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Greener Life: Consumers' Green Intentions to Adopt Bicycle-Sharing Services

Daha Yeşil Yaşam: Tüketicilerin Bisiklet Paylaşım Hizmetlerini Benimsemelerine Yönelik Çevreci Niyetleri

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Abstract

Previous studies mainly focused on the influence of individuals' external environmental characteristics on their bicycle-sharing service intention. Few studies investigated the relationship between consumers' attitudes and intentions. The current study aims to investigate the influence of consumers' attitudes, subjective norm, perceived behavioral control, and convenience on their bicycle-sharing service. A purposive sampling technique was used, and 234 valid respondents were collected for data analysis. The results showed that attitude, subjective norm, perceived behavioral control, and convenience positively and significantly influenced individuals' intentions to adopt bicycle-sharing services. Last, theoretical and practical implications as well as limitations are discussed accordingly.

Keywords: Attitude, convenience, intention to adopt bicycle-sharing services, perceived behavioral control, subjective norm

Öz

Önceki çalışmalar, bireylerin dış çevresel özelliklerinin bisiklet paylaşım hizmeti niyeti üzerindeki etkisine odaklanmaktadır. Tüketicilerin tutumları ve niyetleri arasındaki ilişkiyi inceleyen çok az çalışma bulunmaktadır. Bu çalışma, tüketicilerin tutumlarının, öznel normun, algılanan davranış kontrolünün ve rahatlığın bisiklet paylaşım hizmetleri üzerindeki etkisini incelemeyi amaçlamaktadır. Çalışmada amaçlı örnekleme tekniği kullanılmış ve veri analizi için 234 geçerli katılımcıdan veriler toplanmıştır. Sonuçlar, tutumun, öznel normun, algılanan davranış kontrolünün ve rahatlığın, bireylerin bisiklet paylaşım hizmetlerini benimseme niyetlerini olumlu ve anlamlı şekilde etkilediğini göstermektedir. Son olarak, teorik ve pratik çıkarımlar ve sınırlılıklar buna göre tartışılmaktadır.

Anahtar Kelimeler: Tutum, rahatlık, bisiklet paylaşım hizmetlerini benimseme niyeti, algılanan davranış kontrolü, öznel norm

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Introduction

With the divergent development of countries, the main orientation is to balance the economy and eco-system during the process, neglecting the negative impact of the ecological benefits, leading to an unharmonious relationship between individuals and nature. Improvement of public transportation is a key part of urbanization (Hrelja et al., 2017), which plays an important role in determining eco-development and sustainability (Burcin, 2021). Recently, the green transportation system with the core goal of improving bicycle traffic, pedestrian traffic, and public transportation has been widely concerned globally, due to the concept of a low-carbon life pattern being rooted in individuals' minds and becoming mainstream during the development of urbanization (Voytenko et al., 2016).

Greener and more sustainable consumption have become an important way for individuals to participate in environmental protection in their daily lives (Pickerill, 2018). Bicycle-sharing service is a low-carbon, green, and sustainable mode of transportation (Zhu et al., 2022) that plays an important role in energy saving and emission reduction while relieving the pressure of public transportation (Frenken & Schor, 2017). Meanwhile, bicycle-sharing services also solve the "last mile" transportation problem and provide users with financial benefits (Zhu et al., 2022). For example, dockless bike sharing plays a vital role in promoting sustainable mobility. In addition, bicycle-sharing services contribute to public health by providing physical

activity opportunities and reducing the occurrence of automobile accidents.

Previous studies mainly focused on the influence of the environmental characteristics of the buildings, blocks, and infrastructures on urban residents' daily commuting and leisure activities, including the choice of transportation (Vedagiri & Arasan, 2009; Zhu et al., 2022). Most of these studies explored how objective travel time and cost influence individuals' behaviors to select transportation, such as Eren and Uz (2019) investigated how weather conditions or attributions of sociodemographic influence individuals' behaviors to choose transportation (Rotaris et al., 2022). Therefore, most previous studies explored the relationship between individuals' travel mode selection and a specific external objective environment or explored the travel mode characteristics of a specific group of people to understand the factors influencing their travel mode selection. There are few studies that investigate the relationship between consumers' attitudes and intentions to adopt bicycle-sharing services. Hence, the current study explores factors influencing consumers' intention to adopt bicycle-sharing services based on the theory of planned behavior (TPB) model (Figure 1).

