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Applying Linear Regression Analysis to Identify Willingness of Using Environment-Friendly Electric Motorcycle-Sharing for Tourism Activities: A Case Study of GoShare †

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Abstract: This study aimed to evaluate tourist characteristics, rental factors, non-rental factors, and use intention of shared motorcycles in tourism activities. Linear regression analysis was used to compare the differences and influences of variables. A convenience sampling survey method was adopted to investigate GoShare motorcycle-sharing service. Questionnaires were distributed to 271 respondents aged 20–29 years old who used motorcycles in tourism. With data descriptive statistics, *t*-test, one-way analysis of variance, and regression analysis were conducted, and four main results were obtained: (1) The respondents tended to follow a "Freestyle travel" type. (2) As a rental factor, "Environmental Efficiency" was the most important. (3) "Renting is not easy" was the most important reason not to rent a motorcycle. (4) Tourist characteristics and rental factors impacted use intention significantly. Therefore, the following suggestions were made in this study: it is necessary to (1) strengthen the promotion of the GoShare motorcycle-sharing service, (2) enhance the quality of the rental service, (3) improve the mobile application, and (4) focus on in-depth tourism and expand the services at scenic spots.

Keywords: motorcycle sharing; tourist characteristics; rental factor; use intention; linear regression analysis

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1. Introduction

According to the Survey of Travel by R.O.C Citizens of the Tourism Bureau 2020 of the Ministry of Transportation and Communications, the majority (71.0%) of the young adults had a road trip in their automobiles, with riding motorcycles ranked fifth (7.5%) compared to the MRT (9.2%) and the Taiwan Railway (8.4%). The number of people aged 18–30 years old using motorcycles during their trips was significantly higher than that of the other age groups, as young people commonly rode motorcycles for tourism activities [1]. Most people use their automobiles and motorcycles for tourism activities. Using motorcycle-sharing services for tourism activities reduces carbon emissions and avoids the waste of resources. However, tourists' habits of using transportation are not easily changed. Studies have found that tourism characteristics, payment methods, energy saving, carbon reduction, and comfort level were all important factors in choosing transportation methods [2,3]. *Commonwealth Magazine* [4] wrote that people between 20–30 years old had the second highest use intention of motorcycle-sharing services. The statistics of the Ministry of Transportation and Communications have shown that the rate of owning automobiles and motorcycles by people aged between 20–30 years old was lower than that of people aged 31–39 years old [5]. Thus, people aged between 20–30 years old are more likely to use motorcycle-sharing services. GoShare has tried to develop its business in tourism among the three major motorcycle brands in

Taiwan. In this study, the use intention of GoShare for tourism activities was investigated to estimate the potential market for the age group of 20–30 years olds based on tourism characteristics and rental factors using linear regression analysis.

2. Literature Review

2.1. Sharing Economy

In the original sharing economy system, idle resources are rented and returned. To make sharing economy profit-making, companies try to make a service specifically for the public to share and use [6].

2.2. Tourist Characteristics

The World Tourism Organization (1991) defines a tourist as a person who travels within his or her residence or anywhere else, regardless of the purpose and means of transport. Schneider explored the motivation of adventure tourists and found that there were significant differences between active adventure tourists and moderate adventure tourists [7]. Wu studied mutual relations among personality traits, travel motivations, travel constraints, and travel intentions for senior citizens in Kaohsiung City. Personality traits were categorized as affinity, conscientiousness, extroversion, neuroticism, and open-mindedness. The study found that personality traits significantly impacted travel motivation and behavior intention [8].

This study aims to explore different travelers' current situations and characteristics in using the GoShare motorcycle-sharing service in tourism activities. Referring to Hsieh et al., 10 questions such as "Self-planning", "Degree of Innovation", "Experience Depth", "Travel Pace", "Time Concept", "Tourism Risk", "Sense of Direction", "Saving", "Physical Load", and "Energy Conservation and Carbon Reduction" were included in the questionnaire [2].

2.3. Motorcycle-Sharing Service Rental Factor

Hsu and Chang investigated the Taiwan motorcycle-sharing service market to find out the relationship between consumers' product involvement and value proposition recognition. Their results showed that consumers paid more attention to convenience and battery life, especially female consumers [9]. Chio et al. studied and analyzed the heterogeneity of the selection behavior of travel carriers, and they discovered that the place of living affected the use of the carrier [3]. For rental factors for the GoShare motorcycle-sharing service participating in tourism activities, current research mostly focuses on the purchase of electric locomotives. Based on the research of Chang, Lin, Hsu, and Lu on the factors of renting a shared scooter, we added the elements of tourism activities to make appropriate adjustments, dividing the GoShare motorcycle-sharing service into four factors: environmental efficiency, product attribute, convenience, and perceived value for participating tourism activities [10].

