Research article

Research on the action mechanism of certainty and uncertainty of experience in the consumption context

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ABSTRACT

Research on the positive impacts of uncertainty has primarily focused on promotional activities, with little research in other situations. This study applied the concept of uncertainty to the context of experience consumption, Discovering there is certainty of experience and uncertainty of experience in the context of consumption, The purpose is to study the differences in the mechanism of action of different types of consumer experience. In studyI, 239 valid questionnaires on the mobile app consumption experiences were collected and their data were analyzed using structural equation modeling (SEM). Study 2 collected 160 valid questionnaires on consumer experience in physical stores and analyzed the questionnaire data using partial least squares (PLS-SEM). study finding in the certainty of experience context, standardized interaction relies on product interaction and scene interaction to transmit experience material information, and reduce consumers' commodity service perception uncertainty, resulting in a satisfaction experience; in the uncertainty of experience context, personalized interaction relies on user-enterprise interaction and user-to-user interaction to unleash the subjectivity and creativity of experience participants, and increase consumers' experience process perception uncertainty, resulting in the realization a surprise experience. The research findings provide important practical guidance for enterprises to establish differentiated experience strategies and gain long-term competitive advantages.

1. Introduction

The era of experience economy has arrived, how to create a good experience for the user has become a common concern of the industry and academia, this article focuses on the ideas and methods of experience design. Traditionally, consumers are considered to feel risk in the face of uncertainty [1,2]; they avoid uncertainty and are averse to risks, showing subjective psychological feelings such as worry, anxiety and doubt due to a lack of information when facing risk or uncertainty [3,4]. In online consumption scenarios, both perceived commodity uncertainty and perceived seller's behavior uncertainty can weaken consumers' willingness to purchase [5]. Therefore, standardized management with the feature of certainty can give consumers a sense of security [6]. therefore, by continuing to follow the idea Goods dominant logic (G-D logic) [7,8], and relying on standardization to keep on carrying forward their skills, products, and culture, some traditional old and famous enterprises, western fast food restaurants, coffee shops, steakhouses, etc., provide consumers with unified atmosphere, process, products and services, and gain their love and recognition [9]. However, for some people, uncertainty "is the zest of life. Without uncertainty, the distinction between the present and the future is blurred" [10]. At the same time, repeated consumption with deterministic characteristics will lead to a weakening of the hedonic response to stimuli,

forming a hedonic adaptation [11,12]. Recent research found that uncertainty can also bring positive affective experiences to consumers. Scholars have argued that uncertain promotional can stimulate consumer curiosity [13], create imagination space for consumers [14], Keep consumers in a positive mood longer [15,16], enhance consumers purchase intention by making them experience excitement [17]. Therefore, new businesses including escape rooms, board games, and various types of DIY follow the Service-dominant logic (S-D logic), and realize wonderful experiences through participation, interaction, and co-creation among customers [18,19]. Shou and Zheng [20] summarized the applicable conditions of uncertain promotions, pointing out that uncertain promotions are more suitable for perceptual consumption, process consumption and enjoyment consumption. It can be seen that consumers exhibit two completely opposite behaviors when facing uncertainty. Baranan et al. [21] attempted to explain this phenomenon and found that uncertainty intensifies affective reactions to ongoing positive and negative events, namely, uncertainty makes positive feelings more positive but it also makes negative feelings more negative.

Domestic and international scholars' research on uncertainty in marketing and consumer behavior has been highly illuminating. In summary, should companies design and create experiences characterized by certainty, or should they design and create experiences characterized by uncertainty? This is the question that remains to be answered. The following concerns are addressed in this study. Firstly, in the context of the consumer experience, do consumers demonstrate uncertainty avoidance or acceptance in the face of uncertainty? Secondly, uncertainty in the consumer experience context contains the following types: the ambiguity of experience content (e.g., movie trailer vs. feature movies) [16], the ambiguity of experience process (e.g., continuous experience vs. interrupt experience) [22–24], the ambiguity of experience environment (e.g., personalized theme atmosphere vs. mass atmosphere) [25], the ambiguity of experience tools (standardized goods vs. customized goods) [26,27], and the ambiguity of experience personnel (standardized service vs. personalized service) [28,29], etc. Will the various types of uncertainty produce different results? Thirdly, what kind of experience does uncertainty in the context of consumption experience bring to consumers? Existing research focused on the impact of uncertainty on promotion effects at the cognitive and behavioral levels of customers' purchase intentions [20,21], ignoring the investigation of how uncertainty induces positive emotional experiences, such as exciting experiences, unforgettable experiences, surprise experiences, moving experiences, etc., whose method of action is worth investigating further. To address the aforementioned concerns, this study applied the concept of uncertainty to the context of experience consumption, highlighted the fact that there is certainty of experience and uncertainty of experience in the context of consumption, and attempted to clarify the relevant connotations of certainty of experience and uncertainty of experience and the connection between the two, based on which we created a conceptual model to demonstrate how consumers and enterprises can achieve satisfaction experience and surprise experience through different interactions and different forms of perception uncertainty in the contexts of certainty of experience and uncertainty of experience. The research findings have important practical guidance significance for enterprises to establish long-term experience strategies and gain competitive advantage.

2. Theoretical background and conceptual framework

2.1. Theoretical background

Experiences are not products or services; rather, products and services are an integral part of experiences, with services serving as the stage and products as props for obtaining experiences [30]. Table 1 compares the management modes of products, services and experiences. Experiences involve certainty and standardized management as well as uncertainty and personalized management. Experiences need to take products and services as the carriers [9]. Through standardized management involving product standards, service standards, environmental standards, atmosphere standards, etc., certainty of experiences can be achieved, through

Table 1
Comparison of management modes of products, services and experiences.

		Enterprise management mode		
		Standardization (hard standards)	Standardization (soft standards)	Non-standardized Management
Independent economic offerings	**Experience**	product quality + service facility quality + atmosphere layout quality (i.e. functional requirements) e.g. Amazon's personalized recommendation system	service standards for employees + performance standards for actors (i.e. emotional demands) e.g. Disney theater shows	allowing individuals, including enterprise service personnel and consumers, to maximize their initiative and creativity (i.e. emotional demands, social demands and self-actualization demands) e.g. personalized services from Haidilao
	Service	quality standard of service facilities (i.e. functional requirements) e.g. KFC shop layout design and food processing standards	employee service specifications (i.e. emotional demands) e.g. British Airways' "on call service"	—
	Product	product quality standard (functional demands) e.g. "egg code" in Germany	—	—
Experience type		certainty experience		uncertainty experience

Source: according to the relevant literature. Note: German products are very meticulous about quality. Every egg sold in the supermarket is labeled with a unique code that includes information such as the production place, breeding farm, chicken house, chicken coop, and feeding mode of each egg. This egg "ID card" helps to ensure product quality and standardize standards.

personalized management such as non-standard services, emergency situation handling, immediate demand satisfaction, etc., uncertainty of experiences can be achieved. An experience can simultaneously include both certainty of experience and uncertainty of experience. For example, the Disneyland tourism experience that includes standardized theater programs, rides, dining and food, etc. to bring a certainty experience, but also includes personalized interactions between friends, staff interactions, cartoon stars to take pictures of interactions, etc. to bring an uncertainty experience [31]. Certainty of experience is the basis of consumer satisfaction, which belongs to the hygiene factor in Herzberg's "two-factor theory", and uncertainty of experience is the inevitable requirement of consumer loyalty, which belongs to the motivation factor in Herzberg's "two-factor theory". The two are not contradictory but unified and complementary.

