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A STUDY ON SPORTS ORGANIZATIONS AND CONSUMER BEHAVIOR

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Abstract

This study utilizes multilevel structural equation modeling to investigate the satisfaction and loyalty of participants in the Shu Kang Leisure Sports Association's Rice Heaven Tianzhong Marathon in Taiwan, and their intention to revisit the marathon event as sports tourism. The study aims to understand the preferences of marathon teams (groups) and individuals regarding the facilities and functions provided to marathon participants. The sample data of this study included 56 groups and 1,358 individuals. The empirical results revealed that the main influencing factors of participant satisfaction and loyalty differ between the overall level and the individual level. This indicates that there are differences in sports preferences between marathon teams and individuals, which indirectly affects their willingness to revisit the event.

Key words: Taiwan's Rice Heaven Tianzhong Marathon, satisfaction , loyalty, revisit intention

Introduction

Running has brought people freedom and independence and is often seen as a symbol of human progress and development. Through running, people can break free from walking limitations and gain diverse leisure experiences. Sports tourism has long been one of Taiwan's essential industries. With global awareness of health and the increasing number of sports competitions, it has become a

popular trend for people to take advantage of leisure and outdoor travel opportunities to engage in sports competitions, and sports have become one of the main purposes of sightseeing. Currently, however, due to the lack of uniqueness and high repetition, some of Taiwan's tourist attractions and facilities have become a one-time attraction, lacking public attraction to revisit. Therefore, to further understand the evaluations affecting consumer psychology, exploring revisit and repurchase intentions should be further explored. Several factors influence tourist revisit intentions, among which satisfaction and loyalty are variables addressed in several studies (Kim & Park, 2017; Liu & Chu, 2020; Wang, Chen, & Lee 2021). Moreover, researchers generally use linear structural models while testing measurement models and analyzing structural models, with less emphasis on applying analysis to market segmentation (Wang & Wu, 2022). However, enterprises and organizations can analyze customer segmentation to lay a foundation for focus marketing. Focus marketing extends market segmentation to include differences in lifestyle and behavioral characteristics. When a customer becomes a focus market, personalized marketing can emerge to cultivate satisfaction and loyalty. Therefore, in contrast to previous research and based on the results of factor analysis, the present study categorizes tourists (market segmentation) into K-means clustering. Through MSEM, we can accurately grasp tourists' behaviors while further generating customized marketing strategies and optimizing sports facilities.

Kim, Park, and Jeong (2004) suggest that satisfaction is consumers' perceived satisfaction with a product or service, which can be used to determine whether the hierarchy of consumer needs is met. Early research indicates satisfaction was a holistic evaluation. In subsequent years, satisfaction was gradually subdivided into the satisfaction of each attribute of a product or service and evaluated based on the satisfaction of each attribute.

Tourism loyalty often generates emotions toward a specific tourist destination or product through the experience of activities and services. Gronholdt, Martensen, and Kristensen (2000) indicated that customer loyalty comprises four indicators: (1) repurchase intention, (2) price tolerance, (3) willingness to recommend a brand or company, and (4) willingness to cross-buy. In other words, it represents the impact of the service process and experiential value provided by tourist products or destinations on tourists revisiting or selecting the product.

Revisit intention is an essential indicator for measuring tourist satisfaction based on the image of tourist destinations and customers (Bigné, Sánchez & Sánchez, 2001). A satisfactory sightseeing experience can elicit inner feelings of tourists toward a tourist destination as an effective predictor of revisit intention. Chen and Huang (2010) examined different motivational factors. They divided revisiting into four types: (1) nostalgia, (2) external drive, (3) curiosity and supplementation, and (4) sharing.

Methods

Research Subjects

This study conducted a questionnaire sampling survey on the leisure motivations of the participants of the Taiwan's Rice Heaven Tianzhong Marathon. We used factor analysis to identify key latent variables of recreation. Multilevel structural equation modeling (MSEM) was used to determine the best model combination and path relationships between road runners' motivation and latent variables. The goal is to study the needs and motivations of tourists and to develop the best leisure marketing strategies and the most effective local leisure development. To enhance the entertainment and health purposes of tourists while increasing the value of local tourism.

