A Multidimensional Environmental Value Orientation Approach to Forest Recreation Area Tourism Market Segmentation

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Abstract: This paper uses multidimensional environmental value orientations as the segmentation bases for analyzing a natural destination tourism market of the National Forest Recreation Areas in Taiwan. Cluster analyses identify two segments, Acceptance and Conditionality, within 1870 usable observations. Independent sample *t* test and crosstab analyses are applied to examine these segments' forest value orientations, sociodemographic features, and service demands. The Acceptance group tends to be potential ecotourists, while still recognizing the commercial value of the natural resources. The Conditionality group may not possess a strong sense of ecotourism, given that its favored services can affect the environment. Overall, this article confirms the use of multidimensional environmental value orientation approaches can generate a comprehensive natural tourist segment comparison that benefits practical management decision making.

1. Introduction

Psychological research argues that human cognitions and behaviors are formed hierarchically from value to behavior. People's values are the most basic cognitions that affect their attitudes and behaviors in this hierarchy [1,2]. The nature of values is too abstract for social science research to use them for predicting attitudes and behaviors. Thus, value orientations must be used as patterns of basic beliefs that clarify values [3]. The literature suggests that understanding people's environmental value orientations helps the authorities anticipate people's intentions to interact with the natural resources and make appropriate environmental policies. Accordingly, the relevant studies have examined how people's environmental value orientations relate their attitude toward the natural resources in the context of causal analysis [4–8].

Li *et al.* [9] used the correlation approach to assess the public's multidimensional forest value orientations and their demands for forest recreation services in the National Forest Recreation Areas (NFRAs) of Taiwan. The NFRAs are remote from urban centers to be open for public outdoor recreation. However, in practice, a natural destination caters to different types of tourists; therefore, forest managers can perform their duties more effectively if they know the possible profiles of different tourist segments and their respective environmental value orientations and service demands. In consideration of this concern, this paper extends the study of Li *et al.* [9] by using forest value orientations as the segmentation bases through conducting the cluster and crosstab analyses for investigating whether certain tourist segments tend to possess specific demographic features and service demands for NFRAs. Thus, this communication demonstrates the use of multidimensional environmental value orientations as the segmentation bases for generating more comprehensive nature-based tourist profiles.

2. Materials and Methods

In the original study, Li *et al.* [9] used self-administered questionnaires to conduct on-site and off-site surveys to include on-site tourists and potential NFRA tourists in the samples of their study.

Nine hundred and fifty-five samples were collected from fifteen NERAs and 473 samples were obtained from public places in five main Taiwanese cities by using systematic sampling method. 491 data were collected from the online survey with the link posted on the official websites of the Forestry Bureau, the official administrative unit of the NFRAs. In total, 1919 respondents completed the survey. The questionnaire comprised three sections. The first section investigated respondent sociodemographic profiles. The second section presented 17 basic belief statements on forests; the respondents were asked to express the extent to which they disagreed or agreed with each. Responses were measured on a 5-point scale ranging from 1 (*Strongly disagree*) to 5 (*Strongly agree*), with 3 (*Neutral*) in the middle. A factor analysis was then performed to identify five forest value orientation dimensions from the statements. The dimensions were ecology, spirit, culture, utilitarian, and negativity.

The third section of the questionnaire listed 26 services or amenities that are potentially offered by a forest recreation area. The services were categorized into three types: basic, expanded, and special. The typology was inspired by the Federal Lands Recreation Enhancement Act of the United States. The details of each type of service were designed based on the comments from the senior staff of Forestry Bureau. Basic services included services or amenities that official regulations require NFRAs to offer (e.g., information services). Expanded services included services or amenities for which tourists must pay additional fees (e.g., accommodation and food services). Special services included services or amenities that could affect the natural environment or tourist visit intention (e.g., barbecue facilities and implementing a tourist carrying capacity limit).

In the original study, the respondents were asked to rate the importance of each service on a 5-point scale ranging from 1 (*Very unimportant*) to 5 (*Very important*), with 3 (*Neutral*) in the middle. However, the large overall sample of 1919 was expected to generate tourist segments that each contained a high number of tourists; thus, when the data are ordinal, most comparisons of the mean scores between each segment for service demands would typically yield significant differences. To avoid this problem, in the present study, the original data of service demands were transformed into categorical data. Specifically, 1 (*Very Unimportant*), 2 (*Unimportant*), and 3 (*Neutral*) were converted to "Unimportant", and 4 (*Important*) and 5 (*Very Important*) were converted to "Important".