2.2. Concept proposal

In order to industrialize the experience and meet consumers' foreseeable, stable, and static explicit demands (i.e. the common components of consumer experience demands) [31–33], enterprises can adopt unified and standardized experience products, experience services, and experience atmosphere to allow consumers to participate and bring them foreseeable and good feelings, which is certainty of experience. The application scenarios for certainty of experience include stage plays, movies, concerts, art exhibitions, etc. Manifestations of certainty of experience include satisfaction experience, immersion experience, enjoyment experience, service experience, etc., and its sources include product interaction and scene interaction. Certainty of experience is distinguished by three characteristics: a low degree of two-way interaction, grouping of experience objects and predictability of experience results. First, the interaction of certainty of experience refers to the interaction between consumers and products, the interaction between consumers and scenes, etc. It is not highly two-way, and both parties interact according to certain rules, standards and established action requirements. The interaction of certainty of experience is a type of standardized interaction. Secondly, certainty of experience adopts differentiated value positioning among different consumer groups while adopting unified value positioning within the same consumer group. So its essence is to realize "group differentiation" [34]. Thirdly, certainty of experience adopts standardized approaches to construct unified and undifferentiated content of interactions. Despite individual differences in the process of interactions, standardized interactions, to some extent, limit the play of personalization. The experience results and feelings can be largely foreseen by enterprises and consumers, and consumers' evaluations of the experience are relatively stable and exhibit strong certainty.

Certainty of experience satisfies consumers' explicit demands by extracting common components from emotional needs, but it is unable to identify and satisfy the individual components of consumers' emotional needs, namely their implicit emotions. The individual components of consumers' emotional needs are immediate and dynamic needs that arise in specific contexts, and they are also psychological requirements and behavioral states that go beyond consumer expectations, so consumers are unable to clearly describe them [35,36]. Enterprises can allow individuals (or artificial intelligence) to maximize their initiative and creativity on the basis of standardized experience products, standardized experience services, and standardized experience atmosphere, discover and satisfy the sudden, immediate, and dynamic implicit needs of consumers in the process of interpersonal interaction/human-machine interaction,

Table 2
Certainty of experience and uncertainty of experience.

	Certainty of Experience	Uncertainty of Experience
Subject	enterprise	consumer
Starting point	extracting the common components of consumers' emotional demands (i.e. stable and static explicit demands)	extracting the personalized components of consumers' emotional demands (i.e. sudden and immediate implicit demands)
Feature	achieving group differentiation	achieving individual differentiation
Enterprise strategy	adopting unified and standardized experience products, experience services and experience atmosphere for all consumers	allowing individuals (including consumers, employees and systems) to maximize their subjectivity and creativity on the basis of standardized products, services and atmosphere
Interaction object	mainly consumer-product interaction, consumer-scene interaction, consumer-computer/platform system interaction	mainly consumer-to-consumer interaction, consumer-employee interaction
Interaction form	not a high degree of two-way interaction, hard for consumers to get positive feedback	a high degree of two-way interaction, and consumers can get positive feedback
Predictability of process and result	predictable (static)	unpredictable (dynamic)
For consumers	the first experience is uncertain, but the later experiences become certain and can be predicted by consumers	every experience is uncertain and cannot be predicted by consumers
Influence factor	the development and design of experience products, experience services and experience atmosphere	the ability, insight and initiative of employees, and the creativity and imagination of consumers
Case	KFC, McDonald's, dramas, films, stage plays, painting exhibitions, etc	personalized service from Haidilao, personalized image design of beauty salons, personalized product recommendations from Taobao, personalized news feeds of Toutiao, personalized promotions such as the lottery, all kinds of DIY, the real-life CS, competitive sports, social networking, marriages, expeditions, etc
Experience result	bringing consumers satisfaction experiences	bringing consumers surprise experiences which surpass satisfaction experiences

and create unexpected and unforgettable feelings for consumers, which is uncertainty of experience. The application scenarios for uncertainty of experience include personalized service, personalized recommendations, customer engagement (design, production, etc.), community interaction, etc. Uncertainty of experience can take many forms, including moving experience, surprise experience, transcendent consumption experience, peak experience, etc. The sources of uncertainty of experience include enterprise-user interaction and user-to-user interaction. Uncertainty of experience is distinguished by three characteristics: a high degree of two-way interaction, individualization of the experience objects and unpredictability of experience results. First, uncertainty of experience emphasizes the process of interpersonal interaction/human-machine interaction. Consumers, enterprise service personnel, and computers all exercise their subjectivity and initiative in the experience process and influence the process of experience creation by investing knowledge, experience, and skills. The content, process, and form of interactions are influenced by multiple factors such as time, location, context, and individuals. The interaction is dynamic, changing, and situational, i.e. it is personalized interaction. Secondly, uncertainty of experience is a study that focuses on individuals and adopts differentiated value positioning for different individuals. Therefore, the essence of uncertainty of experience is to achieve "individual differentiation" [34]. Thirdly, the experience processes are dynamic and changing due to the real-time and dynamic interpersonal/human-machine interaction processes, and the experience results are always unstable, unforeseeable, and uncertain. The differences between certainty of experience and uncertainty of experience are shown in Table 2.

2.3. Logical basis

The logical basis of certainty of experience and uncertainty of experience is shown in Table 3. Certainty of experience is based on the assumption that consumers' demands are clear, explicit and unchanging and then standardized experiences are designed for consumers' unchanging demands, and the same experience strategies are implemented for consumers. In this case, the utility obtained by consumers (i.e. certainty utility) is stable and unchanging, as is the value realized (i.e. certainty value). Certainty of experience maintains industrialized society's product thinking and Consistent with Goods dominant logic (G-D logic), in which experience is regarded as a combination of products, services and atmosphere, At this time, the enterprise only focuses on object resources such as products, technology, and the environment. In contrast, uncertainty of experience assumes that consumers' demands are not clear, implicit and changeable, making it difficult for enterprises to directly design experience strategies for dynamic demands. More often enterprises rely on modular structures, open rules and more abundant content, allowing individuals (i.e. consumers or service

Table 3
The logical basis of certainty of experience and uncertainty of experience.

Type	Certainty Personalization	Certainty of Experience	Certainty Utility	Certainty Value
Connotation	explicit personalized demands, i. e. internal requirements and behavior states that consumers have realized and can clearly express	standardized experiences, such as stage plays, movies, concerts, art exhibitions, DIY, traditional education training, mass customization, and other scene experiences, etc; experiences that consumers can predict; involving mainly consumer-product interaction, consumer-scene interaction, consumer-computer/ platform system interaction	before making a choice, consumers are certain about the result of their choice, i.e. they have comprehensive information about the product's performance, price, quality, brand, external environment and other objective conditions, allowing them to construct results and evaluate with certainty	mainly customer value under the commodity-dominant logic, at which time value (or utility) is embedded in the product, product value is realized in the exchange process, and customer value content is mainly functional value
Feature	generally involving the basic survival and development needs	not a high degree of two-way interaction, hard for consumers to get positive feedback	the analysis subject to complete certainty is unrealistic and hard to realize	value is static, fixed and tangible
Type Connotation	**Uncertainty Personalization** implicit personalized demands, i. e. consumers' subconscious, unspoken psychological requirements and behavior states that can meet or exceed their expectations	**Uncertainty of Experience** non-standardized experience, such as personalized recommendations in online shopping, personalized services (but not customization) in offline consumption, one-to-one personalized customization, and personalized interaction in online communities; experiences (including surprises) that go beyond consumers' expectations; also known as "unexpected experience"; involving mainly consumer-to-consumer interaction, consumer-employee interaction, consumer-computer/platform system interaction	**Uncertainty Utility** the principle of rational decision-making under uncertain conditions adopts the principle of expected utility, where "expected utility" is obtained rather than "utility" itself; uncertain utility refers to the uncertainty of the result of each decision-making behavior of consumers under uncertain conditions, i.e. the result of each behavior is unknown	**Uncertainty Value** mainly situation value under the customer-dominant logic: for each beneficiary, the creation of value is unique, dynamic and affected by the situation; the process of value creation has been extended to the interaction of all social and economic roles in specific situations, and any role in a given situation space can participate in the space of value creation
Feature	usually the high-level spiritual satisfaction of consumers	a high degree of two-way interaction, allowing consumers to get positive feedback	the analysis subject to uncertain conditions is in line with the objective reality	value is interactive, dynamic and situational

personnel) or systems to maximize their initiative and creativity, in which the utility obtained by consumers (i.e. uncertainty utility) is dynamic and changing, as is the value realized (i.e. uncertainty value). Uncertainty of experience belongs to the experience thinking of post-industrial society and Consistent with Service-dominant logic (S-D logic), which regards experience as a unique and unforgettable subjective feeling, At this time, companies focus only on operational resources such as knowledge, information and emotions.

