

## Article

# Assessment on the Environmental Concern Level and Driving Mechanism of Beach Recreationists Based on the New Ecological Paradigm Scale

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**Abstract:** This study uses the new ecological paradigm (NEP) scale to measure the level of environmental concern among beach recreationists, innovatively constructs a model based on the measurement results to depict a group portrait, and analyzes the driving mechanism of beach recreation pro-environmental behavior. The level of environmental concern of beach tourists is 66.2%, which is slightly higher than the average level of Chinese urban residents, and is significantly correlated with age, occupation, education level, and income level. The newly constructed environmental behavior group portrait index indicates that the group that actively participates in recreational environmental behavior at Haichow Bay Beach includes college students, primary and secondary school students, retirees, and surrounding residents. Key factors in the generation of environmentally friendly behavior for beach enthusiasts include individual self-control constraints, regional ecological environment management, the improvement in environmental literacy, overcoming individualism, external environmental impacts, and environmental education.

**Keywords:** environmental concern; new ecological paradigm scale; group portrait of environmental behavior; beach recreation



**Citation:** Wu, X.; Zhong, C.; Chen, H.; Zou, X. Assessment on the Environmental Concern Level and Driving Mechanism of Beach Recreationists Based on the New Ecological Paradigm Scale. *Sustainability* **2024**, *16*, 3292. <https://doi.org/10.3390/su16083292>

Academic Editor: Tai-Yi Yu

Received: 6 March 2024

Revised: 25 March 2024

Accepted: 11 April 2024

Published: 15 April 2024



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## 1. Introduction

In the 1960s, the “Silent Spring” sounded the alarm for public attention to the ecological environment [1]. After more than half a century of development, ecological and environmental issues have received widespread attention from countries worldwide and have received unprecedented attention in China. As early as the report of the 19th National Congress of the CPC, the importance of adhering to the basic national policy of conserving resources and protecting the environment was noted [2]. In September 2020, China proposed the “dual carbon” goal with the aim of peak carbon dioxide emissions by 2030 and carbon neutrality by 2060. The ecological environment has become the primary concern in various undertakings in China.

However, environmental issues are ultimately human issues. The level of public concern for ecological and environmental issues and the public’s willingness to actively contribute to environmental protection plays a crucial role in improving the ecological environment and solving environmental problems [3–6]. There are various measurement standards for research on environmental concern. Since the 1970s, many scholars have begun to pay attention to related research. Examples include the Ecological Attitudes and Knowledge Scale (EAKS) proposed by Maloney and Ward (1973) [7] and the Environmental Concern Scale (ECS) proposed by Weigel R (1983) [8]. The new ecological paradigm (NEP) scale designed by Dunlap and Liere (2000) is one of the most influential measurement

standards internationally [8,9]. It has been used extensively in the literature and has good applicability and effectiveness in capturing multiple aspects of people's pro-environmental worldview and measure respondents' level of environmental concern [4,10]. Furthermore, it reflects the level of respondents' pro-environmental behavior [8]. In related studies, scholars use various expressions, such as (ecological) environmental concern, (ecological) environmentally friendly attitude, pro-environmental attitude, and willingness to engage in environmentally friendly behavior. Strictly speaking, these expressions are not completely consistent; however, they generally refer to the degree to which people are aware of and support the resolution of ecological and environmental issues as well as individuals' contributions to solving these problems. Hong (2006) first evaluated the application of the NEP scale in China [3]. To further the continuity of research on the application of the NEP scale in China and reduce the confusion caused by conceptual diversity in scholars' research, this study adopts the internationally used term "environmental concern".

Dunlap and Liere (1978) first proposed the NEP scale consisting of 12 items [9]. After multiple revisions, the final version was proposed in 2000, which is the 15-item scale used in this study [10]. To date, the scale has been translated into multiple languages and has been widely confirmed to have high reliability and validity with regard to environmental concern and pro-environmental behavior [11–14].

Research on environmental concerns in China began in the mid-1990s and gradually intensified after 2000. Early research often focused on the public's environmental awareness of a certain area or of a specific environmental issue, while research on the public's ecological awareness of overall environmental quality was weak and fragmented [15–17]. Benedict and Hussein (2019) discuss how the Jordanian government changes the behavior of its citizens through water awareness campaign messaging, which is in fact an example of how the state can change the behavior of its citizens regarding environmentally friendly behavior [18]. Hong (2006) used the revised NEP scale to assess the level of environmental concern among urban residents based on data from the 2003 China Comprehensive Social Survey [3]. In the past 20 years, acceptance of the NEP in China has continuously improved. Wu et al. (2012) conducted research on the application of the NEP scale in China and verified that the NEP scale has good reliability and validity and can be used as a tool for studying ecological values and ecological awareness [19]. Wu and Zhu (2017) applied the NEP scale to assess environmental attitudes and behaviors among urban student groups in China [20]. The research results confirmed that the revised NEP scale has good reliability and can effectively reflect the psychological characteristics of student groups in terms of their ecological worldview. Xiao et al. (2019) proposed and validated the core role of the NEP scale in measuring environmental concern by reviewing environmental concern assessments for China, the United States, and Canada [5]. In recent years, the evaluation of levels of environmental concern has shown a trend of diversification and complexity, but the key position of the NEP in environmental concern measurement is still highly recognized. Xiao et al. (2021) validated the strong direct and indirect effects of the NEP in predicting pro-environmental behavior based on the value belief norm (VBN) theory [14]. In addition, the NEP scale has been confirmed by multiple studies to have significant effects in predicting specific environmental issues, such as environmental attitudes toward renewable energy [21], the perception of the severity of various environmental issues [22], willingness to pay for environmental protection [23], views on climate change and global warming [24], and the level of environmental policy support [25]. To date, however, there is still a relative lack of theoretical and practical research on the NEP scale in China, and most research focuses on simple reliability and validity tests. Theoretical exploration based on the NEP scale is even rarer, and more group and regional application tests and theoretical exploration are required.

Beaches are the favorite coastal tourist destination for tourists. They are direct interaction zones between the ocean and land, composed of various resource elements such as topography, water, climate and meteorology, biology, and culture. Beaches are popular places for leisure, recreation, and entertainment activities, which provide people

with physical and mental pleasure and relaxation and produce considerable economic benefits [26].

However, most people may have overlooked a fact of how beaches are also a habitat for many organisms and an important component of the marine ecosystem [27–29]; even some scholars also believe that beaches are simply a pile of lifeless sand [30]. This common phenomenon was mentioned by other scientists, such as Dugan, Schlacher, and Thompson. Dugan et al. (2010) published a paper in the journal *Science* on the precariousness of beach ecosystems [31]. The beach ecosystem, as an important component of the global coastline, is facing unprecedented pressure [26]. The impact of recreational activities on the ecological environment of beaches has been a serious environmental problem faced by China's coastal zone development and utilization in recent years. However, there is still a lack of in-depth research on this in China. With the rapid increase in the intensity and scope of beach recreation, coupled with the widespread neglect or underestimation of the ecological characteristics of beaches, this research is becoming more urgent [30,31]. Data from Vousdoukas et al. (2020) confirm that multiple beaches worldwide are at or near the threat of imminent extinction [32]. The recreational beach ecosystem urgently needs more attention and protection, and the environmental attitudes and concern of beach tourists are crucial.