Literature Review

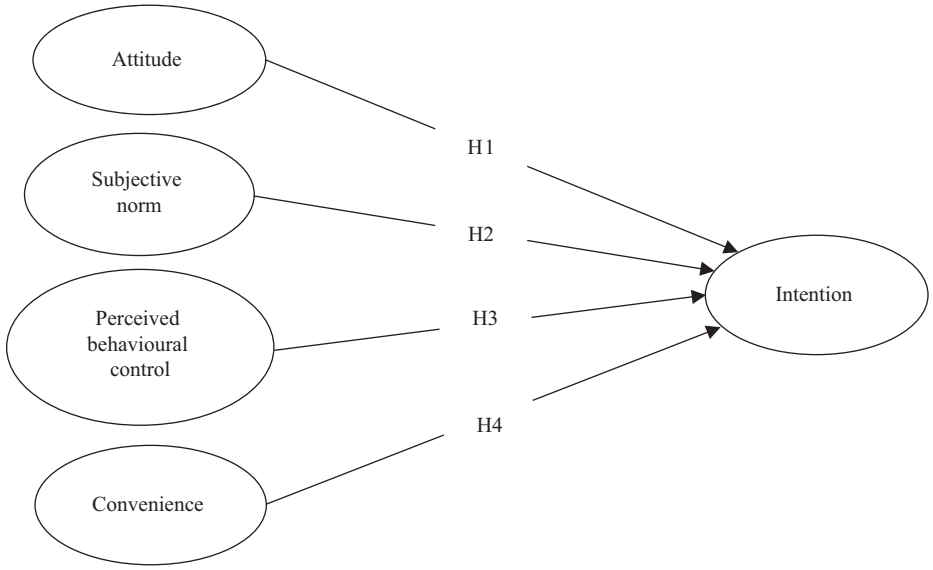
Theory of Planned Behavior Model

The theory of reasoned action (TRA) and TPB are two fundamental cognitive theories on green purchase intention or behavior (Kumar, 2021). The classical TRA model includes attitude, which refers to beliefs about the likely consequences of the behavior; and subjective norm (SN), which regards beliefs about the normative expectations of others. However, researchers demonstrated that TRA shows a major limitation was the requirement that the behavior under consideration is under volitional control (La Barbera & Ajzen, 2020). Thus, perceived behavioral control (PBC) has been added to TRA due to the fact that PBC represents the beliefs about the presence of factors that may facilitate or restrict the performance of the behavior (Wang et al., 2023). Accordingly, a more positive attitude and SN, and a greater PBC lead to individuals' stronger intention to perform a given behavior in question (Wang et al., 2022c). Recent studies showed that TPB is more appropriate for measuring consumer green consumption behavior (Wang, 2022; Wang et al., 2022a) as TPB allows researchers to explore the impact of other contextual variables which might help to explain an individual's behavior (Wang et al., 2022b).

Attitude

Attitude is defined as an individual's overall evaluation and psychological tendency toward the implementation of a particular behavior. According to Ajzen (1991), attitudes have social attributes because they are gradually formed by social individuals through their interactions with others in society and the surrounding environment. Thus, attitude is the key factor affecting an individual's behavioral intention but interacting with SN and PBC; nevertheless, this specific mechanism varies according to the environment in which the subjects conduct the study. Overall, when individuals have a more positive attitude toward a given behavior, it results in a more positive propensity to consume or use it. In the same vein, a particular attitude is a strong predictor of a single behavior toward that particular object of the attitude. Many studies have confirmed how an individual's attitude significantly influences their green purchase intention or behavior. For example, Han et al. (2017)

Figure 1.
Theoretical Research Model.



indicated that tourists believe that bicycle-sharing services are a green way of travelling and conducive to environmental protection, thus they often choose this specific mode of transportation for their short trips. Rivis and Sheeran (2003) found that attitude positively and significantly influences consumers' green consumption behaviors, while Delistavrou et al. (2022) reported similar results in Greece. Therefore, the following hypothesis is proposed:

H1: Attitude positively significantly influences consumers' intention to adopt bicycle-sharing services.

Subjective Norm

Subjective norm refers to the social pressure individuals perceive when making decisions about whether to perform a particular behavior (Botetzagias et al., 2015), it reflects the influence of significant others or groups on individuals' behavioral decisions. Subjective norm of social individuals is the internalized norms and the sense of moral obligation of self (Wang et al., 2019), which is a function of a social individual's normative beliefs about what others in society think he or she should or should not do, and the motivations he or she should follow (Ajzen & Fishbein, 1980). Certain previous studies have shown that SN may exhibit the weakest predictive ability in the theoretical model of TPB (Wang & Wong, 2021), one important reason is that the tendency of social individuals' consideration overshadows the influence of perceived social pressure in specific behavioral situations (Ajzen, 1991). However, other studies have shown that SN positively and significantly influenced an individual's green purchase intention (Wang et al., 2022b), for instance, Ulker-Demirel and Ciftci (2020) found that SN positively influences individuals' green purchase intentions and behavior toward green consumption. Therefore, the following hypothesis is proposed for testing:

H2: SN positively significantly influences consumers' intention to adopt bicycle-sharing services.