3. Conceptual model and research hypotheses

3.1. Conceptual model

The Logical basis of the two factors of experience (certainty and uncertainty) conforms to the classic cognitive mode of "behavior-purpose-result". Through interactions (who and how) the enterprises reduce (or improve) the uncertainty perception (why) of consumers, which ultimately leads to specific experiences (result). It also conforms to the SOR model. As a result of external stimuli (interaction), consumers' cognitive responses (uncertainty perception) are elicited, and their behaviors (experience feeling) are finally changed.

3.1.1. Standardized interaction and personalized interaction
Interaction is an important way to achieve customer experience [37]. It includes standardized interaction (product interaction, scene interaction) and personalized interaction (user enterprise interaction, user interaction). Product interaction refers to the interaction process between consumers and enterprise products that focuses on the acquisition of technical information and functional characteristics. Scene interaction refers to the interaction process between customers and scenes created by enterprises that takes aesthetics and enjoyment as its contents. User-enterprise interaction refers to the interaction process between consumers and enterprises based on help feedback and interpersonal relationship building. User-to-user interaction refers to the interaction process among customers based on help advocacy and interpersonal relationship building [38,39].

3.1.2. Perception uncertainty
Uncertainty refers to the fact that consumers do not know the possible outcome of the future world due to inadequate information, which means that the outcome of the event is unknown, as is the probability of occurrence. Consumers' attitudes towards uncertainty vary depending on the type of interaction. Perception uncertainty is the individual's subjective feeling toward uncertainty, and it is the individual's perception of predicting outcomes in the absence of information [6]. In the context of consumer experience, according to the different perception objects and experience purpose, perception uncertainty can be divided into goods and services perception uncertainty and experience process perception uncertainty. Goods and services perception uncertainty refers to the perception uncertainty caused by consumers' lack of full understanding of standardized management hardware and software such as goods, services, atmosphere and other facilities and equipment in the process of participating in the experience, its essence is a kind of perceptual uncertainty based on rational consumption and result consumption. Experience process perception uncertainty refers to the perception uncertainty caused by consumers' lack of full understanding of personalized service content and processes such as interaction, communication and recommendation in the process of participating in the experience, its essence is a kind of perceptual uncertainty based on perceptual consumption, process consumption.

3.1.3. Satisfaction experience and surprise experience
Experience can be divided into satisfaction experience and surprise experience based on different results. Satisfaction experience refers to pleasure, happiness, satisfaction and joy following the realization of predictable events [40]. It is a pleasant psychological state (expectation satisfaction model) formed by the mutual match between consumer experience expectation and actual experience. Surprise experience refers to a kind of positive feeling accompanied by surprise (surprise = astonishment + joy) after the unexpected event is realized [41], or it means that the actual experience of customers exceeds expectations to a surprising degree [42].

3.2. Research hypotheses

3.2.1. Standardized interaction, goods and service perception uncertainty and satisfaction experience
When it is difficult for buyers to determine whether the information such as commodity quality and style meets their expectations , commodity perception uncertainty is high [43]. According to the theory of concept conflict, uncertainty will improve the wake-up level of the central nervous system, At this time, consumers low sense of control, perceive a threat and face the risk, buyers need to spend more time and energy understanding the commodity information [44]. Information search and personal experience are important methods to reduce the perception uncertainty in the process of shopping, in which personal experience means that consumers get commodity-related information through direct contact with commodities and direct interaction so as to reduce the perception of uncertainty, while information search refers to the indirect interaction between consumers and goods through the collection of goods information, user comments, use experience and other information on the Internet so as to reduce the uncertainty perception [45]. In the online context, Online communication, buyer evaluation and C2C website guarantee can improve the commodity attribute experience and reduce the commodity uncertainty perception [5]. Hence, the following hypotheses are proposed.

Hypothesis 1. Standardized interaction can reduce the consumers' goods and services perception uncertainty.

Hypothesis 1a. Product interaction can reduce the consumers' goods and services perception uncertainty.

Hypothesis 1b. Scene interaction can reduce the consumers' goods and services perception uncertainty.

Hypothesis 2. Goods and services perception uncertainty will have a negative impact on satisfaction experience.

Certainty of experience is realized by enterprises with the help of standardized interaction. Standardized interaction realizes stability and consistency. Stability refers to the enterprises' ability to keep the quality of their products and services consistent across time. Consistency refers to the consistency of consumers' expected value and actual value. In KFC and McDonald's chain restaurants across the country, one can feel the unified environment, atmosphere, service and taste. What consumers recognize is stability and consistency. Stability and consistency make consumers feel at ease, trustworthy and more secure. Standardized interaction can result in consumer satisfaction and satisfaction experience with the help of stability and consistency. Standardized interaction is the basis for consumer satisfaction and plays the role of the hygiene factor in Herzberg's "two-factor theory" [46]. In the online context, goods, services and atmosphere are the basic guarantees for consumers to obtain a good experience [30]. The user's use of products (product interaction) and the user's feeling atmosphere (scene interaction) help consumers to obtain commodity service information, which can reduce the consumer's goods and service perception uncertainty. Hence, the following hypotheses are proposed.

Hypothesis 3. Standardized interaction helps consumers get a satisfaction experience.

Hypothesis 3a. Product interaction helps consumers get a satisfaction experience.

Hypothesis 3b. Scene interaction helps consumers get a satisfaction experience.

Hypothesis 4. Goods and services perception uncertainty plays a partial intermediary role between standardized interaction and satisfaction experience.

3.2.2. Personalized interaction, experience process perception uncertainty and surprise experience

In the uncertainty of experience, consumers' participation modes have changed dramatically, from passive to active [30]. Different from passive participation that is a kind of weak interaction, active participation mainly refers to the strong interaction part of the interaction and is a positive and active two-way interaction [47], which is consistent with the interaction behavior under the perspective of value co-creation [37]. Active participation mainly includes user-to-user interaction and user-enterprise participation. Customers will integrate their creativity, ideas, knowledge and skills into product design and assembly in the process of interaction [48], Li [49] summarized it as Co-create experience. The process of interaction between consumers is dynamic, changing and uncertain. Therefore, personalized interaction is an important way to discover and meet consumers' implicit emotions. When the degree of interpersonal interaction is higher, the degree of personalization is higher, and the degree of experience process perception uncertainty is also higher, while consumers' expectations of the experience results are lower. Experience process perception uncertainty is suspense, and positive experience results can be achieved by stimulating the imagination space, curiosity, mystery and expectation, so as to obtain a surprise experience. Hence, the following hypotheses are proposed.

Hypothesis 5. Personalized interaction can improve consumers' experience process perception uncertainty.

Hypothesis 5a. User-enterprise interaction can improve consumers' experience process perception uncertainty.

Hypothesis 5b. User-to-user interaction can improve consumers' experience process perception uncertainty.

Hypothesis 6. Experience process perception uncertainty will have a positive impact on the surprise experience.

