

# Understanding the Relationship Between Tourists' Consumption Behavior and Their Consumption Substitution Willingness Under Unusual Environment

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**Introduction:** Understanding the relationship between tourists' consumption behavior and their willingness to substitute consumption in unusual environments can promote tourists' sustainable consumption behavior. This study explores the internal relationship between tourists' willingness to engage in sustainable consumption behavior and the substitution of tourism consumption willingness in an unusual environment and the related factors.

**Methods:** Through qualitative and quantitative mixed research, this study first invited 32 interviewees related to the tourism industry to conduct in-depth and focus group interviews and extracted a research model based on the push-pull theoretical model (PPM) through three rounds of coding of grounded theory. Then, through questionnaire design, pre-release, and formal release, 268 valid questionnaires were collected using a convenience sampling method, and the hypothesis and its mediating effect were verified using a structural equation model.

**Results:** Further quantitative analysis and verification showed that being in an unusual environment had a positive effect on tourists' perception of crisis awareness, safety risk, and willingness to engage in sustainable consumption behavior. However, the results did not support the unusual environment positively affecting the substitution of tourism consumption willingness, the psychological transformation cost, and the fixed consumption habit negatively affecting the substitution of tourism consumption willingness. In this study, two mediating variables were used to verify the indirect effect of being in an unusual environment and the substitution of tourism consumption willingness. The results showed that the mediating effect was significant.

**Conclusion:** This study explored an action mechanism model aimed at guiding tourists' willingness for sustainable consumption, based on the environment and consumption behavior, and provided relevant countermeasures for the government and business decision-makers, enterprises, and investors in the tourism sector.

**Keywords:** unusual environment, grounded theory, PPM theory, sustainable consumption behavior, consumption substitution willingness

## Introduction

Carbon emissions and ecological sustainability in the process of tourism have become a common concern of the international community. The role of tourists in sustainable consumption and the integration of economic development and ecological civilization are both important. Sustainable tourists are green travel tourists

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who consider environmental protection during their travels. At present, the huge increase in consumption has brought great pressure to the human living environment. Tourists' behavior and choice preference in travel are the keys to promoting sustainable ecotourism. Tourist activity includes accommodation, tours, and entertainment, all of which consume a certain amount of energy and contribute to carbon emissions. Furthermore, the potential safety and crisis of tourists during tourism consumption process under unusual environment, to a certain extent, lead to the enhancement of tourists' self-protection consciousness and the formation of negative attitude, which will prompt tourists to have different consumption behavior that may cause the waste of resources. Understanding the relationship between tourists' consumption behavior in an unusual environment and their willingness to substitute consumption may make visitors more willing to engage in sustainable tourism consumption.

This study follows the scientific and normative research procedure, starting with micro psychological variables, constructing a theoretical model, and putting forward a research hypothesis based on pushing, pulling, mooring, and other variable elements and breaks away from the previous decision-making mode of tourists' sustainable consumption behavior and psychology. Thus far, studies have often focused on sustainable tourism behavior, psychological attribution, empirical research, and influencing factors. Research on the intrinsic willingness and effect of tourists' consumption behavior under special circumstances has been neglected, so this research provides facts that rely on planned behavior theory and attitude (behavior) situational theory research paradigm and takes the unusual environment as the situational element. It provides a new research perspective for opening the internal "black box" of the micro psychological decision-making of sustainable consumption in the tourism industry. In this study, tourists' sustainable consumption refers to their conscious choice of sustainable and environment-friendly tourism behavior during travel. From the perspective of connotation, tourists' sustainable consumption includes reducing direct environmental pollution caused by tourism and consciously engaging in responsible tourism. In terms of denotation, sustainable consumption includes the whole continuum of tourist behavior, such as the choice of types of tourism with low energy consumption and low pollution. In this study, a theoretical model was built based on grounded theory and the push-pull theoretical model (PPM), and the internal mechanism

of the willingness of tourists in an unusual environment to engage in sustainable consumption behavior and their consumption substitution willingness was studied using mixed quantitative and qualitative research methods.

The main contributions of this paper are summarized as follows:

1. We examined the internal mechanism determining tourists' willingness to engage in sustainable consumption in an unusual environment.
2. We found substitutable behavioral effects and factors that affect tourists and their paths of influence.
3. We explored the micro psychological variables in tourist consumption behavior willingness and introduced tourists' psychological variables and situational environmental variables for the first time, which expands the situational research on empirical analysis of sustainable consumption behavior.

The remainder of this paper is organized as follows. Literature Review provides a literature review. Theoretical Model Construction discusses the research methods and theoretical models. Model Construction and Hypotheses presents the hypotheses. Results of the Analysis and Hypothesis Testing provides the results analysis and hypothesis testing. Finally, Conclusions presents the discussion and conclusions.

## Literature Review

### The Unusual Environment

In the context of the concept of the unusual environment proposed by Zhang,<sup>1</sup> the unusual environment refers to an environment outside of people's daily life, study, and work (including both the natural and cultural environments). As Zhang noted, the psychological and behavioral characteristics of tourists in an unusual environment are abnormal. In a related study, Rogers introduced the concept of the usual environment, pointing out that it is often a complex environmental concept that includes geographical boundaries, frequency of access, and the scope of people's daily activities (living, working, studying, etc.) and that the usual environment is a unique situation as a whole, with its own history and significance, which is to some extent a function of geographical distance.<sup>2</sup> De San Eugenio Vela et al proposed that the usual environment represents a space or place and that space is an abstract physical concept; they also examined individual details, such as the

visiting frequency of attractors (for calculating distance) and the perception of the usual environment through a super-large sample survey.<sup>3</sup>

