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Research on the Influence Mechanism of Low-Altitude Tourism Consumption Intention Based on SOR Framework: The Mediating Role of Flow Experience

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Article

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ABSTRACT

With legislative support, low-altitude tourism—an emerging economic model that merges general aviation and tourism—has shown significant development potential. Enhancing consumer willingness to spend is a crucial issue due to the high price point and associated risks, which complicate decision-making. Given the high-tech and premium nature of low-altitude tourism, consumers maintain stringent expectations for aircraft safety and cabin environmental comfort, such as the tactile quality of aviation textile interiors and the acoustic insulation performance of cabin fabrics, further complicating their choices. To address this, this research constructs a structural equation model based on the Stimulus-Organism-Response (SOR) to systematically investigate the influence pathways of multiple factors, including cost, security, experience, and service. Through a questionnaire survey and empirical analysis of 203 current low-altitude tourists in Hangzhou, the study finds that external cues significantly mediate through the flow experience, in addition to directly and positively influencing consumption willingness. Notably, a comfortable flight environment created by high-performance aviation textiles provides a crucial physical foundation for inducing the flow experience. The following strategic recommendations are proposed based on these findings: improve safety protocols to increase consumer trust; optimize cabin space design and the use of functional textiles to enhance immersive experiences; refine pricing strategies to improve perceived value for money; and enhance supporting service systems to increase overall satisfaction. These findings provide a theoretical foundation for low-altitude tourism businesses and related aviation manufacturing sectors (such as the aviation textile industry) to design marketing and product strategies.

KEYWORDS

low-altitude tourism, consumption willingness, stimulus-response theory, structural equation modeling, aviation textiles

INTRODUCTION

Low-altitude tourism, as an emerging business format that deeply integrates the general aviation industry and the tourism industry, is gradually becoming an important engine driving consumption upgrades and regional economic growth. In 2016, the former National Tourism Administration, in coordination with multiple departments, promoted general aviation tourism and launched the first batch of 16 general aviation tourism pilot projects, paving the way for industry development [1]. In 2024, the “State Council’s Opinions on Promoting High-Quality Development of Service Consumption” encouraged the development of new business formats such as low-altitude tourism, injecting a strong stimulus into the market [2]. In 2025, the General Office of the State Council promulgated “Several Measures on Further Cultivating New Growth Points and Prospering Cultural and Tourism Consumption,” advocating for the development of diversified and distinctive low-altitude flight tourism projects [3]. Driven by this series of policy dividends, low-altitude tourism has encountered unprecedented development opportunities and shows a vigorous development trend. Simultaneously, the rise of the low-altitude economy has driven upgrades in supporting industries, particularly the deep application of the textile industry in the aerospace sector. From lightweight, high-strength composite fabrics for airframes to high-performance cabin interior fabrics with flame-retardant, antibacterial, and temperature-regulating properties, innovations in textile technology provide a dual guarantee of safety and comfort, forming the material basis for enhancing flight quality.

However, compared with traditional forms of tourism, the high unit price and high risk characteristics of low-altitude tourism make the consumer decision-making process more complex. In 2022, the number of domestic participants in aerial sightseeing and air sports was only 480,000. In 2023, the national passenger volume for aerial sightseeing was about 600,000, with 60% distributed in Hainan and Sanya [4]. How to effectively stimulate and enhance consumers’ willingness to spend has become the core issue for the sustainable development of the industry. It is worth noting that consumer perceptions of flight safety and environmental comfort stem largely from direct contact with aircraft hardware, including the visual and tactile feedback provided by aviation textile materials.

Therefore, in-depth exploration of the key factors affecting consumers’ willingness to spend on low-altitude

tourism, constructing a reasonable theoretical analysis framework, and using appropriate research methods for empirical analysis will not only help low-altitude tourism enterprises accurately grasp market demand and formulate effective marketing strategies, but also provide practical guidance for textile enterprises participating in the general aviation supply chain across industries.

Furthermore, most existing research perspectives focus on supply-side analysis, such as the macro development trends of the low-altitude economy and the synergistic development effects of the low-altitude economy [5] and new quality productive forces, etc. [6,7]. Only a few scholars have focused their research on the field of low-altitude tourism, paying attention to certain factors affecting consumption willingness, such as cost and service quality [1]. However, these studies are mostly limited to qualitative discussion or partial verification, lacking empirical testing of the synergistic effects of multiple factors under a unified theoretical framework. Based on this, this study constructs a structural equation model grounded in SOR theory to systematically examine the role of various factors on low-altitude tourism consumption willingness. This study focuses on the core issue of consumption willingness, attempting to overcome the limitations of existing research, reveal the underlying mechanism and influence pathways of low-altitude tourism, and provide a new explanatory scheme for understanding the mechanisms behind consumption decisions. This research framework not only deepens the theoretical understanding of consumption behavior in emerging tourism formats, but also provides actionable strategic references for related enterprises to optimize product supply and improve market conversion rates.

RESEARCH HYPOTHESES AND INDICATOR CONSTRUCTION

Research Hypotheses

The SOR theory, namely the “Stimulus-Organism-Response” theory [2], is widely used to reveal the formation mechanism of tourism behaviors in various scenarios, providing solid theoretical support and an analytical framework for this study. Therefore, based on SOR theory, this paper defines “price discount,” “safety assurance,” “flight experience,” and “pre- and post-flight service chain” as external stimuli; “flow experience” as the internal individual state; and “low-altitude tourism consumption willingness” as the response.

Flow experience was initially proposed by Csikszentmihalyi (1975), referring to the optimal psychological state

in which an individual is fully engaged in an activity, highly concentrated, losing track of time, and feeling intrinsic pleasure [3]. From the perspective of presence, Yao Yanbo and Jia Guangmei (2021) found that flow experience is the direct psychological motivation for impulsive tourism willingness and holds a central position in tourism consumption decisions [4]. From the perspective of viral short video communication, Liu C et al. (2022) found that media can promote flow experience through audience happiness, concentration, and immersion, ultimately affecting tourism attitudes [5], further verifying the key bridging role of flow between media communication and tourism consumption decisions. It can be seen that flow experience is an important link connecting tourism stimulus factors and consumer behavioral willingness. Given the high-experience, high-participation characteristics of low-altitude tourism, if tourists can enter a flow state during the experience, their overall satisfaction and repeat participation willingness will increase significantly.

Thus, hypothesis H1 is proposed: Flow experience has a significant positive impact on consumption willingness.