Employees and customers can stand in the position of customers in the process of interaction, and actively provide appropriate, delicate and accurate services for them, which is reflected in the satisfaction of consumers' personalized needs, the solution of customers' urgent problems and the care for customers' minds, and they summarized it as "weak active service behavior" [50]. Weak active service behavior is a result of interactions between users and enterprises, help consumers form common in-group identity for employees [51]. Weak active service behavior can create a high-level emotional experience for consumers, that is, unexpected surprise,
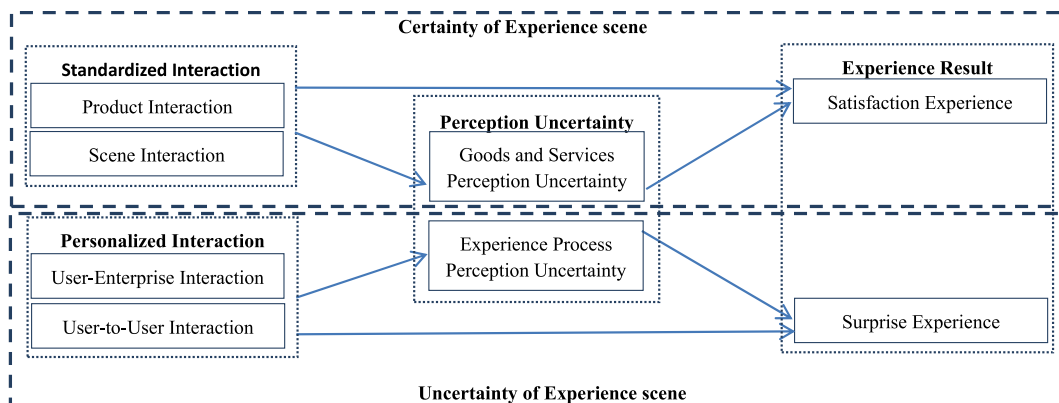

Fig. 1. Conceptual model.

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Table 4
Constructs, variables, and items.

Variable category	Construct	Dimension	Definition	Items	Sources
Independent variable	Standardized Interaction	Product Interaction (PI)	the interaction process between consumers and enterprise products in order to obtain technical information and functional characteristics	PI1: The content of this app is rich. PI2: The function of this app is comprehensive. PI3: The information of this app is comprehensive. PI4: The content of this app is updated in a timely manner.	Nambisan and Baron [52]
		Scene Interaction (SI)	the interaction in which consumers only passively receive services and can achieve immersive experience in a specific environment	SI1: The theme of this app is distinct. SI2: The interface of this app is friendly. SI3: The use of this app is smooth. SI4: The operation of this app is simple.	Lund [53]
	Personalized Interaction	User-to-User Interaction (UI)	the positive two-way communication and interaction process between customers based on emotion and relationship building	UI1: This app creates opportunities for friends to communicate with each other. UI2: This app helps me communicate with my friends. UI3: This app helps me build friendship with my friends. UI4: This app makes my relationship with friends closer.	Yoo et al. [54]
		User-Enterprise Interaction (EI)	the active two-way communication and interaction process between consumers and enterprise service personnel to provide services and meet needs	EI1: This app can recommend suitable goods, services and contents for me. EI2: This app can provide me with the help I need in time. EI3: This app can record my use, browsing and purchase data. EI4: I'm willing to express my needs and expectations to the platform of this app.	Gremler and Gwinner [55]
Mediation variable	Perception Uncertainty	Goods and Services Perception Uncertainty (PU)	the perception uncertainty caused by consumers' lack of full understanding of goods, services and other experience hardware and software that can be standardized management	PU1: I'm not sure about the interface effect of this app. PU2: I'm not sure about the stable operation of this app. PU3: I'm not sure about the content quality level of this app. PU4: I'm not sure if the functions of this app are comprehensive.	Teo et al. [44] Zhang and Liu [5]
		Experience Process Perception Uncertainty (EU)	the perception uncertainty caused by consumers' lack of full understanding of non-standardized experience content such as personal communication and interaction	EU1: Before using this app each time, I'm not sure which high-quality push I will encounter. EU2: Before using this app each time, I'm not sure what changes have happened to my surrounding friends. EU3: Before using this app each time, I'm not sure what interesting content I'll encounter. EU4: Before using this app each time, I'm not sure what valuable information I'll harvest.	Teo et al. [44] Zhang and Liu [5] Wang and Fu [56]
Dependent variable	Experience Result	Satisfaction Experience (SE)	a kind of joy, pleasure, satisfaction and happy feeling after the realization of expectable events	SE1: The use of this app meets my expectation (anticipation). SE2: The use of this app meets my needs. SE3: The use of this app makes me feel happy. SE4: I am satisfied with the use of the app	Cronin et al. [57]
		Surprise Experience (ME)	the amazing experience of consumers suddenly acquiring their desired items; the unexpected and surprising experience for consumers	ME1: I can find many new information via this app, which makes me surprised.	Michelli [58] Huang [59] Wang and Fu [56]

Table 4 (*continued*)

Variable category	Construct	Dimension	Definition	Items	Sources
				ME2: I can get valuable resources via this app, which makes me very excited. ME3: I made many new friends via this app, which makes me very excited. ME4: I will get other people's blessing via this app, which makes me very moved. ME5: I have learned many new skills via this app, which makes me very excited.	Wang et al. [50]

which is an unexpected surprise and a positive experience brought about by uncertainty [50]. Hence, the following hypotheses are proposed.

Hypothesis 7.   Personalized interaction helps consumers get a surprise experience.

Hypothesis 7a.   User-enterprise interaction helps consumers get a surprise experience.

Hypothesis 7b.   User-to-user interaction helps consumers get a surprise experience.

Hypothesis 8.   Experience process perception uncertainty plays a part of intermediary role between personalized interaction and surprise experience.

3.3. Conceptual model

Based on the preceding analysis and discussion, this study developed a corresponding conceptual model (see Fig. 1) in an attempt to clarify the differences in the action mechanisms of personalized and standardized interactions play on experience results in the context of consumption experience, and to lay the groundwork for the realization of satisfaction experience and surprise experiences. There are 4 constructs (standardized interaction, personalized interaction, perception uncertainty, experience result) and 8 dimensions in the model.

4. Research design and research process

4.1. Scale development

In order to accurately capture the differences in the mechanisms of action of personalized interactions and standardized interactions on experience results, we focused on consumers' daily lives， The study was divided into two parts, with Study I selected the experience project on which consumers spend the most time every day as the research content. According to the statistics in the China Internet Network Information Center's fifty-two "Statistical Report on the Development of China's Internet Network" by the China Internet Network Information Center, as of June 2023, the proportion of Internet users in China using mobile phones reached 99.8 %, and the average weekly online time per capita was 29.1 h (4.16 h per day). As can be seen, leisure and entertainment via mobile phones have become an essential part of consumers' daily lives, so the daily consumption experience of mobile apps was selected as the research object. The difference between Study II and Study I is reflected in three aspects: first, Study I is an online (indirect contact) experience scenario, while whether there is a difference between offline (direct contact) experience scenarios needs to be further examined; second, Study I is a free experience scenario, while whether there is a difference between paid experience scenarios also needs to be further examined; Thirdly, the Study I focuses mainly on college students in finance and economics universities, while further research is needed to determine whether there are differences between college students in science and engineering universities and other age groups of users. Therefore, Study II chooses physical stores consumption experience as the research context, and selects science and engineering college students as well as staff of enterprises and institutions as the research subjects to test the robustness and generalizability of the conceptual model.

A semi-open questionnaire for "the daily consumption experience of mobile apps"（Study I）was designed. Following the design of the questionnaire, we selected 8 PhD students from a university in Shanghai and 8 instructors from a university in Fujian as respondents for the pre-experiment. Based on the results of the pre-experiment and the feedback, the structure and content of the questionnaire items were further improved to make the items easier to understand, more adaptable to the research context, and improve the surface validity of the questionnaire. The final survey questionnaire employed in this study included four constructs with eight dimensions measured with 33 items. To ensure the reliability and validity of the scale, the variables measured in this research model are all drawn from existing literature. All of the items were measured on a seven-point Likert scale ranging from 1 ("strongly disagree") to 7 ("strongly agree"). The variable definitions and detailed scale items along with their respective sources are shown in Table 4.