In academic studies, the dimensions of the current environmental situation are usually understood to include economic, information, cultural, cognitive, and economic dimensions.<sup>4,11</sup> Belk proposed that being in an unusual environment means to encounter strangeness and feeling unsafe, leading tourists, in general, to try to overcome the psychological distance to their usual environment by making more efforts to reduce strangeness, which also takes into consideration behavioral sunk costs.<sup>5</sup> McKercher pointed out from the perspective of physical distance that the sunk cost contained in the unusual environment more or less affected tourists' choice of destination and their consumption there.<sup>6</sup> Research on the information dimension of an unusual environment focuses on issues such as chaos and asymmetric information; for example, Beales et al suggested that in an unusual environment, a lack of understanding of the price and quality of goods could easily lure visitors to tourist traps.<sup>7</sup> Gursoy noted that tourists rely on second-hand information channels more than they would in their usual environment, thus leading to chaos, information overload, and fuzzy information.<sup>8</sup> Lu found that tourists' information search and filtering costs are higher in the non-habitual environment.<sup>9</sup> Regarding the cultural dimension, there is a higher incidence of cultural conflict than in the usual environment. Crompton noted that cultural distance caused discomfort, conflict, and discrimination in an unusual environment and investigated the source of cultural distance between the usual routine environment and that of the tourist destination.<sup>10</sup> Ye also proposed that cultural distance acts as a buffer in cross-cultural communication between hosts and guests, reducing conflict between them and concluded that cultural differences between habitual and unusual environments are important representations of the tourism activity space.<sup>12</sup> In terms of the cognitive dimension of an unusual environment, researchers have mainly focused on environmental perception and cognition, including risk safety, familiarity, and strangeness. For example, Cohen mentioned in as early as 1972 that tourists sought both familiarity and strangeness in the process of social contact with host countries.<sup>13</sup> To give another example, Mitchell and Grottores proposed that the unusual environment accompanied by strangeness would increase tourists' risk perception, while the environment cover could reduce such perception.<sup>14</sup> As for the empirical analysis of the unusual

environment, Chen proposed that usual and unusual environments have the function of switching and projecting, with two combined effects of active passivity and positive passivity, which will generate the perception of insecurity and discomfort. The experience of tourism is a combination of the time and space of tourists' (non) unusual environment and (non) leisure time.<sup>15</sup> Hares et al pointed out that tourists have barriers to sustainable consumption in unusual environments, so they seldom pay attention to environmental impacts or interests in their tourism decision-making.<sup>16</sup> In an unusual environment, because their identity is unknown, the moral constraints of tourists are relaxed, their self-discipline is lower, and behavior that do not occur in the habitual environment occur easily.

In summary, information chaos and cultural conflict in an unusual environment will lead to confusion in tourists' cognition and a decrease in their sense of experience, psychological strangeness and sense of crisis and the corresponding psychological adjustments and behavioral decisions to respond to the surrounding tourism environment. Therefore, the theoretical model constructed in this study is based on the relevant research on the information and cognitive dimensions in an unusual environment, deepening and expanding the empirical analysis of tourists' consumption behavior and willingness to substitute consumption.

## Sustainable Consumption Behavior

In terms of the mechanism model of sustainable consumption willingness, research has typically focused on overload tourism in Europe, and studies on the mechanism and countermeasures for sustainable tourism saturation have been from the perspectives of policy, organization, institution, and behavior.<sup>17</sup> There have also been studies on models of relevant decision-making mechanisms to promote the implementation of sustainable consciousness by identifying potential factors in sustainable tourism,<sup>18</sup> such as determining the driving factors in specific tourism environments to formulate rules for the precision and standardization of sustainable tourism for tourists. Since the role of architecture is often neglected in research on sustainable tourism, to achieve the promotion and penetration of sustainable tourism, the internal mechanism architecture of tourists and the environment should be changed.<sup>19</sup> In general, the current sustainable tourism consumption mechanism model carries out relevant research by examining the internal potential factors in attitude and

behavior from an objective perspective and how it can be applied in practice.

In recent years, studies of the factors influencing sustainable consumption willingness have focused on consumer behavior and cognition, such as Lao,<sup>20</sup> who concluded that consumers' innovation consciousness has a significant impact on sustainable consumption intention. Lu et al found that consumers' personality characteristics have a significant impact on their moral beliefs and that some dimensions of consumers' moral beliefs have a significant predictive effect on their willingness to buy sustainable products.<sup>21</sup> Pinto et al examined how the salience of personal and social identity changes the relationship between sustainable consumption and intention types.<sup>22</sup> The results show that when personal identity is significant, the intention to transcend the self has more influence on sustainable consumption than the intention to promote one's self-interest. When social identity is significant, the influence of intention to transcend the self and promote one's self-interest in sustainable consumption are similar. Nguyen et al theoretically developed and tested two key regulators of the relationship between sustainable consumption intentions and behavior from the perspective of consumer behavior, that is, the availability of sustainable products and personal consumption expenditure (PCE).<sup>23</sup>

## Substitution of Tourism Consumption Willingness

There are many forms of consumption substitution. This study focuses on consumption substitution, that is, alternative consumption or consumer behavior, when choosing substitutes. In an unusual environment, tourists' perception of safety risks will be enhanced, and the sense of insecurity and strangeness will prompt them to choose other forms of tourism to replace the original type of tourism or to engage in alternative tourism behavior. Consumption substitution in this study is based on the concept of substitution in Porter's five forces model,<sup>24</sup> which holds that substitution is the process by which one product or service replaces another to achieve certain needs for the buyer and that substitution analysis is equally applicable to products and processes. The object of substitution here usually refers to the category (category substitution), and the substitution originally referred to by Porter is concerned with consumer products. This study extends Porter's concept of substitutes by examining the transformation of the mode of consumption (consumption substitution behavior). As few

studies have considered the issue of consumption substitution, this study examines consumption substitution behavior in the process of participating in tourism activity. This type of tourism substitution behavior is the result of tourists' attention and awareness of environmental protection. It is one of the behavioral results of promoting tourists' green consumption and it can transform tourists' intention of green consumption behavior into a process of consumption substitution.

Previous studies that have examined similar issues include an examination of the migration of purchase channels by Reinartz et al<sup>25</sup> and a paper by Ratneshwar et al<sup>26</sup> on how to provide consumers with alternative product platforms and to offer a comparison standard for products in alternative schemes. Consumption substitution is generally a transformation of long-term trends, usually occurring at an industry level. This study examines the corresponding consumption mode and behavior substitution.