The price factor plays a key role in low-altitude tourism consumption. As a high-priced tourism product, the economic threshold for low-altitude sightseeing is high, and consumers generally show high price sensitivity. Through hindrance factor analysis, Masiero L et al. found that price is an important factor restricting the scale development of low-altitude tourism, and its target customer group reacts significantly to price changes [6]. In this context, price discounts serve as a critical external stimulus not merely for cost reduction, but for optimizing perceived value. They effectively balance the psychological resistance caused by the inherent high price and high risk, signaling value for money and thereby directly affecting purchase decisions. Research by Hardesty and Bearden (2003) shows that price discounts can significantly influence consumers' purchase decisions [7]. Sparks BA et al. (2011) further found that the loss-reduction promotion frame can improve consumers' purchase intention for tourism products more than the benefit-acquisition promotion frame [8]. Sözer EG et al. also confirmed that discount activities positively impact purchase intention [9]. Liang Chuanfei (2025) emphasized that reasonable pricing strategies and promotional activities are important ways to promote the popularization of low-altitude tourism [10]. Therefore, introducing reasonable group purchase, joint tickets, and other discount methods can effectively stimulate consumers' willingness to try low-altitude tourism products.

Thus, hypothesis H2 is proposed: Price discount has a significant positive impact on consumption willingness.

Safety assurance is the basic prerequisite for consumers to participate in low-altitude tourism. Due to the high-altitude operation, strong reliance on technology, and many uncontrollable factors, consumers' concern for safety issues is far greater than that of traditional tourism modes. Fen H et al. emphasized that safety is the "lifeline" of low-altitude tourism, and improved safety management systems and emergency measures can significantly reduce consumers' risk perception and enhance their trust [11]. Li Xue (2023) further pointed out that pilot qualifications, equipment certification, and clear safety procedures are important factors affecting consumer decisions [1]. Wang J et al. (2023) believed that when consumers have the ability and confidence to take measures to avoid potential threats, their willingness to participate in risky tourism activities increases [12]. In the specific context of low-altitude tourism, tourists' trust in the airworthiness of the aircraft, the professional quality of pilots, and the emergency response mechanism directly affects their willingness to try such non-routine tourism experiences. Therefore, building a systematic, visible, and credible safety assurance system becomes an important foundation for stimulating consumption willingness.

Thus, hypothesis H3 is proposed: Safety assurance has a significant positive impact on consumption willingness.

Flight experience, as the core component of low-altitude tourism products, directly affects consumers' emotional responses and behavioral intentions. Compared with conventional tourism forms, the unique value of low-altitude flight lies mainly in the scarcity of aerial viewing, novelty of perspective switching, and immersive interaction brought by technological integration. Şimşek K et al. pointed out that the aerial viewing experience and interactive design are key factors affecting consumers' tourism experience, and high-quality flight experience can significantly enhance tourists' satisfaction and recommendation willingness [13]. Wang C et al. (2025) further confirmed that the unique perspective and immersive experience of low-altitude tourism can stimulate tourists' emotional resonance, thereby enhancing their loyalty and willingness to spend [14]. Related research also shows that high-level tourism experience quality generally has a positive impact on tourist satisfaction [15], and in the context of low-altitude tourism, characterized by high participation and perceived value, the impact of flight experience as the most directly perceived core link is more prominent. Therefore, optimizing flight experience not only helps improve immediate satisfaction but is also a key pathway to promoting the formation of consumption willingness.

Thus, hypothesis H4 is proposed: Flight experience has a significant positive impact on consumption

willingness.

The pre- and post-flight service chain, covering pre-trip consultation, in-service support, and post-trip feedback and relationship maintenance, is a key element in the low-altitude tourism consumption experience and has a systematic impact on consumers' overall satisfaction and loyalty. In the context of low-altitude tourism, which involves high investment and high perceived risk, tourists have particularly strict requirements for the professionalism, responsiveness, and information transparency of the service process. Hajli N pointed out that the usefulness, involvement, and sociality of social media significantly affect consumer trust and willingness to participate, thereby influencing purchase decisions [16]. Gronroos C further emphasized that in the context of tourism consumption upgrades, improving service processes and providing emotional value are crucial for enhancing tourist satisfaction [17]. In low-altitude tourism, information consultation and risk communication in the pre-trip stage, professional assurance and interactive support during the trip, and feedback response and relationship maintenance post-trip together constitute the core elements of perceived service quality. Especially with the widespread use of social media and digital platforms, where tourists can obtain information in real time, express demands, and participate in interactions, the completeness and responsiveness of the service chain directly affect trust and willingness conversion. Therefore, building a full-process, highly responsive service system becomes an important support for promoting consumption willingness.

Thus, hypothesis H5 is proposed: The pre- and post-flight service chain has a significant positive impact on consumption willingness.

In the context of low-altitude tourism, safety assurance is an important prerequisite for tourists to immerse themselves in the flight experience and enter a flow state. Because low-altitude flight activities carry a certain degree of risk, tourists' concerns about safety can continuously distract their attention, hindering the formation of deep immersion. Han Fenchou (2024) pointed out that clear safety measures and transparent safety information can enhance tourists' trust, making them more willing to participate in high-risk, high-interaction projects [11]. Triantafillidou A et al. 's research in ski tourism also found that improving safety facilities helps reduce participants' risk anxiety, making it easier to achieve flow experience [18]. During low-altitude tourism, if tourists have doubts about aircraft status, pilot professionalism, or emergency mechanisms, it is difficult for them to fully engage in core activities such as viewing and interaction, and the

formation of flow experience is restricted. Therefore, building a credible and visible safety environment is the key psychological basis for prompting tourists to shift from passive prevention to active immersion.

Thus, hypothesis H6 is proposed: Safety assurance has a significant positive impact on flow experience.

Flight experience, as the core content of low-altitude tourism, with its unique landscape perspective, multi-level interactive design, and cutting-edge technology application, creates a highly immersive experience for tourists and is a key external condition for effectively stimulating consumers' flow state. According to flow theory, when the activity content presents appropriate challenges, clear goals, and immediate feedback, participants are more likely to enter a state of concentration and self-forgetfulness. In low-altitude flight, real-time perspective switching, the integration of virtual and real through virtual reality (VR) simulation, and high contact with the natural environment not only provide strong sensory stimulation but also create a situation where skills and challenges match, thereby promoting flow experience. Flavián C et al. pointed out that interactivity positively impacts flow experience [19]. Tussyadiah IP et al. further emphasized that immersion and interactivity are key factors in enhancing flow experience, and the introduction of digital technology significantly enhances these aspects [20]. Silver DA et al.'s empirical analysis also proved that scenic spot innovation and atmosphere have a significant positive effect on tourists' flow experience [21]. In low-altitude tourism, the visual impact, interactive participation, and technological integration experienced during the flight together constitute a highly attractive and moderately challenging environment, enabling tourists to naturally engage, ignore the passage of time and external distractions, and thus form a deep flow experience. Thus, hypothesis H7 is proposed: Flight experience has a significant positive impact on flow experience.