The scales for measuring product interaction, scene interaction, user-to-user interaction, user-enterprise interaction, goods and services perception uncertainty, and satisfaction experience were all based on previously developed mature scales. Experience process perception uncertainty and surprise experience are new dimensions proposed in this study, and there are no ready-made scales for reference in the marketing field. Based on the concepts of experience process perception uncertainty and surprise experience in 3.1, this study developed the corresponding scales for them in the following three steps. Firstly, three marketing PhD students were selected as respondents for interviews and discussions. Based on the results of the interviews and discussions, as well as the studies of Teo et al. [44], Zhang and Liu [5], and Wang and Fu [56], we initially proposed a scale with 8 items for measuring experience process perception uncertainty. Then based on the results of the interviews and discussions, as well as the studies of Michelli [58], Huang [59], Wang and Fu [56], and Wang et al. [50], we initially proposed a scale with 9 items for measuring surprise experience. Secondly, three marketing teachers were invited to score the above items on a seven-point Likert scale, and any item with a mean less than 5 or a standard deviation greater than 2 was deleted. Finally, the reliability and validity of the overall scales were tested, and 4 items of the experience process perception uncertainty scale and 5 items of the surprise experience scale were finally selected. The "Physical stores Consumption Experience" scale (Study II) is based on the "Mobile App Daily Consumption Experience" scale (Study I), and in order to minimize the bias caused by the change, Only change "this app" to "this experience" in the original scale. The questionnaire used in this paper has obtained the informed consent of all participants, and has been reviewed and approved by the Ethics Committee of Putian University with the approval number of "Lun Review (2023) −019".

4.2. Study I– the daily consumption experience of mobile apps

4.2.1. Data collection

College students were chosen as questionnaire respondents for this study based on the following two main reasons: first, The Boston Consulting Group (BCG) pointed out in "China's Future Consumers Research Report - Generational Change of Chinese Consumers" [60] that "Generation Z (born in 1995–2009) is the generation of spiritual world expansion, is a digital aborigine, was born in the period of rapid development of globalization, and is accustomed to receiving massive amounts of information through cell phones, and Generation Z is more focused on individuality and experience, which is consistent with the "uncertainty of experience" in the present study, Therefore, the group of college students as the questionnaire respondents fits the research content. Second, college students come from different cities, they often have different customs, different families and cultural backgrounds, so based on different cities, choose more than one university to carry out the questionnaire survey at the same time, the sample has a certain coverage, diversity and breadth. Therefore, Study I chooses university students as the target audience. College students from universities of finance and economics in two cities, Quanzhou and Shanghai, were selected for the questionnaire survey, who were instructed and requested to fill in a semi-open questionnaire in class. The survey lasted for more than half a month. After the removal of the invalid ones due to omissions, all consistent items, and overly obvious response tendencies, 239 valid questionnaires were received from the total collection of 396 questionnaires, yielding a 60.4 % efficiency rate. The statistical characteristics of the sample are shown specifically in Table 5. It was identified that there were 57 male students (23.8 % of the total) and 182 female students (76.2 %), and WeChat, QQ and other social communication apps were the main objects chosen by the sample.

4.2.2. Reliability and validity test

To ensure the scale's accuracy, we first performed exploratory factor analysis with SPSS 21.0 to test the structural validity of the scale. After testing, the KMO value is 0.889, greater than 0.7, and the Bartlett value is 8696.440 (P 0.001), showing that it is eligible for factor analysis. Items PU1 and EU2 with factor loads less than 0.5 were deleted using the orthogonal rotation method, and the factor load of each of the remaining 31 items in the scale was larger than 0.5. Simultaneously, eight factors were identified using principal component analysis, and the cumulative variance contribution rate of the eight factors was 76.031 %, showing that the model has strong structural validity.

SPSS 21.0 was used in this study to calculate the internal consistency Cronbach α coefficient of each dimension to assess the scale's reliability. The Cronbach α coefficient of each dimension is shown in Table 6. All of the coefficients are greater than 0.7, and the

Table 5

Statistical characteristics of the sample.

Characteristics	Value	Frequency (N = 239)	Percentage (%)
Gender	Male	57	23.8
	Female	182	76.2
Hours of using smartphones/day	<1 h	12	5
	2–5 h	129	54
	>6 h	98	41
The most frequently used app	WeChat	81	33.9
	QQ	53	22.2
	Weibo	26	10.9
	Other apps (e.g. Iqiyi, etc.)	79	33
Reason for frequent use	Habit formation	106	44.4
	Connection and relationship maintenance	63	26.4
	Access to information	41	17.2
	Relaxation and leisure	29	12

Table 6
Reliability, validity and correlation coefficient matrix of the scale.

variable	AVE	CR	Items of the scale	Standard factor load	T value	α	PI	SI	UI	EI	PU	EU	SE	ME
PI	0.549	0.829	PI1	0.691	15.946	0.893	**0.741**							
			PI2	0.744	13.378									
			PI3	0.796	16.811									
			PI4	0.729										
SI	0.536	0.821	SI1	0.766	8.805	0.832	0.701	**0.732**						
			SI2	0.669	11.808		***							
			SI3	0.745	12.517									
			SI4	0.743										
UI	0.538	0.823	UI1	0.744	24.632	0.964	0.368	0.163	**0.733**					
			UI2	0.758	27.167		***	**						
			UI3	0.751	29.369									
			UI4	0.677										
EI	0.521	0.813	EI1	0.753	10.562	0.903	0.337	0.372	0.372	**0.722**				
			EI2	0.739	11.359		***	***	***					
			EI3	0.718	11.051									
			EI4	0.673										
PU	0.504	0.752	PU2	−0.680	12.314	0.857	−0.320	−0.318	−0.157	−0.184	**0.710**			
			PU3	−0.774	11.866		***	***	*	**				
			PU4	−0.671										
EU	0.513	0.760	EU1	0.690	13.319	0.842	0.180	0.240	0.306	0.314	−0.199	**0.716**		
			EU3	0.730	10.792		**	***	**	***	*			
			EU4	0.728										
SE	0.511	0.807	SE1	0.725	13.523	0.920	0.477	0.527	0.216	0.446	−0.327	0.174	**0.715**	
			SE2	0.767	14.345		***	***	***	***	***	**		
			SE3	0.690	14.106									
			SE4	0.674										
ME	0.543	0.856	ME1	0.675	8.373	0.876	0.385	0.396	0.502	0.635	−0.205	0.257	0.519	**0.737**
			ME2	0.781	10.014		***	***	***	***	**	***	***	
			ME3	0.745	9.803									
			ME4	0.778	9.292									
			ME5	0.701										
			mean value				5.56	5.51	5.08	4.48	2.16	5.11	5.16	4.68
			standard deviation				0.99	0.96	1.61	1.31	0.78	1.32	1.00	1.20

Note: * * * means $P < 0.001$, * * means $P < 0.01$, * means $P < 0.05$. The number on the diagonal is the square root of AVE.

combined reliability coefficient is greater than 0.8. The overall Cronbach α coefficient is 0.910, which is greater than 0.9, indicating that the scale has a high credibility. For each variable, it implies that the scale has good structure validity. Table 6 displays the results of the reliability and validity tests, as well as the correlation coefficient matrix.

The Average Variance Extracted (AVE) was used to test the convergence validity. AVE indicates how much of the variance explained by each potential variable comes from all items in the potential variable. The AVE value of each variable is greater than 0.50, indicating that the potential variable has good convergence validity. Simultaneously, the AVE of each variable is greater than the square of the correlation coefficient between it and the other variables, showing a considerable difference between variables, which has good discrimination validity.

We tested the Variance Inflation Factors (VIF) among the independent latent variables. The regression results of the model show that: the VIF among the latent variables is all less than 10, the Tolerance is all greater than 0.1, the Eigenvalue is not equal to 0, and the Condition Idex is all less than 30, so the multicollinearity of the sample is not significant.

Finally, AMOS 24 software was used to perform confirmatory factor analysis on the original model. The fitting index results of the model were as follows: absolute fitting index χ^2 (424) = 1215.927, χ^2/df = 2.87, p < 0.001, RMSEA = 0.076; the relative fitting index was NFI = 0.897, CFI = 0.924, TLI = 0.940, IFI = 0.935. From the test results of fitting index, it can be seen that the questionnaire has good convergence validity and can be used to verify the hypothesis.