This research aims to answer the following questions: (1) What is the level of environmental concern of the coastal destination in China? (2) What are the portraits of different environmental behavior groups? How do we distinguish them? (3) What is the driving mechanism of pro-environmental behavior for beach recreationists? We applied the adjusted NEP scale to measure the level of environmental concern. Then, based on the measurement results, a model was innovatively constructed to depict the profile of environmental behavior groups. To gain a deeper understanding of the specific environmental behavior intentions and factors that influenced the respondents, 18 supplementary options were added based on the 15 items in the NEP scale and the characteristics of the coastal area in the study area. Finally, the factor analysis method was used to analyze the driving mechanism of beach recreational behavior.

Our findings first evaluated the environmental concern level of coastal destinations in China. By making comparisons with previous studies, it is also possible to have a clearer understanding of the relative level. Based on the environmental behavior group portrait index, we could distinguish the portraits of the pro-environmental behavior group and individual environmental group and clarify the driving mechanism of beach recreational behavior, which could provide a precise and effective reference for improving strategies and goals of pro-environmental behavior in the coastal region.

This study contributes to environmental concern of coastal destinations and innovatively constructs an environmental behavior group portrait index and clarifies its driving mechanism, which is an extension of NEP theory and practical exploration. The findings could help environmental management departments accurately position the direction and content of work for the public.

## 2. Data Sources and Research Methods

### 2.1. Adjustment and Application of the NEP Scale

#### (1) Contextual Adaptability Translation of the NEP Scale

The NEP scale includes a total of 15 measurement factors, of which 7 items, including 2, 4, 6, 8, 10, 12, and 14, are inverse problems [10]. The fifteen measurement factors involve five dimensions of cognition, namely, natural balance cognition, ecological crisis cognition, growth limit cognition, human exceptionalism, and anti-anthropocentrism [10]. The cognitive level of these five dimensions comprehensively reflects the level of environmental concern of the respondents. Among them, N1, N6, and N11 reflect attitudes toward growth limits; N2, N7, and N12 reflect anti-anthropocentrism; N3, N8, and N13 reflect attitudes toward natural balance; N4, N9, and N14 reflect human exemptionalism; and N5, N10, and N15 reflect the perspective of ecological crisis.

Empirical research on the NEP scale in China is still in its early stages. Feedback from the use of the NEP scale in China recommends modifying the translation of the scale according to the actual situation, which can effectively improve the resolution and internal structural consistency of some items [3,19,20]. In this research, attention was given to timely and flexible interpretation and recording based on respondents' understanding, and positive adjustments to the semantics and processing of scores were made to the reverse measurement project statistics and scoring.

A 5-point Likert method is used to score the scale, with strong agreement scoring 5 points, agreement scoring 4 points, neither agreeing nor disagreeing scoring 3 points, disagreement scoring 2 points, and strong disagreement scoring 1 point. The scoring method for reverse questions was the opposite. The maximum total was 75 points. The higher the NEP score, the higher the respondent's degree of environmental concern, the friendlier the respondent's environmental attitude, and the more positive the respondent's environmental behavior all were. In addition, the final part of the questionnaire included demographic variables (gender, age, occupation, education level, monthly income, etc.).

## (2) Reliability and Validity Testing of the NEP Scale

Using SPSS 26.0 software, exploratory validation analysis was conducted on the collected sample data to determine the structural validity of the NEP scale from both global and local perspectives, including the correlation between observed variables, KMO values, and sampling appropriate measurement values with the measure of sampling adequacy (MSA) and Bartlett's spherical test [33]. At least moderate correlation (not less than 0.3) and KMO value (not less than 0.8) and a significant Bartlett's spherical test and Cronbach's alpha (not less than 0.6) effectively determined the internal correlation and overall consistency of the NEP scale and verified the reliability and validity of the scale.

## 2.2. Construction of the Environmental Behavior Group Portrait Index

To more clearly detect the characteristics of different environmental attitudes of beach recreation groups in Haichow Bay, an environmental behavior group portrait index was constructed. Through this function, profiles of positive environmental groups and anthropocentric environmental behavior were depicted. Specifically, the NEP survey samples were divided into a high group (NH), medium group (NM), and low group (NL). The high group (NH) was environmentally friendly, the middle group (NM) had an ordinary environmental attitude, and the low group (NL) had an anthropocentric attitude. The full score of the 15 options in the NEP scale was 75 points. The NL group, that is, the anthropocentric type, scored 15–35 points; the NM group, that is, the group with ordinary environmental concern, scored 36–55 points; and the NH group, that is, the group that indicated active environmental protection, scored 56–75 points. We constructed an environmental behavior group portrait index that focused on portraying positive environmental groups and individualistic environmental behavior groups. Please refer to Formula (1) for details.

$$I = \frac{Q_i/Q}{S_i/S} \quad (1)$$

where  $I$  is the portrait index for depicting environmental behavior groups;  $Q_i$  is the frequency of item  $i$ , the demographic characteristics in each NEP group (high or low);  $Q$  is the number of groups with environmental concern in the NEP (total number of high groups or total number of low groups);  $S_i$  is the frequency in the total sample of demographic characteristic factors of item  $i$ ; and  $S$  is the total number of samples. When  $I > 1$ , it indicates that the demographic factor features prominently and can be extracted to describe the environmental behavior groups.

## 2.3. Measurement of Beach Recreationists' Specific Pro-Environmental Behavior Intention

To gain a deeper understanding of the specific environmental behavior intentions and factors that influenced the respondents, 18 supplementary options were added based on the 15 items in the NEP scale and the characteristics of the coastal area in the study area

(Table 1). The questions mainly involved people's specific understanding of and protection intentions toward the beach ecological environment. To verify the effectiveness of the questionnaire, reverse questions were added, including items 20, 21, 22, 23, 25, 26, and 29, which were adjusted positively during later recording and statistics.

**Table 1.** The 18 supplementary items for Specific Environmental behavior intention.

NO.	Items
N16	Beach brings joy to our life.
N17	In order to protect the beach environment, I am willing to restrain my behavior.
N18	I am willing to pay some fees to protect the beach.
N19	If I see garbage, I will pick it up and throw it into the trash can.
N20	Smoking and throwing cigarette butts on the beach are not acceptable.
N21	The scenic beach is not just for providing tourists with leisure and entertainment.
N22	Compared to protecting the natural environment of beaches, I do not support the construction of recreational activities and service facilities.
N23	Even with the equipment, I wouldn't barbecue on the beach.
N24	I will take my garbage with me and put it in the trash can.
N25	When encountering beach creatures (such as crabs, sandworms, shellfish, etc.), I cannot pick or excavate them.
N26	Tourists' foraging of beach animals can affect the ecological environment.
N27	If I encounter a public faucet that is not turned off, I will take the initiative to turn it off.
N28	Environmental education is necessary for environmental protection.
N29	If people around me throw garbage around, I won't do it either.
N30	Before taking action, I will consider whether it violates relevant management systems, regulations, and social norms.
N31	Understanding environmental information is more conducive to environmental protection behavior.
N32	The environmental attitudes of friends and relatives around me can affect me.
N33	I will provide environmental protection education to children (or other children).

