

## DOES DISTANCE MATTER? DIFFERENCES IN CHARACTERISTICS, BEHAVIORS, AND ATTITUDES OF VISITORS BASED ON TRAVEL DISTANCE

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**Abstract:** The purpose of this study was to determine if there are distinct socio-demographic and behavioral characteristics among visitors based on distance traveled. The sample consisted of 642 visitors to the Gifford Pinchot National Forest. Chi-Square tests showed that more distant visitors participated more in viewing activities, were more likely to be first time and day visitors, did less camping, and spent more money on activities, private lodging, and transportation than those traveling shorter distances. One-way ANOVA tests revealed that distant visitors had less place attachment with the destination, visited the destination less frequently, and spent longer periods away from home than close visitors.

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### Introduction

Various approaches have been used to predict outdoor recreation participation. The most traditional approach is consideration of socio-economic variables (gender, age, income, education, race, occupation, family composition, and party composition). Some studies (Moutinho & Trimble, 1991; Smith, 1985; Young & Smith, 1989) added geographic variables (e.g. distance,

urbaneness) and found that they play a greater role than socio-economic variables in explaining recreation behavior. Among the geographic variables, distance is the most powerful variable as explained in the "gravity" model. The gravity model was derived from Newton's law of gravity, which states that the interaction between two bodies is proportional to their masses, and inversely proportional to the square of the distance between them (Timmermans, 2001). The model is useful for intercity travel; however, the unmodified gravity model is not applicable to recreation travel, particularly with respect to parks (Wolfe, 1970). In this case, traffic is unidirectional (i.e., traffic is generated in one place and attracted to the other). In the model, distance is treated as friction. Wolfe (1970) indicated that the relationship between distance and visits to public parks is not linear. Wolfe (1970) suggested that the gravity model is applicable only for short recreational trips, between 100 and 150 miles. When trips are very short, the friction of distance is negligible, and beyond a certain considerable distance (500, or 1,000 miles, or one or two days' travel time) the friction of distance not only disappears but even becomes reversed (Wolfe, 1970). This is explained by the concept of "inertia," which helps explain the impediment of the gravity model (Wolfe, 1972).

Previous research shows that distance is an important variable for predicting visitors' behavior and for market segmentation. Wolfe (1972) found that the further people go, the further they want to go. Debbage (1991) tested how various factors influence spatial behavior in a resort context. For example, affluent, well educated, and single people tend to travel further distances. Further, Debbage (1991) hypothesized that distance could be a good predictor of recreation behavior such as the longer distance someone has to travel to reach a destination, the more expensive the trip becomes, the longer they tend to stay, and the more they want to see and do. Moutinho and Trimble (1991) found that those who travel further are more likely to be first-time visitors. Gitelson and Crompton's (1984) study also showed that repeat visitors are from closer distances than first time visitors. They also found that repeat visitors have more desire for relaxation than non-repeaters. The non-repeaters on the other hand have more desire for variety. Gitelson and Crompton's (1984) study also found that older individuals are more likely to be repeat

visitors. Their study also indicated that the tendency to visit more familiar destinations (possibly closer) increases with age. The break point of such age was 40, at which the shift to visit a familiar destination occurs more noticeably, whereas non-repeaters were more likely to be younger. O'Leary et al. (1986; Cited in Moutinho & Trimble 1991) found that people with high education and income, males, and those with professional/managerial occupations travel the farthest distances to reach a destination. Therefore, the degree of change in market behavior with respect to distance traveled will place greater emphasis on facilities and resorts in the future (O'Leary et al. 1986; cited in Moutinho & Trimble 1991). In the travel and tourism field, destination distance is considered an important travelers' decision making criterion (Cook and McCleary, 1983; Ankomah, Crompton, & Baker, 1996). The relationships between distance and other variables, however, are not linear (Moutinho & Trimble, 1991). For example, within a comfortable day's drive, a family can travel by a car at a cost per mile. Beyond that limit, when a family travels by air, an increase in miles is less important than for traveling by car.