4.2.3. Model test

This study used AMOS24.0 to examine the statistical significance of the path coefficient of the model or the load coefficient of the measurement model, as shown in Fig. 1, to determine if the computed parameters had statistical significance. The results of the structural equation model analysis show that there are differences in the action mechanisms of standardized interaction and personalized interaction on experience results in the same experience context. Standardized interaction allows consumers to get a satisfaction experience through product interaction (β = 0.177, t = 3.461), scene interaction (β = 0.322, t = 5.354), hypotheses 3 (3a, 3b) were verified. while personalized interaction allows consumers to get a surprise experience through user-enterprise interaction (β = 0.251, t = 6.908), user-to-user interaction (β = 0.516, t = 6.177), and hypotheses 7 (7a, 7b) were verified. At the same time, the impact of standardized and individualized interactions on perception uncertainty differs. Standardized interaction can effectively reduce the goods and service perception uncertainty through product interaction (β = −0.115, t = −2.522) and scene interaction (β = − 0.148, t = −2.971), hypotheses 1 (1a, 1b) were verified. whereas personalized interaction increased the experience process perception uncertainty through user-enterprise interaction (β = 0.481, t = 4.405) and user-to-user interaction (β = 0.219, t = 2.344), and hypotheses 5 (5a, 5b) were verified. The effect of perception uncertainty on experience results varies, goods and services perception uncertainty can reduce consumers' satisfaction experience (β = −0.200, t = −2.433), hypotheses 2 were verified. while experience process perception uncertainty can increase consumers' surprise experience (β = 0.174, t = 2.865), hypotheses 6 were verified. The specific test results of the model are shown in Table 7.

Table 7
Hypothesis test results of the model.

Research Hypothesis		P	SE	CR	Standardized path coefficient	Inspection results
Hypothesis 1. Standardized interaction can reduce the consumers' goods and services perception uncertainty.						
Hypothesis 1a.	Product interaction can reduce the consumers' goods and services perception uncertainty.	0.012	0.045	−2.522	−0.115	support
Hypothesis 1b.	Scene interaction can reduce the consumers' goods and services perception uncertainty.	0.03	0.050	−2.971	−0.148	support
Hypothesis 2. Goods and services perception uncertainty will have a negative impact on satisfaction experience.		**0.023**	**0.082**	**−2.433**	**−0.200**	**support**
Hypothesis 3. Standardized interaction helps consumers get a satisfaction experience.						
Hypothesis 3a.	Product interaction helps consumers get a satisfaction experience.	***	0.051	3.461	0.177	support
Hypothesis 3b.	Scene interaction helps consumers get a satisfaction experience.	***	0.060	5.354	0.322	support
Hypothesis 5. Personalized interaction can improve consumers' experience process perception uncertainty.						
Hypothesis 5a.	User-enterprise interaction can improve consumers' experience process perception uncertainty.	***	0.109	4.405	0.481	support
Hypothesis 5b.	User-to-users interaction can improve consumers' experience process perception uncertainty.	0.037	0.054	2.344	0.219	support
Hypothesis 6. Experience process perception uncertainty will have a positive impact on the surprise experience.		**0.013**	**0.061**	**2.865**	**0.174**	**support**
Hypothesis 7. Personalized interaction helps consumers get a surprise experience.						
Hypothesis 7a.	User-enterprise interaction helps consumers to get a surprise experience.	***	0.036	6.908	0.251	support
Hypothesis 7b.	User-to-user interaction helps consumers get a surprise experience.	***	0.084	6.177	0.516	support

Note: * * * means P < 0 001, * * means P < 0.01, * means P < 0 05.

4.2.4. Intermediary effect test

This study used the Bootstrap tool in SPSS to test the intermediary effect [61]. Table 8 displays the findings of the analysis. The sample size was set at 1,000, within the 95 % confidence interval, and the indirect impact of standardized interaction on satisfaction experience via goods and service perception uncertainty was 0.5428, with the intermediary effect being significant (excluding 0). When goods and service perception uncertainty is controlled, the impact of the independent variable standardized experience on the dependent variable satisfaction experience remains significant (excluding 0), indicating that goods and service perception uncertainty plays a partial intermediary function in the impact of standardized interaction on satisfaction experience. Similarly, it is discovered that experience process perception uncertainty plays a partial intermediary function in the impact of customized interaction on surprise experience. Hypotheses 4 and 8 have been confirmed.

4.3. Study II– physical stores consumption experience

4.3.1. Data collection

Distinct from Study I, in order to obtain experiential data from a wider range of different research participants. College students from universities of science and engineering in two cities, Quanzhou and Shanghai, were selected for the questionnaire survey, At the same time, through the platform of industry associations, questionnaires were issued to some enterprises in Quanzhou and Shanghai. The survey lasted for a week. After the removal of the invalid ones due to omissions, all consistent items, and overly obvious response tendencies, 160 valid questionnaires were received from the total collection of 219 questionnaires, yielding a 73.1 % efficiency rate. The statistical characteristics of the sample are shown specifically in Table 9.

4.3.2. Reliability and validity test

Compared to the single use scenario of mobile app in Study I, the scenarios in Study II are more diversified, including traveling, partying, movie watching, board games, etc. Meanwhile, the sample size of Study II is relatively small, which makes it suitable for the use of Smart PLS4.0 with the help of Partial Least Squares (PLS-SEM) method.

In this study, Composite Reliability was used to test the internal consistency reliability, and the reliability of all structural variables fluctuated between 0.701 and 0.976, which is high. Convergent validity is analyzed by Outer loading as well as the value of AVE, and the loading values of all measured variables on all structural variables are more than 0.7, and the AVE value of structural variables is the smallest of 0.558, which is greater than 0.5, indicating that the data has a good convergent validity, as shown in Table 10.

4.3.3. Model test

PLS based structural equation modeling was used to do the path analysis of the data as per the assumed model and the results are shown in Figs. 2 and 3. To test the statistical significance of the PLS-SEM results, Bootstrapping technique was used to extract the data for 5000 repetitions and the p-value of the path coefficients was calculated, and the results are shown in Table 11. Hypothesis 1-3 and Hypothesis 5-7 were verified again. According to Hair et al. [62]test step on the mediating effect of PLS, the results show that Hypothesis 4 and Hypothesis 8 were verified again.

4.4. Comparison and analysis

In order to further analyze whether the categorical factors such as gender, type of experience, and number of participants were significantly different in the conceptual model, multiple comparisons were conducted using the LSD method with SPSS24 software. In an offline paid experience context, research finding Gender was not significantly different in PI (F = 1.349,P = 0.247 > 0.05) , SI (F = 1.114, P = 0.293 > 0.05) , UI (F = 0.990, P = 0.321 > 0.05) , EI (F = 0.038, P = 0.846 > 0.05) , EU (F = 3.610,P = 0.059 > 0.05) , SE (F = 0.383, P = 0.537 > 0.05) variables , but Gender was significantly different in PU (F = 5.396, P = 0.021 < 0.05) , Male (PU Mean value = 4.7564) Goods and Services Perception Uncertainty is higher than Female (PU Mean value = 4.1951) , ME (F = 4.891, P = 0.028 < 0.05) , Female (ME Mean value = 5.331) Surprise Experience is higher than male (ME Mean value = 4.871) , This may be because males are accustomed to using rational thinking during experiences, while females will be more emotional.

Types of offline paid experiences (Travel/theme parks、Dinner/Gathering、Watching movies/theaters/various exhibitions、Board Games/Enclosed Room Escapes/Script-based Role Play Game、other) was not significantly different in PI (F = 1.070,P = 0.363 > 0.05) , SI (F = 0.534, P = 0.660 > 0.05) ,EI (F = 0.898, P = 0.444 > 0.05) , PU (F = 0.831, P = 0.478 > 0.05) , EU (F

Table 8
Intermediary effect test.

Effect	Variable relationship	Effect value	Standard error	T value	LLCI (Lower)	ULCI (upper)	P
Standardized interaction → satisfaction experience	Indirect effect	0.605	0.330		0.0149	0.1507	
	Direct effect	0.5428	0.636	8.5345	0.4175	0.6681	***
Personalized interaction → surprise experience	Indirect effect	0.738	0.288		0.044	0.0699	
	Direct effect	0.6465	0.486	13.310	0.5508	0.7422	***

Note: * * * means P < 0 001, * * means P < 0.01, * means P < 0 05.