#### 2.4. Data Analysis

This study first tested the reliability and validity of the questionnaire survey. The relationship between demographic factors and pro-environmental attitudes was analyzed by variance analysis. All data were statistically analyzed with SPSS 26 and Excel 2016 software, and the significance level was 0.05. The drawing was completed using ArcGIS10.2 software.

In the analysis of the driving mechanism of beach recreational behavior, the factor analysis method was used to construct a model, and its weight was determined based on the value of the factor coefficient, as shown in Formula (2):

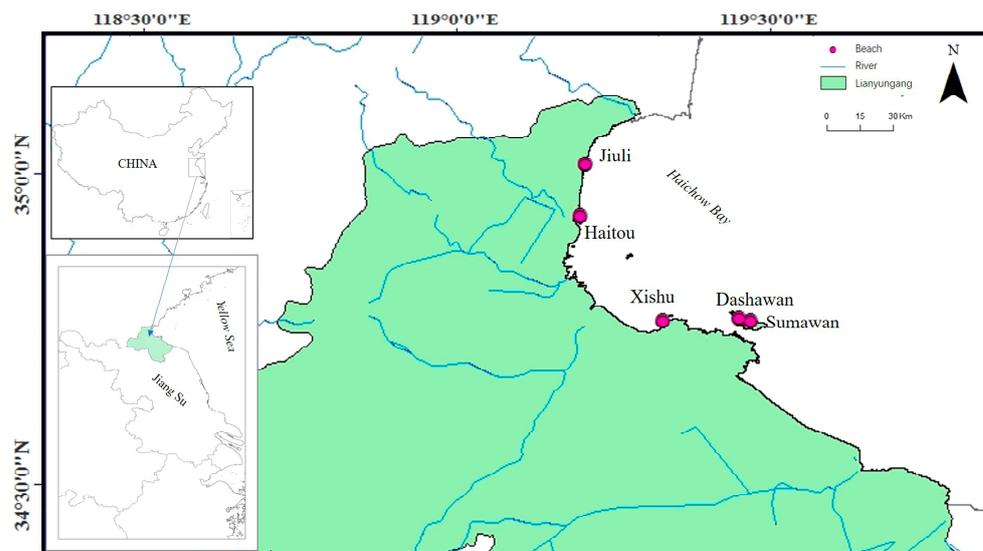
$$f = \frac{\lambda_1}{\sum_{j=1}^m \lambda_j} f_1 + \frac{\lambda_2}{\sum_{j=1}^m \lambda_j} f_2 + \dots + \frac{\lambda_m}{\sum_{j=1}^m \lambda_j} f_m \quad (2)$$

where  $f$  is the driving function of pro-environmental behavior,  $f_m$  is the main influencing factor extracted,  $m$  is the number of main factors extracted, and  $\lambda_m$  is the characteristic root of the principal component factor.

#### 2.5. Data Collection

This study used on-site investigations to obtain first-hand measurement variable data from questionnaire surveys. The survey data were collected in the first ten days of August 2018 and 2019 before COVID-19 in the Haichow Bay area along the coast of Central China (Figure 1), including five beaches: the resort-type Dashawan Beach (E 119°27'56", N 34°46'25.84"), Suma Bay Beach (E 119°29'6", N 34°46'7.7"), the urban-type Xishu Beach (E 119°20'3", N 34°46'2.84"), the semi-urban-type Haizhouwan Beach (E 119°12'35", N 34°56'31"), and the rural Jiuli Beach (E 119°13'12", N 35°1'14.14"). The beach types in this study were based on the beach classification standards of Williams and Micallef (2010) [34]. The classification of representative beaches in the Haichow Bay

area was based on Wu et al.'s classification in 2021 [35]. There are three main reasons for choosing Haichow Bay, as is the case in this paper. Firstly, Haichow Bay has the only sandy beaches in Jiangsu Province, which is one of the most developed provinces in China. It is a famous coastal destination where the interaction between human recreational activities and the ecological environment is significant frequency. Secondly, Haichow Bay has a special geographical representativeness. It is located in the transitional zone between the north and south climates and lies in the intersection of sandy rocky and muddy coasts. Thirdly, the marine dynamics in this region are relatively weak, and the overall stability along the coastline makes it a good research area that reflects the interaction between human activities and the coastal ecological environment.



**Figure 1.** Distribution of recreational beaches in the study area.

To ensure the effectiveness of the questionnaire, during the on-site survey, elderly people and children were interviewed, and the investigator assisted in the completion of the questionnaires. The questionnaire was completed on site and collected immediately. To test the reliability of the questionnaire survey, a small-sample test was conducted in the early stage before the large-sample distribution of the questionnaire. At Dashawan Beach in Liandao, 50 questionnaires were first collected for small-sample reliability and validity testing. The analysis results showed that Cronbach's alpha was 0.823, indicating that the questionnaire had good internal consistency and high reliability and had good applicability for users of Haichow Bay Beach. It could be used for distribution to large samples. A total of 1550 research questionnaires were distributed and 1327 valid questionnaires were collected, with a validity rate of 85.61%.

### 3. Results Analysis

#### 3.1. Reliability and Validity Testing and Application of the NEP Scale

Exploratory factor analysis was conducted on the survey data of 15 items of the NEP scale to test their internal consistency and reliability. It was found that the correlation between measurement factors was good, with values greater than 0.3 (Supplementary Table S1). Cronbach's  $\alpha$  was 0.763 (greater than 0.7 with good acceptance), the KMO value was 0.92 (greater than 0.8 with good acceptance), and the MSA was between 0.887 and 0.957, significantly higher than 0.8 (Supplementary Table S2). Bartlett's spherical test results were significant ( $p = 0.000 < 0.001$ ), indicating that the NEP scale had good structural validity, good internal consistency, and high reliability and validity levels, supporting the applicability of the NEP for this study.

### 3.2. Demographic Characteristics of Beach Recreationists

The demographic characteristics of beach recreationists in Haichow Bay are shown in Table 2. (1) The proportion of female respondents was slightly higher than that of male respondents; (2) approximately half of the respondents were distributed between the ages of 25 and 44; (3) most of the respondents were employees of enterprises, accounting for approximately a quarter, and 20% of the respondents in the survey were freelance workers, some of whom were full-time home-based farmers and most of whom were “new-style farmers” who did not engage in traditional agricultural work; (4) nearly half of the respondents had a bachelor’s degree or a college degree; (5) 40% had an income between CNY 3000 and 7000.

