

# Exploring university students' sports tourism behavior: Based on Structural Equation Model

Qi Yang<sup>1,2</sup>, Irina Mukambaeva<sup>2</sup>, Nurbek Mukambaev<sup>3</sup>, Shuren Yan<sup>4</sup>, Tingting Zhang<sup>5</sup>

<sup>1</sup> Department of Public P.E., Luoyang Normal University, Luoyang, China

[yangqi@lynu.edu.cn](mailto:yangqi@lynu.edu.cn)

<sup>2</sup> PhD program on Economy, Kyrgyz National University named after J. Balasagyn, Bishkek, the Kyrgyz Republic

[mukambaeva@gmail.com](mailto:mukambaeva@gmail.com)

<sup>3</sup> PhD program on Economy, Kyrgyz National University named after J. Balasagyn, Bishkek, the Kyrgyz Republic

[nurbatai@mail.ru](mailto:nurbatai@mail.ru)

<sup>4</sup> College of P.E., Luoyang Normal University, Luoyang, China

[yanshuren@126.com](mailto:yanshuren@126.com)

<sup>5</sup> Informatization Centre, Luoyang Normal University, Luoyang, China

[2045046835@qq.com](mailto:2045046835@qq.com)

**Abstract** - China can be considered one of the countries that have maintained the longest duration of epidemic prevention and control policies. The shift in epidemic prevention and control policies presents both opportunities and challenges for the development of sports tourism in China. Compared to other forms of tourism, sports tourism has a certain threshold for athletic skills and may entail certain risks. In recent years, the rapid development of webcasting on the internet has become one of the decisive factors for young people in their travel choices. To promote the healthy and sustainable development of sports tourism after the transition of epidemic prevention and control policies, this study applied the S-O-R theory and planned behavior theory and incorporated new variables such as risk perception and webcast environment to examine the participation behavior of university students in sports tourism. A questionnaire survey was conducted among university students from five universities in central China to collect data. The structural equation model and conditional process model were used to evaluate the research model. Results show that university students have a "willing but hesitant" tendency towards sports tourism, with high intention but low actual participation behavior. The influencing mechanism of university students' participation in sports tourism is complex, with subjective norms as dominant factors, perceived behavioral control as an auxiliary factor, and risk perception as an inhibiting factor. The webcast environment has a significant moderating effect on the relationship between risk perception, participation attitude, behavioral intention, and actual behavior in sports tourism, with a regulatory effect on consumer participation attitudes. Based on the above results, corresponding strategies and suggestions are put forward for the sustainable and healthy development of sports tourism in China.

**Keywords:** S-O-R theory; theory of planned behavior; sports tourism; participation behavior; risk perception; webcast environment

## 1. Introduction

In recent years, the development trend of the pandemic has become the most important variable affecting the development of sports tourism in China[1]. Industries such as sports and tourism, which are closely related to population mobility, have been directly affected. Under the national anti-epidemic efforts, China's tourism industry is gradually recovering. China can be considered one of the countries that have maintained the longest duration of pandemic prevention and control policies[2]. For a long time, China maintained a strict epidemic prevention and control policy. During this special period, the epidemic is not only testing the immune system of the sports tourism industry but also reshaping people's deep understanding of the importance of enhancing immunity through exercise in the fight against the epidemic, which is closely related to health and quality of life. Meanwhile, a policy shift towards relaxation is inevitably beneficial for the development of service industries such as sports and tourism[3]. As a special consumer group, university students are the main group of people who participate in sports tourism, and their consumption behavior represents the future consumption trend of the nation, which has great development value and market potential[4].