## The Push-Pull Theoretical Model (PPM)

The PPM model (pull, push, and mooring) began with the study of the earliest migration behavior. Heberle summarized the structure and spatial distribution of population migration mechanisms, which gave rise to the initial push-pull theory of population migration.<sup>27</sup> Moon found further factors in migration theory, such as those that encourage people to leave their original habitats, for example, if their former residence had a negative effect on their lives.<sup>28</sup> Some scholars believe that the PPM model is also an effective approach for analyzing the relationship between consumer motivation and behavior. Therefore, it has been introduced to the field and the factors that influence consumer behavior are studied around the three factors "push", "pull" and "mooring".

For example, Goossens studied the motivation of tourists and their emotion-oriented destination selection decisions using the PPM model and proposed that tourists are driven by their emotional needs and interests.<sup>29</sup> In recent years, scholars have turned to the PPM model more frequently to study tourism consumers. For example, Kim et al examined the push and pull factors that increase visitors to South Korea's national parks.<sup>30</sup> The results of their factor analysis showed that there were four push factors: appreciating nature as a family, escaping the obligations of daily life, engaging in exploration, and establishing a friendship. The three pull factors were the core tourism resources: information, facility convenience, and transportation/accessibility. In another



study, Klenosky used the means-ends theory to examine the relationship between driving and pulling factors that motivate and guide travel behavior.<sup>31</sup> Jung et al tested the conversion adaptation behavior of PPM in tourists' choice of airlines and concluded that PPM is directly related to tourists' willingness to change airlines.<sup>32</sup> Poor service, opaque prices, low levels of customer satisfaction, and weak trust push tourists away from existing airlines. The attraction of alternative options, opportunities, and price concessions can motivate tourists to choose new routes, while other factors such as high alternative costs, limited choice trends, and low priority alternative costs, have anchoring effects.

## Theoretical Model Construction

### Overall Design

This study designed a qualitative and quantitative research based on the literature review of the above three important variables and in conjunction with the theoretical model of PPM. It attempted to find explanatory variables through a qualitative analysis, constructed a theoretical framework for the PPM, and then verified the framework through a quantitative analysis.

There are no definite categories, scales, or related theoretical assumptions available for studying sustainable consumption behavior patterns. In a preliminary investigation and interviews, many respondents pointed out the lack of clear boundaries and connotations of sustainable consumption behavior, especially sustainable consumption in travel, as everyone had a different understanding of the issues involved. It was obvious that this could give rise to misunderstandings if a structured questionnaire were to be administered without taking this into account. As this could affect the sample of the quantitative research directly, as well as the reliability and validity of the results, a mixed research method was adopted in the present study. A qualitative research method was first used to establish a theoretical framework and was then combined with variable detection and qualitative research results, which were proposed and verified using a quantitative research method.

This study first used a semi-structured interview, a qualitative approach, and sampling theory to select the interview objectives. Based on grounded theory, an exploratory study was conducted to collect verbatim transcripts of interviews from a representative sample of the public. Through open coding, spindle coding, and selective coding of the verbatim transcripts using the MAXQDA2018 software package, a correlation model, and the influencing factor theory of

tourists' willingness to engage in sustainable consumption and substitutive behavior were constructed. In the process of analyzing verbatim manuscripts, a continuous comparative analysis was adopted to refine and revise the theories continuously until the theories and concepts were saturated. The concepts were verified with the variables after sorting out the theories. After verification, the related variables were measured for concept, model hypothesis, and model validation.

## Category Extraction and Theoretical Model Construction

A total of 32 invited tourism industry experts, scholars, and professionals (middle-aged and young teachers) participated in the survey. A combination of individual in-depth interviews and focus group interviews was used. Overall, there were 16 one-on-one interviews (each 30 to 45 minutes) and 4 focus group interviews with an average of 4 people in each group (each about 1 hour 30 minutes). Participants provided consent before participating in this research and to record the interviews. The interviews were transcribed using a recording software, and the total length of the interview transcripts was 180,000 words. This study randomly selected two-thirds of the interviews for consistency, using the theoretical concepts of the saturation test and trend chart. In open coding category extraction, only concepts that were repeated more than thrice in setting the initial concepts were selected, while less frequently occurring concepts were eliminated. Table 1 shows part of the initial concepts and categories. Owing to a space problem, for each of the initial categories, only the raw data of the three original materials and the corresponding initial concepts were selected. The main axis coding mined and extracted potential logical relations between categories. Table 2 shows the open coding categories. This study classifies different categories according to their conceptual interrelations and logical relations and summarizes eight main categories. The typical relational structures of the main categories in this study are listed in Table 3.

This study identified the core category of sustainable consumption behavior and the consumption substitution willingness. The storyline around the core category can be summarized as an unusual environment, sustainable consumption behavior psychological costs, and fixed consumption. The study used the PPM theoretical model to identify the thrust factors (push) that can promote sustainable consumption behavior. Pull factors for sustainable consumption behavior include urging tourists to choose alternative tourism

**Table 1** Initial Concepts and Categories

Category	Original Statement (Initial Concept)
Environmental problem identification	W05 I sometimes feel insecure during the journey. The design of some of the scenic spots is not reasonable. It has a great impact on the ecological environment (environmental crisis awareness).
	W06 I can judge the serious consequences that may occur in my travel environment (pre-identification).
Awareness of environmental issues	W08 I always think that resources are inexhaustible and abundant, so I do not think about it so much (weak sense of crisis).
	W05 Sometimes I think the tourism environment I am in needs to be improved (perception decision).
Environmental impact	W05 Sometimes the tourist environment will make my mood remain continuously low (emotional impact).
	W09 I am not able to control my emotions and state of mind in a strange environment (controlling influencing factors).
Knowledge of sustainable consumption	W09 Talk to today's young people about sustainable consumption? I do not know how to express it in detail (knowledge propaganda).
	W03 Sustainable consumption covers a wide range, including daily consumption, virtual consumption, etc. so it is difficult to categorize and sort it out (knowledge sorting).
Sustainable consumption values	W04 Sustainable consumption means the sustainable development and sustainable protection of the ecological environment (values).
	W08 I do not buy non-ecological souvenirs and do not visit non-sustainable tourism destinations during a trip (values).
Crisis identification	W11 Sometimes I check weather and geological forecasts for the destination in advance (travel crisis identification).
	W10 Sometimes I can tell if there is a need to continue traveling by the weather forecast (travel crisis identification).
Crisis value	W09 Is there nothing more important than life? Self-protection first (values).
	W07 No matter how beautiful the scenery is, it is not as safe as living at home (values).
Mindset	W06 I have a hard time accepting new ideas or specific ideas (thinking impedance).
	W013 I do not want to make travel decisions (thinking impedance).