**Table 2.** Demographic characteristics of beach recreationists in Haichow Bay.

Item	Demographic	Number of Beach Recreationists	Percentage (%)
Gender	Male	557	42
	Female	770	58
Age	Under 15 years old	31	2.3
	15~24 years old	346	26.1
	25~44 years old	613	46.2
	45~64 years old	293	22.1
	Over 65 years old	44	3.3
Occupation	Administrative agencies	125	9.4
	Public institutions	132	9.9
	Enterprise	337	25.4
	Freelancer	267	20.1
	Farmer	92	6.9
	Student	178	13.4
	Retired	29	2.2
	Others	167	12.6
Education	Junior high school and below	260	19.6
	High school and equivalent	337	25.4
	Junior college	311	23.4
	Undergraduate	380	28.6
	Master or above	39	2.9
Monthly income	Below CNY 1500	202	15.2
	CNY 1500~3000	311	23.4
	CNY 3001~5000	369	27.8
	CNY 5001~7000	263	19.8
	CNY 7001~10,000	110	8.3
	Above CNY 10,000	72	5.4

### 3.3. Environmental Concern Level of Beach Recreationists

Based on Dunlap and Liere’s NEP scale (2000), the higher the level of respondents’ environmental concern or the friendlier their environmental attitude, the more positive their environmental behavior. Environmental concern has a direct effect on environmental behavior [4,5], and the degree of environmental concern directly reflects respondents’ pro-environmental behavior.

Using SPSS software, a comparative mean analysis was conducted on the 15 items of the NEP scale (Table 3). The environmental attitude score of residents and tourists in the Haichow Bay area was 3.31, with an environmental concern level equivalent to 66.2%.

Among the 15 observational variables, the average score of N2’ was the lowest at 3.08, reflecting the overall strong willingness and momentum of beach recreationists toward environmental utilization and transformation, which are in line with the current status and trend of human development and utilization of beaches. The recognition of N7 “animals and plants have the same right to survival as humans” was the highest with an average score of 3.67, which reflects people’s contradictory mentality of “development and protection” when using beaches.

**Table 3.** Environmental concern of recreational beach users.

Dimension	Items	Average	SD
Limits	N1 We are approaching the limit of the number of people the earth can support.	3.23	1.344
	N6' Even if we know how to develop it, the earth's resources will not be inexhaustible.	3.13	1.347
Anti-Anthro	N11 The earth is like a spaceship with very limited room and resources.	3.38	1.375
	N2' Humans have no right to modify the natural environment to suit their needs.	3.08	1.347
	N7 Plants and animals have as much right as humans to exist.	3.67	1.412
Balance	N12' Humans are not born to control nature.	3.43	1.285
	N3 When humans interfere with nature it often produces disastrous consequences.	3.52	1.333
	N8' Although nature has a strong balance ability, it is not enough to cope with the impact of modern industrial countries.	3.25	1.319
Anti-Exempt	N13 The balance of nature is very delicate and easily upset.	3.29	1.416
	N4' Human ingenuity will not ensure that we do not make the earth unlivable.	3.11	1.286
	N9 Despite their special abilities humans are still subject to the laws of nature.	3.61	1.419
Eco-Crisis	N14' Human intelligence cannot guarantee that we will not make the Earth uninhabitable.	3.17	1.295
	N5 Humans are severely abusing the environment.	3.30	1.393
	N10' The so-called "ecological crisis" facing humankind has not been greatly exaggerated.	3.18	1.262
	N15 If things continue on their present course we will soon experience a major ecological catastrophe.	3.36	1.292
	Total	3.31	1.34

Note: N2', N4', N6', N8', N10', N12', N14' are the corrected expression term for N2, N4, N6, N8, N10, N12, respectively.

### 3.4. Demographic Differences in Beach Recreationists' Environmental Concerns

To further analyze the factors that influence beach recreationists' environmental concerns, this study used a single-factor analysis of variance (ANOVA) in SPSS to analyze the relationship between demographic characteristics and environmental concern. Table 4 shows that there was no significant gender difference ( $p = 0.763 > 0.05$ ) in the environmental concern of the respondents, but there was a significant correlation with age ( $p = 0.000 < 0.05$ ), occupation ( $p = 0.000 < 0.05$ ), education level ( $p = 0.018 < 0.05$ ), and income ( $p = 0.000 < 0.05$ ). Therefore, the following conclusion can be drawn: the environmental concern of beach tourists in the study area is not related to gender but is significantly correlated with age, occupation, education level, and income level.

**Table 4.** Demographic differences and environmental concern based on ANOVA.

Item	Demographic	Average	SD	<i>p</i>
Gender	Male	3.32	0.66	0.763
	Female	3.31	0.64	
Age	Under 15 years old	3.65	0.75	0.000
	15~24 years old	3.31	0.68	
	25~44 years old	3.30	0.58	
	45~64 years old	3.21	0.63	
	Over 65 years old	4.00	0.83	
Occupation	Administrative agencies	3.02	0.53	0.000
	Public institutions	3.15	0.62	
	Enterprise	3.25	0.68	
	Freelancer	3.36	0.50	
	Farmer	3.32	0.77	
	Student	3.54	0.69	
	Retired	3.66	0.76	
Education	Others	3.42	0.61	0.018
	Junior high school and below	3.37	0.66	
	High school and equivalent	3.37	0.61	
	Junior college	3.29	0.61	
	Undergraduate	3.26	0.68	
	Master or above	3.13	0.68	

**Table 4.** *Cont.*

Item	Demographic	Average	SD	<i>p</i>
Monthly income	Below CNY 1500	3.53	0.68	0.000
	CNY 1500~3000	3.37	0.64	
	CNY 3001~5000	3.32	0.62	
	CNY 5001~7000	3.20	0.65	
	CNY 7001~10,000	3.07	0.61	
	Above CNY 10,000	3.20	0.54	

The significance level is 0.05.

### 3.5. Group Portraits of Positive and Individualistic Environmental Behaviors

Based on the above results, we further explored the characteristics of different groups of beach recreationists with regard to environmental concern. In this study, the NEP survey sample of the new ecological paradigm was divided into three groups: a high group, comprising the environmental behavior initiative type (56–75 points); a middle group, comprising the ordinary type (36–55 points); and a low group, comprising the anthropocentric type (15–35 points). The results showed that there were 331 people (24.9%) in the high group, 912 people (68.7%) in the middle group, and 84 people (6.3%) in the low group. The environmental behavior group portrait information was extracted according to Formula (1) (Table 5).

**Table 5.** Environmentally friendly behavior and individual portrait index.

Item	Demographic	Portrait Index of Positive Environmental Behavior Groups	Portrait Index of Individualistic Environmental Behavior Groups
Gender	Male	1.4435	0.5173
	Female	1.1575	1.2770
Age	Under 15 years old	0.8959	0.7729
	15~24 years old	0.8063	1.2928
	25~44 years old	2.1970	0.3606
	45~64 years old	0.3532	1.2660
	Over 65 years old	0.6404	1.3232
Occupation	Administrative agencies	0.9157	1.2185
	Public institutions	0.8567	0.4144
	Enterprise	1.1826	1.7246
	Freelancer	1.5104	0.6216
	Farmer	1.6500	0.0000
	Student	0.2635	1.2286
	Retired	0.9556	0.6071
	Others	1.0941	0.6563
Education	Junior high school and below	0.8521	0.9667
	High school and equivalent	1.0776	1.4570
	Junior college	0.9379	2.4621
	Undergraduate	1.3316	0.6263
	Master or above	1.1748	0.6615
Monthly income	Below CNY 1500	0.8910	0.7281
	CNY 1500~3000	0.8545	1.5030
	CNY 3001~5000	0.7277	2.1518
	CNY 5001~7000	0.8389	1.3222
	CNY 7001~10,000	1.4435	0.5173
	Above CNY 10,000	1.1575	1.2770

#### (1) Positive group portrait of environmental behavior

Based on the portrait index of positive environmental behavior groups, data greater than 1 were extracted. The results showed that positive environmental behavior groups had the following characteristics: aged under 24 years old and 65 years old and above; retirees, students, and farmers; a bachelor's degree, high school degree, or equivalent; and

a monthly income level below CNY 3000 (mostly students). Through this group portrait, it can be inferred that college students, high school students, retirees, and surrounding residents are more positive and friendly toward the beach environment.