Distance can be measured in different ways: actual distance between origins and destination (Bell, 1977), highway or travel distance (Smith 1989) travel time (Calatone, di Benedetto & Bojanic, 1987), travel costs (Smith, 1989), or cognitive distance (Ankomah & Crompton, 1992). Recent literature (Ankomah & Crompton, 1992; Ankomah, Crompton, & Baker, 1996) has placed emphasis on cognitive distance rather than actual distance because travelers may rely more upon their cognitive distance. However, the pattern of cognitive distance has not been very clear. For example, Ankomah and Crompton (1992) proposed eight hypotheses to explain cognitive distance, which complicated the measurement of distance. Cook and McCleary (1983) warned marketers and researchers that negative outcomes can occur if consumers use cognitive distance rather than actual distance when selecting a vacation. Mayo and Jarvis (1986; cited in Moutinho & Trimble, 1991) found that tourists perceive destinations as closer than they actually are, whereas Walmsley and Jenkins (1999) indicated that this varies with experience, age, and sex. Cadwallader (1979) found that individual distance estimation is unstable across different

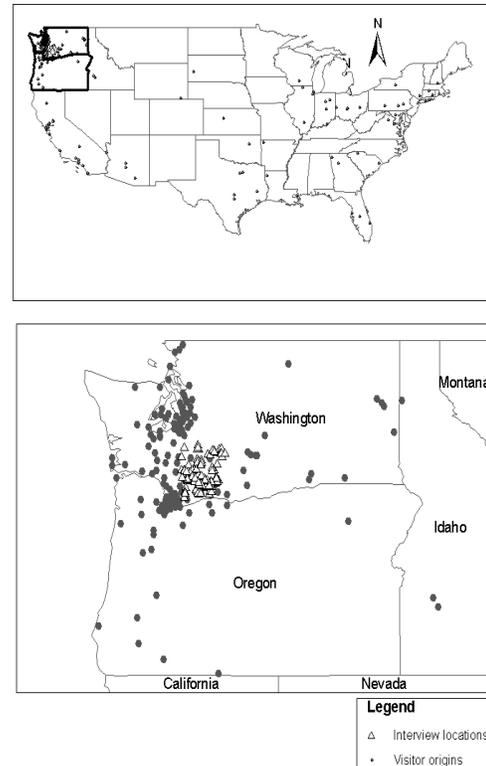


Figure 1. Interview locations and visitor origins

methodologies. In order to reduce the chances of such errors, many studies have used actual distance between the traveler's origin and destination (Applebaum, 1966; Bucklin, 1971; cited in Moutinho & Trimble, 1991).

The objective of the study was to determine if there are distinct socio-demographic and behavioral characteristics among the different market segments based on distance traveled.

### Methods

Data were collected in the Gifford Pinchot National Forest between October 1, 2000 and September 30, 2001 as part of the USDA Forest Service National Visitor Use Monitoring Project. On-site interviews were conducted with a representative sample of National Forest visitors (n=642). Sampling took place at developed sites and access points and was designed to represent the different types of sites within the Forest, and their relative use levels.

Analysis for this paper focused on selected variables within the larger study. For the purpose of measuring distance, the Euclidean (crow fly)

distance was calculated between the origin and the destination for each respondent. GIS software was used to compute the distance in miles between the respondents' home zip code and the site visited (based on latitude and longitude of each site). Although the distance does not represent true driving distance or travel time, it is much more accurate than recalling the distance traveled. Since the sample includes visitors from all states of the contiguous United States (see Figure 1), there will be different means of transportation; some by air, some by road, and consequently the travel distance would vary based on the mode of transportation. Therefore, the Euclidean distance minimizes such errors.

The distance traveled ranged from 2.91 miles to 2668.40 miles with a mean distance of 418.10 miles. For the purpose of analysis, subjects were divided into four categories (less than 50 miles, 50 to 99.99 miles, 100-599.99 miles, and 600 or more miles) based on the distance travel. About one-third (36.6%) of the sample traveled less than 50 miles, 27.9% traveled between 50 and 99.99 miles, 17.1% traveled between 100 and 599.99 miles, and 19.4% traveled more than 600 miles to reach their forest destination (table 1).

Frequency of visitation was measured with an open-ended question asking respondents how many times they had come to the National Forest for recreation during the past 12 months. Age was also asked as an open-ended question. Activity participation was assessed through a two-part question. Subjects first responded to a list of potential activities they may have participated in (yes/no) and then were asked to select their primary activity from all of the activities that they had reported. This analysis used the primary activity, which was further reduced to two categories: viewing activities (including sightseeing, driving for pleasure, viewing natural features and visiting cultural sites) and non-viewing recreational activities (including all active forms of outdoor recreation such as hiking, camping, mountain biking, etc.). Subjects were also asked to indicate whether their visit was first time or repeat, day or overnight, camping or non-camping. Similarly, some questions were asked about their travel expenditures, or how much money they spent in different categories such as accommodations, transportation, etc. These