Compared with traditional sightseeing tourism, the tourists' level of sports skills and the risks associated with the activities directly affect the sports experience and safety in sports tourism[5]. Meanwhile, a sudden relaxation of policies may lead to a new wave of outbreaks, and concerns about health risks associated with physical activity after recovery still

burden the public psychologically. The rapid development of social media has greatly enhanced consumers' ability to obtain and disseminate product information, particularly in recent years with the popularity of webcasts from scenic areas, where potential tourists can engage in social interaction with hosts and other tourists. Social media communication is a decisive factor in the choices made by youth in the tourism sector[6]. To sum up, this article employs the S-O-R theoretical framework and integrates the theory of planned behavior with the new variables of risk perception and online live streaming environments. It constructs a model of the influence mechanism of post-pandemic college students' sports tourism behavior, clarifying the factors that affect their participation behavior. Furthermore, targeted effective recommendations are proposed, which are of significant practical and theoretical significance for promoting the healthy, stable, and sustainable development of China's sports tourism industry.

## 2. Literature Review

Sports tourism, as an emerging form of tourism, has received attention from both within and outside the industry in recent years. Sports tourism has an impact on the local economy and social effects [7], [8]. Furthermore, participating in sports tourism can not only promote physical health but also effectively increase happiness[9]. In terms of inheriting and promoting traditional culture, enhancing national cultural confidence, and strengthening national cultural soft power, sports tourism also plays an important role[10].

The Stimulus-Organism-Response theory (S-O-R theory), proposed by Mehrabian and Russell in 1974, posits that stimuli (S) are external environmental factors, organisms (O) are the psychological or cognitive states that individuals form in response to stimuli, and responses (R) represent the corresponding behavioral responses exhibited by individuals through emotional and cognitive processes[11]. According to the S-O-R theory, individuals in a given environment are influenced by both their emotional cognition and the impact of the stimulus variables in the environment, which can lead to either approach or avoidance behavior[12]. Currently, the S-O-R theory is widely applied in research related to tourist consumption behavior [13] [14]. Against the backdrop of the post-pandemic, the consumption behavior of sports tourism consumers is to some extent influenced by external environmental stimuli that affect their internal psychological or cognitive changes towards sports tourism, leading to their ultimate consumption intentions and behaviors. Therefore, the S-O-R theory framework provides a solid theoretical foundation for the study of sports tourism participation behavior.

The Theory of Planned Behavior (TPB), proposed by Icek Ajzen in 1988 and 1991, posits that people's behavioral intentions can be accurately predicted through their attitudes, subjective norms, and perceived behavioral control[15]. TPB has strong explanatory and predictive utility for different behavioral intentions and actual behaviors, and it has been widely applied in the field of tourism by many scholars both domestically and internationally[16] [17] [18] [19]. Currently, both domestic and foreign scholars are expanding the classic TPB model with new explanatory variables or combining it with other relevant theories to construct more practical research models that improve their explanatory power and adaptability to various fields. The risk perception in this study includes perceptions of both athletic risk and health risk. Risk perception has a very strong negative impact on attitude[20]. For sports tourism participants, their level of risk perception will affect their attitudes and behaviors towards sports tourism[21] [22]. Meanwhile, given the high level of participation in sports tourism, the webcast environment of sports tourism destinations can allow tourists to fully understand project features, the obtain useful information and knowledge for themselves. Several studies found that webcast has a significant effect on tourist behavior[23] [24].

To sum up, this study proposes the following hypotheses:

Hypothesis 1a(H1a): The perceived behavioral control has a positive impact on participation attitudes.

Hypothesis 1b(H1b): The perceived behavioral control has a positive impact on behavioral intentions.

Hypothesis 1c(H1c): The perceived behavioral control has a positive impact on actual participation.

Hypothesis 2a(H2a): The subjective norm has a positive impact on participation attitude.

Hypothesis 2b(H2b): The subjective norm has a positive impact on behavioral intention.

Hypothesis 2c(H2c): The subjective norm has a positive impact on actual behavior.

Hypothesis 3a(H3a): The risk perception has a negative impact on participation attitudes.