In low-altitude tourism consumption behavior, safety assurance and flight experience—key external stimulus factors—not only directly affect consumption willingness but may also have indirect effects through the internal psychological state of flow experience. Specifically, safety assurance establishes a trustworthy environmental foundation, reducing tourists' risk perception and psychological burden, enabling full engagement in flight activities and creating the necessary conditions for flow experience. High-quality flight experience directly stimulates concentration and pleasure through unique landscape perspectives, technological interaction, and immersive design, prompting entry into a flow state. Once flow experience is achieved, it further strengthens perceived value and emotional identification with low-altitude tourism, ultimately translating into stronger consumption willingness. Therefore, flow experience plays a key

mediating role between safety assurance, flight experience, and consumption willingness, forming a complete influence mechanism from external stimulus to internal psychological state and then to final behavioral willingness.

However, since flow experience should be directly stimulated by the intrinsic qualities of the core activity itself, price discount and the pre- and post-flight service chain—auxiliary support systems—primarily serve to lower consumption barriers, optimize the overall experience flow, build consumer trust, and enhance satisfaction. While these clear external obstacles to flow generation, they are not direct sources of flow themselves. Therefore, while acknowledging that high-quality service helps create a conducive environment, this study specifically focuses on safety assurance and flight experience as the direct, proximal triggers of the flow state during the actual flight. Consequently, the mediation model in this paper prioritizes these core activity dimensions.

Thus, regarding the mediating effect, hypothesis H8 is proposed: Flow experience plays a mediating role in the impact of safety assurance and flight experience on consumption willingness.

Based on the above hypotheses, the theoretical model of this study is derived, as shown in Figure 1.

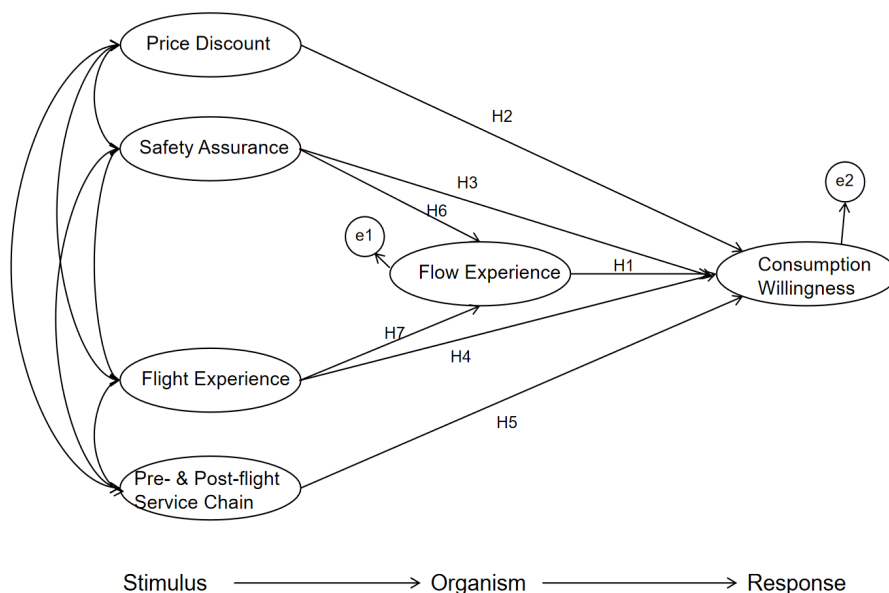


Figure 1. Theoretical Model of the Study

Research Dimensions and Indicator System Construction

The research dimensions and corresponding evaluation indicators of this study mainly refer to Richard’s (2016) Flow Experience Scale [22], the measurement scale for influencing factors of low-altitude tourism consumption experience proposed by Şimşek K et al. [13], and the content on consumption cost and product design mentioned by Li Xue and Yang Hantao (2023) [1]. Based on the characteristics of low-altitude tourism, these were systematically screened and integrated, resulting in six dimensions: Flow Experience, Price Discount, Safety Assurance, Flight Experience, Pre- and Post-Flight Service Chain, and Consumption Willingness, with a total of 21 element indicators. The measurement indicators of latent variables and observed variables are shown in Table 1.

Table 1. Latent Variable and Observed Variable Measurement Metrics

Latent Variable	Corresponding Code	Observation Variable
Flow Experience	a1	I forgot the passage of time.
	a2	I felt pleasure and enjoyment.
	a3	I felt a sense of control.
	a4	I felt completely absorbed.
	a5	I was fully engaged and highly concentrated.
	a6	I was completely immersed in the flight, ignoring surrounding distractions.
Price Discount	a7	Offering group purchase discounts, family packages
	a8	Regularly offering promotional activities
	a9	Professional aircraft, experienced pilots
Safety Assurance	a10	Safety management system and emergency plans
	a11	Pilots comply with safety operating procedures
	a12	Providing safety training and guidance for tourists
Flight Experience	a13	Professional guided commentary and immersive interaction
	a14	Application of AR/VR technology for interactive experience
	a15	Contact with nature, appreciating beautiful scenery

	a16	Pilot perspective switching and landscape layering
Pre-&Post-Flight Service Chain	a17	Collecting tourist feedback, conducting follow-up services
	a18	Maintaining contact with tourists
	a19	Overall satisfaction
Consumption Willingness	a20	Willingness to experience
	a21	Willingness to pay for low-altitude sightseeing

Note: AR: augmented reality

RESEARCH DESIGN

Questionnaire Design

The questionnaire is divided into two parts. The first part covers the basic information of the sample, including demographic characteristics such as age, gender, occupation, income level, and tourism preferences. The second part addresses the core research content, designed according to the six research dimensions and corresponding indicator system constructed earlier, and measured using a five-point Likert scale. Respondents rate each observation variable based on their actual feelings, from “strongly disagree” to “strongly agree.” During the questionnaire design process, multiple pre-surveys and expert consultations were conducted, and the content was repeatedly revised and improved based on feedback to ensure quality and validity.

Data Source and Sample Characteristics

The data in this paper comes from the “Low-Altitude Tourism Consumption Willingness” questionnaire survey conducted in 2025, targeting existing low-altitude tourism consumers in Hangzhou. All respondents had experience with low-altitude tourism. The questionnaire was distributed online; a total of 240 electronic questionnaires were distributed, of which 203 were valid, resulting in an effective recovery rate of approximately 84.58%. The sample characteristics are shown in Table 2. In terms of gender composition, the male-to-female ratio is 99:104, which is relatively balanced. In terms of age structure, the 18–45 age group accounts for 73.89%. Regarding monthly income, those with a monthly income of 4,001–15,000 RMB account for 65%, making up the majority of respondents.

