

Research Paper

The Development of Guidelines on Promoting Bicycle Use for Tourism in Khao Yai National Park

D. Watthanaklang¹ and V. Ratanavaraha²

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ABSTRACT

At present, bicycle use for both health and tourism is supported but it is found that most Thai people do not popularly use bicycles. This study aimed to seek for the factors promoting Thai people to use bicycles by choosing KhaoYai National Park, where there are a large number of tourists, to be studied with the application of the Theory of planned behavior-TPB. The factors, which were considered, included Attitude, Subjective norm, Perceived behavioral control, and Additional factors which were the factor of infrastructure, and number of bicycle possession in the family. The data used in this study were 429 Thai tourists. The data analysis was done by using Structural Equation Modeling. From data analysis, it was found that Perceived behavioral control, Subjective norm, and Attitude influenced behavioral intention in bicycle use at statistical significance 0.01. For Infrastructure, and number of bicycle possession in the family, they positively influenced behavioral intention in bicycle use in KhaoYai National Park at statistical insignificance. This study can be used as guidelines for the government or involved organizations to determine the pertinent policies on promoting bicycle use.

1. Introduction

Bicycle use is both an exercise useful to health and a travel saving energy which does not cause pollution to environment. Thailand has recognized its importance and determined the strategies for bicycle use promotion (Thailand Transport Portal, 2015) . In the past, both local and national government offices held activities promoting incessant bicycle uses but found that most Thai people did not popularly use bicycles. Thus, the study of factors motivating bicycle uses is useful to develop the strategies supporting bicycle uses appropriately.

The tendency towards Thais' travelling for tourism has increased. In 2013, travelling for tourism increased 11.03

percent when compared with the previous year (Department of tourism, 2013) Regarding national parks, the most popular national park for Thai tourists is Khao Yai National Park with the first rank highest number of 1,077,857 tourists (Department of National Parks, 2013). Thus, to comprehend tourists' needs in mentioned place is important for tourism development.

In the past, most studies were involved in bicycle uses in daily lives (Pucher, Komanoff, and Schimek, 1999), (Martens, 2007). Regarding bicycle uses for tourism, Ritchie (1998) analyzed the factors of infrastructure on travel behavior by using performance-importance matrices of which most analyses were descriptive statistics. As the influence of factors of infrastructure has not been

¹ Corresponding Author, Program of Construction Technology, Faculty of Industrial Technology, Nakhon Ratchasima Rajabhat University, 340 Suranarai Road, Nai-Muang, Nakhon Ratchasima 30000, THAILAND, duangdao.w@nrru.ac.th

² Professor, School of Transportation Engineering, Institute of Engineering, Suranaree University of Technology, 111 University Avenue, Suranaree Sub-district, Muang District, NakhonRatchasima 30000, THAILAND, vatanavongs@g.sut.ac.th

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statistically studied, this study analyzed it by using Structural Equation Model (SEM) on the basic of the theory of planned behavior (TPB) and added the consideration of infrastructure factor in order to take the mentioned data to apply to the government and involved organizations for the determination of pertinent policies promoting bicycle uses and increasing bicycle users at significance in the future.

2. Materials and methods

2.1 Participants and data collection

The samples in this study were Thai tourists who decided to travel in Khao Yai National Park. The samples were chosen by Sample Random Sampling according to the suggestions of Stevens (1966) who stated that sample size for Maximum likelihood estimation (MLE) should be at least 15 times of observed variables (Golob, 2003). Thus, the samples should be at least 15x13 equaling 195 tourists. In this study, 429 samples are sufficient enough to take for Structural Equation Model analysis.

This study surveyed the data with face to face interview using questionnaire as a research tool. The question items used five-level rating scale (5 = Strong agree, 1 = disagree). The quality of questionnaire's reliability was checked with cronbach's Alpha value which should be more than 0.70 (Tavakol and Dennick, 2011).

2.2 Analysis

This study analyzed the factors, which include individual characteristics, attitudes, and infrastructure, affecting intention behavior by using SEM to analyze the relation between latent variables and latent variables, as well as latent variables and observed variables. The statistics used to test reliability were relevant to empirical data (model fit) as chi-square (χ^2) where (df) should have $p > 0.05$ (Kline, 2011), Root Mean Square of Approximation (RMSEA) value should be 0.06 or less, Comparative Fit Index (CFI) should be up to 0.90 (Hu and Bentler, 1999), Tucker Lewis Index (TLI) should be up to 0.80 (Hooper, Coughlan, and Mullen, 2008) and Standardized Root Mean Residual (SRMR) should be 0.08 or less (Hu and Bentler, 1999).

