

Article

Influencing the Mechanism of Tourists' Choice of Green Transportation Modes—A Case Study of Beijing, China

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Abstract: This paper discusses the mechanism of tourists choosing green transportation means. Based on relevant research, this paper first constructed the concept of green transportation for tourist destinations. Then, based on the two theories of tourists' environmental responsibility behavior—the theory of planned behavior and the theory of norm activation, combined with the characteristics of tourists' demand for transportation in tourist destinations—a model aimed at influencing the mechanism of tourists' choice of green transportation was constructed. Two tools, SPSS24.0 and AMOS23.0, were chosen for data analysis to provide policy suggestions for the destination to promote the guide for choosing green transportation means and providing tourists with more satisfactory transportation.

Keywords: green transportation mode; tourists' choice; theory of planned behavior; norm activation theory; Beijing; urban transportation



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1. Introduction

With the acceleration of the urbanization process, traffic congestion has become one of the most serious problems in large urban agglomerations [1,2]. In China, with the increasing consumption capacity, the living standards of residents have improved, and the demand for transportation has increased [3,4]. As a result, private cars have become an affordable and popular means of transportation for many Chinese families [5,6]. The rapid economic growth and urbanization over the past few decades have been accompanied by serious air pollution problems in China [6–9]. This problem is particularly acute in large cities, such as Beijing, the capital of China. Thus, congested traffic and poor air quality cannot meet the growing needs of people for comfort and, therefore, hinder the development of urban tourism. In order to alleviate traffic congestion and pollutant emissions in Beijing, the transportation department has implemented a number of traffic policies aimed at reducing the frequency of use of fuel private cars and building a green transportation system. This is not only the direction of future development of urban transportation but also an important measure to alleviate traffic congestion and build a new type of tourist destination. Since the 18th National Congress of the Communist Party of China, environmental protection has taken precedence in governmental strategies and played an important role in social and economic construction. Advocating tourists to choose green transportation, which saves energy and reduces carbon emissions, is an important part of the construction of ecological development and an inevitable move to achieve a sustainable development of urban tourism.

Sustainable development can be defined as a concept of introducing structural change to a society so that development does not physically and socially overwhelm the local community in the sense that it would threaten growth through social unrest, environmental pollution, or resource depletion [10,11]. Sustainable tourism, a subset of sustainable development, is “tourism that takes full account of its current and future economic, social

and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities" [12,13]. Scholars advocate sustainable tourism development in the sense that, besides the positive effects it produces, tourism can also have a number of adverse consequences for local residents [14–18].

In order to achieve sustainable tourism development in a destination, it is important to urgently encourage the development of green transportation. Green transportation refers to a diversified transportation system that revolves around effectively and efficiently using resources, changing transport structure, and making more environmental choices, including carpooling, public transportation, bicycles, and walking [4,19]. According to Björklund [20], green transportation can be defined as "a transportation service with less negative impact on human health and the environment compared to existing transportation services". Constructing a green transportation system and practicing the concept of green transportation requires not only the improvement of technology, policies, and other objective aspects but also the exercise of individual subjective initiatives.

However, many previous studies on green transportation mostly focused on the construction of a green transportation system and the choice of green transportation methods for residents. Tourists, as major users of destination transportation, have sometimes not been considered. In this context, it is, therefore, necessary to study the mechanism of influence of tourists' choice of green transportation. Under the above-mentioned realistic and theoretical background, this paper focuses on the choice of green transportation modes after tourists arrive at their destinations and takes Beijing as a case study. Traffic congestion is a very critical problem in Beijing, which has experienced severe air pollution in recent decades [21,22], as the capital sees tourism as a pillar industry to build a "world-class harmonious and livable city" [23]. The large number of tourists each year poses new transportation challenges. According to the "2019 Beijing Traffic Development Annual Report" [24], the number of private motor vehicles in Beijing is constantly increasing. In 2018, the total number of trips to Beijing's downtown area on a working day was 39.21 million, with an estimated annual increase of 0.8%. In the same year, Beijing received 310 million domestic tourists, an increase of 4.6% over the previous year, with an annual increase of 2.0% [25]. The demand for tourist travel is growing rapidly, resulting in significant tourist traffic. If calculated based on the traffic demand of at least one trip per person (from the departure point to the destination point and then back to the departure point), the tourist traffic demand in Beijing in 2018 was at least 680 million people. In addition, traffic congestion has also led to a series of urban environmental pollution problems. According to the results of the source analysis of PM_{2.5} (particulate matter less than 2.5 µm in diameter) in Beijing in 2018, the contribution of mobile sources including vehicles and nonroad mobile machinery was 45%, and the control of emissions from vehicles is critical for improving the air quality of Beijing in the future [26,27].

This research mainly studies the tourists choosing to use green transportation modes in the specific situation of leaving their usual environment to travel to their destination and analyzes the internal mechanism behind this choice behavior in order to provide theoretical support for Beijing to formulate relevant green transportation promotion policies.

2. Theoretical Basis and Hypotheses Development

2.1. Theoretical Basis

2.1.1. Theory of Planned Behavior

Fishbein and Ajzen [28] first proposed the theory of reasoned action (TRA), which hopes to make a relatively accurate prediction of individual behavior decisions by studying factors such as beliefs, attitudes, and intentions of behavioral decision makers. This theory has two basic assumptions: one is that individuals make decisions of their behavior according to their own wishes; the other is that the implicit meaning of their own behavioral decisions and corresponding behavioral actions are considered before individuals make behavioral decisions [28]. According to the theory of rational behavior, the intention to act is the main reason that determines the performance of a particular behavior of an individual.

At the same time, individual behavioral attitudes and subjective norms will have a joint impact on the travel intention. The theory of reasoned action is mainly studied through indicators such as behavioral attitudes, subjective norms, and behavioral intentions that guide individuals in the decision-making process. Its theoretical framework is shown in Figure 1.

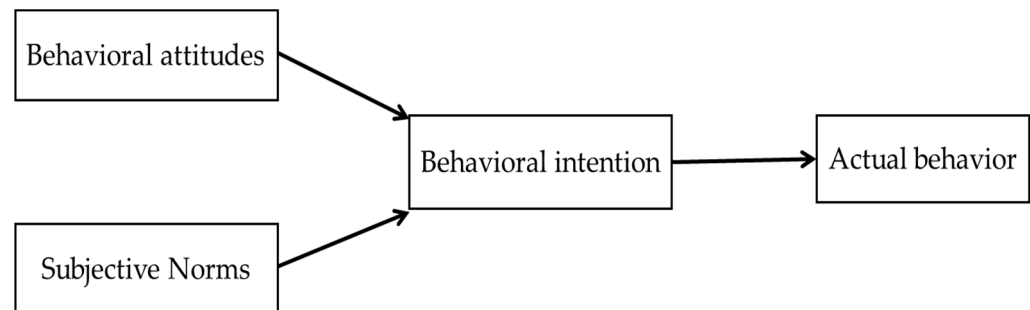


Figure 1. Theory of reasoned action model.

Although rational behavior theory is a well-known attitude–will–behavior model, prior studies have shown that it still has great limitations. First, two assumptions of rational behavior theory may lead to inaccurate predictions of behavior. On the one hand, it argues that final behavior is only determined by the individual’s intention to act and that other important factors can be ignored; on the other hand, it believes that the individual’s decision making is completely rational and will not be affected by external factors. But in actual behavioral decision making, external factors are often very important influencing factors in the final decision, that is, when the theory of rational behavior is limited by external factors such as environment or resources, actors cannot make behavioral decisions completely according to their individual will; then, the validity of the theory will be limited. Ajzen was aware of this problem, and after a series of studies, he found that the theory of rational behavior does not take the external environment into consideration and ignores the situation where decision makers are confused by the external environment. Therefore, he believed that decision makers can only better predict actual behavior when they are fully in control of their own behavior. In order to improve the shortcomings of this theory, Ajzen added the Perceived Behavior Control variable (PCB) to the framework of the reasoned action theory, which means that an individual’s behavior and intention can be explained and predicted using the variables, Attitude Toward the Behavior (ATB), Subjective Norm (SN), and Perceived Behavioral Control (PBC), forming the Theory of Planned Behavior (TPB) [29], as shown in Figure 2. Moreover, through the Perceived Behavioral Control (PBC), the figure shows that external factors can directly affect the behavior regardless of the intention.