Research Tools and Settings

This study used factor analysis to explore the motivational behavior of Taiwan's Rice Heaven Tianzhong Marathon participants. We established three latent variables: tourist satisfaction, tourist loyalty, and revisit intention to understand road runners' leisure motivations and preferences. We then used multilevel structural equation modeling (MSEM) to establish the optimal path relationships of the latent variables. We analyzed the sports and leisure preferences and motivational behaviors of tourists at different levels.

The basic assumptions of the multilevel structural equation model (MSEM) in this study are as follows:

H1: For road running routes, participants' satisfaction has a positive impact on loyalty.

H2: Participants' satisfaction with road running has a positive impact on their intention to revisit.

H3: In terms of road running, participants' loyalty has a positive impact on revisit intention.

Generally speaking, multi-level data will be clustered, causing the measured sample data to exhibit special dependencies. This results in a violation of the assumption of sample independence, rendering the statistical test invalid. When the sample data has multi-level characteristics, there are complex control and regulation relationships between variables at different levels of the dependent variable. General regression analysis and variance analysis cannot handle such problems, and multi-level analysis should be used. Otherwise, the analysis data will be confused due to hierarchical relationships, resulting in incorrect statistical conclusions.

In recent years, scholars have used the SEM framework to process multilevel data and conduct multi-level structural equation modeling (MSEM), such as, Goldstein (2003), Goldstein and Browne (2001) and Hoxi (2007). Traditional MLM analysis and SEM are two independent and unrelated statistical techniques, each with its own advantages. If a database has a multi-level structure and requires the estimation of latent variables, these two analytical methods must be combined. Therefore, MSEM was developed to simultaneously address the multi-level data structure and latent

variable estimation problems (Bentler & Liang, 2003; Heck & Thomas, 2000).

Road running enthusiasts and tourists from all over Taiwan have different leisure motivations and purposes. Moreover, each road running team and tour group also has different characteristics. Therefore, traditional SEM analysis cannot grasp tourists' multi-level leisure motivations and purposes. Therefore, this study uses MSEM to explore the leisure motivations and loyalty of road running among tourists from different groups. We use this to estimate and analyze latent variables, understand the needs of various types of riders, and improve the quality of riding services. Provide precise and customized leisure marketing strategies to achieve mutual benefit and win-win results between Taiwan's Rice Heaven Tianzhong Marathon and tourists.

Based on the unbiased statistics ρ_b^2, the overall variance within the group, and ρ_b^2, the between-group variance of each variable vector was obtained from the sample observation data of riding tourists. It is used to measure the ratio of the between-group variation to the total variation of each variable, namely ICC (intragroup coefficient). The following formula is used to analyze the heterogeneity between groups or homogeneity within groups of observable variables:

$$ICC_M = \rho_M = \frac{\rho_b^2}{\rho_b^2 + \rho_w^2}$$

ICC_M is the proportion of intergroup differences in the variability of sample observations. If the measured value of ICC_M is less than 0.3, the intergroup variation is not significant, and traditional methods can be used. Conversely, if the measured value of ICC_M is large, it indicates significant intergroup variation and must be processed using multilevel analysis (Roberts, 2002); otherwise, significant statistical estimation errors will occur. Based on this study's observed values of the sample of cyclists from the road running participant, the ICC_M is 0.72. Therefore, MSEM was used for empirical analysis.

According to Hox and Maas (2001), the estimation statistics of intergroup matrices are influenced by sample characteristics. When the ICC between groups is low, errors in estimating factor loadings can occur. This can lead to the underestimation of error variance and standard deviation, making it easy to reject the null hypothesis or make a statistical type I error. Therefore, Hox and Maas (2001) suggested that the intraclass sample characteristics should be homogeneous and the differences between groups should be significant. At the same time, when the number of subjects in each group is not equal, parameter testing should be performed with a more stringent type I error rate (e.g., α=0.01). The more samples and groups there are, the more complex the statistical estimation model becomes. Therefore, the multilevel structural equation modeling analysis must be based on a stable measurement model so that the measured parameters can have appropriate estimation solutions. Thus, this study used the two-stage MSEM analysis proposed by Anderson and Gerbing (1988) to identify the most appropriate measurement model before proceeding with

structural modeling analysis. This allowed us to explore the path relationship between individuals and groups in their satisfaction, loyalty, and revisit intention among cycling tourists at the road running participant.