All data analyses were performed using SPSS 22.0 software (IBM Corp., New York, USA) for Windows. The five forest value orientations were used as the segmentation bases. Because a nonhierarchical algorithm is suitable for large sample sizes [10], a K-means analysis was chosen to group responses for the five orientations into clusters. There is no universal way to choose a cluster number for segmentation [11]. Therefore, before the K-means analysis, the present study used a hierarchical analysis to help determine the cluster numbers [10]. The present study employed Ward's method to perform hierarchical analysis to segment the standardized data. Table 1 presents the results of the reformed agglomeration schedule with changes in the coefficients as the number of clusters increased. Because of the significant changes in the coefficients, a two-cluster solution was considered optimal. The K-means analysis was conducted to segment the value orientations into two clusters.

Table 1. Reformed agglomeration schedule.

Number of Clusters	Agglomeration Last Step	Coefficients This Step	Change
2	3741.753	2748.602	993.151
3	2748.602	2268.339	480.263
4	2268.339	2051.350	216.989
5	2051.350	1840.814	210.536

An independent sample *t* test was used to examine the significant differences among each dimension of the five forest value orientations between the two segments. Furthermore, crosstab analyses were employed to examine the differences between the segments' sociodemographic characteristics and opinions on the 26 services.

3. Results

The two segments comprised 1052 (56.3%) and 818 (43.7%) responses, respectively, of the 1870 useable samples selected from the original 1919 respondents through the cluster analysis. The segments were named according to their mean forest value orientation scores, as presented in Table 2. Cluster 1 was termed "Acceptance" because the group highly valued the forest environment and did not regard this environment negatively. Cluster 2 was called "Conditionality" because the group seemed to recognize the value of the forest but still held negative attitudes toward the forest environment. According to the results of an independent sample *t* test, the mean scores for the Acceptance group on ecology, spirit, and culture value orientations were significantly higher than those of the Conditionality group. Nonetheless, no significant difference was found between the mean scores of the two segments' utilitarian value orientations.

Table 2. Cluster analysis result and overall mean scores.

Forest Value Orientations	*t*	*p*	Acceptance (*n* = 1052)	Conditionality (*n* = 818)
Ecology	16.896	0.000	4.92	4.57
Spirit	19.599	0.000	4.82	4.32
Culture	15.729	0.000	4.64	4.25
Utilitarian	1.500	0.132	3.57	3.53
Negativity	−48.041	0.000	1.74	3.14

A crosstab analysis was performed to examine the statistical significance between the two segments' sociodemographic characteristics (Table 3). The significance was found in age, education level, occupation, and average monthly disposable income. The Acceptance group tended to have higher socioeconomic status than the Conditionality group did. At the time of this study, in Taiwan, the age of majority was 18, the retirement age was 65, and the official stipulated minimum wage for a full-time employee per month was approximately US $570.

Table 3. Sociodemographic characteristics of each segment.

Categories	X^2	*p*	Variables	Acceptance (*n*)	Conditionality (*n*)
Gender	2.131	0.144	Male	509	368
			Female	543	450
Age	15.500	0.000	⩽17	17	38
			18–64	1024	769
			⩾65	9	10
Education	33.994	0.000	(Less than) Junior high	37	56
			Senior high school	122	149
			Undergrate	644	472
			Postgraduate	248	141
Occupation	9.676	0.022	Primary or 2nd industries	336	255
			Teritary industries	432	307
			Students	142	153
			Others	141	103
Income	37.508	0.000	None	152	158
			Less than US $570	69	75
			US $571–$1140	238	200
			US $1141–$1670	268	215
			US $1671–$2240	143	92
			US $2241–$2810	75	39
			US $2811 or more	99	32

An additional crosstab analysis was conducted to examine the perceptions of the segments concerning the importance of the 26 services or amenities. These results are shown in Tables 4–6. The majority of respondents in both segments recognized the importance of all the basic services (Table 4). Moreover, the Acceptance group tended to have a greater demand for the seven nonphysical basic services (S1, S3, S4, S5, S6, S7, and S8). Regarding the four physical basic services (S9, S10, S11, and S12), the Conditionality group tended to have a greater demand for shuttle bus services inside the NFRAs (S10).