**Table 1. — Table showing the characteristics of sample**

Independent Variables	N	%
<b>Distance</b>		
<50 miles	187	35.6
50-99.99 miles	147	27.9
100-599.99 miles	90	17.1
≥600 miles	102	19.4
Total	526	100.0
<b>Dependent variables</b>		
<b>Age</b>		
30 and younger	85	16.3
31 to 40	115	22.0
41 to 50	146	28.0
51 to 60	103	19.7
Over 60	73	14.0
Total	522	100.0
<b>Primary Activities</b>		
Viewing activities	235	48.0
Non-viewing activities	255	52.0
Total	490	100.0
<b>Repeat Visitation</b>		
First time visitor	198	40.6
Repeat visitor	290	59.4
Total	488	100.0
<b>Day/Overnight Visitors</b>		
Day visitors	327	66.6
Overnight visitors	164	33.4
Total	491	100.0
<b>Camping</b>		
Campers	150	30.4
Non-campers	343	69.6
Total	493	100.0
<b>Expenditure within 50 miles</b>		
<b>Activity</b>		
No expense	123	90.4
Expense	13	9.6
Total	136	100.0
<b>Private lodging</b>		
No expense	119	87.5
Expense	17	12.5
Total	136	100.0
<b>Transportation (plane, bus, etc.)</b>		
No expense	71	52.2
Expense	65	47.8
Total	136	100.0

expenditure answers were recoded into dichotomous variables, representing whether they spent any money or not within each category.

**Table 2. — Chi-square table showing the relationships between distance and dependent variables**

Dependent Variables	Distance (miles)				N	df	Chi-square
	<50	50-99.99	100-599.99	599.99>			
Age					522	12	24.52*
30 and younger (%)	16.0	22.6	13.6	10.0			
31 to 40 (%)	26.2	20.5	25.8	13.0			
41 to 50 (%)	27.8	28.8	25.8	29.0			
51 to 60 (%)	19.8	15.8	15.7	29.0			
Over 60 (%)	10.2	12.3	19.1	19.0			
Total (%)	100.0	100.0	100.0	100.0			
Primary Activities					490	3	55.33***
Viewing activities (%)	34.8	38.3	56.5	78.7			
Non-viewing activities (%)	62.2	61.7	43.5	21.3			
Total %	100.0	100.0	100.0	100.0			
Repeat Visitation					488	3	125.10***
First time visitor (%)	15.3	33.3	59.3	80.9			
Repeat visitor (%)	84.7	66.7	40.7	19.1			
Total (%)	100.0	100.0	100.0	100.0			
Day/Overnight Visitors					491	3	8.39*
Day visitors (%)	65.9	62.1	61.6	78.7			
Overnight visitors (%)	34.1	37.9	38.4	21.3			
Total (%)	100.0	100.0	100.0	100.0			
Camping					493	3	15.22**
Campers (%)	30.7	38.1	34.9	14.9			
Non-campers (%)	69.3	61.9	65.1	85.1			
Total (%)	100.0	100.0	100.0	100.0			
Expenditure within 50 miles							
Activity					136	3	12.17**
No expense (%)	93.5	95.1	95.8	72.0			
Expense (%)	6.5	4.9	4.2	28.0			
Total (%)	100.0	100.0	100.0	100.0			
Private lodging					136	3	10.82*
No expense (%)	95.7	92.7	79.2	72.0			
Expense (%)	4.3	7.3	20.8	28.0			
Total (%)	100.0	100.0	100.0	100.0			
Transportation (plane, bus, etc.)				110	3	2.42	
No expense (%)	100.0	100.0	100.0	84.0			
Expense (%)				16.0			
Total (%)				100.0			

\*significant at .05 level , \*\*significant at .01 level, \*\*\*significant at .001 level

Place attachment was measured with a four-item scale based on previous studies. Two of the items represented the affective dimension of place attachment (place identity) and two represented the functional (place dependence) component (Williams & Roggenbuck, 1989). The overall reliability of the place attachment index was high (alpha = .88). Since there were only two items representing each dimension, no attempt was made to ascertain differences in the effects of the possible

sub-dimensions of place attachment. To measure the crowding variable, a 10-point scale, 1 for “hardly anyone” through 10 for “over crowded” was used. Overall satisfaction of their visit was measured with another 10-point scale, with 10 being the most satisfied. The characteristics of the sample are presented in Table 1.