Results

The sample data for this study were collected and organized based on a digital questionnaire survey conducted from October 2023 to 2024 on the travel motivation and behavior of Tanaka Road Run tourists. The purpose of this study is to analyze the satisfaction and loyalty of road running participants and their intention to revisit the road running event. Understand the preferences of road running teams (groups) and individuals regarding the facilities and functions provided by road running. To this end, we propose customized marketing services to increase tourists' willingness to revisit road running and sightseeing, thereby promoting the development of local tourism and public health.

The sample data of this study included 56 groups and 1,358 tourists. Among the 56 participating teams, there are 12 women's teams, 20 men's teams and 24 mixed teams. Most teams were experienced road runners, with 25 teams having more than 20 years of experience (44.6%), 18 teams having more than 10 years of experience (32.1%), and the remaining teams having less than 10 years of experience. A total of 1,560 individual tourist rating scales were collected, of which 1,358 were valid. Among them, there were 586 female respondents (43.2%) and 772 male respondents (56.8%), mainly under 30 years old (76.5%). A road running team has a minimum of 6 people and a maximum of 35 people, with an average of 24.3 people per team.

This study used factor analysis to extract two potential independent variables from the sample data, namely "road running tourists' satisfaction" (four items, Cronbach's α=.90), "road running tourists' loyalty" (two items, Cronbach's α=.93) and the potential dependent variable "revisit intention" (Cronbach's α=.96). The reliability of these three latent variables is relatively high, indicating that the data are more consistent.

This study uses Mplus 8 for MSEM empirical analysis. Its advantage is that it can directly calculate the sample covariation matrix without measuring the relationship between the inter-class and intra-class variation matrices separately.

Table 1 shows the statistics and correlation coefficients of 56 road running teams and 1,358 individual tourists. Overall, the average scores of tourist satisfaction and loyalty items ranged from 3.36 to 3.78 (out of 5 points). The scores of various tourism motivation behaviors varied consistently, with a standard deviation of 0.52–0.82. The correlations between the items reached a significant level of 0.01, with coefficients ranging from 0.49 to 0.87. The correlation coefficients (R1 and R2) between the two revisit intentions were both higher than

Table 1: Motivational behavior table of road running tourists, narrative statistics and

correlation matrix

tourist motivation behavior	Descriptive Statistics			SA: Tourist satisfaction				LO: Tourist loyalty		RE: Revisit intention	
	M	SD1	SD2	S1	S2	S3	S4	L1	L2	R1	R2
S1: Security facility services	3.58	0.52	0.48	1.00	0.82	0.65	0.61	0.63	0.72	0.82	0.87
S2: Health and fitness functions	3.46	0.61	0.42	0.56	1.00	0.72	0.58	0.57	0.70	0.85	0.82
S3: Entertainment landscape function	3.28	0.82	0.36	0.62	0.68	1.00	0.68	0.72	0.68	0.88	0.76
S4: Convenience of the route	3.78	0.56	0.41	0.72	0.73	0.60	1.00	0.69	0.61	0.81	0.85
L1: Recommend road running	3.62	0.48	0.38	0.68	0.67	0.63	0.68	1.00	0.66	0.83	0.84
L2: perfect road running	3.36	0.72	0.52	0.57	0.61	0.58	0.63	0.75	1.00	0.85	0.86
R1: Will visit again	3.28	0.51	0.38	0.82	0.72	0.75	0.59	0.66	0.68	1.00	0.88
R2: Will bring friends	3.19	0.61	0.49	0.72	0.68	0.66	0.61	0.58	0.72	0.63	1.00

Note: The lower triangle is the correlation coefficient at the individual level (individual tourists), and the upper triangle is the weighted correlation coefficient at the overall level (road running team). SD1 is the standard deviation at the individual level of 1,358 tourists; SD2 is the weighted standard deviation of the 56 groups at the overall level.