## (2) Individual group portrait of environmental behavior

According to the individualistic environmental behavior portrait index, data greater than 1 were extracted. The results showed that the main characteristics of individualistic environmental behavior were as follows: aged 15~24 and 45~64; enterprises, institutions, administrative agencies, and some farmers; a bachelor's degree or above; and a monthly income of over CNY 5000. From the above portrait, it can be inferred that individuals in enterprises, institutions, and administrative agencies with relatively high educational and income levels have significant individual characteristics.

### 3.6. Factors Affecting the Pro-Environmental Behavior of Beach Recreationists

#### (1) Analysis of intention to engage in pro-environmental behavior

Using SPSS software, the approval rates of the 18 pro-environmental behavior intention questions in Table 6 were statistically analyzed (including the strongly agree and agree options). The reverse questions were positively adjusted during the recording and statistics. The consent rate for beach environmental protection behavior intentions among the respondents ranged from 43.6% to 68.1%.

**Table 6.** Environmental behavior intention of beach recreationists.

NO.	Items	Consent Rate (%)
N16	Beach brings joy to our life.	63.6
N17	In order to protect the beach environment, I am willing to restrain my behavior.	60.9
N18	I am willing to pay some fees to protect the beach.	52.3
N19	If I see garbage, I will pick it up and throw it into the trash can.	64.3
N20	Smoking and throwing cigarette butts on the beach are not acceptable.	64.4
N21	The scenic beach is not just for providing tourists with leisure and entertainment.	57.2
N22	Compared to protecting the natural environment of beaches, I do not support the construction of recreational activities and service facilities.	43.6
N23	Even with the equipment, I wouldn't barbecue on the beach.	50.6
N24	I will take my garbage with me and put it in the trash can.	65.7
N25	When encountering beach creatures (such as crabs, sandworms, shellfish, etc.), I cannot pick or excavate them.	49.4
N26	Tourists' foraging of beach animals can affect the ecological environment.	53.7
N27	If I encounter a public faucet that is not turned off, I will take the initiative to turn it off	68.1
N28	Environmental education is necessary for environmental protection.	60.5
N29	If people around me throw garbage around, I won't do it either.	62.2
N30	Before taking action, I will consider whether it violates relevant management systems, regulations, and social norms.	63.3
N31	Understanding environmental information is more conducive to environmental protection behavior.	65.2
N32	The environmental attitudes of friends and relatives around me can affect me.	53.0
N33	I will provide environmental protection education to children (or other children).	64.6

According to survey data, 63.3% of respondents affirmed the joy that beaches bring to life, which was directly related to their positive support of environmental protection; 60% of respondents expressed a willingness to restrain their behavior to protect the beach; approximately 65% of respondents had good environmental responsibility, such as water conservation and waste recycling, as well as low-carbon behaviors; 65% of respondents believed that understanding ecological and environmental information is conducive to environmental protection behavior; 60% supported various types of environmental education; 66% of parents said they would provide environmental education to their children; and 63% showed fear and compliance with relevant management systems, regulations, and social norms.

It was also observed that approximately 43% of the respondents believed that the beach was only for tourists, and approximately half of the beach enthusiasts said they would pick and excavate benthic beach animals and believed that this behavior did not have an impact on the ecological environment. These data reflect a significant lack of understanding of beaches as benthic habitats and their ecological characteristics. In terms of protecting the environment or building recreational facilities, 60% of respondents decisively chose the latter. Some respondents also stated that they would engage in activities such as barbecuing on the beach. Regarding ecological compensation, only approximately half of the respondents clearly expressed their willingness to pay a fee to protect the beach. There are serious threats and hidden dangers to the ecological environment of recreational beaches, and there is a long way to go to protect the ecological environment of beaches.

## (2) Analysis of the factors influencing pro-environmental behavior

Through a comprehensive analysis of the above 18 additional factors in Table 6, multicollinearity was shown among them. Therefore, Principal Component Analysis (PCA) was applied to extract the main factors. A dimensionality reduction on the scale was operated with the help of SPSS software. The results showed that there were three factors with eigenvalues greater than 1 in the scale, with a cumulative contribution rate of 70.57%. Among them, the first rotation factor could explain 46.70% of the total variation, the second rotation factor could explain 17.36% of the total variation, and the third rotation factor could explain 6.51% of the total variation. The loads on each factor are shown in Table 7.

**Table 7.** Eigenvalues and variance contribution rate of principal factors of environmental behavior.

Factor	Eigenvalue	Variance Percentage (%)	Cumulative Percentage (%)
1	8.406	46.702	46.702
2	3.125	17.363	64.065
3	1.171	6.507	70.572

By combining the factor load matrix data in Supplementary Table S3, the explanatory information of the principal component factor variables can be analyzed. Factor 1 was mainly related to good environmental and low-carbon behavior habits and methods of beach recreational users as well as relevant social management systems and norms, reflecting the mechanism of social ecological environment constraint, individual constraint ability, and environmental responsibility. Factor 2 was mainly related to individuals' consumption of casual enjoyment and lack of environmental awareness. Factor 3 mainly reflected the impact of the external environment and the importance of environmental education. Therefore, the factors that affect pro-environmental behavior in the research area can be summarized into four categories: social ecological environment constraint and individual self-control, environmental cognition and individualism, external influence, and environmental education.

### 3.7. The Driving Mechanism of Pro-Environmental Behavior for Beach Recreationists

Based on the above analysis, weight is an indicator that measures the relative importance of common factors. The larger the value is, the higher the contribution of the characterization factor. Therefore, the variance contribution rate of common factors is used as the weight. The weights of these three induced influencing factors are shown in Table 7, and the corresponding eigenvalues are 8.406, 3.125, and 1.171, respectively. The contribution rates of each factor are calculated as 0.662, 0.246, and 0.092, respectively, using Formula (2). Based on the weights of the three main influencing factors, the pro-environmental behavior-driven generation mechanism of beach tourists can be constructed as follows:

$$f = 0.662f_1 + 0.246f_2 + 0.092f_3 \quad (3)$$

where  $f_1$  reflects individual self-control and regional ecological environment management constraints,  $f_2$  reflects the improvement of environmental literacy and the overcoming of individualism, and  $f_3$  refers to external influences and environmental education.