Perceived Behavioral Control

Perceived behavioral control refers to an individual's perception of how easy or difficult it is to perform a particular behavior (Wang & Wong, 2021). According to Ajzen (1991), an individual's perception of the difficulty of performing an action is pertaining to the individual's perceived ability to perform the action (Botetzagias et al., 2015). The more control a person has over the obstacle, the more engaged he or she will be in the behavior (Nimri et al., 2020). Thus, the concept of PBC can be understood as the personal beliefs of individuals that they have complete control over performing or carrying out certain actions that they want to do (Wilson & Edelyn, 2022). In this circumstance, PBC is important in determining or ensuring that a particular behavior can actually be performed. Generally, PBC has high explanatory power in situations characterized by high behavioral costs and strong constraints (Steg & Vlek, 2009), and some studies found that there is a positive relationship between PBC and green purchase intention (Mohiuddin et al., 2018; Nimri et al., 2019). Nevertheless, certain studies did not detect a relationship between PBC and green purchase behavior (Sutikno et al., 2020). Thus, the following hypothesis is proposed:

H3: PBC positively significantly influences consumers' intention to adopt bicycle-sharing services.

Convenience

The accessibility of the services and facilities offered to consumers is represented by convenience motivation (Teng et al., 2020). The approach and location of products or services are a crucial economic decision for service providers since it has a significant impact on how consumers make decisions, and favorable locations affect the products' profitability and future development potential (Puciato, 2020). It gives consumers the flexibility of time and place in relation to many aspects of their behaviors (Wang et al., 2021a). Bicycle-sharing service is seen as a new mode of transportation with low-carbon and low-cost advantages that can effectively ease traffic congestion (Zhu et al., 2022). Before bicycle-sharing services, individuals mainly relied on walking, the bus, the subway, or a combination of these forms of transportation. With the advent of bicycle-sharing services, individuals are turning to them as an alternative or supplement to walking and taking the bus because they can reduce walking time and are convenient for residents to use green transportation. Specifically, in the case of a closer distance, the advantages of using bicycle-sharing services with convenience and flexibility attributes are more prominent. Certain studies have shown how convenience positively influences individuals' choices; for example, Wang et al. (2021a) found that convenience positively and significantly influences consumers' green purchase intention to select green hotels. Yang et al. (2012) reported that the high explanation capacity of convenience is a determinant of Chinese consumers' attitudes toward making travel decisions. Based on the above discussion, it is believed that when individuals are faced with a series of reasons, such as time shortage, distance with strong travel flexibility, green savings, convenience, speed, and environmental pollution, they are more willing to use bicycle-sharing service as a mode of transportation. Thus, the following hypothesis is proposed:

H4: Convenience positively significantly influences consumers' intention to adopt bicycle-sharing services.

Method

Data Collection

The purposive sampling technique was used as it allows researchers to use self-judgment in selecting the respondents that have the best fit to answer the researchers' questions (Neuman, 2002). A total of 300 questionnaires were distributed to college students at Xuzhou University in Xuzhou City, Jiangsu Province, China from December 1 to December 31, 2022. Because Chinese young generation expressed a high intention to use novel products and services in the future (Wang et al., 2022c) and the young generation are better educated and more concerned and knowledgeable about environmental issues (Varah et al., 2021), and they like sustainable

lifestyles and are often ready to adopt innovative and green technology and green products and services (Wang et al., 2022c). All of the questionnaires were distributed to multiple majors (i.e., hospitality and tourism management, marketing, international trade, and e-commerce). To ensure anonymity for all respondents, they browsed the largest free online survey questionnaire collection website (i.e., https://www.wenjuan.com) to complete the questionnaire using a scanned WeChat OR code to assure confidentiality and reduce possible pressure from surveyors. Overall, a total of 234 valid questionnaires were collected for analysis, with 66 of these being incomplete resulting in a response rate of 78%, which is in line with Sekaran's (2006) recommendation that a sample size larger than 30 and less than 500 was adequate for most research. In addition, a pilot test was conducted involving 30 respondents to ensure that the questionnaire was reliable and valid and to avoid any issues that might negatively affect the results.