Table 4. Perceptions of the importance of basic services by segment.

Basic Services	X^2	p	Assessment	Acceptance (n)	Conditionality (n)
S1: A good forest environment [1]	20.659	0.000 [2]	Unimportant	8	31
			Important	1042	786
S2: Ecotourism and other nature-based leisure activities [1]	3.514	0.061	Unimportant	155	147
			Important	893	669
S3: Environmental education [1]	28.100	0.000 [2]	Unimportant	22	58
			Important	1029	759
S4: Preserving natural and cultural landscapes [1]	44.708	0.000 [2]	Unimportant	3	41
			Important	1048	777
S5: Regulating tourists' activities to preserve the forests' ecosystem and special species [1]	31.390	0.000 [2]	Unimportant	8	40
			Important	1043	777
S6: Introducing Taiwanese forest history and culture [1]	22.617	0.000 [2]	Unimportant	81	119
			Important	970	698
S7: Introducing contemporary and future public forest policies [1]	16.122	0.000 [2]	Unimportant	185	206
			Important	865	610
S8: Multi-language guide services [1]	6.842	0.009 [2]	Unimportant	252	240
			Important	798	577
S9: Mountaineering facilities [1]	1.021	0.312	Unimportant	154	106
			Important	898	709
S10: Shuttle bus services inside the NFRA [1]	9.951	0.002 [3]	Unimportant	353	219
			Important	698	598
S11: Facilities for the disabled [1]	1.587	0.208	Unimportant	225	195
			Important	827	623
S12: Multifunction tourist center [1]	0.749	0.387	Unimportant	284	206
			Important	767	610

[1] Both the majorities of the two segments approve the opinion; [2] the Acceptance group had more tendency to approve the opinion; [3] the Conditionality group had more tendency to approve the opinion.

The majority of respondents in both segments recognized the importance of all the expanded services, except for vending machines (S15), the selling of souvenirs and refreshments at shops (S16), and camping site services (S18). In addition, the Acceptance group tended to have more tendency to be against S15 and S16 (Table 5). Overall, in contrast to the Acceptance group, the Conditionality group tended to demand packaged mass consumption goods in the natural destinations.

Regarding special services (Table 6), the majority of respondents in both segments did not recognize the importance of grilling amenities (S19), water leisure activities (S20), mountain biking areas (S21), fishing (S22), and prepaid entry cards (S26). Furthermore, the majority of respondents in both segments acknowledged the importance of weekday/nonpeak entry discounts (S23), establishing regular closure periods and a tourism carrying capacity (S24), and hosting relevant seasonal or local events (S25). The statistical results suggested that the Acceptance group tended to be more opposed to S19, S20, S21, and S22 and more supportive of establishing regular closure periods and a tourism carrying capacity (S24). Overall, in comparison to the Conditionality group, the Acceptance group was more aware of the potential impact of special services on the NFRAs.

Table 5. Perceptions of the importance of expanded services by segment.

Expanded Services	X^2	p	Assessment	Acceptance (*n*)	Conditionality (*n*)
S13: Accommodation services [1]	0.235	0.628	Unimportant	460	384
			Important	591	468
S14: Food services [1]	2.228	0.136	Unimportant	432	308
			Important	619	509
S15: Vending machines	16.817	0.000 [2]	Unimportant	614	399
			Important	438	418
S16: Shops selling refreshments and souvenirs	11.214	0.001 [3]	Unimportant	649	442
			Important	400	374
S17: Group appointment services [1]	0.016	0.900	Unimportant	413	323
			Important	638	493
S18: Camping site services	0.228	0.633	Unimportant	543	413
			Important	508	404

[1] Both the majorities of the two segments approved the opinion; [2] The Acceptance group had more tendency to be against the opinion, while the Conditionality group had more tendency to approve the opinion; [3] The Acceptance group had more tendency to be against the opinion.

Table 6. Perceptions of the importance of special services by segment.