consumption types include a sense of risk to safety and crisis cognition. The psychological transformation cost and consumption habits of tourists have an anchoring effect (mooring) in this model, which will hinder the formation of tourists' willingness to consume instead of traveling. Therefore, the theoretical model developed in this study is consistent with the PPM model. A specific theoretical model based on PPM is shown in Figure 1. To test the saturation of theories and concepts, one-third of the interview records were used for the theoretical saturation test. Neither new categories and relationships nor new factors in the five main categories were found. Figure 2 shows the trend consistency chart of categories. The number of new categories shows a linear trend distribution and the number of new categories of interviewees from P9 to P16 is greatly reduced,

indicating that the categories of interviewees have obvious internal consistency. The above theoretical model based can thus be considered theoretically saturated.

## Model Construction and Hypotheses

### Measurement and Analysis of Variables

#### Push Factors

The usual environment: Based on Ajzen's theory of planned behavior (TPB),<sup>33,34</sup> individual environmental behavioral willingness is considered the first psychological variable. In this study, the concept of the usual environment is understood in a manner similar to that proposed by Gursoy et al<sup>8</sup> and Crompton,<sup>10</sup> with an emphasis on the information dimension and the related characteristics of the cultural dimension, that is,

**Table 2** Categorization of Open Coding

Main Categories	Corresponding Category	Connotation of the Relationship
Unusual Environment	Environmental recognition	The respondents are able to identify the status of the environment in an unusual environment.
Sustainable consumption behavior	Knowledge of sustainable consumption	The unclear knowledge of sustainable consumption is related to the intention of sustainable consumption behavior.
	Sustainable consumption attitude	The attitude of sustainable consumption is related to the willingness of sustainable consumption behavior.
	Sustainable consumption values	The holding of sustainable consumption values can promote the willingness of sustainable consumption behavior.
Crisis and security risk perception	Security risk identification	The interviewees have good security risk identification ability.
Psychological costs and fixed consumption	Mindset	Mindset is a state in the process of psychological cost estimation.
	Spending habits	Respondents have fixed spending habits while traveling.

**Table 3** Typical Relational Structure of the Main Categories

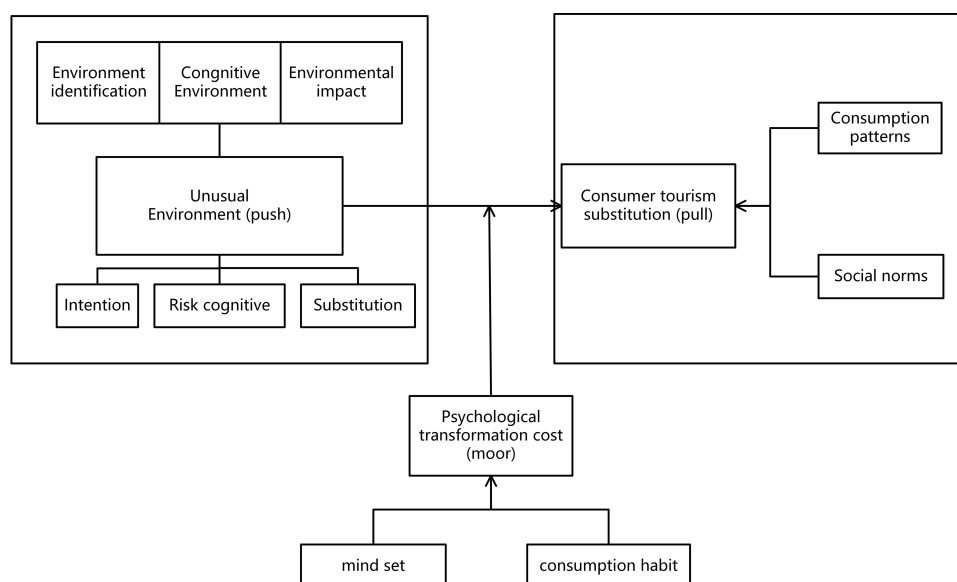
Relational Structure	Model Element Extraction	Connotation of Relationship Structure
Unusual environment willingness	PPM	Unusual environment is the external driving factor (external factor) that prompts tourists to produce behavioral intention, which determines tourists' willingness to produce a type of consumption behavior.
Unusual environment	Push	The identification, cognition, and influence of environmental problems in non-habitual environments are related to the behavioral intention of sustainable consumption, which affects tourists during their travels willingness to act sustainable.
Sustainable consumption behavior		
Unusual environment	Push	In the non-usual environment, tourists can judge the related impact of environmental problems by themselves, which will generate the willingness of consumption to replace tourism.
Willingness for tourism consumption substitution		
Cognition-willingness		
Psychological transformation costs and fixed consumption	Moor	The psychological transformation cost and fixed consumption habit of tourists in tourism can affect tourists' willingness to replace tourism.

that in unusual circumstances, a situation of information asymmetry and chaos occurs, with conflicts resulting from cultural distance and discomfort. Therefore, based on the environmental behavior scale proposed by Stern and the four dimensions identified in the literature review (economy, information, culture, and cognition), seven question options were set.