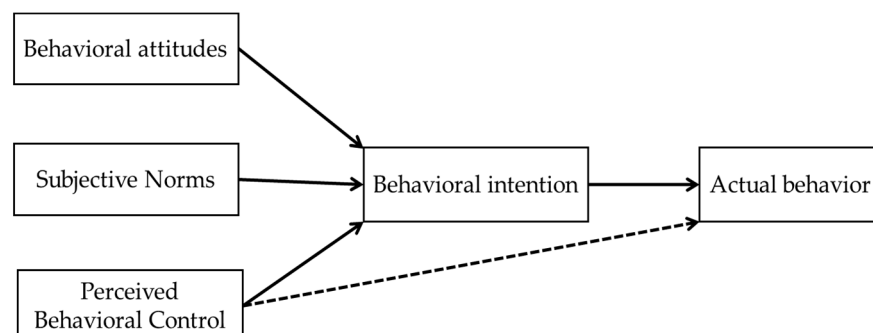


Figure 2. Theory of planned behavior (TPB) model.

This paper takes the theory of planned behavior as the first important theoretical basis. On the one hand, it is through the systematic integration and analysis of existing academic

and empirical research results that domestic and foreign scholars generally agree that the theory of planned behavior can better predict the actual behavior of decision makers [30]; it is an important theory in the field of behavioral research. On the other hand, the theory of planned behavior has been widely applied in the field of research tourism [31–34], which confirms that the theory has good predictive and explanatory influence, and it is very important to choose such a mature theory as the basis for this paper.

2.1.2. Norm Activation Theory

The norm activation model (NAM) was first proposed by Schwartz in 1973 and has been considered an important theory in the field of social psychology to study prosocial behavior. The basic premise of the theory is that personal norm is the most important and proximal determinant of pro-social behavior [35,36]. Within the norm activation framework, problem awareness and ascribed responsibility act as significant activators of personal norm [37–40]. In other words, the core idea of this theory is that the activated personal norms can affect an individual's environmental behavior, emphasizing the difference between individual norms and social norms. The norm activation theory emphasizes that personal norms are a restraining force born from within consumers, and compliance with personal norms can bring consumers a sense of pride and self-esteem. At the same time, the norm activation theory also points out that the two prerequisites for the activation of personal norms are as follows: first, individuals must realize that failure to perform prosocial behaviors will cause adverse consequences to others, that is, Awareness of Consequence (AC); second, individuals must feel responsible for these adverse consequences, that is, responsibility attribution (Ascription of Responsibility, referred to AR). When one of the two conditions is met, personal norms can be activated, and activated personal norms can affect individual behavior; the relationship diagram between the variables in the norm activation theory model is shown in Figure 3 [41]. The norm activation theory is mainly composed of three variables: Awareness of Consequence (AC), Ascription of Responsibility (AR), and Personal Norms (PN). In this model, internal values and norms are the driving force of helping behavior, and the activation of the two forms the people's sense of moral obligation which is the individual norm.

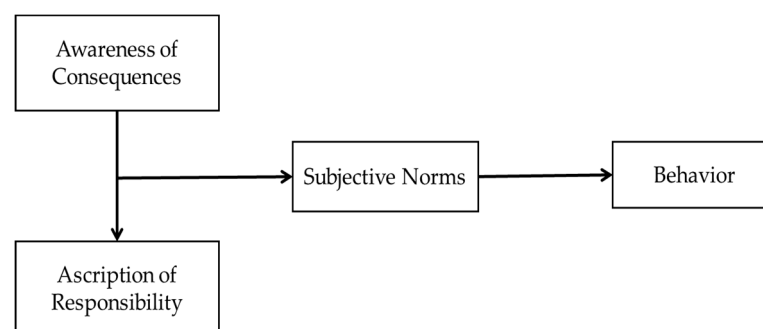


Figure 3. Norm activation model.

This paper uses the norm activation theory as the second theoretical basis, on the one hand, because it has been widely recognized by the academic community since its introduction. Many scholars have since conducted behavioral research on environmental protection based on the theory of norm activation [42]. On the other hand, the theory emphasizes the role of individual norms in environmental behaviors, which is not mentioned in the theory of planned behavior [43]. The choice of tourists to take green transportation in their destination is essentially a pro-social behavior or environmentally responsible behavior, which is a kind of altruistic behavior. This paper argues that tourists who implement this altruistic behavior will be influenced not only by the opinions of others (i.e., the subject norm in the theory of planned behavior) but also by their personal cognition of the impact of taking green transportation on destinations (i.e., individual norms in norm activation

theory). Therefore, the combination of the norm activation theory and planned behavior theory helps test whether the theories are applicable to this study of tourists' choice behavior of green transportation modes in the destination and whether it is an extension of the two theories and enriches their content.

2.2. Hypotheses Development

2.2.1. Background Factors and Behavioral Attitude, Behavioral Intention and Actual Behavior

In 2006, Maria demonstrated that among different travel modes, people prefer flexibility, environmental protection, and comfortable means of transportation [44]. Steg [45] showed that attributes such as comfort, flexibility, independence, and other influences are still prominent today and have negative impacts on the choice of green transportation methods. In addition, Kinsella and Caulfield concluded that tourists have different transportation needs compared to the local public [46,47]. The attitude–behavior–situation theory proposed by Stern [39] posits that individual behavior is the product of the interaction between individual attitude variables and objective situational factors or that people's behavior is not only affected by variables of individual attitude but also by situational factors. Therefore, while considering the influence of consumers' individual factors on their choice of transportation mode, the potential impact of external factors (such as rules and regulations, environmental impact, and publicity) on the choice behavior of tourist transportation methods should also be taken into account. The following assumptions are put forward:

Hypothesis H1. *Background factors have a positive impact on behavioral attitudes.*

Hypothesis H2. *Background factors have a positive impact on actual behavior.*

Hypothesis H3. *Behavioral attitudes have a mediating effect on the relationship between background factors and behavioral intentions.*

2.2.2. Behavior Attitude and Behavior Intention

In the process of personal growth influenced by the environment, education, and the social status and identity formed in the personal development, each person forms a relatively stable psychological character. These conditions will affect the traveler's psychological activities and behavioral results in the process of tourists choosing travel methods [48]. Traditional research on consumer behavior views customers as rational people. Holbrook and Hirschman [49] pointed out that although the information processing model can explain the purchase behavior of most customers, traditional research has neglected the important aspect of customer experience characteristics. Black [50] helped us understand this through the emotional attitude which he defined as a series of emotions such as excitement, happiness, and boredom brought about by the travel mode. Morris et al. [51] found that for residents, cycling brings the most positive emotions, followed by cars and finally public transportation and walking. Therefore, the following assumption is made:

Hypothesis H4. *Behavioral attitudes have a significant positive impact on behavioral intentions.*

2.2.3. Personal Norms and Intention to Behave

Schwartz [52] defined personal norms as a value-based self-expectation that reflects an individual's perceived sense of obligation or responsibility in implementing environmentalism. Halpern et al. [53] believed that compared to the sense of obligation, residents rely more on the sense of responsibility to implement genuine environmental protection behaviors. Bamberg et al. [54] found that guilt is also a component of personal norms, and it also has a significant effect on the choice of car when traveling. As for Wood et al. [55], they believe that individuals' choice of travel mode is strongly influenced by habits. Verplanken et al. [56] reduced the role of habits by encouraging residents to think carefully before choosing a travel mode. Knowledge is also put forward and defined by Anable et al. [57]

as an individual's scientific understanding of the reality of environmental changes (need awareness) and of the environmental consequences of one's own methods of travel (result awareness). Antimova et al. [58] believed that only when residents realize that car use will harm the environment and think that they should take responsibility for it, personal norms will be activated. For this, the following assumption is proposed:

Hypothesis H5. *Personal norms have a significant positive impact on the intention to choose green transportation modes.*

2.2.4. Group Norms and Behavioral Intention

According to Moutinho [59], individuals or any related group can exert a key influence on an individual's beliefs, attitudes, and choices because an individual may submit to their group. Park [60] clarifies that subjective norms are essentially social attributes and that an individual considers whether they should perform a certain behavior based on the opinions or perspectives of those who are important to them and behaves in a specific way according to perceived social pressure behavior. Nicholls and Sandipa [61] added that if people around them continue to use cars to have a higher-quality travel experience, it is difficult for individuals to rely on their own moral standards to criticize the behavior of people around them as abnormal. For this, the following assumption is made:

Hypothesis H6. *Group norms have a significant positive impact on behavioral intentions.*

2.2.5. Perceived Behavioral Control

According to Chiou's theory [62], perceived behavioral control reflects an individual's beliefs regarding the resources and opportunities necessary to perform a behavior. The residents who frequently use cars often have a one-sided or poor perception of other modes of transportation, leading to the formation of false control beliefs. Therefore, reshaping control beliefs may be an effective way to change the travel methods of these residents. Mill [63] proposed that an individual's level of health regulates the intensity of their behavior, and the relationship between the two has long been recognized in the tourism industry. In addition, the familiarity of tourists with the destination also determines the use of a certain mode of transportation [64]. Therefore, when travelers choose travel time and travel routes, their past travel experience is very important. In summary, the following hypotheses are put forward:

Hypothesis H7. *Perceived behavioral control has a significant positive impact on tourists' intention to choose green transportation modes.*

Hypothesis H8. *Perceived behavioral control has a significant positive impact on tourists' choice of green transportation modes.*

2.2.6. Choice Intention and Choice Behavior

The main point of the theory of planned behavior is that since the actual behavior of the individual is difficult to predict, it is very important to infer the behavior according to the intention. The individual behavioral attitude and subjective norms will lead to behavioral intention, and individual willpower will directly affect actual behavior [28]. This indicates that people's rational behavior is actually behavior that can both satisfy one's wishes and meet the expectations of others. Many scholars have verified this conclusion in the development and explanation of the theory of planned behavior [65]. Therefore, the following assumption is proposed:

Hypothesis H9. *Intention to choose has a significant positive impact on choice behavior.*

3. Materials and Methods

3.1. Model Construction

According to the theory of planned behavior, the behavior and attitude of tourists in choosing a transportation mode in a destination mainly depends on the performance of the transportation tool itself and the psychological feelings caused by the choice of this transportation mode [28]. Different travel purposes are accompanied by different psychological activities. A successful travel purpose largely depends on the level of service provided by the transportation mode to satisfy the demander, as well as the convenience, economy, comfort, and safety of the transportation means. Gender, as well as the quality of services provided by the transport sector, will affect the traveler's choice of transportation means [66]. Therefore, first, background factors are added based on the original model. The behavioral intention of tourists choosing green transportation for their destinations is a variable that determines whether or not tourists really choose green transportation, and it is affected by tourists' attitudes towards transportation. The psychological experience of liking or disliking when choosing the tourist transportation mode is the positive or negative evaluation of tourists on participating in low-carbon tourism. Behavioral attitude positively affects behavioral intention, that is, the more positive the behavioral attitude, the stronger the individual's intention to perform a specific behavior, and vice versa. Second, norms also affect tourists' intention to choose green transportation modes. Based on the objective norms of the theory of planned behavior, the model adds subjective norms, which jointly affect tourists' intention to choose green transportation modes. Finally, the third factor affecting the behavioral intention is perceived behavioral control, which includes the tourists' familiarity with destinations that will have an impact on tourists' intention to choose green transportation methods. In addition to the above four main influencing variables, the demographic characteristics of tourists, including gender, age, income, education level, occupation, family structure, etc., as control variables also affect tourists' intention to choose green transportation modes for their destinations. Therefore, the model of the influence on the mechanism of tourists choosing green transportation mode for their destinations is constructed, as shown in Figure 4.

3.2. Structural Equation Modeling

3.2.1. Construction of Structural Equation Model

Using AMOS23.0, the seven latent variables: background factor (BF), behavioral attitude (ATB), subjective norm (SN), group norm (GN), perceived behavioral control (PCB), behavioral intention (BI), and actual behavior (AB) were used to plot the graph shown in Figure 5. Then, the maximum likelihood estimation method was used to conduct first-order confirmatory factor analysis on the model to evaluate the overall fitting degree of the model and import the corresponding questionnaire data into the model to obtain the non-standardized coefficient path diagram (Figure 6). This also helped to analyze the relationship between variables parameter estimates at the confidence level and the relationship between the latent variables combined with the standardized path coefficients.

3.2.2. Evaluation of Model Fitness

One of the primary criteria for the fitness of the structural equation model is to determine whether the chi-square statistic can pass the test. If the P-statistic is less than 0.05, it means that the model is acceptable, but using the chi square statistic alone to test the value is not very reliable. If the sample size is small, the chi-square test T-statistic may deviate from the chi-square distribution. If the sample size is large, the chi-square test T-statistic needs to maintain a significant statistical testing power to avoid being rejected due to the minimal difference between the sample covariance matrix and the adaptation model reflected by the test statistic. In addition, the data structure of the test statistic must satisfy the multivariate normality setting, and if this condition is violated, it will also deviate from the chi-square distribution. In the evaluation of the model, the fitting results of the indicators should be comprehensively considered. If the expected standard is not

met, the current model must be corrected on the basis of the theory by adding, deleting, or changing variables and paths in order to achieve the best fit [67].

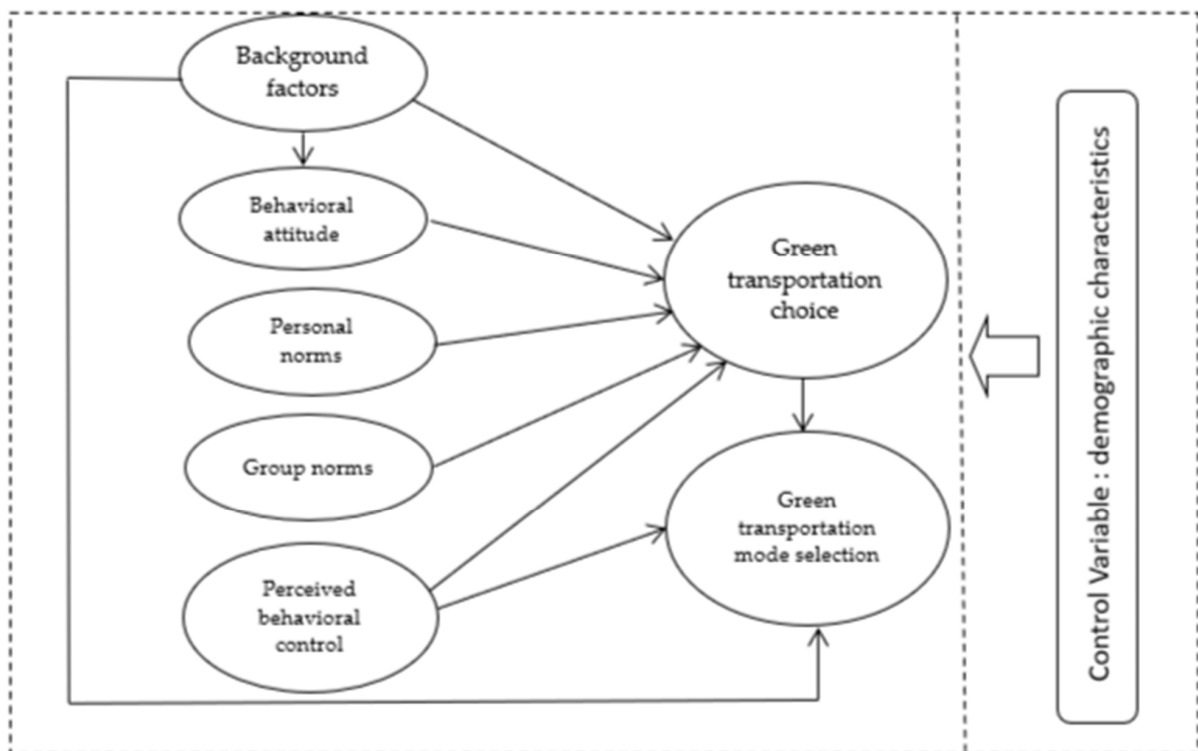


Figure 4. Model of the influence on tourists' choice of green transportation modes.