Table 2. Basic Information of Respondents

Item	Classification	Frequency	Proportion (%)
Gender	Male	99	48.8
	Female	104	51.2
Age	18–25 years old	63	31.0
	26–35 years old	42	20.7
	36–45 years old	45	22.2
	46–55 years old	33	16.3
	Over 55 years old	20	9.8
	Monthly Income	Below 4,000 RMB	43
	4,001–8,000 RMB	75	36.9
	8,001–15,000 RMB	57	28.1
	15,001–20,000 RMB	20	9.9
	Over 20,000 RMB	8	3.9
Total		203	100

EMPIRICAL ANALYSIS

Reliability and Validity Tests

Reliability Test

The Cronbach's alpha coefficient is an important indicator for measuring the internal consistency of a questionnaire. Its value ranges from 0 to 1, and the closer it is to 1, the better the internal consistency of the scale. Generally, an alpha value greater than 0.7 is considered acceptable. This study used SPSS 27.0 to conduct a reliability test on the questionnaire, and the results are shown in Table 3. The total reliability is 0.923, and the Cronbach's alpha coefficients for each dimension are greater than 0.7, indicating that the questionnaire has high internal consistency and the measurement results for each dimension and the overall

scale are reliable.

Table 3. Reliability Analysis

	Flow Experience	Price Discount	Safety Assurance	Flight Experience	Pre-& Post-Flight Service Chain	Consumption Willingness	Total Reliability
Cronbach's Alpha Coefficient	0.927	0.731	0.881	0.843	0.728	0.808	0.923

Validity Test

The validity test mainly examines whether the scale can accurately measure the concept under study. The KMO measure assesses the correlation between variables in factor analysis. The range of the KMO value is 0 to 1. Generally, if the KMO value exceeds 0.7, it indicates that factor analysis is feasible. Bartlett's test of sphericity checks whether there is a correlation between variables. This test is based on the hypothesis that there is a correlation between the variables under study. If the test result indicates that the null hypothesis is rejected (p-value is lower than the set significance level of 0.005), it can be concluded that there is a correlation between the variables, and factor analysis is suitable.

Using SPSS 27.0, the KMO and Bartlett's tests were conducted on the questionnaire data. The results show that the KMO value is 0.91, greater than 0.7. The significance level of Bartlett's test of sphericity is less than 0.001, rejecting the null hypothesis and indicating that the data is suitable for factor analysis. The KMO measurement and Bartlett's sphericity test are shown in Table 4.

Table 4. KMO Measurements and Bartlett's Sphericity Test

KMO Measure of Sampling Adequacy	0.910	
Bartlett's Test of Sphericity	Approximate Chi-squared	2420.283
	degree of freedom	210
	Statistical significance	0.000

Exploratory factor analysis was conducted on the 21 items using the principal component analysis method to extract common factors. The results are shown in Table 5, indicating that 6 common factors can be extracted from the 21 items, and the cumulative variance contribution rate reaches 70.071%, which is greater than 60%. This indicates that the extracted common factors explain the original variables well.

Table 5. Total Variance Explained

Ingredients	total variance explained								
	Initial Eigenvalue			Sum of Squares of Extracted Loads			Rotating Load Square Sum		
	total	Variance Percentage	Cumulative Percentage	total	Variance Percentage	Cumulative Percentage	total	Variance Percentage	Cumulative Percentage
1	8.407	40.035	40.035	8.407	40.035	40.035	4.667	22.222	22.222
2	2.096	9.980	50.014	2.096	9.980	50.014	3.185	15.167	37.388
3	1.734	8.257	58.271	1.734	8.257	58.271	2.851	13.575	50.963
4	1.298	6.180	64.451	1.298	6.180	64.451	2.163	10.302	61.266
5	1.180	5.620	70.071	1.180	5.620	70.071	1.849	8.805	70.071
6	0.930	4.429	74.500						
7	0.585	2.787	77.287						
8	0.527	2.512	79.799						
9	0.501	2.387	82.185						
10	0.464	2.209	84.394						
11	0.408	1.941	86.335						
12	0.386	1.839	88.174						
13	0.375	1.788	89.961						
14	0.318	1.513	91.475						
15	0.316	1.506	92.980						
16	0.293	1.394	94.374						
17	0.277	1.317	95.691						

18	0.257	1.223	96.914
19	0.236	1.123	98.037
20	0.211	1.006	99.043
21	0.201	0.957	100.000

Extraction Method:Principal Component Analysis

The theoretical model of this study sets Price Discount, Safety Assurance, Flight Experience, and Pre- & Post-Flight Service Chain as independent variables, Consumption Willingness as the dependent variable, and Flow Experience as the mediating variable. To conduct confirmatory factor analysis on the scale, AMOS 24.0 was used to draw the confirmatory factor analysis model, as shown in Figure 2, and the calculation results were output.

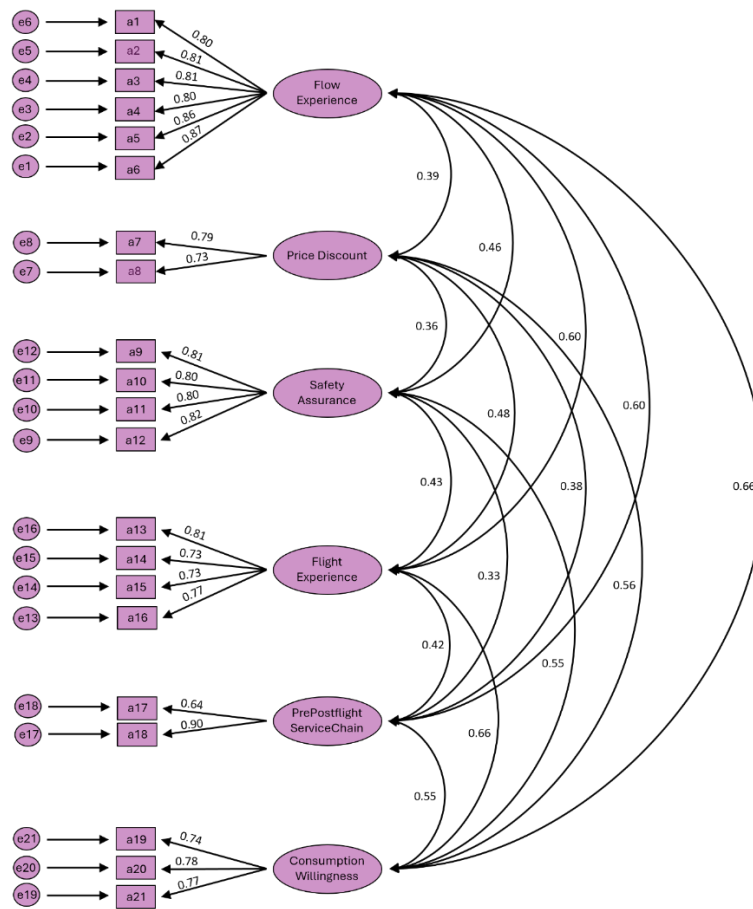


Figure 2. Confirmatory Factor Analysis Model

The model fit index verification results are shown in Table 6. All indicators have reached the model fit standards. The χ^2/df value is 1.25, much less than 3; the RMSEA value is 0.035, also less than 0.05; the SRMR value is 0.0423, less than 0.05; and other fit indices (GFI = 0.908, NFI = 0.914, CFI = 0.981) are all greater than 0.9. Thus, all types of fit indices meet the reference value requirements, indicating that the proposed model fits the actual data well and can be used to verify the research hypotheses.