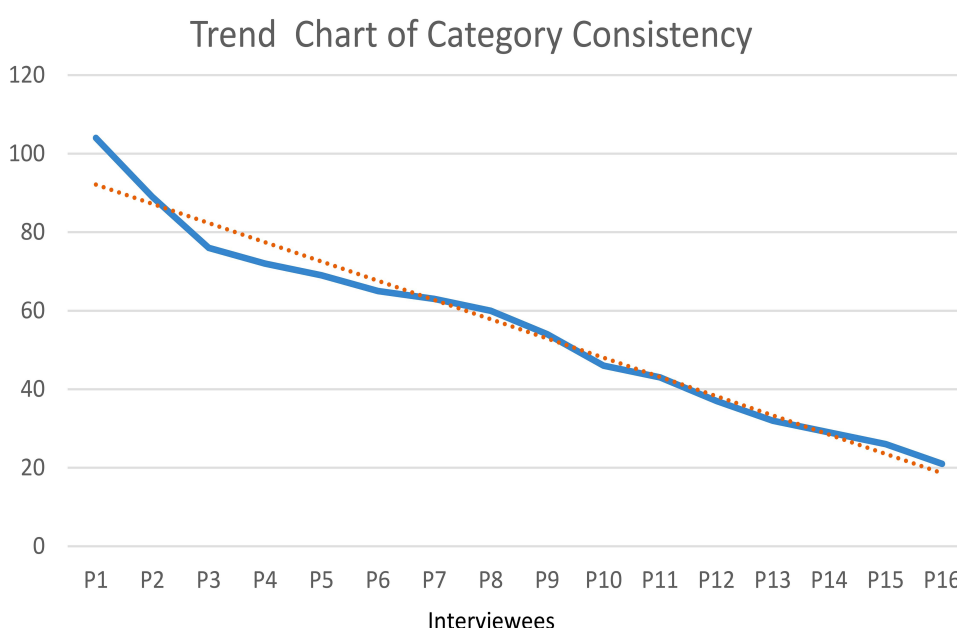
### Pull Factors

Sustainable consumption behavior: Stern et al argued that tourists' sustainable consumption behavior was affected by

environmental values and social norms, combining the attitude - behavior - situational theory with a focus on the individual environmental behavior associated with external situation factors.<sup>35</sup> Recently, many scholars have studied and analyzed the situational factors that affect behavior, as the paper by Stern et al, who proposed that environment and policy support can influence consumer behavior.<sup>36</sup> Therefore, with reference to the environmental behavior scale proposed by Stern et al and the appropriate modification of Ajzen's theory of planned behavior scale, eight sustainable consumption behavior



**Figure 1** This study is based on the theoretical model of PPM.



**Figure 2** Trend chart of category consistency.

measurement questions were designed based on the perspectives of housing, travel, tourism, shopping, and entertainment.

The willingness of tourism consumption substitution: Consumption substitution in this study is the concept of total substitution in Porter's five-force model.<sup>24</sup> With reference to the new environmental paradigm (NEP) scale developed by Dunlap and combined with the results of the existing literature review, six options (mainly situational measurement items for

consumption to replace tourism behavioral intentions) were designed.

Crisis and safety risk perception: based on the NEP scale developed by Dunlap et al and the results of the existing literature review, seven options for crisis and risk safety perception were designed (mainly for the perception and judgment of non-sustainable tourism).<sup>37</sup>



## Anchoring Factors

Psychological transformation costs and fixed consumption: Conversion costs are faced in the conversion of one-time costs.<sup>38,39</sup> Related studies have shown that conversion costs are important factors in the process of consumers' offline to online channel migration. Therefore, because of the cost of the transformation of psychological perception, the migration behavior of tourists may be suppressed.<sup>40,41</sup> With reference to Dunlap's NEP scale and combined with the findings of existing literature, six items of psychological transformation cost and fixed consumption were designed (mainly measuring the anchoring effect of benefit perception).

## Research Model and Research Hypothesis

Using grounded theory and the PPM as this study's theory correlation model, the usual role is the thrust of the unusual environment variables; positive roles are crisis and security risk perception, sustainable consumption behavior, and the willingness to substitute tourism consumption.<sup>38,42</sup> As variables of pull forces, crisis and security risk perception have a positive influence on sustainable consumer behavior.<sup>43–47</sup> Psychological transformation costs and fixed consumption have a negative impact on the substitution of willingness to consume tourism.<sup>48,49</sup> To ensure the accuracy of the model and hypothesis construction, two mediating variables were introduced into this study: crisis and safety risk perception and sustainable consumption behavior. It is assumed that these two variables play a mediating role in influencing consumption substitution willingness in an unusual environment. The research hypotheses are presented in Table 4.

The research model of this study was constructed through the above theoretical analysis and research hypotheses, as shown in Figure 3.

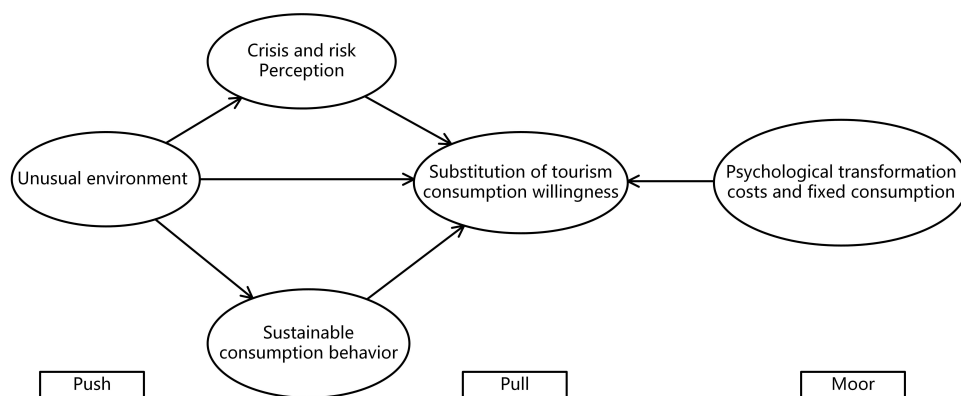
## Questionnaire Design and Descriptive Statistics

This study randomly recruited 15 ordinary tourists to conduct focus group discussions on the outcome and impact variables and invited 6 professors from the academic tourism studies field and 3 experts from the tourism industry to analyze the contents and questions of the focus group discussions. The results of the discussions of the tourists, academic professors, and experts were fully summarized and refined. The relevant outcome and influence variables were selected, which confirmed the results of the literature review. On this basis, this study designed the initial questionnaire, which was distributed by researchers in the field of tourism as part of the pre-test. The questionnaire's content structure and topics were inspected and evaluated using the SPSS 24.0 software reliability test data and deleted if they did not conform to the standard question based on the results of the test. Moreover, part of the subject expressions was also adjusted in the multi-item colloquial correction and in the green tourism consumption concepts; further, notes were added to the scene and concept descriptions.