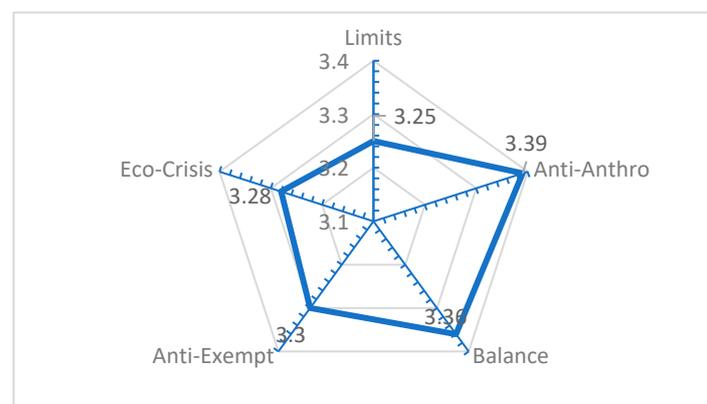
The driving mechanism of beach recreation pro-environmental behavior is ranked based on weight values, including (1) individual self-control and regional ecological environmental management, (2) improving environmental literacy and overcoming individualism, and (3) external influences and environmental education.

#### 4. Discussion

##### 4.1. Environmental Concern Level of Beach Recreationists

In this study, the level of environmental concern among beach enthusiasts was found to be equivalent to 66.2%. Comparing these data with those of previous studies, it was found that the environmental behavior friendliness of Chinese urban residents was 61.24% [3], significantly lower than the average environmental behavior friendliness of residents in large cities such as Guangzhou, Xi'an, Urumqi, Kunming, Harbin, Lanzhou, Shanghai, Chengdu, Beijing, and Wuhan at 74.86% [19]. According to Xiao's (2021) comparison of 10-year data on urban residents in China [14], it can be inferred that the level of environmental concern of beach tourists in Haizhou Bay may not change significantly without strong external interference.

The level of environmental concern of residents and tourists around the recreational beach was reflected in the average values of the five dimensions of "natural balance", "ecological crisis", "growth limit", "human exceptionalism", and "anti-anthropocentrism" (Figure 2), indicating that the respondents' five dimensions of cognitive levels were relatively balanced. However, it is worth noting that the respondents had slightly lower cognition in the dimensions of ecological crisis and growth limit.



**Figure 2.** Average of five dimensions of NEP.

##### 4.2. Group Portraits of Beach Recreationists' Environmental Behaviors

Based on the constructed environmental group behavior model, this study suggests that college students, high school students, retirees, and surrounding residents are more positive and friendly toward the beach environment. However, individuals from enterprises, institutions, and administrative agencies with relatively high levels of education and income exhibit more obvious characteristics of individualism. This environmental behavior demonstrates a significant deviation from people's usual cognition. Comparing the characteristics of the high-NEP group and the low-NEP group, the environmental behavior of 15- to 24-year-old undergraduate-educated individuals and some farmers shows a two-stage differentiation phenomenon, which is evident in both groups. Some environmental behaviors are positive and friendly, while others have a significant tendency toward individualism. However, common sense suggests that administrative and public institution staff with relatively high education and income as well as stable jobs exhibit a clear tendency toward environmental utilization and individualism in beach recreation.

College students, high school students, retirees, and some farmers are more friendly toward beach environment behavior. This conclusion provides a warning for the management of recreational beaches and emphasizes the need for environmental education for student groups. Some students' performance reflects the effectiveness of current environmental education, and they have good environmental attitudes and behaviors. However, some students aged 15–24 still need to improve their attitudes and behaviors. By comparison, the environmental attitudes of staff in administrative and public institutions with relatively high education and income as well as relatively stable jobs are worrying. This finding is inconsistent with many existing research conclusions [3,5]. However, if we combine the negative impact relationship between materialistic values and environmental care and behavior [36], we can explain this conclusion. We believe that overcoming the random behavior and hedonism of beach recreation is of urgent research significance, and the protection of the beach ecological environment should be considered by society as a whole. On the other hand, the distance between recreational activities and the beach in the study area significantly affects people's pro-environmental behavior. Shortening the spatiotemporal distance between recreational activities and the beach ecological environment or increasing the correlation with individuals can change pro-environmental attitudes from being intangible to tangible, thereby improving people's pro-environmental behavior [37].

#### *4.3. The Driving Mechanism of Pro-Environmental Behavior for Beach Recreationists*

The driving effect of personal self-restraint and regional ecological environment management on the pro-environmental behavior of beach recreationists is most significant. Personal self-control constraints include a strong sense of environmental responsibility and low-carbon and environmentally friendly lifestyle and habits among the behavioral subjects. Environmental crises and environmental protection promotion can be strengthened in communities, families, schools, work units, and other areas to promote low-carbon and environmentally friendly behavior during leisure. Strengthening the improvement of regional ecological environment management systems and norms can effectively restrain people's behavior of damaging the ecological environment and improve people's active environmental protection behavior. It is necessary to develop a recreational environment behavior guide, with a clear and detailed list of things that recreationists "can do" and "cannot do".

In addition, it is necessary to develop beach ecological management standards that are suitable for China's national conditions. To date, there is no specific beach grading standard in China, and only some seaside resorts are assessed based on the quality of seawater. There is difficulty meeting the current goals and requirements of marine ecological civilization construction. Given the widespread nature of the recreational beach footprint, it is necessary to include the entire coastal beach line in management evaluation and distinguish between vacation-type and regular-type beaches. Unified evaluation standards can transform rural beaches into mature vacation-oriented beaches. The standards for beach ecological management can refer to mature certification and evaluation index systems at home and abroad. However, it is necessary to pay attention to the ecological characteristics of beaches based on the problems faced by the development of beaches in the new era.

In addition, these data should be incorporated into an appropriate geographic information system (GIS), and a cloud platform should be established for the ecological management of recreational beaches. The design should include two major perspectives: the beach itself and the recreational user. The design should also include management parameters such as beach safety, beach hygiene, beach ecology, beach space, beach dynamics, and information on recreational users' perceptions. A cloud platform for recreational beach ecological management would provide decision-making assistance for beach management departments through information technology. It would also provide timely information services for users to promote the digital management of recreational beaches, which would help to improve and enhance environmental protection behavior.

The improvement in environmental literacy can effectively overcome individualistic consumption concepts and behaviors, enhance the willingness to engage in pro-environmental behavior, and ultimately promote positive and friendly environmental behavior. Recreational beach users include tourists and surrounding residents, and the improvement of their environmental literacy can be achieved through awareness of the environmental crisis, the urgency of environmental protection, and other aspects. In this study, a contradictory phenomenon was found: beach recreationists with stable jobs, high incomes, and high educational backgrounds did not exhibit corresponding positive and friendly behaviors toward the environment. Instead, they tended to prefer high consumption and enjoyment in beach recreation and beach barbecues, and they supported the development of various recreational beach activities. This result indicates that the improvement of environmental literacy is a shared responsibility of the entire society, and we cannot assume or value certain groups. It is necessary to promote the importance of environmental literacy among various working groups in society and resist individualistic environmental behavior.