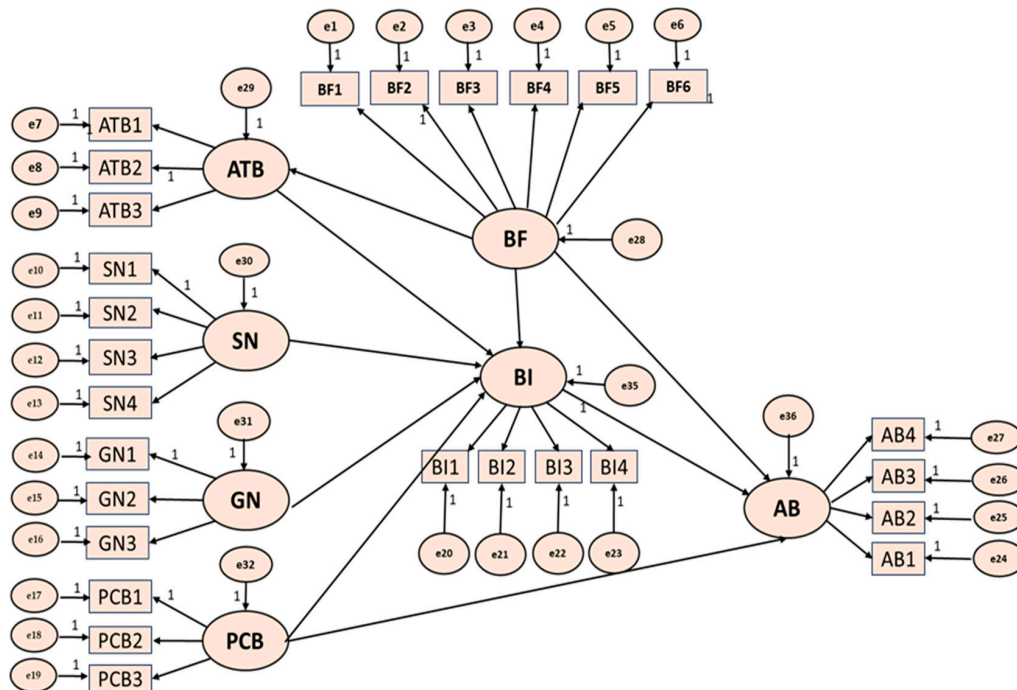


Figure 5. Initial model diagram. 1 = Default path coefficient.

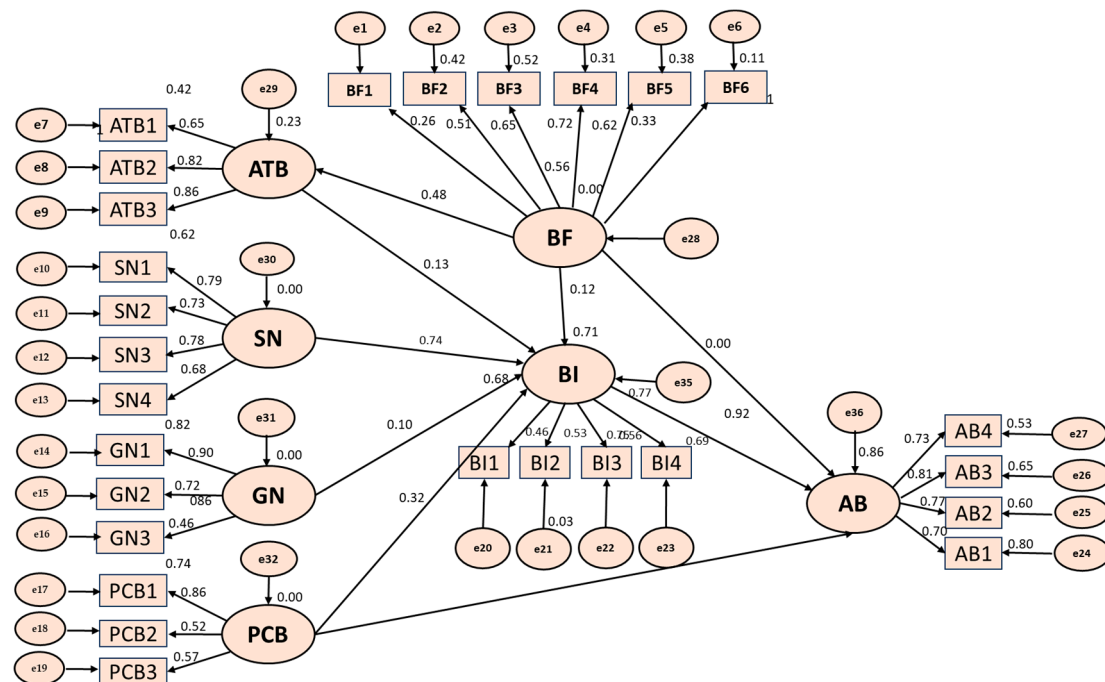


Figure 6. Normalized path coefficient diagram. Standardized path coefficient. Numbers indicate a positive relationship which is stronger towards 1.

According to AMOS23.0 software, the test results of the initial model of this study are shown in Table 1. The value of the chi-square degree of freedom ratio (CMIN/DF) is 4.260, which is greater than 3 and less than 5, indicating that the model can be analyzed, but the fit is not suitable (poor fit). Therefore, the model needs to be corrected.

Table 1. The fitting results of the structural equation model test.

Statistical Quantity Test	CMIN/DF	RMSEA	GFI	AGFI
Fitting criteria	<3	<0.08	>0.9	>0.9
Test results	4.260	0.108	0.731	0.677
Judgment of suitability	No	No	No	No

3.2.3. Model Corrections

If the assumed model fails to fit the data observed via the fitness test, it means that the model must be revised. In this paper, according to the actual data situation, a total of three revisions were made to the model.

After the first operation, according to the model correction index, the correlation between e30 and e31, e30 and e3 were added, and the relationship between BF (background factor) and AB (actual behavior), as well as PCB (perceived behavior control) and AB (actual behavior), were removed. That is, assuming H2 and H8, the premise for deleting the path is that the fitting degree of the model does not change significantly, and the chi-square value does not increase significantly. In theory, it can be explained that background factors have no direct influence on actual behavior, and perceived behavior control has no direct influence on actual behavior, and the path of SN (subjective norm) to GN (group norm) is added, as shown in Figure 7.