Hypothesis 3b(H3b): The risk perception has a negative impact on behavioral intentions.  
Hypothesis 3c(H3c): The risk perception has a negative impact on actual participation.  
Hypothesis 4a(H4a): The webcast environment has a positive impact on participation attitudes.  
Hypothesis 4b(H4b): The webcast environment has a positive impact on behavioral intention.  
Hypothesis 4c(H4c): The webcast environment has a positive impact on actual behavior.  
Hypothesis 5(H5): The positive attitude has a positive impact on behavioral intention.  
Hypothesis 6(H6): The behavioral intention has a positive impact on actual participation.

### **3. Materials and Methods**

#### **3.1. Measurement**

This study employed a quantitative research method to empirically test the proposed model. The questionnaire survey method was used to select measurement variables of sports tourism participation behavior and its influencing factors, and the questionnaire design was based on existing research findings both domestically and internationally. The first section of the questionnaire in this study consists of the research introduction and basic information of the respondents, including gender, age, personal disposable income, and preferred sports tourism activities. The second section is used primarily to measure the variables of perceived behavioral control(PBC), subjective norm(SN), risk perception(RP), webcast environment(WE), participation attitude(PA), behavioral intention(BI), and actual behavior(AB). The questions are valued on a Likert five-point scale, with 1-5 indicating strongly disagree, disagree, neutral, agree, and strongly agree, respectively.

The study utilized scales developed by Zeng[25], Li[19], and Ajzen & Driver[26] to measure the variables of perceived behavioral control and subjective norm. Perceived behavioral control included 5 items such as "I think I have enough time to experience sports tourism". Subjective norm included 6 items such as "People around me (family, friends, etc.) have experience in sports tourism". The scale developed by Tan et al.[27] and Liu et al.[21] was used to measure risk perception, including 4 items such as "I think there may be health risks (such as COVID-19 infection) in sports tourism at present". The scale developed by Liu[28] and Xue et al.[29] was used to measure the webcast environment, including 3 items such as "I often see live broadcasts and promotions about sports tourism on various platforms such as Douyin". The scale developed by Li[19] was used to measure participation attitudes, including 5 items such as "I think sports tourism can promote health and fitness". The scale developed by Liu et al.[21] and Jarvenpaa et al.[30] was used to measure behavioral intention, including 3 items such as "I am willing to participate in sports tourism and related activities". Finally, the actual behavior was measured using the scale developed by Dai et al.[31] to assess the respondents' actual participation in sports tourism activities.

All questions in the questionnaire were in Chinese, and experts in the field of sports tourism were invited to evaluate the questionnaire. Through a pilot survey, the scales were revised and improved, and the final version of the questionnaire was confirmed.

#### **3.2. Data Collection**

The survey was conducted through the website Wenjuanxing (<https://www.wjx.cn/>) in December 2022 using a cluster sampling method among five ordinary universities in central China. A total of 550 questionnaires were distributed, and after eliminating invalid questionnaires with abnormal response times or excessive repetition, 504 valid samples were obtained, yielding an effective rate of 91.64%. The survey respondents comprised 220 male students (43.65%) and 284 female students (56.35%) between the ages of 18 and 25 years (20.43±1.45). The majority of respondents (91.27%) had a monthly disposable income of less than 2000 yuan. The sports tourism activities they enjoyed included rafting, skiing, marathon running, mountaineering.

#### **3.3. Data Analysis**

This study primarily employed SPSS 24.0, PROCESS v3.3 plugin, and AMOS 24.0 software to analyze the data. Firstly, the reliability and validity of latent variables were examined through Cronbach's  $\alpha$  coefficient method, exploratory factor analysis, confirmatory factor analysis, convergent validity, and discriminant validity. Subsequently, structural equation model and moderated mediation effects were employed to test the relationships among the latent variables.

## 4. Results

### 4.1. Reliability and validity analysis

The Cronbach's  $\alpha$  coefficients of each variable range from 0.842 to 0.947, and the composite reliability (CR) ranges from 0.847 to 0.946, all exceeding the standard of 0.7, indicating good internal consistency among the variables in this study. To test the construct validity of the scale, an exploratory factor analysis was conducted on the five dimensions of perceived behavioral control, subjective norm, risk perception, online environment, and participation attitude. The principal axis factoring method was used with varimax rotation to orthogonalize the data, and items SN6 and NE3 with factor loadings less than 0.5 were removed. The results showed that five common factors were extracted with a cumulative variance of 65.396%, which met the standard.