0.80, indicating a high degree of consistency between the two questionnaire questions. In order to verify the validity of the three latent variables of "tourist satisfaction", "tourist loyalty" and "revisit intention", this study conducted a CFA analysis on the eight observed variables. Due to the multi-level structure of the data in this study, we first conducted a single-level CFA on the individual-level data of the motivational behaviors of 1,358 tourists. This confirmed the factor structure at the individual level. We then used a multilevel confirmatory finance factor (CFA) to test the factorial validity of the three latent variables at the aggregate level. Single-level CFA model

validation involved eight observed variables. The independent model (SEM1) showed that there were no factor restrictions or correlations between the observed variables. The remaining single-level CFA models are divided into three types of models according to whether there is a correlation between the latent variables: (1) uncorrelated three-factor model (SEM2), assuming that the correlation between the three latent variables is 0; (2) correlated three-factor model (SEM3), which means that there is a correlation between the three latent variables, and a correlation analysis is performed; (3) independent variable single factor model (SEM4), "there is a correlation between the latent variables, and a correlation analysis is performed; the results of the fitness verification indicators of each model are shown in Table 2.

Table 2 shows that among the three hypothetical models, the correlated three-factor model (SEM3) had the best data fitness, with $\chi2(31)=435.26$, $p<.001$, $\chi2/df=14.03$, RMSEA=0.068, CFI= 0.968, TLI=.0.946, SRMR=0.052. In contrast, the uncorrelated three-factor model SEM2 did not fit well with the independent one-factor model (SEM4). This indicates that the three latent variables were not independent or uncorrelated, nor were they a combined latent variable. Therefore, in this study, the correlated three-factor model was the best among the factor structure paths at the individual level, and this model was used as the basis for the multilevel CFA analysis.

Figure 1 shows that the factor loadings of the measured variables of the latent variables were all greater than 0.80. This indicates high explanatory power and consistency within the latent variables. The correlation between the two latent variables was 0.85 ($p<.001$), indicating high satisfaction among cyclists and loyalty to the Sun Moon Lake cycling trail. The correlation between the independent and dependent variables was also high. The correlation between “tourist satisfaction” and “revisit intention” and the correlation between “tourist loyalty” and “revisit intention” were both 0.82 ($p<.001$).

This study analyzed the latent variable structures at the individual level (intraclass) and the overall level (between groups). This was retained as the best individual level model (the uncorrelated model of three latent variables), as mentioned above. The latent variables at the overall level were divided into four different structural models. The first multilevel model (MSM1) was an entirely independent model, with eight latent variables set as uncorrelated and mutually independent. This model made no assumptions or limitations on the latent variables and served as the baseline model for the overall-level path. The latent variable structure at the overall level was set according to the individual-level model in the following order: the three-factor uncorrelated model (MSM2), the three-factor correlated model (MSM3), and the independent variable one-factor model (MSM4). The fitness test results of these four overall multilevel CFA models are presented in Table 2.

Table 2 shows that MSM1 had no latent variable structural limitations or settings. The fitness results of this model test

were the least ideal, with $\chi 2(57)=623.78$, $p <.001$. The intergroup SRMRB indicator (0.802) at the overall level shows that the standard deviation between groups was significant; the residual at the individual level was relatively small (SRMRW=.0.072), indicating that the fitness results of the MSM1 model were not ideal. If the three latent variables are assumed to be in the uncorrelated three-factor model (MSM2) at the overall level, their fitness test results were even less ideal, with $\chi 2(52)=587.62$, $p <.001$, RMSEA=.0.086. The three latent variables were partially correlated at the overall level, and since SRMRB= 0.657, the model setting at the overall level was poor. The model fitness test results for the MSM3 and MSM4 models were similar. However, various testing indicators indicate that the correlated three-factor model (MSM3) was better, with $\chi 2(48)=206.85$, $p <.001$, RMSEA= 0.032, SRMRB=0.102, SRMRW=0.038.