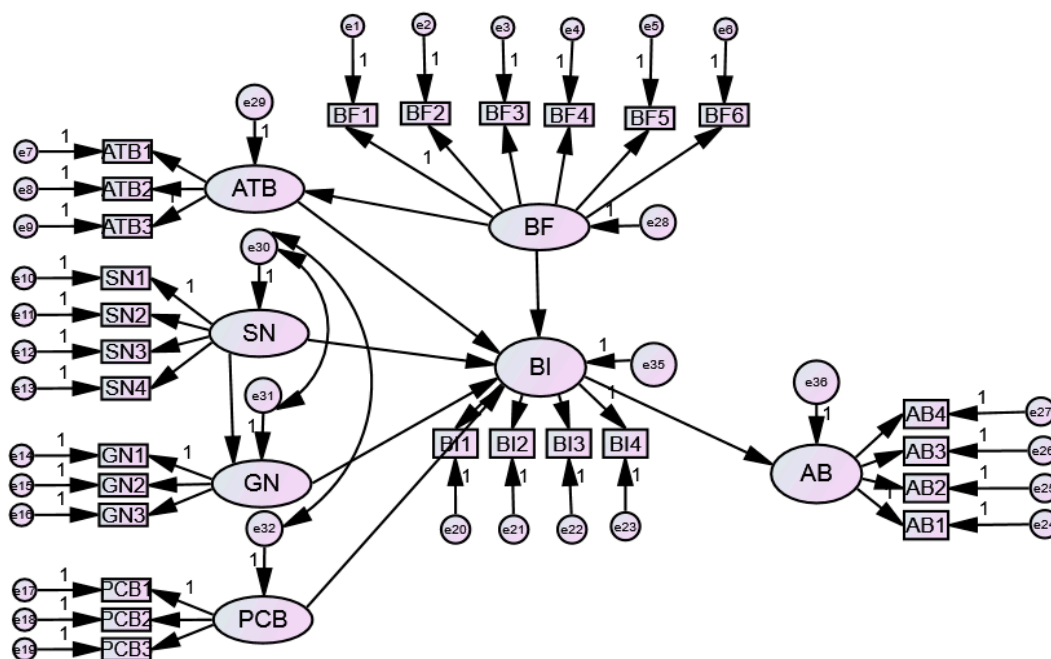


Figure 7. Model diagram after the first revision. 1 = Default path coefficient.

After the first model correction, it was found that the fitness index still cannot meet the optimal fit standard (Table 2), and further model correction was required. Based on the model correction index, there was an increase in the correlation between e1 and e2, e29 and e30, e28 and e30, and the influence of SN (subjective norm) on ATB (behavioral attitude), as shown in Figure 8.

Table 2. Fitting results of the structural equation model test after the first revision.

Statistical Quantity Test	CMIN/DF	RMSEA	GFI	AGFI
Fitting criteria	<3	<0.08	>0.9	>0.9
Original model	4.260	0.108	0.731	0.677
Judgment of suitability	No	No	No	No
After first correction	3.094	0.086	0.812	0.774
Judgment of suitability	No	No	No	No

After the second model revision, it was found that CMIN/GF and RMSEA had met the fitting index, but GFI and AGFI had not yet met the optimal fitting standard (Table 3), so a third revision of the model was required. According to the model correction index, there was an increase in the correlation between e21 and e25 and the correlation between e20 and e24 (Figure 9).

Table 3. Fitting results of the structural equation model test after the second revision.

Statistical Quantity Test	CMIN/DF	RMSEA	GFI	AGFI
Fitting criteria	<3	<0.08	>0.9	>0.9
Original model	4.260	0.108	0.731	0.677
Judgment of suitability	No	No	No	No
After first correction	3.094	0.086	0.812	0.774
Judgment of suitability	No	No	No	No
Second revision	2.355	0.069	0.842	0.807
Judgment of suitability	Yes	Yes	No	No

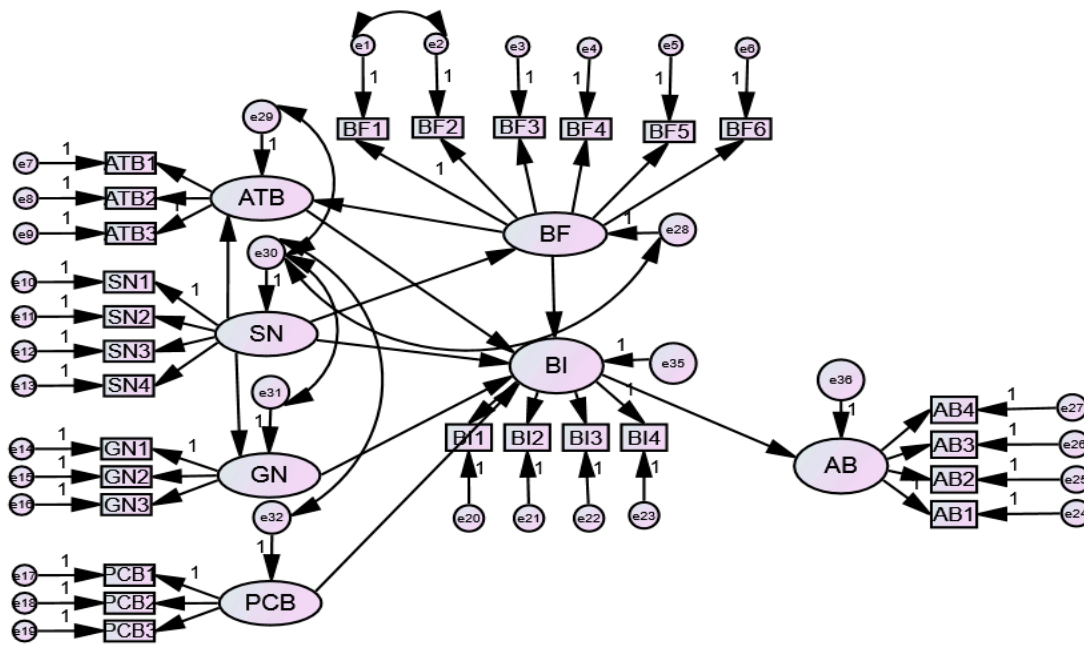


Figure 8. The model diagram after the second revision. 1 = Default path coefficient.

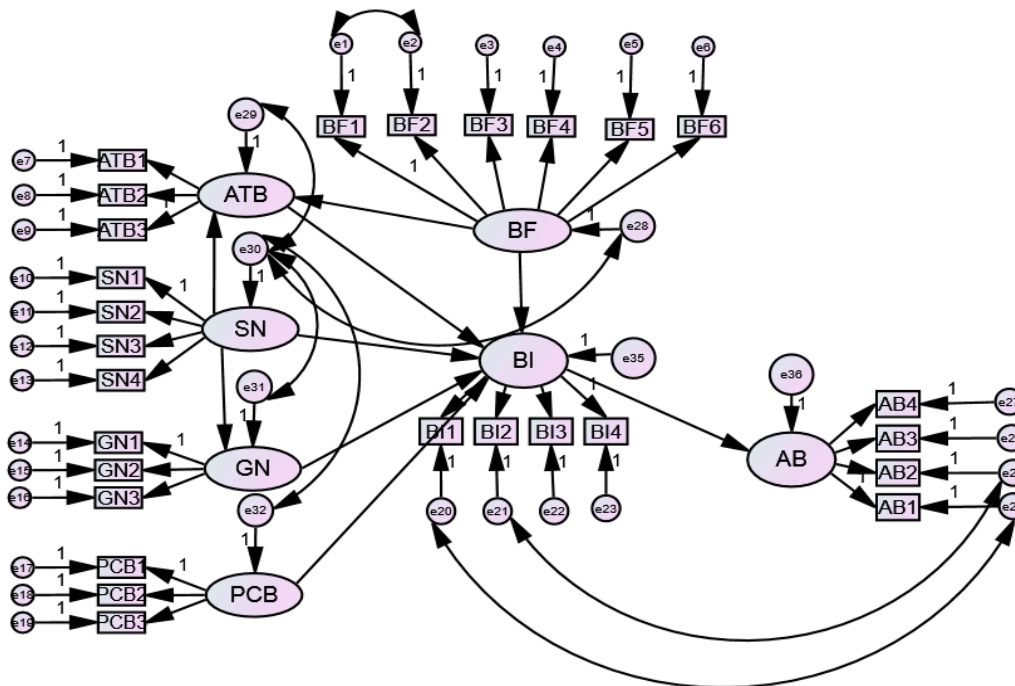


Figure 9. Model diagram after the third Revision. 1 = Default path coefficient.

The fitness after the third revision is shown in Table 4. The results showed that all fitness indicators met the optimal fitting standard, so the model could be accepted.

