Therefore, it is advised that theme park operators enhance the app by incorporating in-app ordering functions for food, drinks, show seats, and souvenirs to streamline the booking and purchasing process. This will greatly save users' time, making them more likely to continue using the app. Other forms of functional value, including real-time information, map navigation, virtual queues, and recommended routes, are also identified as peripheral conditions (S1a, S1b, S1c). This indicates that these features, while not central, still play a significant role in enhancing user experience by solving specific problems during a theme park visit. Therefore, it is essential for theme park operators to include these functions in app design to satisfy users' practical needs.

Furthermore, perceived hedonic value is found to be a peripheral condition in five solutions (S1a, S1b, S2a, S2b, S2c), suggesting that apps should provide an enjoyable use experience. Therefore, theme park operators should focus on incorporating elements that enhance users' intrinsic enjoyment, such as beautiful attraction

photos, themed animations, and park-specific music, videos, and games, to make the app appealing, engaging, and enjoyable. Additionally, perceived social value is identified as a peripheral condition in four solutions (S1b, S2a, S2b, S2c), suggesting that apps should facilitate social interaction. Therefore, theme park operators should include in-app communication tools like chat to enable users to interact with others. Additionally, integrating the app with social media platforms like Facebook would allow visitors to share their theme park experiences seamlessly with their broader social network. These enhancements can fulfill users' social needs, thereby increasing their sustained usage of the apps.

Moreover, the findings from S2 indicate that user features do matter: frequent theme park visitors who are habitual smartphone users tend to utilize various app functions in different combinations. Based on this, it is recommended to include toggle options (e.g., turn on/off) to enable or disable specific functions within the app. Such personalization would allow users to tailor the app to their preferences by selecting functions that meet their personal needs, thereby minimizing clutter and saving mobile storage space. For example, visitors who prefer to follow a recommended route without constant event updates can choose to deactivate the real-time information function (S2c).

Finally, this study is highly relevant to the Asia-Pacific region, as the data was collected in China, a country that plays a significant economic and cultural role in the area. As a result, the findings are applicable to theme park operators across the region. The actionable strategies proposed in this study can help operators develop apps that offer diverse value and personalized user experiences, tailored to the specific needs of Chinese visitors. By applying these insights, not only the Chinese theme park operators can significantly enhance their users' continued intention of theme park apps, and strengthen long-term relationships between the visitors and the parks; but also the Asia-Pacific region theme park operators can take these findings into account to improve their theme park apps as well as their parks.

Limitations and Future Research

This research has limitations and offers opportunities for further exploration as well. Firstly, it centers specifically on theme park apps, and the motivators of continuance intention identified in this context may not apply universally to other travel mobile apps. Therefore, future studies might explore how these identified predictors vary across different contexts of specific travel apps. Secondly, this study focuses on only four types of perceived value and two user features, potentially overlooking other relevant dimensions and features. Future research could expand this study's model by including and examining additional dimensions and factors, like financial value, age, and gender, which have been examined in other contexts (Holbrook, 2006; Li et al., 2018). Furthermore, while the overall sample size (N = 347) exceeds the minimum threshold for fsQCA, the representation of frequent users is still limited, with only 19.6% of respondents using the app three times or more annually. Future research should include a larger proportion of frequent app users, or employ a mixed-method approach to obtain a more comprehensive understanding of user behavior and preferences. Lastly, as the data collection was confined to China, it is valuable to replicate this study in various countries to uncover any cultural differences that might exist for future research.

Conclusion

Drawing on fsQCA, this study empirically investigates how different types of perceived value and different types of user features can determine continuance intention of theme park apps jointly. The fsQCA analysis identified six pathways and concluded that four different types of perceived value, including functional, hedonic, social, and convenience value, can foster continuance intention, together with two user features, including smartphone use habit and travel frequency. This study further suggests that five sub-types of functional value, including real-time information, map navigation, online order, virtual queue, and recommended routes, are important in impacting continuance intention. In sum, this study offers a comprehensive framework for understanding theme park apps continued usage, highlighting the need for a holistic consideration of diverse value perceptions and user features to trigger users' continuance intention effectively.