Table 9
Statistical characteristics of the sample.

Characteristics	Value	Frequency (N = 160)	Percentage (%)
Gender	Male	78	48.8
	Female	82	51.2
The most recent experience that stood out to you was	Travel/theme parks	51	31.9
	Dinner/Gathering	69	43.1
	Watching movies/theaters/various exhibitions	18	11.3
	Board Games/Enclosed Room Escapes/Script-based Role Play Game	10	6.3
	Other	12	7.4
Your approximate cost for this experience	Less than 50 RMB per person	25	15.6
	50-100 RMB per person	51	31.9
	100-200 RMB per person	32	20
Career	200 RMB or more per person	52	32.5
	Undergraduate and graduate students	92	57.5
	Teachers/civil servants/public institutions	33	20.6
	Enterprise managers/entrepreneurs/professional managers	23	14.4
	Other	12	7.5

Table 10
Reliability and validity results.

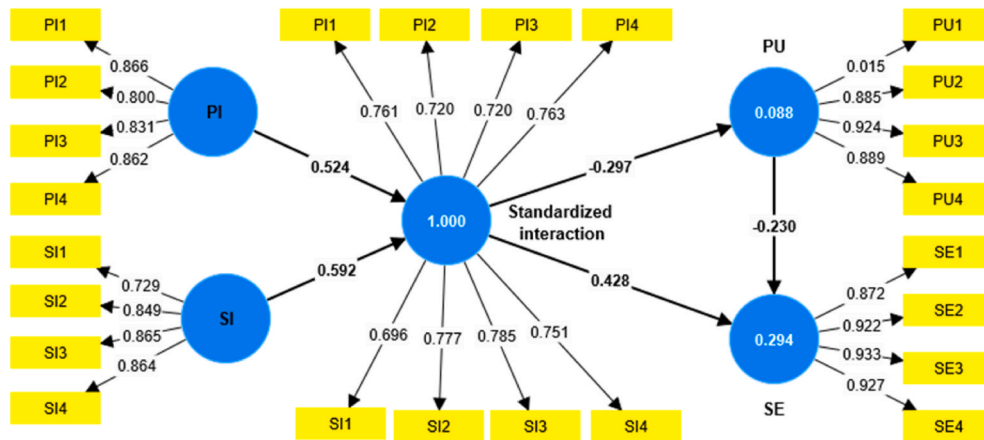| Factor	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	AVE
PI	0.861	0.862	0.906	0.706
SI	0.846	0.889	0.910	0.558
Standardized interaction	0.887	0.889	0.910	0.558
PU	0.701	0.882	0.824	0.607
SE	0.934	0.934	0.953	0.835
UI	0.976	0.976	0.982	0.932
EI	0.935	0.936	0.954	0.838
Personalized Interaction	0.943	0.943	0.953	0.716
EU	0.886	0.912	0.920	0.744
ME	0.928	0.930	0.946	0.777

Fig. 2. Standardized interactions and their test results.

= 2.079, P = 0.105 > 0.05), SE (F = 1.587, P = 0.195 > 0.05), ME (F = 0.071, P = 0.975 > 0.05). but Types of offline paid experiences was significantly different in UI (F = 4.976, P = 0.003 < 0.05), Dinner/Gathering (UI Mean value = 6.0479) User-to-User Interaction is higher than Other. This may be due to the differences in the social goals of offline experience scenes, Dinner/Gathering are usually aimed at communication and networking, board games such as escape rooms for challenges, and movies for viewing, Travel/theme parks usually aim to explore new things, Watching movies/theaters/various exhibitions is usually aimed at viewing program content.

A comparison of the online free experience context (Study I) and the offline paid experience context (Study II) revealed that, first, in the online free context, compared to product interaction, scene interaction was more helpful in reducing perceived uncertainty of
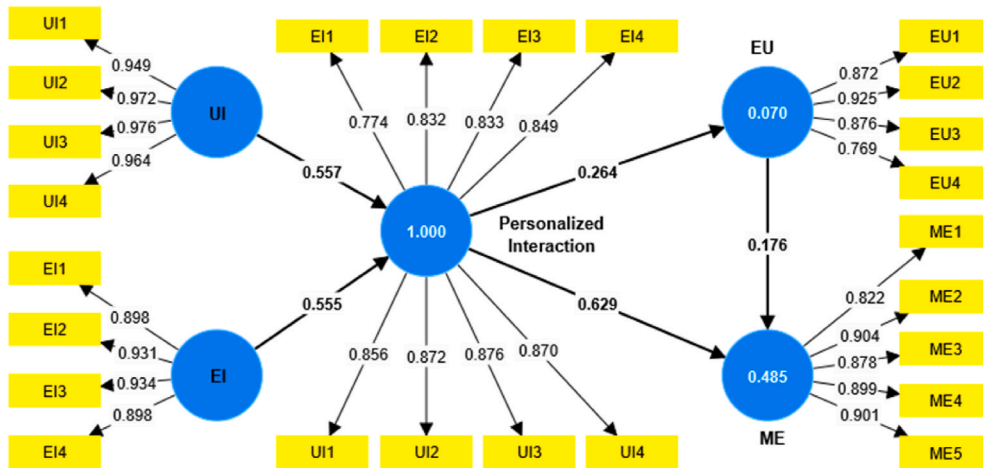
Fig. 3. Personalized interactions and their test results.

Table 11
Path coefficients and significance of results.

	Research Hypothesis	Path coefficient	P value
Model 1	Product Interaction (PI) →Standardized interaction	0.524	0.000
	Scene Interaction (SI) →Standardized interaction	0.592	0.000
	Standardized interaction→Goods and Services Perception Uncertainty (PU)	−0.297	0.000
	Standardized interaction→Satisfaction Experience (SE)	0.428	0.000
	Goods and Services Perception Uncertainty (PU) →Satisfaction Experience (SE)	−0.230	0.013
Model2	User-to-User Interaction (UI) →Personalized Interaction	0.557	0.000
	User-Enterprise Interaction (EI) →Personalized Interaction	0.555	0.000
	Personalized Interaction →Experience Process Perception Uncertainty (EU)	0.264	0.008
	Personalized Interaction →Surprise Experience (ME)	0.629	0.000
	Experience Process Perception Uncertainty (EU) →Surprise Experience (ME)	0.176	0.003

goods and services (SI Path coefficient = −0.148>PI Path coefficient = −0.115) and enhancing customer satisfaction (SI Path coefficient = 0.322>PI Path coefficient = 0.177); whereas, in the offline paid context, compared to product interactions, scene interactions have a greater impact on standardized interactions (SI Path coefficient = 0.592>PI Path coefficient = 0.524), which in turn helps to reduce the perceived uncertainty of goods and services, and helps to enhance customer satisfaction more. Second. In the online free experience context, User-Enterprise interaction (Path coefficient = 0.481) is more conducive to enhancing Experience Process Perception Uncertainty than User-to-User Interaction (Path coefficient = 0.219); however, User-to-User interaction (Path coefficient = 0.516) is more conducive to enhancing the surprise experience than User-Enterprise interaction (Path coefficient = 0.251); in the offline paid experience context, User-Enterprise and User-to-User interactions have similar effects path coefficients on personalized interactions, and thus their effects on perceived uncertainty in the experience process and on the surprise experience are also similar.