3. Results

3.1 Descriptive statistics

The samples in this study were 429 tourists divided into 234 females as 55 percent, and 195 males as 45 percent. Most of tourists were in the age range of 21-30 years as 42 percent, followed by the age range below 20 years as 36 percent. For the highest graduation, bachelors' degree was 51 percent followed by M.6/ vocational certificate as 33 percent. Most of them have one bicycle as 41 percent while having no bicycle as 24 percent. The number of tourists using bicycles was 151 people as 35 percent and not using bicycles as 278 tourists as 65 percent.

Table 1 showed the results of infrastructure analysis of 14 question items of observed variables. When considering the mean, standard deviation values, it was found that the indicator A3 "Bicycle use makes me feel relaxed" at the average mean 3.83 (SD=0.95) followed by PBC2 "I think that riding bicycles is very easy for me" (M=3.73, SD=1.00). The indicator having the least average mean was A1 "using bicycles makes me look good, chic, and smart" (M=3.29, SD=1.12). When considering the overview of Skewness, the value was between - 0.60 and - 0.05, while the value of Kurtosis of observed variables was between -0.66 and -0.004. From the mentioned value, it was found that Skewness value was less than 3.0 and Kurtosis value was less than 10. This showed the data normal distribution (Kline, 2011) which was suitable to take it for SEM analysis consecutively.

In Table 2, when considering Pearson's correlation coefficients values between 14 observed variables in the model, it was found that the relation between 91 pairs of observed variables have coefficient values between -0.027 and 0.780. And when considering the results of statistical test Bartlett's Test of Sphericity which is the statistics testing hypothesis if matrix correlates to Identity matrix, it was found that the value of $\chi^2 = 2703.007$ (df = 91, $p = 0.00$) was different from zero at statistical significance 0.01. This was relevant to the results of Index analysis

Table 1. Mean, Standard Deviation, Skewness, and Kurtosis of variables in Model

Variables		\bar{x}	SD	Sk	Ku
Attitude (conbach $\alpha = 0.707$)					
A1	Using bicycles makes me feel cool , chic, and smart	3.29	1.12	-0.15	-0.66
A2	Using bicycles makes me recognize environmental love	3.52	1.02	-0.30	-0.34
A3	Using bicycles makes me feel relaxed	3.83	0.95	-0.46	-0.30
Subjective norms (conbach $\alpha = 0.849$)					
SN1	If family members use bicycles for tourism, I will use it too	3.60	1.00	-0.30	-0.38
SN2	If my friends use bicycles for tourism, I will use it too	3.51	0.98	-0.27	-0.08
PBC (conbach $\alpha = 0.836$)					
PBC1	I am able to use bicycles for traveling by myself	3.64	1.01	-0.38	-0.36
PBC2	I think that using bicycles is very easy for me	3.73	1.00	-0.38	-0.44
Bikelane (conbach $\alpha = 0.666$)					
F1	The width of bike lanes is suitable for utility	3.76	0.92	-0.37	-0.29
F2	There are specific bike lanes	3.89	0.96	-0.60	0.002
Facility (conbach $\alpha = 0.832$)					
F3	There are lockers at the beginning of routes	3.54	1.08	-0.42	-0.34
F4	There are dressing rooms for service in tourist attractions	3.58	1.02	-0.31	-0.48
Behavioral intention (conbach $\alpha = 0.874$)					
Int1	I intend to use bicycles for tourism most frequently	3.70	0.98	-0.47	-0.16
Int2	I want to use bicycles in tourist attractions next time	3.64	0.98	-0.05	-0.004

X =Mean, SD =Standard deviation, Sk=Skewness, Ku=Kurtosis

Table 2. Pearson correlation coefficients for the observed variables

Item	A1	A2	A3	SN1	SN2	PBC1	PBC2	F1	F2	F3	F4	IN1	IN2	Nbicycle
A1	1													
A2	.648**	1												
A3	.301**	.424**	1											
SN1	.445**	.319**	.369**	1										
SN2	.397**	.362**	.379**	.737**	1									
PBC1	.272**	.308**	.388**	.527**	.492**	1								
PBC2	.235**	.328**	.452**	.457**	.449**	.724**	1							
F1	.215**	.236**	.271**	.207**	.264**	.281**	.254**	1						
F2	.178**	.248**	.371**	.142**	.199**	.251**	.223**	.500**	1					
F3	.247**	.292**	.318**	.202**	.209**	.230**	.190**	.455**	.567**	1				
F4	.296**	.335**	.340**	.291**	.283**	.280**	.256**	.394**	.479**	.713**	1			
IN1	.298**	.245**	.328**	.395**	.393**	.428**	.325**	.220**	.128**	.223**	.212**	1		
IN2	.272**	.281**	.340**	.398**	.411**	.436**	.363**	.219**	.199**	.203**	.237**	.780**	1	
Nbicycle	.052	.027	.224**	.173**	.170**	.223**	.155**	.137**	.170**	.132**	.118*	.190**	.179**	1