The external environment has an impact on respondents. If the group with negative environmental behavior is in a healthy and positive environment, it can effectively suppress their negative behavior and transform it into positive environmental protection behavior and vice versa. It is extremely important to shape a good regional ecological and cultural atmosphere. In addition, actively conducting various forms of environmental education activities can help generate positive pro-environmental behavior. Environmental education helps people change from being close to the beach to understanding the beach and then to protecting the beach, from low-level emotional experiences to high-level specialized protection. Environmental education can be conducted in three spatial dimensions, including family environmental education, school environmental education, and community environmental education. The content of ecological environmental education about beaches includes the popularization of ecological environmental knowledge of beaches and the participation and guidance of beach protection actions. These can be selected and designed according to needs, such as the scientific popularization of the ecological vulnerability of beaches and their animal habitats. Most people believe that exposed beaches are just a pile of sand with no plants or obvious animals and are only charming landscapes. Environmental education behavior helps to increase awareness of the importance and ecological vulnerability of beach ecosystems and their habitats, thereby effectively reducing destructive behavior to beach habitats. Another example is conducting microplastic environmental education about beaches to make people realize that a recreational beach is not only a recreational place but also an important place for the production of microplastics. This type of education advocates low-carbon, plastic-free travel and lifestyles, rejects disposable plastic items, and encourages the use of environmentally friendly bags.

## 5. Conclusions

The ecological environment has become a primary concern in the development of various undertakings in China. In recent years, the ecological and environmental issues of recreational beaches have become increasingly prominent and have gradually attracted attention from all sectors. Environmental issues are ultimately human issues, and the level of environmental concern directly and effectively reflects the public's intention and actual actions in environmental protection. This study introduces one of the most influential international measurement standards, the NEP scale. After testing its reliability and validity and making adjustments, the scale was used to measure the level of environmental concern of recreational beach users. Based on the measurement results of the NEP scale, a model was innovatively constructed to depict the profile of environmental behavior groups. Finally, the driving factors of beach recreation pro-environmental behavior include "individual self-control and regional ecological environmental management", "improving environmental literacy and overcoming individualism", and "external influences and environmental education".

The results validate the good reliability and validity of the NEP scale in measuring environmental concern among Chinese recreational beach users. The environmental concern level of beach tourists in the Haichow Bay area is equivalent to 66.2%, slightly higher than the national average level of urban residents (61.23%) and significantly lower than the average level of large cities in China such as Guangzhou, Shanghai, Beijing, Kunming, Harbin, Chengdu, and Xi'an (74.86%). The responses were relatively balanced in the five dimensions of "natural balance cognition", "ecological crisis cognition", "growth limit cognition", "human exceptionalism cognition", and "anthropocentrism cognition". However, it is worth noting that the respondents were slightly lower in the dimensions of ecological crisis and growth limits. There was a significant correlation between the pro-environmental attitudes of people who participate in beach recreation and demographic characteristics other than gender. Based on the constructed environmental behavior group portrait, it is inferred that the group that is active in recreational environmental behavior at Haichow Bay Beach includes college students, high school students, retirees, and surrounding residents. However, individuals from enterprises, institutions, and administrative agencies with relatively stable jobs, relatively high incomes, and high educational backgrounds did not show positive environmental behavior but instead showed a more individualistic trend. This conclusion serves as a warning to the management of recreational beaches. It is of urgent significance that recreation subjects overcome the randomness and hedonism of beach recreation in the new era.

This study innovatively constructed an environmental behavior group portrait index, which is an extension of NEP theory and practical exploration and can help environmental management departments accurately position the direction and content of work for the public. China's coastline is over 18,000 km long. This study selected only the Haichow Bay Beach located on the central coast for research and data collection and cannot fully represent other coastal beaches. In future research, it is necessary to consider research on the environmental behavior of regional beach tourists, accumulate more relevant data on China's coastal areas, put the research results into practice, and effectively promote public participation in the protection of coastal beaches.

**Supplementary Materials:** The following supporting information can be downloaded at <https://www.mdpi.com/article/10.3390/su16083292/s1>, Supplementary Table S1: Correlation matrix of NEP, Supplementary Table S2: Anti-image Correlation Matrix of NEP. Supplementary Table S3: Load matrix of environmental behavior influence factor.

**Author Contributions:** X.W., C.Z. and X.Z. contributed to the study conception and design. Material preparation, data collection, and analysis were performed by X.W., C.Z. and H.C. The first draft of the manuscript was written by X.W., C.Z. and X.Z., who supervised the research. X.W. and X.Z. provided funding support. X.W. contributed to the revision. All authors have read and agreed to the published version of the manuscript.

**Funding:** This study was supported by the Natural Science Foundation of China [41471431], as well as Major Projects of Philosophy and Social Sciences in Colleges and Universities in Jiangsu Province [2021SJZDA034].

**Informed Consent Statement:** Informed consent was obtained from all subjects involved in the study.

**Data Availability Statement:** The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

**Conflicts of Interest:** The authors declare that they have no conflict of interest.

## References

1. Carson, R. *Silent Spring*; Houghton Mifflin: Boston, MA, USA, 1962.
2. XI Talks about the Basic Strategy of Adhering to and Developing Socialism with Chinese Characteristics in the New Era [EB/OL] (2017-10-18). Available online: [http://www.xinhuanet.com/politics/2017-10/18/c\\_1121820368.htm](http://www.xinhuanet.com/politics/2017-10/18/c_1121820368.htm) (accessed on 12 September 2022).