Table 6. Summary Table of Confirmatory Factor Analysis Model Fit Results

Fitting Index	χ^2	df	χ^2 / df	RMSEA	SRMR	GFI	NFI	CFI
Criteria for Judgment	-	-	<3	<0.05	<0.05	>0.9	>0.9	>0.9
Model	217.462	174	1.250	0.035	0.0423	0.908	0.914	0.981

Note: RMSEA, Root Mean Square Error of Approximation; SRMR, Standardized Root Mean Square Residual; GFI, Goodness-of-Fit Index; NFI, Normed Fit Index; CFI, Comparative Fit Index.

After conducting the fit index test to verify the structural validity of the scale, the convergent validity (AVE) and composite reliability (CR) of each dimension of the scale were further tested. The standardized factor loadings of each item on the corresponding dimension were calculated through the established CFA model, and then the AVE and CR values of each dimension were calculated. According to the standards, the AVE value must reach a minimum of 0.5, and the CR value must reach a minimum of 0.7 to indicate good convergent validity and composite reliability. According to the analysis results in Table 7, all AVE values are above 0.5, and all CR values are above 0.7. Overall, each dimension has good convergent validity and composite reliability.

Table 7. Convergent Validity and Composite Reliability Tests for Each Dimension of the Scale

Dimension	Number	Estimate	AVE	CR
Flow Experience	a6	0.873	0.682	0.928
	a5	0.861		
	a4	0.801		

	a3	0.806		
	a2	0.808		
	a1	0.801		
Price Discount	a8	0.730	0.578	0.732
	a7	0.789		
Safety Assurance	a12	0.822	0.651	0.882
	a11	0.799		
	a10	0.799		
	a9	0.806		
Flight Experience	a16	0.769	0.576	0.844
	a15	0.726		
	a14	0.729		
Pre-&Post-flight Service Chain	a13	0.809		
	a18	0.898	0.606	0.749
	a17	0.637		
Consumption Willingness	a21	0.774	0.586	0.809
	a20	0.781		
	a19	0.741		

Additionally, discriminant validity between the dimensions of the scale was further tested to determine whether there are significant differences between the concepts measured by different dimensions. The results are shown in Table 8. The square root of the AVE value for each variable is greater than the correlation coefficient between that variable and other variables, indicating good discriminant validity between the dimensions.

Table 8. Discriminant Validity Test for Each Dimension of the Scale

	Consumption Willingness	Pre- & Post-Flight Service Chain	Flight Experience	Safety Assurance	Price Discount	Flow Experience
Consumption Willingness	0.766					
Pre-&Post-flight Service Chain	0.548	0.778				
Flight Experience	0.655	0.417	0.759			
Safety Assurance	0.548	0.327	0.433	0.807		
Price Discount	0.562	0.381	0.480	0.357	0.760	
Flow Experience	0.656	0.417	0.598	0.461	0.387	0.826

Model Fit and Hypothesis Testing

Model Fit Test

The fit test evaluates whether the model is suitable for the data. Amos 24.0 was used to fit the model, obtaining the model’s fit parameters and standardized fit indices. As shown in Table 9, the various fit indices all perform well. The χ^2/df value is 1.265, far lower than the commonly accepted threshold of 3. The RMSEA value is 0.036, less than 0.05. Furthermore, other goodness-of-fit indices (GFI = 0.907, IFI = 0.980, TLI = 0.976, CFI = 0.980) all exceed the standard of 0.9. Thus, the structural equation model is acceptable.

Table 9. Model Fit Test

Fitting Index	χ^2	df	χ^2 / df	RMSEA	GFI	IFI	TLI	CFI
Criteria for Judgment	-	-	<3	<0.05	>0.9	>0.9	>0.9	>0.9
Model	222.626	176	1.265	0.036	0.907	0.980	0.976	0.980

Hypothesis Testing Results and Discussion

The research hypothesis testing mainly uses standardized path coefficient indicators. Figure 3 shows the standardized path coefficients of the established structural equation. Table 10 presents the hypothesis testing results, discussed below:

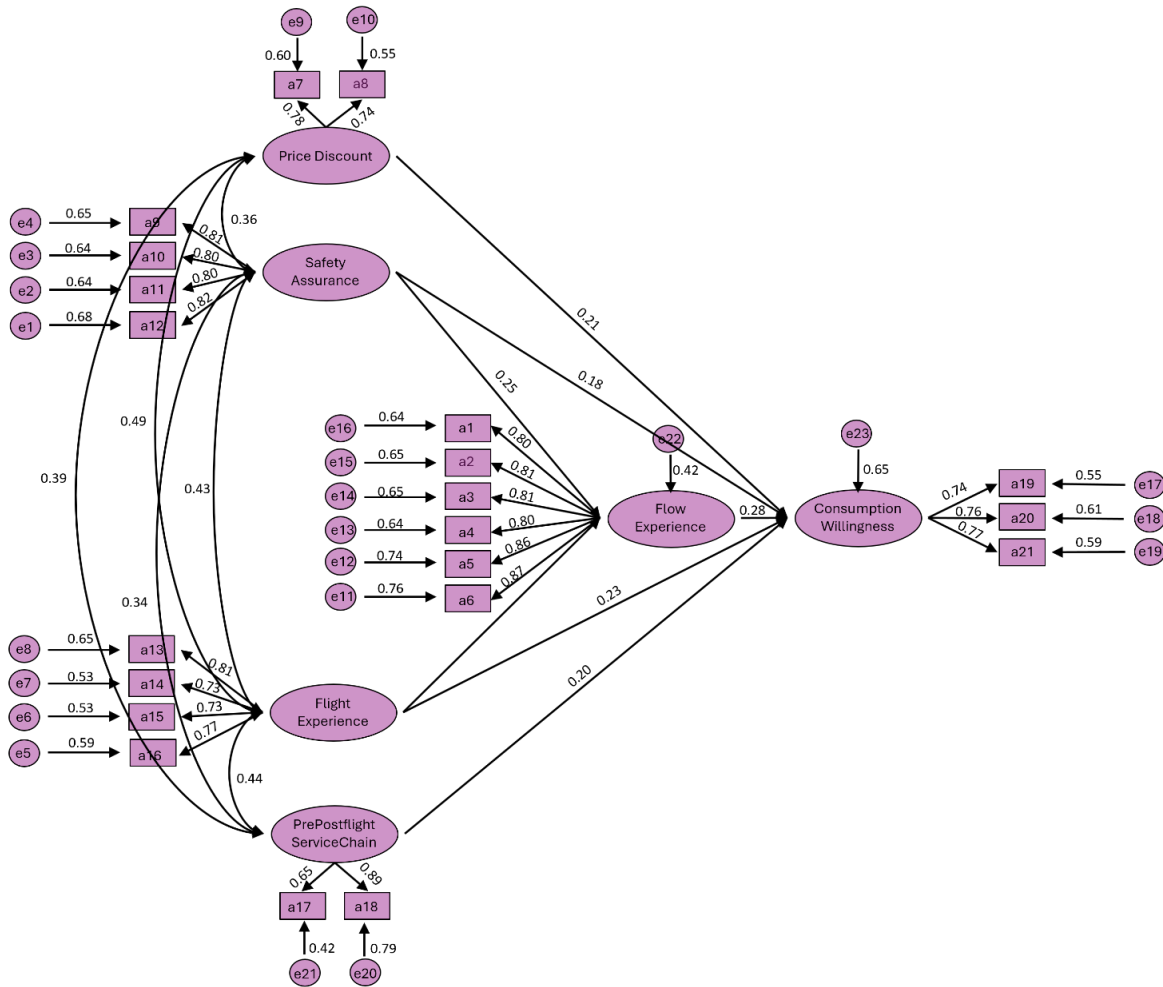


Figure 3. Standardized Path for the Overall Model

Table 10. Model Path Coefficients and Hypothesis Testing

Path	Corresponding Hypothesis	Path Coefficient	Critical Ratio	P-value	Test Result
Flow Experience → Consumption	H1	0.28	3.346		Supported

Willingness					
Price Discount → Consumption	H2	0.21	2.415	0.016	Supported
Willingness					
Safety Assurance → Consumption	H3	0.18	2.459	0.014	Supported
Willingness					
Flight Experience → Consumption	H4	0.23	2.344	0.019	Supported
Willingness					
Pre- & Post-Flight Service Chain →	H5	0.20	2.395	0.017	Supported
Consumption Willingness					
Safety Assurance → Flow Experience	H6	0.25	3.345		Supported
Flight Experience → Flow Experience	H7	0.50	6.169		Supported

For the first hypothesis, flow experience has a significant positive impact on consumption willingness (C.R. = 3.346, $P < 0.001$), with a corresponding path coefficient of 0.28. Hypothesis H1 is supported. This result reveals that when consumers are completely immersed in the flight experience, reaching a state of high concentration, forgetting the passage of time and self-awareness, and enjoying the process itself, their consumption willingness is significantly enhanced. This path is statistically significant, and its coefficient is relatively high among direct influencing factors, indicating that flow experience goes beyond mere satisfaction; it establishes a strong purchase motivation at the emotional and cognitive levels.

The second hypothesis, price discount, has a significant positive impact on consumption willingness (C.R. = 2.415, $P = 0.016$), with a path coefficient of 0.21. Hypothesis H2 is supported, meaning that price discount is an important factor attracting consumers to low-altitude tourism. When consumers perceive price discounts, they are more likely to express willingness to spend because discounted prices lower the consumption threshold and improve the product’s cost-effectiveness.

The third hypothesis, safety assurance, has a significant positive impact on consumption willingness (C.R. = 2.459, $P = 0.014$), with a path coefficient of 0.18. Hypothesis H3 is supported, indicating that safety assurance is a major concern for consumers when considering low-altitude tourism. Only when they are convinced that there are adequate safety measures will they feel comfortable generating consumption willingness.

The fourth hypothesis, flight experience, has a significant positive impact on consumption willingness (C.R. = 2.344, $P = 0.019$), with a path coefficient of 0.23. Hypothesis H4 is supported, confirming the importance of the core product of low-altitude tourism—the flight process itself. An excellent flight experience, such as perspective switching, magnificent views, or the novelty and excitement of flying, can directly and significantly enhance consumers' willingness to spend.

The fifth hypothesis, the pre- and post-flight service chain, has a significant positive impact on consumption willingness (C.R. = 2.395, $P = 0.017$), with a path coefficient of 0.20. Hypothesis H5 is supported, meaning that the service chain is also a key factor affecting consumption willingness. The formation of consumption willingness runs through the entire process from booking, reception, explanation, flight, to post-landing follow-up and problem handling. Consumers consider not only the flight experience but also the services before and after the flight. A complete service chain enhances overall satisfaction, thereby strengthening willingness to spend.

The sixth hypothesis, safety assurance, has a significant positive impact on flow experience (C.R. = 3.345, $P < 0.001$), with a path coefficient of 0.25. Hypothesis H6 is supported. According to flow theory, individuals are most likely to enter a state of immersion when perceived challenge matches their skills and they are in a safe, non-threatening environment. During the flight experience, if consumers are internally worried about safety, such anxiety and fear interrupt their attention, preventing relaxation and enjoyment. Strong safety assurance allows consumers to let down their guard and wholeheartedly enjoy the excitement and fun of flight, enhancing flow experience.

The seventh hypothesis, flight experience, has a significant positive impact on flow experience (C.R. = 6.169, $P < 0.001$), with a path coefficient of 0.50. Hypothesis H7 is supported. The coefficient of this path is relatively high, indicating that the quality of the flight experience itself is the most critical factor prompting consumers to experience flow. A stimulating, smooth, or pleasant flight process is a high-challenge, high-skill activity that naturally attracts consumers' full attention, making them completely immersed and generating excitement and pleasure. Whether it's the thrill of flying low through a canyon or the tranquility of soaring above the clouds, these experiences constitute optimal conditions for flow.

The eighth hypothesis is that flight experience and safety assurance positively affect consumption willingness through flow experience. The mediating effect test results are shown in Table 11. For the mediating effect of

safety assurance on consumption willingness through flow experience, the 95% confidence interval does not contain 0 (P = 0.006, lower limit 2.5% = 0.020, upper limit 2.5% = 0.146). Therefore, hypothesis H8a is supported, meaning that flow experience mediates the relationship between safety assurance and consumption willingness. For the mediating effect of flight experience on consumption willingness through flow experience, the 95% confidence interval does not contain 0 (P = 0.005, lower limit 2.5% = 0.050, upper limit 2.5% = 0.256). Thus, hypothesis H8b is supported, meaning that flow experience mediates the relationship between flight experience and consumption willingness.