2.4. Use Intention

Fishbein and Ajen defined use intention as the subjective likelihood that one performs, and found a correlation between use intention and actual behavior [11]. Hsieh et al. found that travelers with a higher degree of innovation, depth of experience, time planning, and physical load had a higher use intention [2]. Chuang et al. found that playfulness, aesthetics, and excellence effectively increased purchase intention [12]. We explored the use intention for GoShare motorcycle-sharing service in tourism activities, defining use intention as tourists' willingness based on Fishbein and Ajzen's definition of the use of intentions, adjusted and measured as appropriate for this study.

3. Research Methodology

3.1. Research Subjects

Questionnaires were distributed to people aged 20–29 who had used motorcycles for tourism activities. An online questionnaire survey was conducted using a convenient

sampling method on LINE and FACEBOOK. The survey was carried out from 6 April to 4 July 2019. A total of 403 questionnaires were distributed, and 132 incomplete answers were deducted, while 271 valid questionnaires were recovered with an effective recovery rate of 67.20%.

3.2. Research Method

GoShare motorcycle-sharing service is commonly used for daily transportation or emergency vehicles. To explore consumer's adoption behavior and use intention for GoShare motorcycle-sharing service during tourism, we used the characteristics of tourists and rental factors to interpret and predict consumer intentions. Research Framework (Figure 1) is listed below.

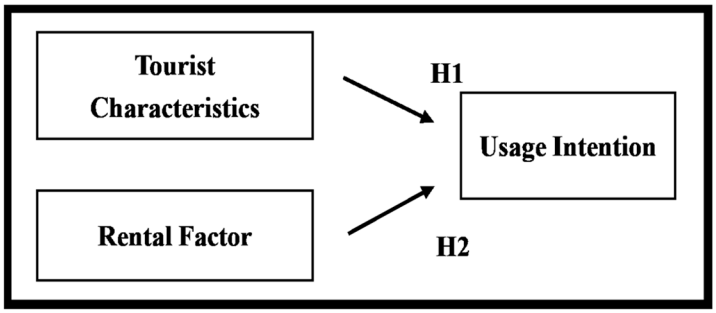

Figure 1. Research framework.

According to the above research framework, two research assumptions were proposed.

H1: *Tourist characteristics has a significant impact on use intention.*

H2: *Rental factor has a significant impact on use intention.*

4. Results

4.1. Tourist Characteristics on Use Intention

Tourist characteristics had a significant effect on use intention (F = 30.749, $p = 0.000 < 0.001$). Freestyle travel ($\beta = 0.289$, $p = 0.000 < 0.01$) and enthusiasm ($\beta = 0.289$, $p = 0.000 < 0.001$) had a significant positive effect on use intention. Freestyle travel was more influential than enthusiasm, which means that travelers were more likely to use the GoShare motorcycle-sharing service in tourism activities. Planners did not have any significant effect as GoShare motorcycle-sharing service existed anywhere and it took time to locate motorcycles, which delayed the trip. Freestyle travel and enthusiasm did not force travelers to follow the planned schedule and handle unexpected situations. Therefore, such travelers were more accepting and tried the GoShare motorcycle-sharing service. The explained variance for tourist characteristics on use intention was 0.285, which explained use intention by 28.5%. Regression analysis of tourist characteristics each dimension on use intention (Table 1) is listed below.

Table 1. Regression analysis of tourist characteristics each dimension on use intention.

	Unstandardized Coefficient β	Standardized Coefficient β	T	VIF
(constant)	2.516		9.693	0.000
Freestyle	0.252	0.289	4.173 ***	1.553
Planner	0.057	0.071	1.119	1.288
Enthusiasm	0.220	0.271	3.838 ***	1.616
F = 30.749 ***			$R^2 = 0.285$	

*** Standardized loadings are significant at $p < 0.001$.

4.2. Rental Factors on Use Intention

Rental factors had a significant effect on use intention (F = 76.073, $p = 0.000 < 0.001$). Environmental efficiency (β = 0.219, $p = 0.000 < 0.001$) and product attribute (β = 0.482, $p = 0.000 < 0.01$) had a significant positive effect on use intention. Product attribute had a greater impact than environmental efficiency. Travelers were more likely to use the GoShare motorcycle-sharing service because of them. Product attribute showed the lowest recognition in the rental factor, but the regression analysis result showed that its impact was the largest. This indicated that the respondents were concerned about the battery life of rented motorcycles. However, the recognition rate was relatively low. Therefore, improving the product attribute effectively increased use intention. Convenience and perceived value did not have any significant effect. The explained variance for rental factors on use intention was 0.570. Regression analysis of rental factors each dimension on use intention (Table 2) is listed below.