Considering that hotel accommodation is an obligatory choice for overnight tourists in an unusual environment and their consumption behavioral willingness is more representative, overnight tourists traveling in Hangzhou were selected as the objects of the survey. The convenience sampling method was adopted to represent the front desk of H&H Hotels among mainstream budget hotels. The front desk service staff

**Table 4** Hypothesis of This Study

HY	Content
H1	Being in an unusual environment positively affects the crisis and risk perception
H2	Being in an unusual environment positively affects sustainable consumption behavior
H3	Being in an unusual environment positively affects the substitution of tourism consumption willingness
H4	The crisis and risk perception positively affects the substitution of tourism consumption willingness
H5	The sustainable consumption behavior positively affects the substitution of tourism consumption willingness
H6	The psychological transformation costs and the fixed consumption negatively affect the substitution of tourism consumption willingness
H7	The crisis and risk perception plays a mediating role in the influence of an unusual environment on substitution of tourism consumption willingness
H8	Sustainable consumption behavior plays a mediating role in the influence of an unusual environment on substitution of tourism consumption willingness



**Figure 3** Research model.

cooperated with the sharing of a questionnaire link for tourists to fill in and submit on their mobile phones.

From July 15, 2019, to July 20, 2019, five members of this group in Hangzhou, China, gathered a total of 280 questionnaires. After deleting incomplete samples, there remained 268 valid questionnaires, which gave an effective response rate of 95.7%. The sample ratio was roughly 51.6:48.4 and the age group best represented was between 25 and 45 years (64.8%), the level of education was bachelor's degree holders (67.8%), and the monthly income bracket was RMB 5500–8000 (56.7%). The sample thus conformed to the next-stage characteristics of travel tourist properties. The variable descriptions and statistical descriptions are presented in Table 5.

According to the different use purposes, a confirmatory factor analysis (CFA) was performed to verify the theoretical model, that is, to test the ability of the model to fit the actual data with pre-defined factors. First, an exploratory factor analysis was carried out on the behavioral variables and then the measurement model was tested through CFA to ensure the reliability and validity of the model. Finally, the SEM model was used to verify the research hypothesis and the bootstrap method was used to test the indirect effect sizes of the two mediation routes to ensure the effectiveness of the mediation variable test.

## Results of the Analysis and Hypothesis Testing

### Testing the Measurement Model

To measure the reliability and validity, a CFA was performed on the measurement model. CFA is a research method that determines whether the correspondence between measurement factors and measurement items (scale items) is consistent with the predictions of the

researchers. Its main purpose is to analyze the validity of convergence and to verify the measurement items belonging to the same factor at the time of measurement. In this study, AVE (average variance extracted) and CR (composite reliability) were combined for analysis. If the AVE of each factor is greater than 0.5 and the CR value is greater than 0.7, it indicates good polymerization validity. Simultaneously, this study checked whether the factor load coefficient corresponding to each measurement item was greater than 0.7.

In general, the factor load of the CFA analysis was between 0.5 and 0.95, indicating that the model has good adaptability. Table 6 lists the factor loads of all the variables. All factor loads from Y1 to X28 were between 0.5 and 0.95, so all the questions were retained. The combined reliability was greater than 0.5 and the mean variation extraction was greater than 0.5. The combination reliability of all the potential variables was above 0.7, indicating that the internal consistency of each variable was good. The AVE of all the variables exceeded the minimum value of 0.5 and the correlation coefficient between all the variables was less than the square root of the AVE (Table 7), indicating that the measurement model had good aggregation and discriminant validity.

### Analysis of the Structural Model Results

Figure 4 shows the influence path of the structure model and its normalized path coefficient, and Table 8 lists the results of hypothesis testing. The unusual environment had a significant positive impact on tourists' perception of crisis and safety risk (score = 0.392,  $t = 4.4$ ,  $p < 0.001$ ) and on their sustainable consumption behavior (score = 0.243,  $t = 3.0$ ,  $p < 0.001$ ) but no significant impact on substitution of tourism consumption willingness ( $p > 0.5$ ).

**Table 5** Variable and Statistical Description

Variables		Predictor Variables	Variable Definitions	The Mean	Standard Deviation	Partial Degrees	Kurtosis
The results of variable	Substitution of tourism consumption willingness	Y1 I will choose green tourism to replace my existing unsustainable tourism behavior	A Likert scale was used, with 1–5 representing the enhancement of behavior and willingness. (1 = strongly disagree, 3 = strongly agree, 5 = strongly agree)	3.59	0.89	–0.086	–0.304
		Y2 I will choose safe and environmentally friendly green tourism to replace my current tourism behavior		3.71	0.91	–0.254	–0.141
		Y3 I would like to reduce some of my unsustainable travel behavior of thrills and adventures		3.74	1.03	–0.468	–0.317
		Y4 I can identify which behavior are green tourism and find alternatives		3.37	1.05	–0.061	–0.658
		Y5 It is everyone's social responsibility to replace tourism behavior with green consumption		3.73	0.91	–0.402	–0.035
		Y6 I will use green consumer products and services instead of my original unsustainable tourism behavior		3.71	0.90	–0.4	0.25
Affect the variable	Sustainable consumption behavior	X1 I do not actively use disposable items		3.46	1.13	–0.268	–0.668
		X2 I economize with the use of unsustainable travel resources		4.00	1.03	–1.022	0.836
		X3 I reduce unnecessary waste		4.39	0.92	–1.788	3.326
		X4 I use public transportation in tourist areas		4.09	0.95	–1.15	1.366
		X5 I do not buy over-packaged souvenirs		3.99	0.99	–0.692	–0.16
		X6 I choose green hotels		3.89	0.90	–0.514	–0.076
		X7 I select green tourism activities with low energy consumption		3.83	0.97	–0.579	–0.005
		X8 I actively promote green tourism behavior and concepts to fellow travelers		3.70	1.09	–0.582	–0.28
	Unusual environment	X9 I feel insecure		3.28	1.17	–0.178	–0.745
		X10 I feel confused		3.21	1.18	–0.147	–0.911
		X11 I feel a culture clash		3.01	1.06	–0.02	–0.56
		X12 My travel experience is decreasing		2.82	1.17	0.196	–0.899
		X13 I think the environment is very strange		3.34	1.11	–0.273	–0.549
		X14 I have a sense of crisis		2.86	1.18	0.079	–0.941
		X15 I want to travel in a different way		2.83	1.22	0.28	–0.904