Table 11. Mediating Effect Test Results

Path	Estimate	95% Confidence Interval	
		Lower 2.5%	Upper 2.5%
Safety Assurance → Flow Experience → Consumption Willingness	0.069	0.020	0.146
Flight Experience → Flow Experience → Consumption Willingness	0.140	0.050	0.256

By analyzing and calculating the direct, indirect, and total effects, Table 12 presents the results. In terms of direct effects, the direct effect of safety assurance on consumption willingness is 0.184, and the direct effect of flight experience on consumption willingness is 0.229. In terms of indirect effects, the indirect effect of safety assurance on consumption willingness through flow experience is 0.069, and the indirect effect of flight experience on consumption willingness through flow experience is 0.140. Regarding total effects, the total effect of safety assurance on consumption willingness is 0.253, and the total effect of flight experience on consumption willingness is 0.369. This indicates that flight experience has a greater total impact on consumption willingness compared to safety assurance. The structural model of the potential variable's influence effect after standardization is shown in Figure 4.

Table 12. Path Effects Between Latent Variables in the Standardized Structural Equation Model

Path (Total Effect)	Direct Path (Direct Effect)	Indirect Path (Indirect Effect)
Safety Assurance → Flow Experience (0.247)	Safety Assurance → Flow Experience	—

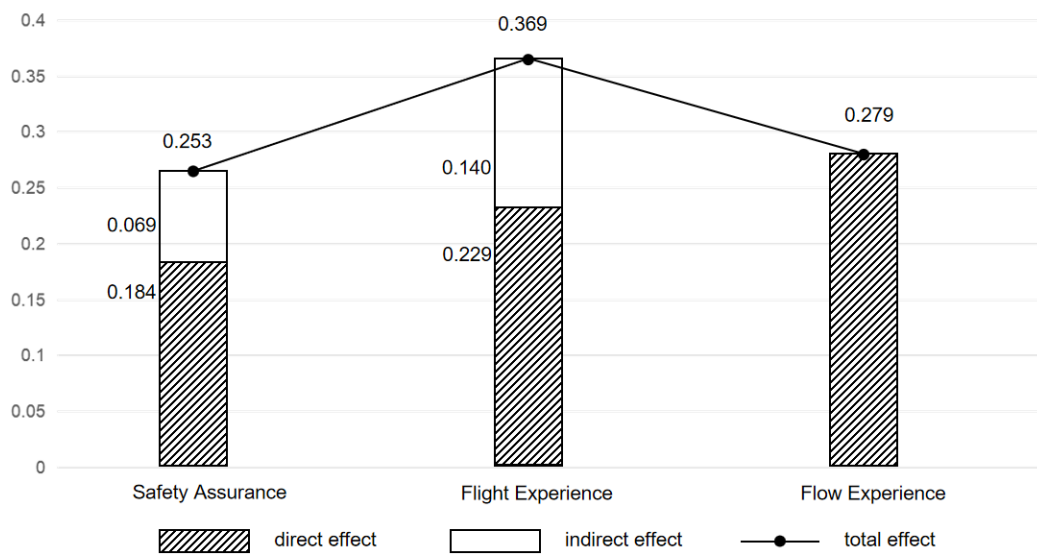
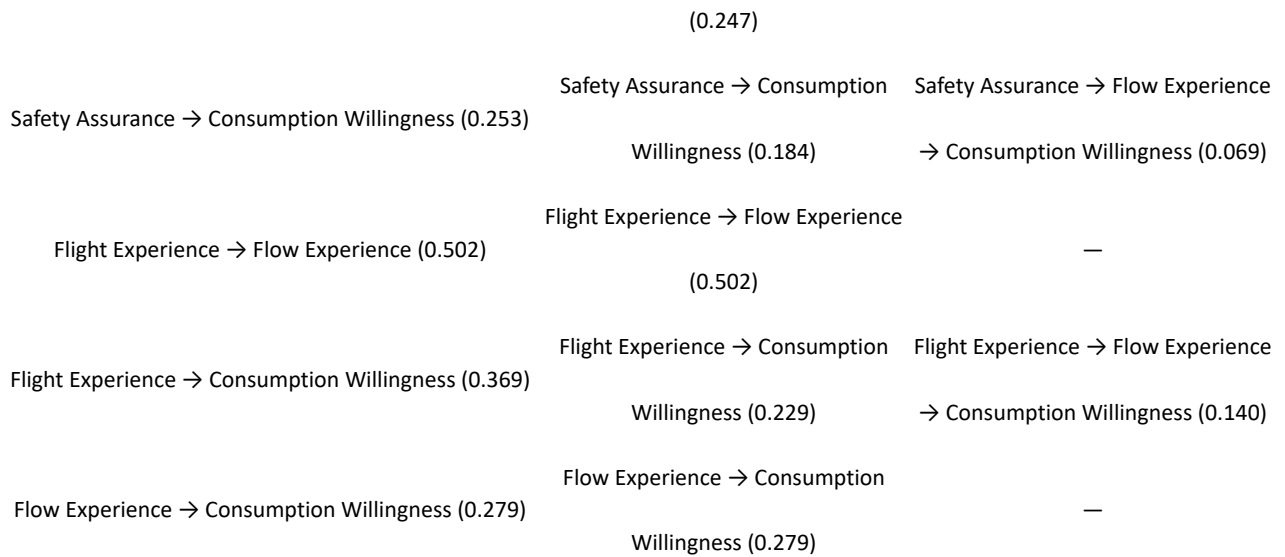


Figure 4. Structure Diagram of Latent Variable Influence Effects After Standardization

CONCLUSION AND IMPLICATIONS

Research Conclusions

This study constructed a theoretical model of factors influencing low-altitude tourism consumption willingness based on SOR theory, took existing low-altitude tourism consumers in Hangzhou as the research object, and empirically tested the relationships among price discount, safety assurance, flight experience, pre- and post-flight service chain, flow experience, and consumption willingness through structural equation modeling. The main conclusions are as follows:

First, flow experience has a significant positive impact on consumption willingness. When consumers reach a flow state during the low-altitude tourism process, their willingness to spend is greatly enhanced. Flow experience not only provides a deep sense of satisfaction but also builds a strong purchase motivation at the emotional and cognitive levels, becoming a key factor driving consumption willingness.

Second, price discount, safety assurance, flight experience, and the pre- and post-flight service chain all have significant positive impacts on consumption willingness. Price discounts attract more price-sensitive consumers by lowering the consumption threshold and improving cost-effectiveness. Safety assurance is a key factor for consumers considering low-altitude tourism; flight experience directly determines satisfaction through sensory feedback, where high-quality cabin interior fabrics and ergonomic seat textiles play an indispensable role in improving physical comfort. Only when consumers are convinced that safety is fully guaranteed during the tourism process will they feel comfortable generating willingness to spend. Flight experience, as the core product of low-altitude tourism, directly determines satisfaction and willingness to spend. The pre- and post-flight service chain covers the entire tourism process, from booking and reception to post-landing follow-up and problem handling, with each link affecting the overall experience and decision. Third, safety assurance and flight experience have significant positive impacts on flow experience. This indicates that a safe and reliable environment and high-quality flight experience are important prerequisites for entering a flow state. Safety assurance allows consumers to fully engage in the flight without worries, while the excellence and stimulation of the flight experience itself directly stimulate flow. The two complement each other, jointly creating an unforgettable tourism experience.