5. Discussion

First, previous studies based on the commodity purchase context found that consumers would show risk aversion when facing uncertainty [1,2], and based on the commodity promotion context found that consumers would show excitement and curiosity when facing uncertainty [14,17]. This study jumps out of the original commodity-based research framework and applies uncertainty theory to the experience consumption context, finding that consumers show uncertainty aversion when facing certainty needs such as commodities and services (the tools of experience, [30]), while they show uncertainty preference when facing uncertainty needs such as experiences. Among them, deterministic demand refers to explicit personalized demand, i.e., the internal requirements and behavioral states that consumers are already aware of and can express clearly and unambiguously. At this time, consumers who pursue a satisfying experience with specific certainty characteristics will show uncertainty aversion in the face of uncertainty. Uncertainty demand refers to implicit personalized demand, i.e., consumers' subconscious internal requirements and behavioral state that cannot be clearly expressed. In this case, consumers who pursue the surprise experience with uncertainty characteristics will show uncertainty preference when facing uncertainty. To further clarify differences in consumer attitudes toward uncertainty in experiential consumption situations, this study according to the different perception objects and experience purpose, perception uncertainty can be divided into goods and services perception uncertainty and experience process perception uncertainty. Goods and services perception uncertainty refers to the perception uncertainty caused by consumers' lack of full understanding of standardized management

hardware and software such as goods, services, atmosphere and other facilities and equipment in the process of participating in the experience, its essence is a kind of perceptual uncertainty based on rational consumption and result consumption. Experience process perception uncertainty refers to the perception uncertainty caused by consumers' lack of full understanding of personalized service content and processes such as interaction, communication and recommendation in the process of participating in the experience, its essence is a kind of perceptual uncertainty based on perceptual consumption, process consumption. This study further expands the relevant research of uncertainty theory.

Second, previous research has suggested that uncertainty intensifies emotional responses to ongoing positive and negative events, i. e., uncertainty makes positive emotions more positive but also negative emotions more negative [21]. Based on the original emotional reinforcement viewpoint, this study points out specific emotional outcomes and finds that product interaction and scene interaction help to reduce perceived uncertainty of goods and services, which reduces consumers' negative emotions and creates a satisfying experience, Satisfaction experience refers to pleasure, happiness, satisfaction and joy following the realization of predictable events [40]. It is a pleasant psychological state (expectation satisfaction model) formed by the mutual match between consumer experience expectation and actual experience. At this time, experience value (experience utility) is embedded in products and services, and the value of products and services is realized in the exchange process, Its essence is a kind of Certainty Utility and Certainty Value under the background of commodity dominant logic. Finds that user-to-user interaction and user-enterprise interaction help to increase perceived uncertainty of the experience process, which increases consumers' positive emotions and creates a surprising experience, Surprise experience refers to a kind of positive feeling accompanied by surprise (surprise = astonishment + joy) after the unexpected event is realized [41], or it means that the actual experience of customers exceeds expectations to a surprising degree [42]. At this point the process of experience value (experience utility) creation extends to the interaction of all social and economic actors in a given context, and any actor in a given contextual space can participate in the space of value creation, Its essence is a kind of uncertain utility and uncertain value under the background of customer dominant logic. This study proposes different combinations of behaviors from the interaction perspective to make the uncertainty theory research more operational, and it also proposes the results brought by uncertainty from the emotion perspective to enrich the existing research.

6. Conclusion

6.1. Summary

The conclusions of this study include the following aspects. Firstly, experience is not a substitute for products and services. According to the degree of emotional arousal of consumers, experiences can be divided into satisfaction experiences and surprise experiences. Standardized product interaction and scene interaction are the basic guarantees for realizing a satisfaction experience. Personalized user-to-user interaction and user-enterprise interaction are the basic guarantee for realizing surprise experience. Secondly, the certainty and uncertainty factors of experience coexist. In the context of certainty of experience, consumers obtain information through product interaction and scene interaction, raise awareness and knowledge of goods and services, and reduce the goods and services perception uncertainty, so as to realize a satisfaction experience. In the context of uncertainty of experience, consumers play on an individual's initiative and creativity through user-enterprise interaction and user-to-user interaction, and realize a surprise experience by enhancing the experience process. Thirdly, the empirical test results reveal that goods and services perception uncertainty and experience process perception uncertainty both play a part of the intermediary role.

6.2. Theoretical contributions

The experience economy has arrived, but the industry and academics often confuse the satisfaction experience under low emotional arousal and the surprise experience under high emotional arousal, and few scholars have paid attention to the phenomenon of "two-factor theory" in the context of consumer experience. This study pioneered the introduction of uncertainty theory and two-factor theory into the consumer experience context, and categorized experiences into Certainty of experiences and Uncertainty of experiences, and an overall conceptual model is built to analyze the theoretical boundary and relationship. The theoretical value includes the following aspects: Firstly, it is found that in the context of consumption experience, consumers have different attitudes towards uncertainty. This study believes that in the context of certainty of experience, consumers are rational and risk-averse, and enterprises realize satisfaction experiences by reducing the consumers' goods and services perception uncertainty. In the context of uncertainty of experience, consumers are emotional and curious. Enterprises realize surprise experiences by stimulating consumers' experience process perception uncertainty. Secondly, we clarify the relationship between the certainty and uncertainty of experience and conduct an empirical test. The two are interdependent. Certainty of experience is the basic guarantee of uncertainty, and uncertainty of experience is the deepening and improvement of certainty of experience. Among them, certainty of experience belongs to the hygiene factor. If it is not realized, it will lead to consumer dissatisfaction. Uncertainty of experience belongs to the motivation factor, and even if it is not realized, it will not lead to consumer dissatisfaction. Thirdly, through empirical analysis, we build a conceptual model of surprise experience and satisfaction experience. Among them, surprise experience is formed by stimulating consumers' experience process perception uncertainty under the uncertainty situation, and satisfaction experience is formed by reducing consumers' goods and service perception uncertainty under the certainty situation.

6.3. Implications for practice

This study attempts to provide ideas for developing experiential economy in physical stores, and provide experience for the healthy and high-quality development of the real economy. The practical value involves the following aspects: Firstly, all experiences contain two types of factors: certainty and uncertainty. Among them, the certainty factor of experience requires enterprises to build standardized products, services and atmosphere centered on the explicit needs of consumers. Enterprises should reduce consumers' goods and service uncertainty through brand externalization, make consumers feel satisfied and form recurring purchases. Uncertainty experience requires enterprises to provide personalized services centered on the implicit needs of consumers, as well as allowing employees and consumers to give full play to their creativity. Enterprises should stimulate consumers' uncertainty perception of the experience process through brand internalization, brand co-creation and brand ecology, so as to achieve a surprise experience and form unique competitiveness. Secondly, in the process of implementing the experience strategies, enterprises should prioritize the combination of two types of factors: certainty of experience and uncertainty of experience. Certainty of experience is the basis and guarantee, and uncertainty of experience is the supplement and promotion. Certainty experience belongs to the health care factor, which is the first standard to be implemented in the early stages of the implementation of the experience strategy. The uncertain experience belongs to the incentive factor, which is the attractive demand in the Kano model, and should be considered in the middle of the experience strategy's implementation.

7. Limitations and future research directions

This study has a few shortcomings that allow for future improvements. First of all, we selected "mobile app consumption experience" as the research setting, in which WeChat, QQ and other social communication apps are the main apps chosen by the respondents. At the same time, "consumption experience in physical stores" was selected as another research context, and daily entertainment experiences such as traveling, dinners, movies and board games were the main scenarios chosen by the respondents. More work is needed to determine whether similar robust results can be obtained in other experience situations such as e-commerce platforms, live e-commerce platforms, etc. Secondly, the respondents to this study are mainly students from universities in Shanghai and Quanzhou, Although the research object also includes enterprise and public institution employees, but the sample proportion is relatively small, More research is needed to determine whether there are age disparities in perception uncertainty. Third, with the development of information technology and artificial intelligence, are there new dimensions of standardized and personalized interactions in virtual and digital person scenarios? How standardized and personalized interactions can be matched, coordinated and combined deserves further research. Future research can be approached in two ways based on the shortcomings mentioned above. First, the two-factor model of experience needs to be tested in a wider range of experience situations and consumer groups. Secondly, in the context of personalized interaction, the way, process, scene and stage characteristics of interpersonal interaction are worth further study.

Ethics statement

The questionnaire used in this paper has obtained the informed consent of all participants, and has been reviewed and approved by the Ethics Committee of Putian University with the approval number of "Lun Review (2023) −019".

Data availability statement

The experimental data used to support the findings of this study are available from the corresponding author upon request.

Funding statement

Consent for publication

As per the journal guidelines and norms.

CRediT authorship contribution statement

Zhen Li: Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization.

Declaration of competing interest

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