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Appendix A. The Measurement Items

Appendix A – The Measurement Items		
Construct	Measurement items	Reference
Real-time information (RI)	• During the on-site visit, this theme park app provides detailed and timely information about the events/attractions in the park. • During the on-site visit, this theme park app provides a comprehensive list of the events/attractions in the park. • During the on-site visit, this theme park app provides real-time information on a large number of attributes for each of the events/attractions featured. • During the on-site visit, the information provided by this theme park app is up to date.	Cenfetelli et al. (2008); Liu et al. (2020)
Map navigation (MA)	• During the on-site visit, the theme park app helps me avoid being lost with a map. • During the on-site visit, the theme park app provides the necessary map to guide my visit in the theme park. • During the on-site visit, the theme park app helps me find the way to an attraction with a map navigation.	
Online order (OO)	• During the on-site visit, the theme park app allows me to place orders for different products online, such as food, drink, tickets, and merchandise. • During the on-site visit, the theme park app provides the necessary functions to order various products, such as food, drink, tickets, and merchandise. • During the on-site visit, the theme park app allows me to order products online.	
Virtual queue (VQ)	• During the on-site visit, the theme park app allows me to queue online. • During the on-site visit, the theme park provides the necessary functions to queue virtually. • During the on-site visit, the theme park allows me to queue for attractions online.	
Recommended routes (RR)	When I was in the theme park, • the theme park app offered me suggestions regarding visiting schedules in the theme park. • the theme park app provided the necessary functions to help me develop or choose a visit plan for the theme park. • the theme park app recommended me a list of visiting routes.	
Hedonic value (HV)	• Theme park app is fun to use. • The actual process of theme park app is pleasant. • Using theme park app is enjoyable.	Kim, Lee, et al. (2019); Li et al. (2018)
Social value (SV)	• Using the theme park app enables me to create interpersonal relationships with other users. • Using the theme park app enables me to maintain a personal connection with other users. • Using the theme park app enables me to make new friends. • Using the theme park app enables me to enhance my relationship with others.	
Convenience value (CV)	Using theme park apps would • help me to make my visit in a convenient way. • not make my visit a hassle. • help me to make my visit without any extra effort. • help me to use my time wisely. • help me not to waste time when visiting a theme park. • enable me to make my visit quickly.	Souiden et al. (2019)
Smartphone use habit (SH)	• The use of smartphone has become a habit for me. • I am addicted to using smartphone. • I must use smartphone.	Venkatesh et al. (2012)
Continuance intention (CI)	• I intend to continue using theme park app rather than discontinue its use, when I visit the theme park next time. • My intentions are to continue using theme park app than use any alternative means, when I visit the theme park next time. • If I could, I would like to continue my use of theme park app, when I visit the theme park next time.	Bhattacherjee (2001)

Appendix B. Results of Robustness Tests

Appendix B – Results of Robustness Tests						
Outcome	Solutions with thresholds changed	Raw consistency threshold/Frequency threshold/PRI threshold	Numbers of solutions	Solution consistency	Solution coverage	Solution differences
High continuance intention	Baseline solution	0.8/3/0.75	6	0.970	0.636	
	Changing raw consistency thresholds	0.85/3/0.75	6	0.970	0.636	None
		0.75/3/0.75	6	0.970	0.636	None
	Changing frequency thresholds	0.8/4/0.75	3	0.972	0.617	Higher solution consistency, lower solution coverage. Two out of three solutions are the same with S1b and s2b, the other one is similar to S1a and s1c, differing by one element.
		0.8/2/0.75	10	0.965	0.672	Lower solution consistency, higher solution coverage. The results are supersets of the baseline solution logically.
	Changing PRI thresholds	0.8/3/0.8	6	0.970	0.636	None
		0.8/3/0.7	6	0.970	0.636	None

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