### Analysis and Results

Chi-square and one-way ANOVA tests were

**Table 3. — One-way ANOVA table**

Dependent Variables	Distance (miles)				N	F
	<50	50-99.99	100-599.99	599.99>		
Place attachment (mean) <sup>1</sup>	3.46 <sup>a</sup>	3.32 <sup>ab</sup>	2.99 <sup>bc</sup>	2.88 <sup>c</sup>	236	8.05***
Frequency of visit (mean) <sup>2</sup>	18.12 <sup>a</sup>	5.81 <sup>b</sup>	2.86 <sup>b</sup>	1.24 <sup>b</sup>	488	10.45***
Days away from home (mean)	1.44 <sup>a</sup>	1.60 <sup>a</sup>	4.54 <sup>a</sup>	10.42 <sup>b</sup>	133	24.00***
Crowding (mean) <sup>3</sup>	4.22	3.61	3.27	2.8	111	2.42
Satisfaction (mean) <sup>4</sup>	8.58	8.79	8.40	8.63	235	.629

\*significant at .05 level, \*\*significant at .01 level, \*\*\*significant at .001 level

<sup>1</sup>Measured on 5-pt scales ranging from strongly agree (1) through strongly disagree (5), higher mean scores more place attachment.

<sup>2</sup>Frequency of visit during the past 12 months

<sup>3</sup>Measured on 10-pt scales ranging from hardly anyone (1) through over crowded (10)

<sup>4</sup>Measured on 10-pt scales, 10 being the most satisfied

<sup>a b c</sup> superscripts with different letters indicate significantly different groups at .05 level.

conducted to examine differences in socio-demographic and behavioral characteristics among four groups of subjects based on traveling distance. The results showed significant age differences among the four categories of visitors ( $X^2 = 24.52$ ,  $p < .05$ ) (Table 2). Visitors between age 41 and 60 were more likely to travel longer distances. For example, 58% of the longest distance travelers (>600 miles) were between 41 and 60. Nearly one-fifth of those traveling more than 100 miles were over 60 years old. There was also a significant relationship between the primary activities of the visit to the National Forest and traveling distance ( $X^2 = 55.33$ ,  $p < .001$ ) (Table 2). Those who traveled longer distances were more likely than the short distance travelers to participate in viewing activities. The pattern is very clear; as the distance increases the participation in viewing activities also increases. The first two categories of travelers (less than 50 miles, and between 50 and 99.99 miles) had similar primary activities. About two-thirds of the travelers who traveled less than 100 miles participated in non-viewing activities, whereas more than three-quarters of the longest distance (>600 miles) travelers participated in viewing activities. The results also showed a significant relationship between distance and repeat visitation ( $X^2 = 125.10$ ,  $p < .001$ ) (Table 2). About 85% of the shortest distance visitors (<50 miles) were repeat visitors, whereas only about the 21% of longest distance visitors were repeat visitors. Again, the pattern was clear; as the distance increases visitors are less likely to repeat their trip to the National Forest. The results showed that distance played a significant role in camping behavior. Only about 15% of visitors who traveled the longest distance (>600 miles) did camping, whereas more than

30% of visitors traveling less than 600 miles did so.

When visitors' expenditures within 50 miles of the site visited were compared across the four different groups of travelers, the results showed significant differences for three types of expenditures: activity, private lodging, and other transportation. Expense on activities including guide fees and equipment rentals were significantly different among the four categories of visitors ( $X^2 = 12.17$ ,  $p < .05$ ) (Table 2). The longest distance visitors (>600 miles) spent more on activities than the visitors traveling less than 600 miles. Over one-fourth (28%) of the longest distance visitors (>600 miles) spent some amount of money on activities as opposed to 4-6% visitors who traveled less than 600 miles. Similarly, more visitors who traveled longer distance (more than 100 miles) spent some money on privately-owned lodging than the shorter distance (less than 100 miles) visitors ( $X^2 = 10.82$ ,  $p < .05$ ) (Table 2). Very few (4%) of the short distance visitors (<50 miles) spent any money on private lodging, whereas 28% of long distance (>600 miles) visitors did so. A similar result was found for the expense category, other transportation, such as plane, bus, etc. No visitors traveling less than 600 miles spent money in this category, whereas 16% of the visitors who traveled farther than 600 miles did so.