3.3. Data Collection

The research objects of this paper are the tourists who traveled to Beijing in 2019 and mainly chose green transportation when traveling. Data were collected mainly through on-line surveys supplemented by field surveys. The online questionnaire distribution method was inexpensive and quick to complete. It could avoid the cumbersome process of printing and data entry in traditional survey methods and overcome geographical limitations so that the survey scope could be wider and more representative. From 15 December 2019 to

24 December 2019, a 10-day questionnaire survey was carried out through the “Questionnaire Star” professional questionnaire survey website, WeChat, QQ, email and other online survey methods. Through online and on-site surveys, a total of 342 questionnaires were returned, of which 315 were valid, with an effective recovery rate of 92.3%.

Table 4. Fitting results of the structural equation model test after the third revision.

Statistical Test Quantity	CMIN/DF	RMSEA	GFI	AGFI
Fitting criteria	<3	<0.08	>0.9	>0.9
Original model	4.260	0.108	0.731	0.677
Judgment of suitability	No	No	No	No
After first correction	3.094	0.086	0.812	0.774
Judgment of suitability	No	No	No	No
After the second correction	2.355	0.069	0.842	0.807
Judgment of suitability	Yes	Yes	No	No
After the third revision	2.182	0.065	0.913	0.907
Judgment of suitability	Yes	Yes	Yes	Yes

3.3.1. Questionnaire Design

The questionnaire for this study is divided into three parts. The first part is the identification option, asking tourists whether they choose green transportation when traveling in Beijing, and by choosing “yes” or “no” to eliminate invalid questionnaires and identify valid samples, the research object of this paper being tourists who will choose green transportation in tourist destinations. The second part is the main body of the questionnaire. In social science research, the Likert scale is a widely used measurement tool. Therefore, this paper uses the 5-point Likert scale to measure the seven variables involved in this research according to user perception with “strongly disagree”, “disagree”, “neutral”, “agree”, and “strongly agree”. The third part is the personal information of the respondent, with a total of 7 options, including gender, age, marital status, occupation, education, monthly income, and travel companions.

A small-scale pre-investigation was conducted before the formal distribution of questionnaires to ensure the reliability and validity of the data obtained and the objectivity and accuracy of the conclusions. The pre-investigation was conducted on the campus by randomly distributing paper questionnaires at the entrance of the campus. In this pre-investigation, a total of 60 questionnaires were distributed. A total of 55 effective questionnaires were obtained by screening the answer results of the items, and the effective recovery rate was 91.6%. During the reliability test, it was found that the reliability of the overall sample and each item exceeded 0.8, indicating that the reliability of the questionnaire was good, and then the validity test was carried out to obtain the KMO value that is 0.945, which is close to 1 and passes the Bartlett ball test statistical value, so the questionnaire design is more effective and can be distributed on a large scale.

3.3.2. Descriptive Statistical Analysis

The samples recovered in this survey are shown in Table 5. A total of 315, including 154 male tourists, accounting for 49% of the total sample, and 161 female tourists, accounting for 51% of the total sample, participated in this survey, and the gender ratio is basically equal, indicating that the sample of this survey is scientifically acceptable. Family structure is an important factor affecting tourist behavior. In this survey, there were 271 unmarried tourists, accounting for 86%, and 44 married tourists, accounting for 14%. The survey found that the survey samples were distributed between the ages of 18 and 45, accounting for 93%, of which the majority were between 18 and 25, accounting for 63.8% of the total. It can be seen that young and middle-aged tourists chose green transportation. Mostly, this is because it takes more physical strength and energy to use green transportation when traveling, and the chances of tourists who are too old or too young to choose green transportation are relatively small. Regarding the educational background of the respondents,

the group with a bachelor's degree had the highest proportion, accounting for 49.7% of the total group, followed by the group with a master's degree and above, accounting for 39.94% of the total sample size, whereas the lowest proportion was displayed by the group with high school education and below, accounting for 2.13% of the total sample. These results indicate that people with higher education levels are more aware of green environmental protection. Moreover, it was found that the tourists who chose green transportation in the survey sample were mainly students, accounting for 44.8% of the total sample, followed by corporate employees, accounting for 22.5% of the total sample. The distribution of income in the survey sample was relatively uniform. The category of respondents with a monthly income below CNY 2000, 2001 to 5000 and 5001 to 10,000 accounted for 38.1, 22.9, and 27.6%, respectively, whereas only 1% of the respondent had a monthly income above CNY 30,000. It can be seen that the level of economic income is not directly related to the choice of green transportation.

Table 5. Descriptive statistics analysis.

Statistical Variable	Category	Quantity	Percentage (%)
Gender	Male	154	49
	Female	161	51
Marital status	Single	271	86
	Married	44	14
Age	Under 18	4	1.3
	18–25	201	63.8
	26–35	73	23.2
	36–45	19	6
	46–55	6	1.9
	56–65	8	2.5
	66 and beyond	4	1.3
Education level	High school and below	7	2.13
	Specialist	26	8.23
	Undergraduate	156	49.7
	Master and above	126	39.94
Monthly income (¥)	below 2000	120	38.1
	2001–5000	72	22.9
	5001–10,000	87	27.6
	10,001–30,000	33	10.5
	Above 30,001	3	1
Occupation	Student	141	44.8
	Enterprise managers	21	6.7
	Corporate staff	71	22.5
	Civil servants/institutions	13	4.1
	Teacher	19	6
	Scientific research workers	4	1.3
	Private enterprise owner	8	2.5
	Self-employed	14	4.4
	Others	24	7.6

Data source: compiled by the author.

4. Research Findings and Policy Recommendations

4.1. Model Interpretation

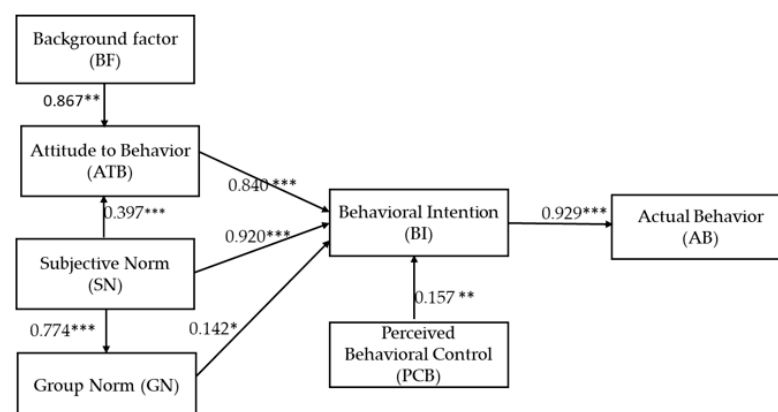
After three model revisions, according to the optimal fit model obtained, the condition of each hypothesis test is presented in Table 6. During the model revision process, two very insignificant hypotheses, H2 and H8, were first removed. H2 was assumed to have a significant positive impact on actual behavior as a background factor, and H8 was assumed to have a positive impact on actual behavior as a perceived behavior control. According to the revised results, background factors did not directly affect the actual behavior of tourists choosing green vehicles. Hypotheses H1 and H3 were not valid, indicating that background factors cannot directly affect behavioral intentions but indirectly through

behavioral attitudes. Hypothesis H4 was valid, indicating that behavioral attitudes can indeed have a significant positive impact on behavioral intentions. The removed hypothesis H8 indicates that perceived behavioral control cannot have a significant positive impact on actual behavior, while in the planned behavior theory, perceived behavioral control directly affects actual behavior. Therefore, when using the planned behavior theory to explore tourists' environmental responsibility behavior, further exploration should be conducted on the impact of perceived behavioral control on actual behavior. Hypotheses H5, H6, and H7 were also valid, indicating that individual norms, group norms, and perceived behavioral control all have significant positive impacts on behavioral intentions. However, the positive impact of group norms and perceived behavioral control was relatively small. This conclusion is basically reliable with the theory of planned behavior and the norm activation theory. According to Hypothesis H9, the actual behavior was indeed positively and significantly affected by the behavioral intention. The higher the intention, the greater the possibility of implementing the behavior, so when studying tourist behavior in the future, if it is difficult to measure whether the actual behavior occurs or not, the behavioral intention can be used instead of the actual behavior for measurement. In the model revision process, two additional hypotheses were added: H10 and H11. As shown in Figure 10, H10: subjective norms had a significant positive impact on behavioral attitudes; H11: subjective norms had a significant positive impact on group norms, and both hypotheses passed the test. This shows that subjective norms play a key role in the choice of tourists' green transportation modes, which can not only directly affect behavioral intentions but also have a significant impact on behavioral attitudes and groups. By adding these two hypotheses and testing them, it not only compensates for the lack of consideration of individual norms in the theory of planned behavior but also provides a basis for the feasibility of combining normative activation theory with planned behavior theory in the study of tourists' green transportation mode choice behavior.