Conclusion

Discussion

Based on the CFA validation results of this study, we determined that the relevant three-factor model is most suitable for Taiwan's Rice Heaven Tianzhong Marathon tourists at the individual level. The potential independent variables were bifactorially correlated at the aggregate level. Therefore, this study uses the MSM3 structural model to analyze the travel motivation and satisfaction of Taiwan's Rice Heaven Tianzhong Marathon tourists and the impact of tourist loyalty on revisit intention.

The empirical results of this study are based on multilevel structural equation modeling. Figure 1 shows that the R^2 at the overall and individual levels are 0.88 and 0.81, respectively. This suggests that the two potential independent variables in the model can effectively explain the potential dependent variables.

The overall level of the structural equation model is consistent with the basic hypothesis of this study, that is, customer satisfaction has a positive impact on customer loyalty, with an impact coefficient of 0.11 and a significant t value. This shows that the relationship between the two potential independent variables is not significant and does not lead to the problem of collinearity statistical fallacy between the potential independent variables. As for potential independent variables, among the main factors of cycling team satisfaction (SA), the most influential one is the landscape entertainment function of Tanaka Road Run (S3), with an influence coefficient of 0.36 and a significant t value. It can be seen that road running teams attach the most importance to the scenery and entertainment of road running, which indirectly affects the team's willingness to revisit. Second, Taiwan's Rice Heaven Tianzhong Marathon has a healthy and strong fitness function, with an influence coefficient of 0.32 and a significant t value. This suggests that the road

Table 2: Analysis of appropriateness standard indicators for single-level and multi-level CFA models

Within group	Between groups	X^{2*}	df	X^2/df	RMSEA	CFI	TLI	SRMR	
								Within group	Between groups
Single level CFA									
SEM1 Standalone model		4368.52	42	104.11	0.356	0.000	0.000	0.517	
SEM2 Three-variable orthogonal		1020.21	33	30.91	0.282	0.702	0.628	0.486	
SEM3 three-variable oblique intersection		435.26	31	14.03	0.068	0.968	0.946	0.052	
SEM4 independent variable single factor		798.62	32	24.94	0.105	0.876	0.912	0.162	
Multi-level CFA									
MSM1 three-variable oblique intersection	independent model	623.78	57	10.94	0.062	0.921	0.945	0.072	0.802
MSM2 three-variable oblique intersection	Orthogonal three variables	587.62	52	11.29	0.086	0.918	0.958	0.061	0.657
MSM3 three-variable oblique intersection	Three-variable oblique intersection	206.85	48	4.29	0.032	0.962	0.968	0.038	0.102
MSM4 three-variable oblique intersection	Independent variable single factor	305.60	50	6.10	0.051	0.927	0.935	0.042	0.281

* The χ2 values of all single-level and multi-level models reach the 0.001 significance level.

running group has a significant impact on their satisfaction with the sports function. As for potential independent variables, the key factor (LO) affecting road running loyalty is the advice of road running (L1), with an influence coefficient of 0.46 and a significant t value. This indicates that the group that is believed to recommend teammates and friends to Taiwan's Rice Heaven Tianzhong Marathon ~~and Leisure~~ shows considerable loyalty, which indirectly affects their willingness to revisit. Among the two potential independent variables, the influence of road running team loyalty on the potential dependent variable (intention to revisit) is more significant, with an influence coefficient of 0.31 and a significant t value. This shows that the revisit intention of road running groups is significantly affected by loyalty.