Operationalization

A closed-ended questionnaire that incorporates a set of verified scales was adopted in this study. The first section consists of the components of TPB and added variable: convenience. Four items were used to measure attitude were adapted from Wang and Wong (2021). Three items were used to measure SN and another three items to measure PBC were adapted from Wang et al. (2023). Four items were used to measure intention were adapted from Bashir et al. (2019). Last section introduced relevant demographic characteristics: age, gender, monthly expenditure, and major. The questionnaire items utilized a 5-point Likert scale, ranging from "strongly disagree" to "strongly agree."

Data Analysis and Results

Demographic Characteristics

Table 1 shows the demographic characteristics of the sample. Among 234 usable questionnaires, 50.4% were female, 23.1% were aged 19 years old, 30.8% spent 2001–2500 Chinese yuan per month and most of respondents (39.3%) studied in hospitality and tourism management.

Descriptive Statistics

The Cronbach's alpha value of 0.7 and above was considered as acceptable (Hair et al., 2010). The results showed that the Cronbach's alpha value raged from 0.898 to 0.96, indicating reliability was established. The Kaiser–Meyer–Olkin (KMO) and Bartlett's test showed that the KMO measure of sampling adequacy value was 0934 > 0.7, approximate chi-square was 4649.479, $df=136$, and $p < .001$, indicating data adequacy. The exploratory factor loading showed that factor loadings ranged from 0.44 to 0.907, which exceed Tabachnick and Fidell (2012) suggested that 0.32 as a good rule of thumb for the minimum loading of an item. In addition, for measuring the multicollinearity issue, the results showed that variance inflation factor (VIF) value ranged from 1.676 to 2.939 < 5, and the tolerance value ranged from 0.34 to 0.597 > 0.2, indicating multicollinearity is not an issue for this study. Furthermore, the results showed that the skewness ranged from -1.809 to -0.615, kurtosis value ranged from -0.494 to 3.807. According to Byrne (2016), skewness ranges from -2 to +2, and kurtosis ranges from -7 to +7 exhibit a stronger deviation from normality. Thus, the results indicated normality was present (Table 2).

Regression Analysis

The last step was performing the regression analysis for this study. The model summary showed that $R=0.883$, R-square$=0.779$, adjusted R-square$=0.776$. The analysis of variance results showed that sum of squares$=140.693$, $df=4$, mean square$=35.173$, $F=202.332$, and $p < .001$. The regression results are shown in Table 3.

Discussion and Conclusion

The results of this study support the validity of the theoretical foundation used in this study. The findings showed a positive correlation between attitude and intention ($\beta=0.445$, $p < .001$). This result is consistent with those reported in previous studies that showed attitude was an important variable that influenced consumers' green purchase intention (Wang et al., 2020; Wang et al., 2021b). Thus, H1 is supported. The results also showed that SN positively and significantly influenced intention to adopt bicycle-sharing services since $\beta=0.264$, $p < .001$. These findings also correspond to past studies that

Table 1.
Demographic Characteristics (N=234)

Items	Characteristics	Frequency	Percentage (%)
Gender	Male	116	49.6
	Female	118	50.4
Age	Below 18	39	16.7
	18	44	18.8
	19	54	23.1
	20	31	13.2
	21	28	12.0
	22	25	10.7
	Other	13	5.5
Monthly expenditure	Below 1500	33	14.1
	1501–2000	57	24.4
	2001–2500	72	30.8
	2501–3000	35	15.0
	Above 3001	37	15.8
Major	Hospitality and tourism	92	39.3
	Marketing	76	32.5
	International trade	41	17.5
	e-Commerce	25	10.7