Table 2. Regression analysis of rental factors each dimension on use intention.

	Unstandardized Coefficient β	Standardized Coefficient β	T	VIF
(constant)	1.118		4.717	0.000
Environmental Efficiency	0.214	0.219	3.596 ***	1.984
Product Attribute	0.441	0.482	6.450 ***	2.987
Convenience	0.055	0.058	0.825	2.658
Perceived Value	0.074	0.082	1.356	1.952
F = 76.073 ***			$R^2 = 0.570$	

*** Standardized loadings are significant at $p < 0.001$.

4.3. Tourist Characteristics and Rental Factors on Use Intention

Using regression analysis, the relationship between tourist characteristics, rental factors, and use intention was analyzed. They had a significant impact (F = 147.748, $p = 0.000 < 0.001$). Tourist characteristics (β = 0.159, $p = 0.003 < 0.001$) and rental factors (β = 0.712, $p = 0.000 < 0.001$) had a significant impact on use intention. The influence of rental factor was greater than tourist characteristics. Rental factor showed a greater impact on using the motorcycle-sharing service in tourism activities. Tourist characteristics had less influence than the rental factor. By improving the quality of the GoShare motorcycle-sharing service, use intention will increase. Regression Analysis of Tourist Characteristics and Rental Factors on use intention (Table 3) is listed below.

Table 3. Regression analysis of tourist characteristics and rental factors on use intention.

	Unstandardized Coefficient β	Standardized Coefficient β	T	VIF
(constant)	0.733		2.946	0.000
Tourist Characteristics	0.159	0.155	3.022 **	1.388
Rental Factor	0.712	0.655	12.763 **	1.388
F = 147.748 ***			$R^2 = 0.550$	

Standardized loadings are significant at ** $p < 0.01$, *** $p < 0.001$.

5. Conclusions

Based on the research results, young adults' perception of tourist characteristics, rental factors, and use intention of the GoShare motorcycle-sharing service in tourism activities was summarized as follows.

5.1. Summary

5.1.1. Tourist Characteristics

The characteristics of tourists are grouped into three types: freestyle travel, planning, and enthusiasm. The respondents who led a companion during the trip thought they could plan the trip and handle unexpected incidents. The conservative respondents showed no intention to invest in tourism and cared more about the process than the destination.

5.1.2. Rental Factor

There are four types of rental factors: environmental efficiency, product attribute, convenience, and perceived value. Environmental efficiency was the major rental factor of the motorcycle-sharing service. As the awareness of environmental protection is prevalent, using electric energy is regarded as a power source without emitting gases and saves energy in tourism. However, product attributes did not have much recognition as rental factors. The respondents believed that the appearance and services of the GoShare motorcycles were not important factors for rent.

5.1.3. Tourist Characteristics on Use Intention

Users with freestyle travel and enthusiasm were more willing to use the GoShare motorcycle-sharing service. The selling point of the GoShare motorcycle-sharing service is renting and returning anywhere. Thus, users were not afraid of unexpected situations and could enjoy themselves without worrying about times for arrival and departure at destinations.

5.1.4. Rental Factors on Use Intention

Rental factors of environmental efficiency and product attributes had a significant impact on the use intention of the GoShare motorcycle-sharing service. Product attributes affected use intention more than environmental efficiency. The GoShare motorcycles had an attractive appearance with low noise, energy saving, and carbon reduction, which effectively increase use intention.

5.2. Relevant Recommendations

Relevant recommendations for the industry were suggested as follows based on the research results.

5.2.1. Promotion of Environmental Significance

The respondents were willing to use the GoShare motorcycle-sharing service in tourism activities to save energy and reduce carbon. Thus, the industry must strengthen the promotion of environmental protection significance.

5.2.2. Improvement of Product and Rental Services

The results of the study showed that the GoShare motorcycle-sharing service had a greater impact on use intention, but fewer respondents used it before. The appearance, battery life, and rental service need to be improved.

5.2.3. Improvement of Mobile Application

The respondents indicated that it was difficult to use due to the limited number of motorcycles. The GoShare motorcycle-sharing service mobile application needs to locate motorcycles with GPS information for increasing the intention of use of the GoShare motorcycle-sharing service.

5.2.4. In-Depth Tourism and Service at Scenic Spots

The respondents who are willing to use pursued freestyle travel and had enthusiasm. Although the GoShare motorcycle-sharing service promotes urban use, it must include attractions in each city accessible by motorcycles in order to make relevant tourist maps or

activities. This will attract tourists in traveling. In addition, the expansion of rental services in tourism can also solve the problem of transportation in and to tourist destinations where there are not many cars or charging stations.

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