To further validate the construct validity of the variables, this study conducted a confirmatory factor analysis on the independent variable section of the questionnaire using Amos 24.0. After modification, the results showed that CMIN/DF=2.654, GFI=0.899, NFI=0.931, IFI=0.956, TLI=0.948, CFI=0.956, RMR=0.049, and RMSEA=0.057, indicating a good fit and suggesting good structural validity.

The factor loadings of each latent variable were all greater than 0.5, indicating high representativeness. The average variance extracted (AVE) of each latent variable ranged from 0.542 to 0.852, and the composite reliability (CR) values were all above 0.7, indicating satisfactory convergent validity. Discriminant validity between latent variables was mainly assessed by comparing the absolute values of the correlation coefficients between each latent variable and other latent variables with the square root of its AVE. The results showed that the absolute values of the correlation coefficients between each latent variable and other latent variables were smaller than the square root of its AVE, indicating good discriminant validity between the latent variables in this study.

### 4.2. Structural Equation Model

A structural equation model was used to test the relationships between latent variables in the study, based on the hypothesized model of university students' participation in sports tourism. After modification indices were taken into account, the fit indices improved significantly: CMIN/DF=2.446, GFI=0.912, NFI=0.939, IFI=0.963, TLI=0.955, CFI=0.963, RMR=0.044, RMSEA=0.054. The path relationships between the latent variables are shown in Fig 2.

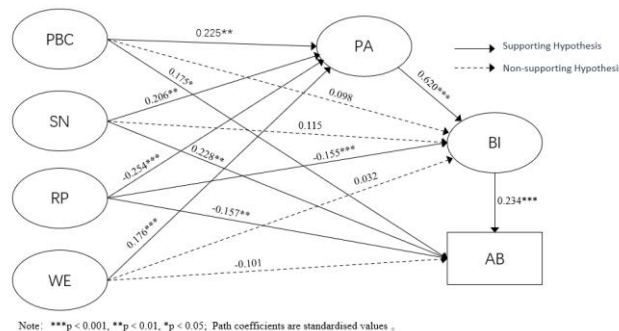


Fig 2. Structural model path diagram.

Table 1. Structural Model Assessment.

Hypotheses		$\beta$	S.E.	z-Value	p	Result
H1a	PBC→PA	0.225	0.07	3.097	0.002**	Support
H1b	PBC→BI	0.098	0.053	1.656	0.098	Not support
H1c	PBC→AB	0.175	0.115	2.366	0.018*	Support
H2a	SN→PA	0.206	0.069	2.653	0.008**	Support
H2b	SN→BI	0.115	0.052	1.817	0.069	Not support
H2c	SN→AB	0.228	0.115	2.855	0.004**	Support

H3a	RP→PA	-0.254	0.043	-6.006	***	Support
H3b	RP→BI	-0.155	0.034	-4.288	***	Support
H3c	RP→AB	-0.157	0.078	-3.277	0.001**	Support
H4a	WE→PA	0.176	0.038	3.352	***	Support
H4b	WE→BI	0.032	0.029	0.744	0.457	Not support
H4c	WE→AB	-0.101	0.063	-1.893	0.058	Not support
H5	PA→BI	0.62	0.044	12.981	***	Support
H6	BI→AB	0.234	0.103	3.944	***	Support
Note: *** $p < 0.001$ , ** $p < 0.01$ , * $p < 0.05$						