(Continued)

**Table 5** (Continued).

Variables		Predictor Variables	Variable Definitions	The Mean	Standard Deviation	Partial Degrees	Kurtosis
	Crisis and security risk perception	X16 A lot of travel is not green these days		3.45	0.97	−0.398	−0.044
		X17 Non-green tourism will accelerate the global greenhouse effect		3.72	1.03	−0.565	−0.142
		X18 Non-green travel is an unsafe type of travel		3.07	1.16	0.009	−0.897
		X19 Mankind is facing serious environmental problems		4.05	1.00	−0.843	0.139
		X20 The deterioration of the ecological environment is worrying		4.06	0.97	−1.037	1.039
		X21 Many travel destinations are currently not sustainable		3.79	1.00	−0.465	−0.445
		X22 I did not realize that the current type of travel is not sustainable		3.82	0.96	−0.56	0.044
	Psychological transformation costs and fixed consumption	X23 It is difficult for me to change my travel behavior and ways		2.99	1.08	0.222	−0.703
		X24 I do not think green tourism can save money		2.78	1.25	0.309	−0.942
		X25 I think green tourism consumption will cause trouble and inconvenience		2.84	1.09	0.309	−0.731
		X26 I think green tourism will reduce the comfort of travel		2.87	1.21	0.314	−0.847
		X27 I think green tourism will meet with resistance from fellow travelers		2.69	1.11	0.404	−0.663
		X28 I do not think green tourism will be respected or appreciated		2.67	1.22	0.256	−1.042

Therefore, H1 and H2 are supported, while H3 was not. The perception of crisis and safety risk had a significant positive affect on the substitution of tourism consumption willingness (score = 0.355,  $t = 3.4$ ,  $p < 0.001$ ), so hypothesis H4 is supported. The willingness to engage in sustainable consumption behavior had a significant positive affect on the substitution of tourism consumption willingness (score = 0.494,  $t = 4.8$ ,  $p < 0.001$ ), so hypothesis H5 is supported. However, the psychological transformation cost and the fixed consumption habit had no significant influence on the willingness to replace tourism with consumption (ie, score = 0.021,  $t = 0.3$ ,  $p > 0.5$ ), so hypothesis H6 is not supported.

Because there are two parallel mediating variables in this model, to verify their reliability, the indirect effect size of the two mediating routes was tested using the bootstrap method. The test data are presented in Table 9. The results show that  $P < 0.01$ , indirect effect size  $> 0.01$ , and there is a significant mediating effect.

## Conclusions

### Conclusions and Discussion

Through a mixture of qualitative research based on grounded theory and quantitative model verification, this study explores the willingness of tourists to engage in sustainable

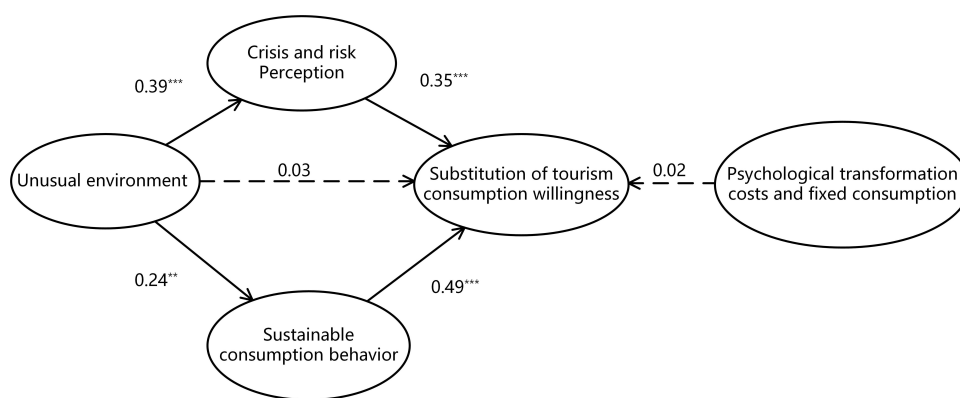
**Table 6** Reliability and Validity Tests of the Measurement Model

Variable Options		Factor Loading ( $\lambda$ )	Composite Reliability (CR)	Mean Variance Extraction Value (AVE)
Substitution of tourism consumption willingness	Y1 Y2 Y3 Y4 Y5 Y6	0.741 0.718 0.607 0.626 0.771 0.826	0.517	0.864
Sustainable consumption behavior	X1 X2 X3 X4 X5 X6 X7 X8	0.667 0.788 0.621 0.626 0.716 0.765 0.816 0.724	0.516	0.894
Unusual environment	X9 X10 X11 X12 X13 X14 X15	0.696 0.741 0.803 0.846 0.727 0.792 0.784	0.595	0.911
Crisis and security risk perception	X16 X17 X18 X19	0.615 0.714 0.767 0.761	0.523	0.884

**Table 7** Correlation Coefficient Matrix Between Variables

	Substitution of Tourism Consumption Willingness	Sustainable Consumption Behavior	Unusual Environment	Crisis and Security Risk Perception	Psychological Transformation Costs and Fixed Consumption
Substitution of tourism consumption willingness	0.747				
Sustainable consumption behavior	0.678	0.799			
Unusual environment	0.290	0.253	0.830		
Crisis and security risk perception	0.746	0.729	0.405	0.781	
Psychological transformation costs and fixed consumption	0.086	0.035	0.564	0.124	0.792

**Note:** The value on the diagonal of the matrix is the square root of the average variance extract.



**Figure 4** Analysis results of the influence path of the structural model.

**Note:** (1) \*\* represents the P value less than 0.01 for significance level ( $P < 0.01$ ), and \*\*\* represents the P value less than 0.001 for significance level ( $P < 0.001$ ). (2) solid line arrow indicates that the influence path is established, dotted line arrow indicates that the influence path is not established.