Kaiser-Meyer-Olkin Measure of Sampling Adequacy=0.809, Bartlett's Test of Sphericity =2703.007 ,df=91,p<0.001

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Kaiser-Meyer-Olkin (KMO) equaling 0.809 which was close to 1. This showed that coefficient Matrix of observed variables was not Identity matrix and had sufficient relation to take for composition analysis of structural equation.

3.2 Bicycle Use Intention model in Khao Yai National Park by SEM

The analysis of bicycle use intention in Khao Yai National Park by using structural equation model found $\chi^2= 151.280$, $df = 61$, $p<0.001$, $CFI = 0.966$, $TLI = 0.949$, $SRMR = 0.064$, $RMSEA = 0.059$ as shown in **Fig.1**. It was found that every value was qualified through determined criteria. This showed that structural equation model was relevant to empirical data. When considering all seven

measurement models, it was found that all 13 indicators were able to confirm the composition of each latent variable at statistical significance ($p < 0.001$) as shown in Table 3. And when considering the details of each factor, it was found that the factor most influencing bicycle use intention in Khao Yai National Park was Perceived behavioral control ($\beta = 0.261$) which directly positive influenced bicycle use intention in Khao Yai National Park at statistical significance 0.01, followed by Subjective norm ($\beta = 0.228$) directly positive influencing

bicycle use intention in Khao Yai National Park at statistical significance 0.01, and Attitude ($\beta = 0.159$) influencing bicycle use intention in Khao Yai National Park at statistical significance 0.01. In terms of Infrastructure and the number of bicycle possession, it was found that the number of bicycle possession positive influenced bicycle use intention in Khao Yai National Park at no statistical significance.