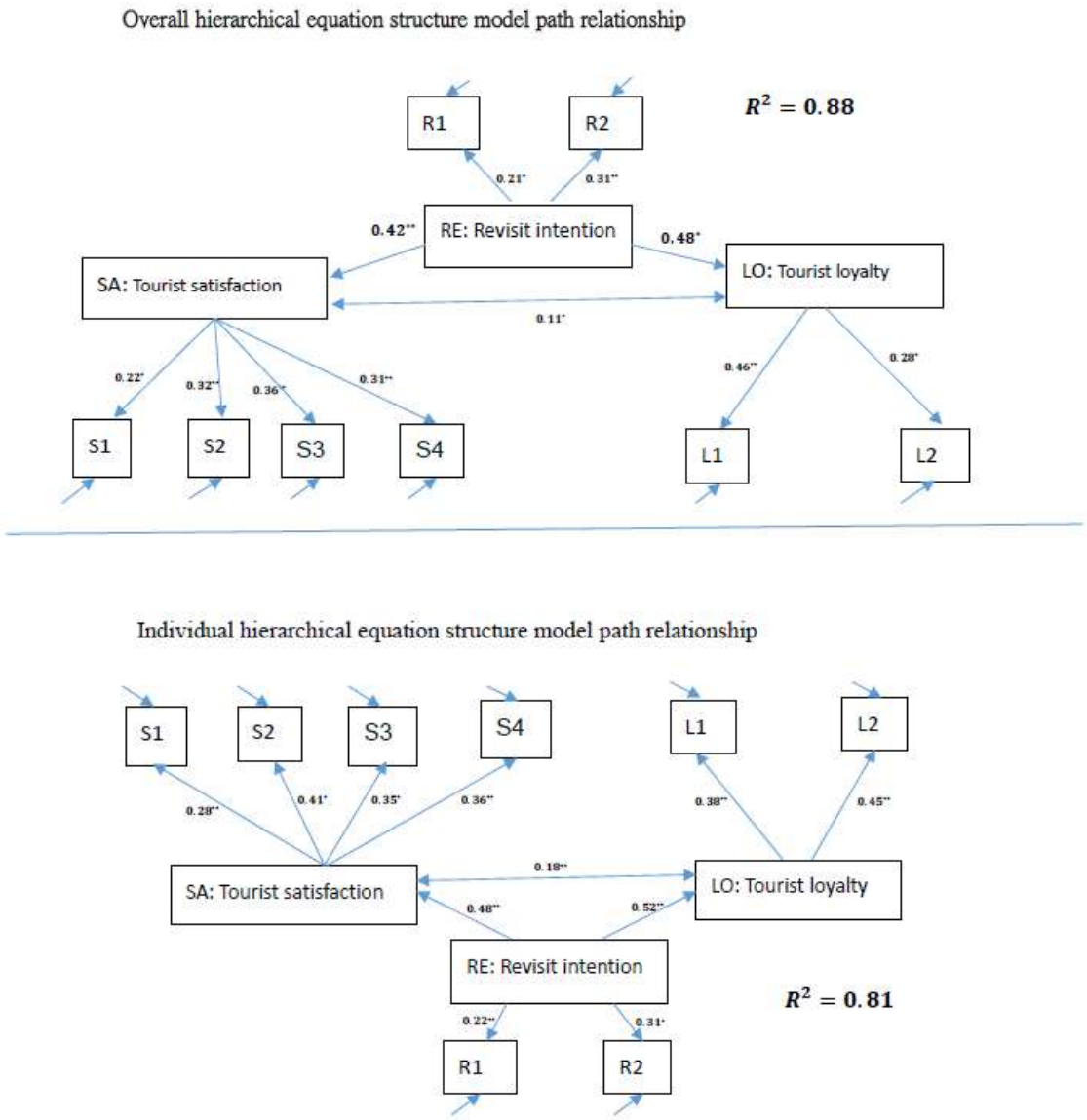
Figure 1 shows that the structural equation model at the individual level meets the basic assumptions of this study. The research results show that customer

personal satisfaction has a positive impact on loyalty, with an impact coefficient of 0.18 and a significant t value. Although the impact coefficient is higher than the overall level, it is still within a reasonable range and does not lead to collinearity between potential independent variables. The main factor affecting tourist satisfaction (SA) in the individual level model is the health and fitness function (S2) of Taiwan's Rice Heaven Tianzhong Marathon, with an influence coefficient of 0.41 and a significant t value. This shows that tourists personally believe that the fitness function of Taiwan's Rice Heaven Tianzhong Marathon is significant, which affects tourists' satisfaction and indirectly affects their willingness to revisit. The main factor (LO) affecting tourist loyalty is the operational perfection of Taiwan's Rice Heaven Tianzhong Marathon (L2), with an influence coefficient of 0.45 and a significant t value. This shows that a well-established road run is the most critical factor in building tourist loyalty, which indirectly affects tourist loyalty.