From Table 1, it can be observed that in terms of sports tourism stimulation factors, perceived behavioral control has a significant influence on participation attitude ( $\beta=0.225$ ,  $p < 0.01$ ) and actual behavior ( $\beta=0.175$ ,  $p < 0.05$ ), supporting hypotheses H1a and H1c, while its influence on behavioral intention ( $\beta=0.098$ ,  $p > 0.05$ ) is not significant, rejecting hypothesis H1b. Subjective norm has a significant influence on participation attitude ( $\beta=0.206$ ,  $p < 0.01$ ) and actual behavior ( $\beta=0.228$ ,  $p < 0.01$ ), supporting hypotheses H2a and H2c, while its influence on behavioral intention ( $\beta=0.115$ ,  $p > 0.05$ ) is not significant, rejecting hypothesis H2b. Risk perception has a significant influence on participation attitude ( $\beta=-0.254$ ,  $p < 0.001$ ), behavioral intention ( $\beta=-0.155$ ,  $p < 0.001$ ), and actual behavior ( $\beta=-0.157$ ,  $p < 0.01$ ), supporting hypotheses H3a, H3b, and H3c. Webcast environment has a significant influence on participation attitude ( $\beta=0.176$ ,  $p < 0.001$ ), supporting hypothesis H4a, while its influence on behavioral intention ( $\beta=0.032$ ,  $p > 0.05$ ) and actual behavior ( $\beta=-0.101$ ,  $p > 0.05$ ) is not significant, rejecting hypotheses H4b and H4c. In terms of sports tourism organism factors, participation attitude has a significant influence on behavioral intention ( $\beta=0.620$ ,  $p < 0.001$ ), supporting hypothesis H5. Finally, in terms of sports tourism response factors, behavioral intention has a significant influence on actual behavior ( $\beta=0.234$ ,  $p < 0.001$ ), supporting hypothesis H6.

#### 4.3. Conditional process analysis model

A moderated mediation model was examined using Model 83 in the SPSS plugin PROCESS developed by Hayes (2012) (Fig 3)[32]. Results indicated that after including the webcast environment in the model, the interaction term between risk perception and the webcast environment significantly predicted participation attitude ( $\beta=0.1098$ ,  $t=3.7277$ ,  $p < 0.001$ ), suggesting that the webcast environment could negatively moderate the relationship between risk perception and participation attitude (Table 2). To reveal the specific moderating effect of the webcast environment, a further simple slope analysis was conducted (Fig 4). Results showed that for participants with lower levels of the webcast environment (M-1SD), risk perception significantly negatively predicted participation attitude (simple slope=-0.4208,  $t=-7.8336$ ,  $p < 0.001$ ). For participants with higher levels of the webcast environment (M+1SD), risk perception also significantly negatively predicted participation attitude, but the effect size was smaller (simple slope=-0.1758,  $t=-3.7152$ ,  $p < 0.001$ ), indicating that as the webcast environment improves, the predictive effect of risk perception on participation attitude gradually decreases.

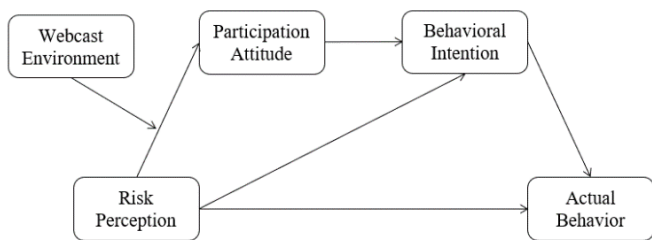


Fig 3. Conditional process analysis model.

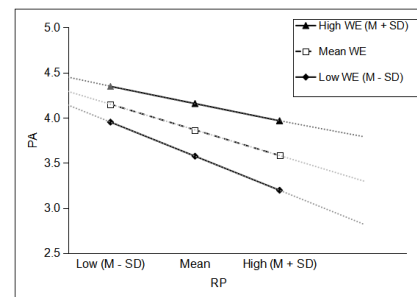


Fig 4. The moderating effect of webcast environment between risk perception and participation attitude