One-way ANOVA tests were conducted to see the effects of distance on place attachment, frequency of visiting, days away from home, crowding, and satisfaction. Among them, place attachment ( $F(3, 235) = 8.05$ ,  $p < .001$ ), frequency of visits ( $F(3, 487) = 10.45$ ,  $p < .001$ ), and days away from home ( $F(3, 132) = 24$ ,  $p < .001$ ) were significant (table 3). Post-hoc tests for place attachment showed that

visitors who traveled less than 50 miles had significantly higher place attachment scores ( $m=3.46$ ) than the visitors that traveled more than 100 miles. Post-hoc tests of frequency of visits showed that the visitors traveling less than 50 miles visited the National Forest more frequently during the past 12 months (18 times) than visitors traveling more than 50 miles. The results clearly depicted that visitors traveling from more than 600 miles spent more time (about 11 days) away from home on this recreation trip than the visitors traveling less than 600 miles (Table 3). Although crowding was not statistically significant, the descriptive results showed a pattern in which, as distance increased, visitors felt less crowding (Table 3). This is based on a smaller number of subjects because this version of the questionnaire was distributed to only one-quarter of the total sample. If the sample size was larger, the results may have been significant. Finally, there was no significant difference in satisfaction between the different groups. Forest visitors were equally satisfied with their visit regardless of the distance they had traveled.

### **Discussion**

The findings of this study reveal that, among the demographic variables, age is related to distance; however, the pattern is not consistent. It could be inferred from the results that those between 41 and 60 travel longer distances than the other age groups. Possibly, this is related to life stage and income. Gitelson and Crompton (1984) indicated a break point of repeat visitation at age 40, which could not be seen in this study. Rather, this study shows that age group between 31 and 50 is not much different while traveling less than 600 miles. Beyond the 600 miles, the age group between 41 and 50 is the same. The findings of this study on the relationship between distance and repeat visitation is consistent with the previous studies (Bell, 1977; Gitelson & Crompton, 1984; Moutinho & Trimble, 1991; Smith, 1985). The short distance visitors are more likely than the long distance visitors to be repeat visitors.

In terms of camping, it is interesting to note that the first three groups of travelers are similar. The threshold of camping appears to be 600 miles. Wolfe (1970, 1972) suggested a threshold point between 500 and 1000 miles because it is within a comfortable driving distance. Findings from this

study suggest a threshold within Wolfe's (1970, 1972) range. When visitors travel longer than 600 miles, they are more likely to fly to a destination and more likely to spend the night at lodges or with friends/families. This assumption is supported by the expenses of this group of travelers on private lodging and other transportation. Only the visitors traveling farther than 600 miles spent some amount of money on other transportation. All of the visitors traveling less than 600 miles probably traveled by their own transportation. This study also supports Debbage's (1991) hypothesis that, the longer distance someone has to travel to reach a destination, the more money they are likely to spend in their destination.

There is a clear pattern that distance and place attachment are reciprocal; i.e. as distance increases place attachment decreases. Close visitors are more likely to visit the National Forest more frequently than the distant visitors. This result is consistent with the gravity model in that, the closer one lives to a park, the more frequently they visit the park. In addition, the results showed that the frequency dropped significantly when the distance increases, particularly above 50 miles, which could be a threshold distance for frequency of visit. Findings of this study suggest that visitors traveling farther than 600 miles spend more time on their trip than visitors traveling less than 600 miles. Again, the threshold is 600 miles because the number of days increases significantly when the distance exceeds 600 miles.

Descriptive comparison of crowding and distance clearly showed that closer visitors are more likely to feel crowded than the distant visitors. The possible reason for such a difference could be a difference in activities. Distant visitors participated in viewing activities, which may have greater tolerance for crowding than the non-viewing activities. Since the result was not statistically significant, possibly because of the small sample, it is suggested to test this with a bigger sample.

The above findings suggest that there could be two possible distance break points, 50 miles and 600 miles. Place attachment and frequency of visit are different between the visitors traveling less and more than 50 miles, suggesting that those visitors who live within the 50 miles consider park as their home and consequently frequently visit the park.

For camping, days away from home, and expenses on other transportation such as bus plane and bus, 600 miles appears to be the break point. When distance exceeds 600 miles they tend to plan for longer vacation trips, travel by air rather than car, and tend to spend more money in the destination.

### Conclusions and Implications

The findings of this study increase our understanding of visitors' behavior by exploring the difference between visitors based on distance traveled. Distance was found to be a good predictor of recreation behavior, specifically with regard to activity participation, repeat visitation, day/overnight visiting pattern, camping, place attachment, frequency of visiting, days away from home, and crowding. This has great application for resource managers as it may help them to design and provide facilities to visitors from different distances.

In addition, it also provides a criterion for market segmentation based on distance. The apparent break points are 50 miles and 600 miles. For travel and tourism marketers, these geographic segments should be considered when designing travel promotions that are effective in attracting target consumers.

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