The empirical analysis results of this study found that the leisure behavior motivations and preferences of the Taiwan's Rice Heaven Tianzhong Marathon team and individual tourists are different. This leads to differences in satisfaction and loyalty, which indirectly affects revisit intention. The overall level of tourism sports behavior reflects the individual attributes of tourists. But considering the collective behavior and mutual assistance spirit of the team, a group of road running pairs will form another independent group. Therefore, in order to promote the development of tourism industries related to Taiwan's Rice Heaven Tianzhong Marathon, it is necessary to fully understand the leisure needs and behaviors of tourist groups and individuals. This enables customized services to be provided accurately and efficiently and maximizes economic benefits.

Conclusions

The empirical results of this study found that among the potential variables of tourist satisfaction and loyalty, the main influencing factors at the overall level are different from those at the individual level. This shows that there are differences in sport preferences between road running teams and individuals, which indirectly affects the willingness of teams and individuals to revisit. Therefore, operators related to Taiwan's Rice Heaven Tianzhong Marathon activities must provide customized services with different leisure functions based on the leisure needs of road running groups and individuals to enhance the economic value of Taiwan's Rice Heaven Tianzhong Marathon sports and leisure activities.



Note: The above path coefficients are standardized coefficients; *p < 0.05

Figure 2: Multi-layer equation structural model of path relationship of Taiwan's Rice Heaven Tianzhong Marathon participants

Recommendations

1. Taiwan's Rice Heaven Tianzhong Marathon Management

According to the results of this study, the motivations for participating in the Taiwan's Rice Heaven Tianzhong Marathon are different from those of

individual tourists. This leads to differences in satisfaction and loyalty, which indirectly affects revisit intention. According to the research results, the most significant factors affecting the satisfaction of road running teams are the landscape and leisure functions of Taiwan's Rice Heaven Tianzhong Marathon. In comparison, the main factor affecting individual rider satisfaction is the health and fitness function of Taiwan's Rice Heaven Tianzhong Marathon. The Taiwan's Rice Heaven Tianzhong Marathon Team focused on showcasing the scenery and entertainment of Sun Moon Lake. Individual participants focus on the sports and health functions of Taiwan's Rice Heaven Tianzhong Marathon. Therefore, we recommend that the managers of Taiwan's Rice Heaven Tianzhong Marathon adjust the existing Taiwan's Rice Heaven Tianzhong Marathon plan in a timely manner to meet different needs. For example, because road running groups have so many people, they may influence others on the trail, especially when taking group photos or running together. However, individual participants often pursue fitness as their purpose, which may conflict with the leisure and entertainment purposes of others. In other words, the managers of Taiwan's Rice Heaven Tianzhong Marathon should re-plan a larger space in areas where group photography is required so that individual runners will not be disturbed whether they are resting or taking photos. The "wooden plank road" section in particular has a wide view and excellent scenery, and has always been a gathering place for runners to take photos. Therefore, adequate planning of the use of space by management units will help reduce the unpleasant feelings of users in the same space caused by external factors and increase their willingness to revisit. In other words, managers of Taiwan's Rice Heaven Tianzhong Marathon must have a complete plan for road running safety, usage, and even marking and line specifications. Ensure that both running teams and individual runners are motivated to participate in Tanaka running events.

2. Participants of the Taiwan's Rice Heaven Tianzhong Marathon

In terms of loyalty, the results of this study show that the Taiwan's Rice Heaven Tianzhong Marathon team (group) believes that the Taiwan's Rice Heaven Tianzhong Marathon event is a place worth recommending. Individual road runners consider this a fully functional road running track. Therefore, both group and individual runners generally have a positive experience running in the field after experiencing unique and real situations. However, to ensure that all types of participants can have a good leisure experience, be willing to recommend it to others, or even visit again, it requires the joint efforts of road runners.

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