consumption behavior in an unusual environment and the substitution of tourism consumption willingness.<sup>50,51</sup> The results show that, first, being in an unusual environment has a positive relationship with tourists' perceptions of crisis and safety risk.<sup>52</sup> Tourists can consume instead of going through problem identification, cognition, and the prediction of an unusual environment.<sup>53,54</sup> Being in an unusual environment will prompt tourists to review their knowledge and attitudes toward sustainable consumption and construct and strengthen values for sustainable consumption by themselves.<sup>55–59</sup> Crisis and safety risk perceptions are positively correlated with the substitution of tourism consumption willingness.<sup>60,61</sup> Tourists can identify the crisis and safety risks and make decisions on their own crisis interests to enhance the substitution of tourism consumption willingness to reduce travel. However,

willingness to engage in sustainable consumption behavior is positively correlated with the substitution of willingness to consume tourism. The values of sustainable consumption held by tourists will promote changes in tourists' own consumption mode and will be influenced by social norms, promoting willingness to replace tourism with consumption.<sup>62,63</sup>

Second, as an intervening variable, crisis and safety risk awareness has a significant effect on sustainable consumption behavior, as strangeness in the usual environment will increase tourists' perception of risk and strengthen their willingness to consume as an alternative to tourism. Therefore, crisis and safety risk perception positively regulate the relationship between the environment and consumption behavior to engage in the substitution of tourism consumption willingness.<sup>64</sup> As for the mediating variable of willingness to engage in

**Table 8** Results of the Hypothesis Test: Direct Action

Model Hypothesis				β	CR	P	Result
H1	Crisis and security risk perception	<—	Unusual environment	0.392	4.434	***	Support
H2	Sustainable consumption behavior	<—	Unusual environment	0.243	2.982	0.003	Support
H3	Substitution of tourism consumption willingness	<—	Unusual environment	0.028	0.364	0.716	Not support
H4	Substitution of tourism consumption willingness	<—	Crisis and security risk perception	0.355	3.356	***	Support
H5	Substitution of tourism consumption willingness	<—	Sustainable consumption behavior	0.494	4.843	***	Support
H6	Substitution of tourism consumption willingness	<—	Psychological transformation costs and fixed consumption	0.021	0.307	0.759	Not support

**Notes:** (1) \*\*\* represents the P value less than 0.001 for significance level ( $P < 0.001$ ). (2) solid line arrow indicates that the influence path is established, dotted line arrow indicates that the influence path is not established.



**Table 9** Results of Hypothesis Testing Mediation

Model Hypothesis				Indirect Effect	BootMean	BootSE	P	Result
H7	Substitution of tourism consumption willingness	Crisis and security risk perception	Unusual environment	0.106	0.104	0.051	0.002	Support
H8	Substitution of tourism consumption willingness	Sustainable consumption behavior	Unusual environment	0.091	0.087	0.042	0.009	Support

sustainable consumption behavior, this can also positively adjust the relationship between the unusual environment and the substitution of tourism consumption willingness. In an unusual environment, tourists' ecological and sustainable tourism values are easy to awaken, and the substitution of tourism consumption willingness will be significantly enhanced.<sup>65</sup>

Third, as the mooring effect in PPM model theory has not been confirmed, the psychological transformation costs and fixed consumption of tourists are mainly affected by mindset and tourists' own interest decision-making, but the correlation between them and the substitution of tourism consumption willingness has not been confirmed.<sup>66,67</sup> The unusual environment directly acting on the substitution of tourism consumption willingness has not been confirmed. The study found that an unusual environment plays a correlating role with two mediating variables, namely, the perception of risks to safety and sustainable consumption behavior, through a crisis.

The theoretical contribution of this study is mainly reflected in two aspects: First, it introduces a new environmental variable and uses this variable as the core to build an understanding of the substitution of tourism consumption willingness. This theoretical structural model and the use of the two mediating variables in moderator variable correlation functions extends and expands the current academic focus on the single perspective of the usual environment and may be conducive to the further study of the usual environment as a variable in tourists' travel behavior and experiences. However, tourists' psychological and situational environmental variables are introduced for the first time, expanding, and enriching the situational and empirical research on sustainable consumption behavior.

In the process of planning and development of tourist attractions, the government should pay attention to the "push" effect under an unusual environment to create a familiar and safe tourism environment for tourists, design suitable instructions, and create guidelines to form rich and varied publicity channels to promote the generation

of sustainable tourism under unusual environment. Tourism enterprises should reduce redundant facilities and high-energy tourist items in the process of developing tourist attractions. The generation of sustainable tourism behavior requires tourists to integrate their own accurate identification under unusual environments, establish the mentality of safety risk cognition, and replace tourism behavior that may have an impact on the ecological environment with sustainable tourism consumption behavior.

## Limitations

As related studies have found, tourism is a low-frequency activity that has different rates of consumption and frequency of revisiting.<sup>68</sup> The apparent time-limited characteristic of tourism activity may dampen tourists' enthusiasm toward the idea of sustainable consumption and, from the usual environment to the usual circumstances, not only is the change geographical but tourists' individual behavior patterns and psychology also change.<sup>69,70</sup> In a heterogeneous environment, tourists' personal sustainable consumption behavior pattern will also change. Since this is a dynamic game process, it is also one of the research limitations of this study; one of its hidden assumptions is that it treats the willingness of tourists to engage in sustainable consumption and sustainable consumption behavior as inevitable, while in fact, there is a large gap between tourists' willingness and their actual behavior. Although tourists may engage in sustainable consumption in different environments and situations, this does not necessarily represent a full implementation. The relevant laws and ways to positively motivate sustainable consumption in tourists also need to be further examined through in-depth studies. Although the willingness to engage in sustainable consumption and consumer behavior has been the subject of a great deal of research,<sup>70–72</sup> there is still need for further study of the effect of being in a heterogeneous environment similar to the usual environment. In addition, dynamic game research on tourists'

sustainable consumption behavior in unusual environments also needs to be further discussed.

## Ethics Statement

We declare that participants in our research study allow us to use their data for academic research and publication. All the participants were anonymous and their data was protected. All participants provided informed consent and this study was conducted in accordance with the Declaration of Helsinki. All the programs in our research study were approved by the Institutional Review Board of Zhejiang University of Finance and Economics.

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## Disclosure

The authors declare that they have no conflicts of interest for this work.

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