Table 2. Mediation effect test with regulation

Variable	PA			BI			AB		
	$\beta$	S.E.	t	$\beta$	S.E.	t	$\beta$	S.E.	t
constant	3.9654	0.03	132.3972***	1.0463	0.1264	8.2806***	0.5431	0.2889	1.8801
RP	0.2983	0.0385	-7.7451***	0.1373	0.0313	4.3793***	0.208	0.0685	-3.0375***
PA				0.7144	0.0314	22.7252***	0.0503	0.0961	-0.5237
BI							0.7089	0.0958	7.4009***
WE	0.2771	0.027	10.2751***						
RP x WE	0.1098	0.0295	3.7277***						
R	0.5309			0.759			0.4844		
R2	0.2819			0.576			0.2346		
F	65.4254			340.3515			51.0871		

Note: \*\*\* $p < 0.001$

## 5. Discussion

Based on the S-O-R theoretical framework and the analysis of the theory of planned behavior, this study incorporated two new variables, namely risk perception and the webcast environment, to examine the influencing factors and mechanisms of sports tourism participation intention during the special period of pandemic prevention and control policy adjustments.

During the pandemic, university students showed a "willing but hesitant" tendency in participating in sports tourism. Despite the high intention to participate in sports tourism with a mean value of 3.791, the actual participation behavior had a mean value of only 3.087. The cautious tourism behavior adopted by university students is consistent with the research conclusion of Zheng et al.[21], [22].

The process of external stimuli transforming into internal psychological factors between the environment and behavior can effectively explain university students' behavioral intentions toward sports tourism. In terms of stimulus factors, subjective norms, perceived behavioral control, and webcast environment all have significant positive effects on participation attitudes, while risk perception has a significant negative effect on participation attitudes. This is consistent with previous research findings[18], [19]. However, only participation attitudes have a significant positive effect on behavioral intentions, and risk perception has a significant negative effect on behavioral intentions. This contradicts previous research findings[16], [17].

The webcast environment can have a significant moderating effect on the relationship between risk perception, participation attitude, behavioral intention, and actual behavior in the context of sports tourism. It is worth noting that the online live broadcast environment may not directly influence consumer participation behavior, but it has a regulatory effect on consumer attitudes toward sports tourism participation. In the conditional process analysis model, compared to individuals with a high webcast environment, risk perception is more likely to have a detrimental effect on the participation attitude of those with a low webcast environment.

## 6. Conclusion

Developing rational policies and measures to intervene and guide the factors influencing university students' participation in sports tourism can stimulate their demand for sports tourism, promote sports tourism consumption, and drive the development of the sports tourism market.

After the adjustment of epidemic prevention and control policies, there will inevitably be a wave of sports tourism peaks. The government and businesses should make reasonable use of this "revenge" consumption, leverage the social attributes of sports, improve market marketing strategies, enhance sports tourism service quality, and increase the visibility and influence of scenic spots. On the other hand, the university student group has sufficient time, energy, and a strong herd mentality, but faces economic pressure. By distributing consumer vouchers, offering group-buying tickets

and discounted tickets, and other methods to reduce the cost of sports tourism, the participation rate of university students in sports tourism can be increased, transforming them from potential consumers into sports tourism enthusiasts.

The professionalism, riskiness, and uncontrollability of sports tourism, as well as the pandemic, are the main reasons for sports tourism consumers' risk perception. A sound protection system can not only enhance the enterprise's ability to resist risks but also effectively protect the personal rights and interests of tourists. On the other hand, in the era of rapid development of short video social media, sports tourism companies can use webcasts on the internet to provide detailed knowledge and features of sports tourism projects, allowing potential consumers to have a better understanding of sports tourism in advance, improving university students' attitudes and interests in sports tourism, alleviating risk perception, and increasing sports tourism participation behaviors.

University students are a special group who are the main participants in sports tourism. They have both adventurous spirit and sufficient time and energy to study various sports tourism projects. Developing diversified services targeting university students can continuously improve their sports skills and effectively cultivate their lifelong sports tourism habits, making them loyal fans of sports tourism. This can not only improve their physical fitness but also stimulate market demand for sports tourism.

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