Table 6. Hypothesis test results of the revised model.

Hypothesis		Estimate	S.E.	C.R.	Conclusion
H1	ATB<---BF	0.867 ***	0.168	5.161	Confirmed
H3	BI<---BF	0.099	0.102	0.972	Rejected
H4	BI<---ATB	0.840 ***	0.058	14.48	Confirmed
H5	BI<---SN	0.920 ***	0.187	4.919	Confirmed
H6	BI<---GN	0.142 *	0.086	1.648	Confirmed
H7	BI<---PCB	0.157 **	0.083	1.896	Confirmed
H9	AB<---BI	0.929 ***	0.058	16.020	Confirmed
H10 (added)	ATB<---SN	0.397 ***	0.143	2.776	Confirmed
H11 (added)	GN<---SN	0.774 ***	0.091	8.505	Confirmed

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$ (The lower the significance level, the stronger the correlation).



* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$ (The lower the significance level, the stronger the correlation).

Figure 10. Conceptual model diagram under optimal fitness.

4.2. Analysis of the Influencing Mechanism of Tourists' Choice of Green Transportation Modes

In the structural equation model, if there is only one observation variable or measurement index for the latent variables, all the measurement indexes can explain 100% of the variation in the latent variables, with a measurement error of 0. A structural model among latent variables, each with a single observed variable, is called path analysis. In path analysis, the influence effects between variables include direct effects and indirect effects, and the total effect of the two is called the total effect value of the dependent variable on the independent variable (total effects). The mediating effect refers to the fact that the influence relationship between variables ($X \rightarrow Y$) is not a direct causal chain relationship but is produced by the indirect influence of one or more variables (M). In this case, we call M the mediating variable, while the indirect influence of X on Y through M is called the mediating effect. When there is only one mediating variable in the model, the mediating effect is equal to the indirect effect; and when there is more than one mediating variable, the mediation effect is not equal to the indirect effect. In this case, the indirect effect can be a partial mediating effect or the combination of all mediating effects.

According to the effect values between the variables, the influence of tourists' choice of green transportation can be analyzed. In the model of the influence of tourists' choice of green transportation, there are seven variables, and there are interactions between the following variables: background factors, behavioral attitudes, subjective norms, group norms, perceived behavior control, behavioral intentions and actual behavior.

First, as shown in Figure 11, behavioral attitudes, group norms, and perceived behavioral control all directly affect behavioral intentions, with direct effect values of 0.840, 0.153, and 0.164, respectively. This conclusion is in line with the basic model of the theory of planned behavior, and the impact of behavioral attitude on choice intention is far greater than that of group norms and perceived behavioral control. This indicates that in the decision to choose green transportation, the importance of tourists' attitudes and perceptions towards green transportation is far greater than the others' opinions. As long as the travel experience brought by green transportation is better, and tourists can realize that choosing such type of transportation has a positive effect on environmental protection and relieve traffic pressure in the destination, the intention of tourists to choose this mode of transportation will be stronger. Group norms and perceived behavioral control will also have a direct impact on behavioral intentions, that is, the opinions of travel companions will play a certain role in whether they choose green transportation as long as their physical condition, money and time, and energy can meet the requirements of taking green transportation; however, the impact of both on the behavioral intention is not significant.

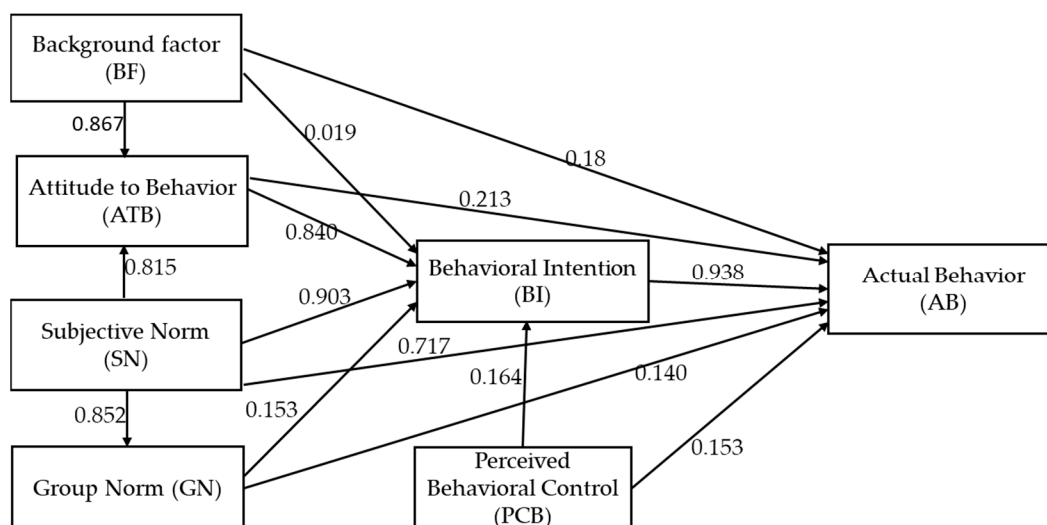


Figure 11. Effects between variables.

Second, behavioral intention is directly affected by behavioral attitude. The more positive the attitude, the stronger the intention to choose green transportation. However, in addition to the direct impact of behavioral attitude on behavioral intention, behavioral attitude was directly influenced by background factors and subjective norms, which indirectly affected behavioral intention. Background factors refer to the characteristics of the transportation itself, which will have a significant impact on the behavioral attitude of taking this type of transportation. On the one hand, tourists' positive attitude towards choosing green transportation comes from the low cost, convenience, accuracy, and accessibility of transportation information that can fully meet the travel needs of tourists within the destination. On the other hand, we have the role of subjective norms: if tourists have a certain knowledge of environmental protection, they will be influenced by a sense of responsibility and morality in the context of destination tourism, and this will affect their choice of green transportation.

Third, according to the revised conceptual model diagram and the effect table, it can be seen that subjective norms play a very important role in the entire model of tourists' green transportation mode choice, and the total effect of subjective norms on behavior intention was the largest, reaching 0.903. This is because subjective norms not only directly affect behavioral intentions but also have an indirect effect on behavioral intentions through behavioral attitudes and group norms. Tourists are more and more inclined to pursue personalization and experience during the tourism process, so their true thoughts play a very important role in their choice behavior. If tourists have environmental protection awareness and pursue sustainable development concepts of energy conservation and emission reduction, these subjective norms will motivate them to choose green transportation, and they will be more likely to agree and reach consensus on the suggestion of choosing green transportation for their travel companions.

Fourth, the actual behavior is the final dependent variable of the model. After several revisions and tests of the model, it was found that only behavioral intention had a direct effect on actual behavior, while the other variables showed indirect effects. With the exception of the background factors, they all affected actual behavior by influencing behavioral intention. This shows that in the behavior of using or not using green transportation, as long as there is an intention, it can be put into practice without many restrictions. This shows that Beijing can basically meet the needs of tourists for green transportation, and tourists can choose green transportation according to their own wishes. If the destination wants to encourage tourists to choose green transportation, improving their choice intention is a very important step.