Special Services	X^2	p	Assessment	Acceptance (*n*)	Conditionality (*n*)
S19: Grilling amenities [1]	5.190	0.023 [2]	Unimportant	759	549
			Important	293	267
S20: Water leisure activities [1]	10.549	0.001 [2]	Unimportant	809	576
			Important	241	242
S21: Mountain biking areas [1]	9.016	0.003 [2]	Unimportant	714	501
			Important	336	316
S22: Fishing [1]	17.559	0.000 [2]	Unimportant	895	635
			Important	156	183
S23: Weekday/non-peak entry discounts [3]	0.491	0.483	Unimportant	361	268
			Important	690	549
S24: Establishing regular closing periods and tourism carrying capacity [3]	12.609	0.000 [4]	Unimportant	115	136
			Important	933	682
S25: Hosting relevant seasonal or local events [3]	0.001	0.977	Unimportant	201	156
			Important	850	662
S26: Prepaid entry cards [1]	0.270	0.603	Unimportant	662	506
			Important	387	311

[1] Both the majorities of the two segments were against the opinion; [2] the Acceptance group had more tendency to be against the opinion; [3] both the majorities of the two segments approved the opinion; [4] the Acceptance group had more tendency to approve the opinion.

4. Discussion

Through the K-means analysis, two segments were identified: Acceptance and Conditionality. Both segments recognized the ecological, spiritual, cultural, and utilitarian value of the forest. The Conditionality segment negatively perceived the forest environment. A notable finding was the lack of a significant difference between the two segments' mean scores for the utilitarian value orientation. Previous studies have suggested that an individual's environmental value orientation is a dual continuum on which the opposite of ecocentrism is anthropocentricism [7,12]. This suggests that people who recognize the ecological value of the forest do not recognize its utilitarian value. However, using the multidimensional forest value orientations as the segmentation base, the present study indicated that even people who highly appreciate the ecological value of the forest and embrace the

forest environment still acknowledge its commercial potential. Accordingly, authorities may consider delivering messages about sustainable forestry products to the general public. Moreover, this finding highlights that multidimensional environmental value orientation may be a more comprehensive approach to exploring the diverse thoughts of natural recreation seekers. In our study, echoing the results of previous studies [13,14], the Acceptance group members, who were potential ecotourists following the principles of ecotourism, tended to have higher education levels and incomes than the Conditionality group members did.

The majority of respondents in both segments approved of all the basic services. Hence, the 12 basic services arguably are seen as the fundamental service design guidelines for NFRAs. Moreover, a majority of respondents in both segments approved of all the expanded services, except for vending machines (S15), the selling of souvenirs and refreshments at shops (S16), and camping site services (S18), of which the Acceptance group showed more disapproval. A majority of the Acceptance group were also more likely to support establishing regular closure periods and a tourism carrying capacity, which were categorized under special services (S24). However, the approval of the Acceptance group of accommodation and food services (S13 and S14), which were categorized under expanded services, reflects the findings in the literature that suggest that tourists may prefer recreating a natural environment while still having access to proper accommodations and food services [15,16]. Thus, to avoid misleading tourists or the general public, authorities must convey a clear message about the expanded services that a natural destination can offer.

The majority of respondents in both segments approved ecotourism and other nature-based leisure activities (S2). However, the Conditionality group was not as likely as the Acceptance group to appreciate other nonphysical basic services (S1, S3, S4, S5, S7, S7, and S8). Moreover, the Conditionality group was more likely to have a higher demand for consumer goods sold by vending machines (S15) and shops (S16) located at the NFRAs. Furthermore, although their view of most special services was similar to that of the Acceptance group respondents, the awareness of the Conditionality group respondents of the potential impact of special services on the NFRAs was not as strong as that of the Acceptance group. This finding was apparent according to the groups' opinions on the four special services: grilling amenities (S19), water leisure activities (S20), fishing (S21), mountain biking (S22), and establishing regular closure periods and a tourism carrying capacity (S24). Overall, although the two groups seemed to have similar opinions of the recreation services, the Conditionality group tended to perceive the natural destination as an ordinary purpose built entertainment venue.

5. Conclusions

The information that can assist in public forest recreation management decision making is summarized as follows:

1. Compared with using the ecocentrism–anthropocentricism continuum, using multidimensional environmental value orientations as the segmentation bases can explore more psychological profiles of nature-based tourists.
2. Potential ecotourists tend to have higher socioeconomic status. They also enjoy living in a natural environment and are aware of the recreation services that can affect the environment. Paradoxically, they still approve of commercially using natural resources and appreciate being able to use accommodation and food services at a natural destination in this case study.
3. Those who are not ideal ecotourists may lack a strong awareness of how certain recreation services can environmentally influence a natural destination. They wish to perceive the destination as a typical artificial recreation venue.

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