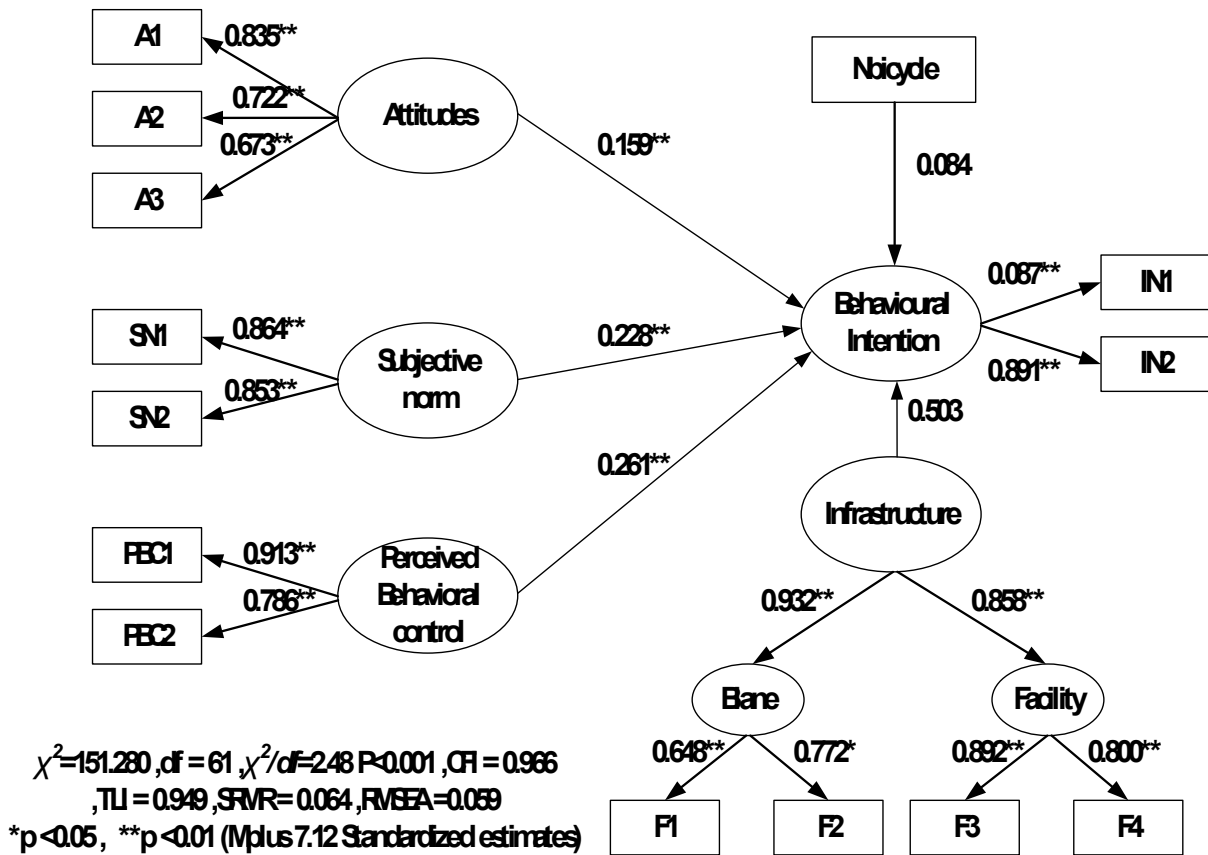


Fig.1 Structural Equation Model of Behavioral Intention of Bicycle Use for Tourism in Khao Yai National Park

Table 3. Parameter estimates of Measurement Model

Variables		Standardized estimates	Standard Error (S.E.)	p -value	R-square
Attitude					
A1	Using bicycles makes me feel cool , chic, and smart	0.835	0.035	<0.001	0.698
A2	Using bicycles makes me recognize environmental love	0.722	0.034	<0.001	0.522
A3	Using bicycles makes me feel relaxed	0.673	0.046	<0.001	0.453
Subjective norms					
SN1	If family members use bicycles for tourism, I will use it too	0.864	0.023	<0.001	0.746
SN2	If my friends use bicycles for tourism, I will use it too	0.853	0.024	<0.001	0.727
PBC					
PBC1	I am able to use bicycles for traveling by myself	0.913	0.025	<0.001	0.834
PBC2	I think that using bicycles is very easy for me	0.786	0.028	<0.001	0.617
Bikelane					
F1	The width of bike lanes is suitable for utility	0.648	0.037	<0.001	0.420
F2	There are specific bike lanes	0.772	0.035	<0.001	0.597
Facility					
F3	There are lockers at the beginning of routes	0.892	0.025	<0.001	0.795
F4	There are dressing rooms for service in tourist attractions	0.800	0.027	<0.001	0.639
Behavioural intention					
Int1	I intend to use bicycles for tourism most frequently	0.870	0.026	<0.001	0.757
Int2	I want to use bicycles in tourist attractions next time	0.891	0.026	<0.001	0.793
Infrastructure					
	Bikelane	0.932	0.055	<0.001	0.869
	Facility	0.858	0.048	<0.001	0.736

4. Discussion and conclusion

This research aims to study the factors affecting tourists' bicycle use in Khao Yai National Park by applying SEM and take the mentioned factors to determine the policies promoting bicycle uses. The samples in this study were 429 Thai tourists. The considered factors, which comprised Attitude, Subjective norm, and Perceived behavioral control, were the compositions of the Theory of planned behavior. In addition, the consideration of Infrastructure factor and the number of bicycles in families were added by testing the mentioned factors of Thai tourists' behavioral intention.

According to the results of analysis, it was found that Perceived behavioral control, Subjective norm, and Attitude had influence on Behavioral intention in bicycle use in Khao Yai National Park at statistical significance 0.01. When considering the details of each factor, it was found that (1) Perceived behavioral control was the factor having most influence on bicycle use intention. In the measurement model, "I can use a bicycle to travel for tourism by myself" had the most standard factor loading value (0.913). In other words, if there is an emphasis on tourists' confidence in travelling by themselves, it will affect higher needs for bicycle uses, (2) subjective norm which is the most important indicator " I will use a bicycle if

the members in my family suggest me to use it" (0.864) indicates that family is a crucial part in bicycle use promotion, (3) Attitude has "using a bicycle makes me feel good, chic, and smart" as the indicator having the most standardize factor loading value (0.835). In other words, if the importance of bicycle use making them feel good, chic, and smart is promoted by making public relations to tourists, it will affect tourists' higher needs for bicycle uses. Regarding Infrastructure and the number of bicycle possession, it was found that they have positive influence on bicycle use intention in Khao Yai national park at no statistical significance.

In this study, the factors which are not taken to be considered such as weather condition or seasons influencing bicycle uses in Khao Yai National Park potentially affect different bicycle use intention. Additionally, the study of foreign tourist groups is interesting for further research in the future.

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