4.3. Policy Recommendations

4.3.1. Cultivate Tourists' Positive Attitude towards Green Transportation

Compared to group norms and perceived behavioral control, two variables in the theory of planned behavior, behavioral attitude showed a greater impact on tourists' intention to choose green transportation modes. The so-called behavioral attitude refers to an individual's perception of a certain behavior, which is usually expressed as a positive or negative evaluation of such behavior. It is the internal driving force for choosing a certain mode of transportation and has the function of regulating the transformation of behavioral intentions into actual travel behaviors. Therefore, the intention to choose green transportation can be promoted by cultivating tourists' positive attitudes towards green transportation.

Promoting Tourists' Awareness of Green Travel through Publicity

First of all, the Beijing Municipal Bureau of Culture and Tourism can strengthen cooperation with the Transportation Commission and guide and teach tourists the benefits and necessity of choosing green transportation modes. For example, video advertising can be conducted on subways and buses, with the main content focusing on the convenience and environmental benefits of green transportation modes. In addition, government

marketing departments can also use Beijing Television, government official websites and subway media. The official public and other mass media should vigorously promote knowledge related to climate change, environmental protection, and green tourism and transportation by creating public service advertisements, establishing portal websites, and releasing fresh information. They should widely broadcast the environmental protection and green transportation knowledge to tourists so that they can realize the necessity of choosing green transportation modes.

Tourism Enterprises in the Promotion of Green Transportation

Tourism enterprises also play an important role in the promotion of the green transportation mode, so their orientation can be strengthened. Tourism booking platforms or travel agencies are the first to come into contact with tourists and directly influence their decisions. Before the tour, the service staff can explain to tourists the green transportation modes that can be used, introduce to them the amount of carbon emissions that can be reduced once implemented, and convert the amount of emission reductions into a way that tourists can easily understand, such as equivalent of the number of green plants added to the scenic area. During tourism activities, they can promote low-carbon travel modes such as walking and cycling. It is, therefore, worth encouraging various associations and other non-governmental organizations to take active measures to promote green transportation among tourists and low-energy consumption travel methods.

4.3.2. Optimizing Green Transportation Facilities and Services

According to the above research results, background factors can influence the behavioral intention to choose green transportation through behavioral attitudes. Therefore, by optimizing green transportation facilities and services, reducing the cost of green transportation, and improving the convenience for tourists to choose it, can greatly promote the optimal development of green tourism. If there is a means of transportation that can offer the greatest benefit with the least effort (here, effort includes cost, time, experience, and emotion, and the benefit is reflected in viewing, experiencing, feeling joyful emotions, etc.), tourists are naturally willing to go for it. Therefore, in order to enhance tourists' intention to choose green transportation, it is necessary to optimize tourism transportation facilities and services.

Enhancing the Personalization of Tourism Transportation Facilities

In order to attract tourists to use public transportation within the destinations, it is recommended to build a tourism distribution center integrating tourist transfer, public transportation hub, and tourism information service center at the first station where tourists arrive at their destinations, such as Beijing railway stations and airports. Compared to local tourists, foreign tourists have a major disadvantage of not knowing the specific local traffic conditions. Therefore, establishing a tourist distribution center will help tourists know the route to the destination scenic spot at a glance and make more reasonable and economical travel choices. In addition, the configuration specifications for specialized tourist traffic can be increased, and corresponding professional tour guides or artificial intelligence tour guides can be encouraged. Different themes can also be set for tourism buses according to the content of the connected scenic spots enriching the cultural connotation of the buses. It is, therefore, necessary to pay attention to the design of accessible facilities in station construction and transportation equipment, provide waiting seats, discounted fares, and other services.

Road Construction Provides Supports to Green Travel

Improving the construction of walking systems and greenways between stations and scenic spots, as well as between scenic spots, and creating comfortable and pleasant walking and cycling spaces are also crucial for tourists to choose green transportation. Nowadays, tourists attach great importance to the experience of traveling, and slow traffic seems to

take up a lot of time. More and more people would like to walk and ride bicycles during the last miles from the station to the scenic spot, but in Beijing, the public transportation station is often quite far from the scenic spot. Through the construction of a complete walkway and greenway network, the landscape of roads in a scenic spot can be strengthened. This can not only meet the needs of tourists for cycling and walking but also improve the fun and safety in scenic spots while improving the accessibility of the public tourism transportation system and the experience of tourists.

4.3.3. Strengthening the Tourists' Subjective Norms of Environmental Protection

The improvement of subjective norms for green tourism transportation means, on the one hand, lies in the improvement of personal moral standards, that is, the improvement of personal moral awareness and social responsibility awareness. On the other hand, tourists may also be influenced by the psychological factors of their travel companions, which may prevent them from participating in the practice and experience of green tourism transportation. Cultivating and improving tourists' sense of social responsibility is a gradual process, which should gradually move from "unconscious vision" to "responsive vision" and then to "principal consciousness vision".

Enhancing Tourists' Personal Environmental Protection Awareness

At present, people's awareness of environmental protection is constantly improving, but there is still a long way to go. First of all, the environmental protection awareness of tourists can be improved through alert education. At present, some environmental problems seriously threaten the living environment of human beings, which is expected to arouse great attention and reflection of tourists. Therefore, the government should not only promote and educate the implementation of the concept of green environmental protection but also strive to explain the importance of choosing green transportation to tourists, fundamentally enhancing their sense of environmental protection responsibility and awareness. In this way, tourists' environmental protection norms will encourage them to prioritize green transportation within their destinations.

Guide Tourists to Become Opinion Leaders in Green Transportation Choices

Under the tourism policy, the government can provide strong guidance and promotion to attract tourists to choose green transportation in their destinations, strengthen tourists' awareness and recognition of green travel, and create a good atmosphere, enabling the whole of society to consciously choose green transportation. It is also necessary to establish the normative belief that tourists choose green transportation as their priority and also to serve as opinion leaders to guide their peers in choosing this type of transportation when traveling. In order to stimulate and strengthen tourists' awareness of green transportation and their intention to choose this type of transportation, priority will be given to the normalization of green transportation tourism.

5. Research Conclusions

First, behavioral attitudes, group norms, and perceived behavioral control all directly affected behavioral intentions, which is in line with the basic model of the theory of planned behavior. However, the path of perceived behavioral control affecting the choice behavior is not reliable. Therefore, future studies should further research in this area.

Second, the influence of behavioral attitude on choice intention was much greater than that of group norms and perceived behavioral control; that is, tourists' attitudes and perceptions towards green transportation are much higher than those of other categories. Moreover, as long as the travel experience brought by green transportation is better, and tourists realize that choosing such a transportation category has a positive effect on the environmental protection of the destination and alleviate traffic pressure, their choice of this transportation will be stronger. The positive attitude of tourists towards choosing green transportation comes from the fact that the transportation itself is inexpensive, convenient

and has easily accessible traffic information, which can fully meet the travel needs of tourists for their destinations.

Third, subjective norms play a very important role in the entire model of tourists' green transportation mode choice because subjective norms not only directly affect behavioral intention but also have indirect effects on it through behavioral attitudes and group norms. Tourists are increasingly inclined to seek personalization and experience during their visits. If tourists have the awareness of the environmental protection, the concept of sustainable development, the energy saving and emission reduction, these subjective norms will encourage them to choose green transportation, and they will be more likely to agree with the suggestion of their travel companions to choose such a transportation category.

Fourth, in the behavior of whether to adopt green transportation, as long as there is an intention, it can be put into practice without difficulty. This indicates that Beijing can basically meet the needs of tourists for green transportation, and they can choose this type of transportation according to their own wishes. If the destination wants to encourage tourists to choose green transportation, it is very important to improve their choice intention. Additionally, in future research on tourist behavior, if actual behavior cannot be directly measured, behavioral intention may be used instead.

6. Limitations and Future Research

This paper still has some shortcomings which need to be considered in future studies. This research was only interested in tourists that chose the green transportation mode in the destination of Beijing. Future research can be conducted on the other categories that contributed to a different choice in order to understand their lack of motivation. Moreover, the research model and questionnaire design can be further optimized. Further adjustments and optimizations of the model and questionnaire of this study by adding more variables and items to the model and further enriching the structure and content of the questionnaire on the basis of this article will make the research more in-depth and easier to obtain more convincing and representative results.

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