3. Hong, D.Y. Measurement of Environmental Concern: Evaluation of the Application of the NEP Scale in China. *Society* **2006**, *26*, 71–92. [[CrossRef](#)]
4. Stern, P.C. New environmental theories: Toward a coherent theory of environmentally significant behavior. *J. Soc. Issues* **2000**, *56*, 407–424. [[CrossRef](#)]
5. Xiao, C.; Buhrmann, J. Ideas to action: Environmental beliefs, behaviors, and support for environmental policies. *J. Environ. Stud. Sci.* **2019**, *9*, 196–205. [[CrossRef](#)]
6. Li, W.; Pei, L. Study on E-commerce Entrepreneurship Process of Farmers in Poverty-stricken Areas in the Context of E-commerce Poverty Alleviation: An Exploratory Research Based on Grounded Theory. *Areal Res. Dev.* **2021**, *40*, 113–120.
7. Maloney, M.; Ward, M.; Nicholas, B. A Revised Scale for the measurement of ecological attitudes and knowledge. *Am. Psychol.* **1975**, *30*, 787–790. [[CrossRef](#)]
8. Weigel, R.H. Environmental attitudes and the prediction of behavior. In *Environmental Psychology: Directions and Perspectives*; Feimer, N.R., Geller, E.S., Eds.; Praeger: New York, NY, USA, 1983; pp. 257–287.
9. Dunlap, R.E.; Kent, V.L. The new environmental paradigm. *J. Environ. Educ.* **1978**, *9*, 10–19. [[CrossRef](#)]
10. Dunlap, R.E.; Van Liere, K.; Mertig, A.; Jones, R.E. Measuring endorsement of the new ecological paradigm: A revised NEP scale. *J. Soc. Issues* **2000**, *56*, 425–442. [[CrossRef](#)]
11. Hawcroft, L.J.; Milfont, T. The use (and abuse) of the new environmental paradigm scale over the last 30 years: A meta-analysis. *J. Environ. Psychol.* **2010**, *30*, 143–158. [[CrossRef](#)]
12. Englis, B.G.; Phillips, D.M. Does innovativeness drive environmentally conscious consumer behavior? *Psychol. Mark.* **2013**, *30*, 160–172. [[CrossRef](#)]
13. Unanue, W.; Vignoles, V.L.; Dittmar, H.; Vansteenkiste, M. Life goals predict environmental behavior: Cross-cultural and longitudinal evidence. *J. Environ. Psychol.* **2016**, *46*, 10–22. [[CrossRef](#)]
14. Xiao, C.; Kojola, E.; Fan, Y. Changes in environmental worldviews among Chinese urban residents during economic growth and accelerating polluting in the 2000s. *Environ. Sustain. Indic.* **2021**, *12*, 100152. [[CrossRef](#)]
15. Lee, Y.F. Public environmental consciousness in China: Early empirical evidence. In *China's Environment and the Challenge of Sustainable Development*; M E Sharpe: New York, NY, USA, 2005.
16. Harris, P. Environmental perspectives and behavior in China: Synopsis and bibliography. *Environ. Behav.* **2006**, *38*, 5–21. [[CrossRef](#)]
17. Harris, P. Green or Brown? Environmental attitudes and governance in greater China. *Nat. Cult.* **2008**, *3*, 151–182. [[CrossRef](#)]
18. Benedict, S.; Hussein, H. An Analysis of Water Awareness Campaign Messaging in the Case of Jordan: Water Conservation for State Security. *Water* **2019**, *11*, 1156. [[CrossRef](#)]
19. Wu, J.; Zi, F.; Liu, X.; Wang, G.; Yang, Z.; Li, M.; Ye, L.; Jiang, J.; Li, Q. Measurement of New Ecological Paradigm: Revision and Application of NEP Scale in China. *J. Beijing For. Univ. (Soc. Sci.)* **2012**, *11*, 8–13.
20. Wu L and Zhu, Y. Revision of New Ecological Paradigm (NEP) Scale in Urban Student Groups in China and its Reliability and Validity Test. *J. Nanjing Tech Univ. (Soc. Sci. Ed.)* **2017**, *16*, 53–61.
21. Larson, E.; Krannich, R. "A great idea, just not near me!" understanding public attitudes about renewable energy facilities. *Soc. Nat. Resour.* **2016**, *29*, 1436–1451. [[CrossRef](#)]
22. Lee, H.; Zhang, D. Perceiving the environment from the lay perspective in decertified areas, Northern China. *Environ. Manag.* **2008**, *41*, 168–182. [[CrossRef](#)]
23. Choi A S and Fielding, K.S. Environmental attitudes as WTP predictors: A case study involving endangered species. *Ecol. Econ.* **2013**, *89*, 24–32. [[CrossRef](#)]
24. Ziegler, A. Political orientation, environmental values, and climate change beliefs and attitudes: An empirical cross country analysis. *Energy Econ.* **2017**, *63*, 144–153. [[CrossRef](#)]
25. Rhodes, E.; Axsen, J.; Jaccard, M. Exploring citizen support for different types of climate policy. *Ecol. Econ.* **2017**, *137*, 56–69. [[CrossRef](#)]
26. Schlacher, T.A.; Dugan, J.; Schoeman, D.S.; Lastra, M.; Jones, A.; Scapini, F.; McLachlan, A.; Defeo, O. Sandy beaches at the brink. *Divers. Distrib.* **2007**, *13*, 556–560. [[CrossRef](#)]
27. Defeo, O.; McLachlan, A.; Schoeman, D.S.; Schlacher, T.A.; Dugan, J.; Jones, A.; Lastra, M.; Scapini, F. Threats to sandy beach ecosystems: A review. *Estuar. Coast. Shelf Sci.* **2009**, *81*, 1–12. [[CrossRef](#)]
28. Schlacher, T.A.; Thompson, L.M. Beach recreation impacts benthic invertebrates on ocean-exposed sandy shores. *Biol. Conserv.* **2012**, *147*, 123–132. [[CrossRef](#)]
29. Nel, R.; Campbell, E.E.; Harris, L.; Hauser, L.; Schoeman, D.S.; McLachlan, A.; du Preez, D.R.; Bezuidenhout, K.; Schlacher, T.A. The status of sandy beach science: Past trends, progress, and possible futures. *Estuar. Coast. Shelf Sci.* **2014**, *1*, 1–10. [[CrossRef](#)]
30. Schlacher, T.A.; Lucrezi, S.; Connolly, R.M.; Peterson, C.H.; Gilby, B.L.; Maslo, B.; Olds, A.D.; Walker, S.J.; Leon, J.X.; Huijbers, C.M.; et al. Human threats to sandy beaches: A meta-analysis of ghost crabs illustrates global anthropogenic impacts. *Estuar. Coast. Shelf Sci.* **2016**, *169*, 56–73. [[CrossRef](#)]
31. Dugan, J.E.; Defeo, O.; Jaramillo, E.; Jones, A.R.; Lastra, M.; Nel, R.; Peterson, C.H.; Scapini, F.; Schlacher, T.; Schoeman, D.S. Give beach ecosystems their day in the sun. *Science* **2010**, *329*, 1146. [[CrossRef](#)] [[PubMed](#)]
32. Voudoukas, M.I.; Ranasinghe, R.; Mentaschi, L.; Plomaritis, T.A.; Athanasiou, P.; Luijendijk, A.; Feyen, L. Sandy coastlines under threat of erosion. *Nat. Clim. Change* **2020**, *10*, 260–263. [[CrossRef](#)]

33. Hair, J.F.; Anderson, R.E.; Tatham, R.L.; Black, W.C. *Multivariate Data Analysis*, 7th ed.; Prentice Hall: Englewood Cliffs, NJ, USA, 2010.
34. Williams, A.; Micallef, A. *Beach Management: Principles and Practices*; Earthscan: London, UK, 2009.
35. Wu, X.; Zhong, C.; Wang, T.; Zou, X.; Zang, Z.; Li, Q.; Chen, H. Occurrence and distribution of microplastics on recreational beaches of Haichow Bay, China. *Environ. Sci. Pollut. Res.* **2021**, *28*, 1–14. [[CrossRef](#)]
36. Hurst, M.; Dittmar, H.; Bond, R.; Kasser, T. The relationship between materialistic values and environmental attitudes and behaviors: A meta-analysis. *J. Environ. Psychol.* **2013**, *36*, 257–269. [[CrossRef](#)]
37. White, K.; Habib, R.; Hardisty, D. How to SHIFT consumer behaviors to be more sustainable: A literature review and guiding framework. *J. Mark.* **2019**, *83*, 22–49. [[CrossRef](#)]

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