Finally, the study reveals the mediating role of flow experience between safety assurance, flight experience, and consumption willingness. Strong safety measures (such as professional equipment, experienced pilots,

safety training, etc.) eliminate anxiety and fear, enabling consumers to let down their guard and focus all attention on the flight activity itself. In this way, safety assurance enhances flow experience, thereby promoting willingness to spend; and the effect of flight experience on consumption willingness strongly relies on flow experience as a mediating link. High-quality, unique, immersive flight experiences (such as magnificent views and novel interactions) can directly and strongly attract full attention, causing consumers to enter a “self-forgetful” flow state. Flow experience subsequently becomes a powerful internal psychological motivation, greatly enhancing purchase motivation.

In summary, the decision-making behavior of low-altitude tourism consumers is a complex process in which external stimuli cause changes in internal psychological states, which in turn drive behavioral willingness. Among these, flight experience has the strongest driving effect on flow experience, and flow experience has the most significant impact on consumption willingness.

Strategic Suggestions

Based on the empirical conclusions regarding the mediating role of flow experience and the influence pathways of various stimulus factors on consumption willingness, this paper proposes strategic suggestions in four aspects to systematically enhance consumer experience, stimulate willingness to spend, and effectively improve market conversion rates.

Focus on Flow Stimulation to Create Immersive Core Experiences. The research confirms that flow experience is the strongest psychological driver of consumption willingness, and flight experience is its most critical trigger. Enterprises should make “creating and deepening flow experience” the core goal of product design. First, flight routes should be carefully designed to maximize the unique advantages of aerial viewing. Through professional control of flight altitude, angle, and speed by pilots, achieve layered switching and dynamic presentation of landscapes, bringing strong visual impact and novelty to tourists. Second, actively introduce intelligent technologies such as augmented reality (AR) and VR to provide interactive content during the flight, such as real-time guided tours, topographic information annotations, or historical scene reproductions, upgrading simple “viewing” to deep “participation” and “exploration.” Finally, moderately challenging activities can be designed, such as specific viewing tasks or photography challenges, so that tourists’ skills match the challenges of the flight experience, thus entering the state of full concentration and forgetting time and space more smoothly.

Build a Credible Safety System to Lay the Psychological Foundation for Immersive Experience. Safety assurance not only directly and positively affects consumption willingness but is also an important prerequisite for promoting flow experience. Enterprises must systematically build safety as the cornerstone of brand reputation. At the hardware and system level, invest continuously in advanced, professional aircraft and maintenance, strictly select and train pilots, and establish public and transparent safety management systems and emergency plans. At the communication and perception level, actively transform safety assurance measures into information consumers can perceive and trust. For example, use pre-flight safety briefings, immersive VR safety drills, promotional videos, and venue displays to intuitively demonstrate the professionalism of the aircraft, the experience and qualifications of pilots, and complete backup rescue procedures. This eliminates consumers' safety concerns and enables wholehearted engagement in flight activities.

Implement Flexible and Precise Pricing and Value Packaging Strategies. In response to the high unit price characteristics of low-altitude tourism, enterprises need flexible and diversified pricing and promotion strategies. Family packages, group discounts, and joint ticket products with popular scenic spots and high-end accommodations can be launched, spreading and diluting the single-item price of the low-altitude project by enhancing the comprehensive value perception of the overall product. Use data analysis to design differentiated promotional activities during off-peak seasons or specific holidays, such as early bird tickets, limited-time discounts, and membership point redemptions. In marketing communication, emphasize the uniqueness, scarcity, and high value of the experience, guiding consumers' attention from "price" to "value gained," thereby reducing price sensitivity.

Optimize the Full-Process Service Chain to Consolidate Long-Term Customer Relationships. The direct impact of the pre- and post-flight service chain on consumption willingness and its role in enhancing overall satisfaction cannot be ignored. Enterprises should build a seamless, emotionally interactive full-process service system. In the pre-trip stage, provide detailed and professional consultation and booking services, use social media and mini-programs to maintain interaction with potential customers, and stimulate anticipation. During the trip, ensure professionalism and efficiency in ground reception, boarding guidance, and other processes, providing sufficient emotional value. In the post-trip stage, establish systematic feedback and relationship maintenance mechanisms, such as proactively conducting satisfaction follow-ups, promptly

handling complaints and suggestions, gifting flight commemorative photos or videos, and providing exclusive discounts for repeat or referral customers. The concept of “the flight ends, but the service continues” greatly enhances satisfaction and loyalty, transforming one-time experiencers into loyal brand supporters and word-of-mouth promoters.

Research Limitations and Future Prospects

Although this study has achieved certain results in identifying the influencing factors of low-altitude tourism consumption willingness, there are some limitations. First, this study is mainly based on a specific sample group, with respondents limited to existing low-altitude tourism consumers in Hangzhou. The geographical concentration in a single city and the sample size (N = 203), which is at the lower threshold for structural equation modeling, limit the representativeness and generalizability of the findings. Future research can expand the sample scope to cover groups from different regions, age groups, and consumption capacities to improve universality. Second, this study mainly uses the structural equation modeling method, which may not deeply explore the true thoughts and complex motivations of consumers. Future research can combine qualitative methods, such as interviews and case studies, to more comprehensively understand consumer behavior and decision-making processes. Furthermore, this study mainly focuses on the influencing factors of consumption willingness. Future research can further explore how to effectively enhance willingness and actual consumption behavior through marketing strategies and product design, providing more practical guidance for the development of the low-altitude tourism industry.

Author Contributions

Lanhui Shen and Xiaonan He designed the study; all authors conducted the study; Lanhui Shen and Xiaonan He collected and analyzed the data. Lanhui Shen and Xiaonan He participated in drafting the manuscript, and all authors contributed to critical revision of the manuscript for important intellectual content. All authors gave final approval of the version to be published. All authors participated fully in the work, took public responsibility for appropriate portions of the content, and agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or completeness of any part of the work were appropriately investigated and resolved.

Conflict of Interest

The authors declare no conflict of interest.

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Ethics Approval and Consent to Participate

This survey was conducted in compliance with Ethics Committee of School of Business, Hohai University. Participants were informed of the study's purpose and data usage prior to participation, and responses were collected anonymously. No personally identifiable information was stored.

Availability of Data and Materials

The datasets used and/or analysed during the current study were available from the corresponding author on reasonable request.

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Not applicable.

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