Table 2.
Descriptive Statistics Results

Variable (Cronbach's Alpha)	Item	Factor Loading	Standard Deviation	Kurtosis	Skewness	Tolerance	VIF
Attitude (β = 0.932)	For me, use a bicycle-sharing service is:					0.340	2.939
	1. Extremely undesirable/desirable	0.785	0.812	1.962	-1.442		
	2. Extremely unpleasant/pleasant	0.810	0.809	3.261	-1.709		
	3. Extremely foolish/wise	0.447	0.907	2.214	-1.529		
	4. Extremely negative/positive	0.440	0.833	1.357	-1.240		
SN (β = 0.952)	1. Most people who are important to me think I should use bicycle-sharing service	0.819	1.224	-0.494	-0.615	0.597	1.676
	2. Most people who are important to me would want me to use bicycle-sharing service	0.907	1.190	-0.375	-0.641		
	3. People whose opinion I value would prefer me to use bicycle-sharing service	0.793	1.091	-0.375	-0.631		
PBC (β = 0.898)	1. I am confident that if I want, I can use bicycle-sharing service	0.809	0.913	1.895	-1.467	0.594	1.683
	2. Whether or not I use bicycle-sharing service is entirely up to me	0.762	0.855	1.107	-1.242		
	3. I have resources, time, and opportunities to use recycle-sharing service	0.780	1.002	0.780	-1.169		
Convenience (β = 0.96)	1. The current location of the bicycle-sharing service is only one taken into account	0.806	0.834	3.807	-1.809	0.360	2.776
	2. The location of bicycle-sharing service is the most important factor for me	0.740	0.852	2.388	-1.553		
	3. My decision of choosing bicycle-sharing service results from some stimulating activities undertaken by local or regional authorities	0.776	0.861	2.514	-1.593		
Intention (β = 0.942)	1. I am willing to use bicycle-sharing service	0.641	0.882	1.922	-1.366		
	2. I plan to use bicycle-sharing service	0.702	0.990	0.696	-1.089		
	3. I plan to recommend bicycle-sharing service to others	0.668	0.919	0.781	-1.097		
	4. I will make an effort to use bicycle-sharing service	0.619	1.019	1.084	-1.279		

showed that SN positively influenced intention toward green consumption (Wang & Wong, 2021; Wang et al., 2022b). Thus, H2 is supported. Furthermore, the results of this study showed that PBC positively influenced intention (β=0.092, $p < .05$). This is consistent with many previous studies which showed that PBC positively influenced an individual's green purchase intention and behavior (Fauzi et al., 2022; Sutikno et al., 2020). Thus, H3 is accepted. In addition, the results showed that

Table 3.
Regression Results

Items	Parameter	Standardized Coefficient Beta	*t*	Significance	Decision
H1	Attitude → intention	0.445	8.371	***	Supported
H2	Subjective norm → intention	0.264	6.575	***	Supported
H3	Perceived behavioral control → intention	0.092	2.292	0.023	Supported
H4	Convenience → intention	0.224	4.329	***	Supported

***$p < .001$.

convenience positively significantly influenced the intention to adopt bicycle-sharing services (β=0.224, $p < .001$). This finding is in line with previous studies showing that convenience positively influences one's decision-making process (Puciato, 2020; Wang et al., 2021a). Thus, H4 is supported.

Some theoretical contributions can be concluded from this study. First, many researchers suggested that the TPB model is a flexible one compared to other theories since it allows researchers to incorporate some new variables into it. The results of this study showed that not only the original components of TPB (i.e., attitude, SN, PBC) can exert a certain level of function that influences one's intention, but also convenience plays an important role in determining consumers' intention to adopt bicycle-sharing services. Second, most previous studies focused on the influence of individuals' external environmental characteristics on their bicycle-sharing service intention. Few studies have investigated the influence of the relationship between consumers' attitudes and intentions. The current study showed that consumers' attitudes play the most important role in determining their intention to adopt bicycle-sharing services. Lastly, there have been limited investigations into bicycle-sharing services in China, resulting in the lack of standardized foundation. The findings of this study offer valuable insights into the significance of the TPB model in assessing the influence of convenience.

There were several practical implications for practitioners based on the findings of this study. First, a better understanding of the various attitudes can benefit bicycle-sharing service providers. For example, educating individuals that using bicycle-sharing services is a wise and positive decision can boost their actual pro-environmental behaviors. Since SN positively influenced one's intention to adopt a bicycle-sharing service, therefore, advertising to the public is necessary to undertake. Perceived behavioral control also plays an important role in adopting bicycle-sharing services. Low price and discount strategies should be considered by practitioners. In addition, convenience positively influenced consumers' intentions to adopt bicycle-sharing services. Therefore, ease of use, findability, and returnability should be highlighted in bicycle-sharing service publicity. Hence, consumers will have a more positive evaluation of using bicycle-sharing services, more positive perceived perceptions from their significant others (e.g., close-friends, relatives, partners), high confidence to overcome the obstacles to using bicycle-sharing services, and an easy assessment to take actual actions, resulting in a high possibility of adopting such products.

Certain limitations were also revealed in this study. First, this study was conducted in a very limited location, focusing on Xuzhou City in Jiangsu Province, China. The sample respondents are college students who were studying in this city, and most of them were studying business-related majors (i.e., hospitality and tourism, marketing, international trade, e-commerce), and therefore are not representative of the population. Second, an individual's actual behavior is not equivalent to the stated behavioral intention. Thus, the mode used in this study should be duplicated and extended to other locations and different demographic groups in the future.

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