INFLUENCE OF COGNITIVE DISTANCE IN VACATION CHOICE

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Abstract: The study investigated the relationship of cognitive distance to the assignment of vacation destinations into individuals' choice sets: late, inert, reject, action, and inaction. Survey data were used to test four hypotheses. A positive relationship between respondents' mental ordering of destinations in the late set and the degree of preference for those destinations was generally confirmed. Cognitive distance estimates to destinations in the late set were more accurate than those to destinations in the reject set. Another hypothesis was partially supported since destinations in the late set were associated with cognitive distance underestimates. Further, analyses confirmed that underestimates of destinations in the action set were significantly higher than those in the inaction set. Keywords: destinations, choice sets, cognitive distance, decision process.

INTRODUCTION

The notion of choice sets has been generally accepted in tourism literature as a structural framework useful for conceptualizing how tourists sift through the very large number of vacation destinations available to them. The concept postulates that there is a funneling process which involves a relatively large initial set of destinations being reduced to a smaller late set, from which a final destination is selected. This concept has been incorporated as a central component of the general models of a tourist's vacation destination selection process (Um and Crompton 1990; Woodside and Lysonski 1989).
Figure 1 shows that those destinations from the initial set that are not assigned to the late set are assigned either to an individual's inert or reject sets (Narayana and Markin 1975). The late set consists of those places which a traveler considers as probable destinations within a given time period, for example, a year. This set can be subdivided into an action set, comprising those destinations towards which potential tourists have taken some action such as requesting information, and an inaction set of places for which the individual took no further action (Spiggle and Sewall 1987). The inert set is comprised of destinations which individuals evaluate neither positively nor negatively because they do not have sufficient information to make an evaluation. Destinations in individuals' reject sets have been excluded from consideration because individuals either have had an unpleasant experience at them, or because they have acquired negative information about them.

When destinations are assigned to the late set they are not likely to be perceived as being equally preferable. While all of them, by definition, are considered probable destinations within a given time period, their probabilities are likely to be unequal (Muhlbacher and Woodside 1987; Woodside and Carr 1988). It has been suggested that relative preferences at the late set stage can be assessed by looking at the order in which respondents list them (Axelrod 1965; Bronner and de Hoog 1985; Woodside and Wilson 1985). Although the taxonomy of sets shown in Figure 1 has been identified and described,
relatively little work has been reported in the tourism literature investigating how they are formed. Figure 1 suggests the assignment of destinations to sets is influenced by three types of variables — internal social psychological processes, situational constraints, and external stimuli emanating from the destinations.

The study reported here investigated the influence of cognitive distance on the formation of choice sets. Cognitive distance is a situational constraint that is formed by social psychological processes. It is defined as people’s beliefs about distances between places in large-scale spaces, which are far apart and obscured so as not to be visible from each other (Montello 1991). It is a mental representation of actual distance molded by an individual’s social, cultural, and general life experiences. A substantial number of researchers have reported findings which indicate that cognitive distance estimates significantly differ from actual distance measures (Briggs 1973; Cadwallader and Clark 1973; Canter and Tagg 1975; Cook and McCleary 1983; Downs and Stea 1977; Ekman and Bratfisch 1965; Gould and White 1986; Mackay and Zinnes 1981; Mayo, Jarvis and Xander 1988; Thompson 1963).

Although an empirical literature has emerged on both choice sets and cognitive distance, no previous study was found which considered the relationship between the two concepts. The conceptualization of this relationship (Figure 1) suggests that the three sets of influencing variables serve as evaluative criteria against which destinations in the initial consideration set are assessed. On the basis of this assessment they are assigned either to the late, inert, or reject sets. This assessment process is repeated both in the categorization of destinations in the late set into the action or inaction sets, and in selection of a final destination from the action set.

The influence of cognitive distance on choice set formation was selected for investigation in this study because it was believed likely to be a primary evaluation criterion used by tourists and because its impact could be influenced by destination marketers. Cognitive distance has the potential to increase or decrease tourists’ cognition of vacation transport costs. In addition to monetary expenditures, transport costs include the investment made by tourists in physical effort and time resources to overcome the friction of distance. To prevent vacation costs from spiraling, individuals are likely to have a stated distance constraint beyond which they may be unwilling to undertake vacation travel (Cook and McCleary 1983). In the geographic literature, this is referred to as the “critical distance” (Getis 1969). Cognitive distance may be critical in destination marketing because “while it is true that travelers will ultimately consult a map for actual distance in most cases, a problem arises for the travel marketer when his destination is eliminated by cognitive distance estimates before the map reading phase of the decision process is ever reached” (Cook and McCleary 1983:33).

The cause and effect directionality of the relationship between cognitive distance and destination choice is problematic. One conceptualization is that distance to a destination is underestimated because a destination is preferred. However, an alternative
explanation is that the reason a destination is preferred over others is because the cognitive distance to it is underestimated. Further, it is possible that these explanations may interact. Thus, an individual's cognitive distance assessment may influence preference in the case of some destinations in a choice set, while the same person's preferences may influence his or her cognitive distance estimates for other destinations in the same set. From the perspective of practitioners, the conceptual explanation for the relationship may not be crucial. Their main concern is likely to be on identifying distance distortions and rectifying them in their promotional efforts, rather than seeking to understand why they occur. In the absence of authoritative guidance on this conundrum, the authors adopted the conceptualization that cognitive distances are shorter or longer than actual distances because of preferences. The initial intuitive expectation of the relationship between cognitive distance and the three alternative choice sets emanating from the initial consideration set, was that respondents' estimates would fall along a continuum ranging from underestimates to destinations in the late consideration set, through slight overestimates to those in the inert set, to substantial overestimates in the reject set. Such an estimation pattern could partially contribute to explaining the assignment of destinations to each set. This intuitive reasoning appears to be supported by cognitive dissonance theory (Festinger 1957) which is concerned with the relationship between two cognitive elements. This relationship may be dissonant or consonant. Two elements are said to be in a dissonant relationship if the obverse of one element would follow from the other. On the other hand, if either element follows from the other, then the relationship between them is consonant (Festinger 1957). Dissonance may be reduced by seeking new consonant information, by avoiding dissonant information, or by reducing the importance of one or both elements in the dissonant relationship.

If a destination's attributes are relatively attractive to an individual, then he or she may cognitively underestimate the distance to it in order to reduce the possibility of a dissonant relationship with the monetary, physical, and time costs of getting there. Such a process would increase the probability of it being in the late set. Conversely, if a destination's stimuli are negative, then cognitive distance may be overestimated with the result that costs are inflated and a decision to assign the destination to the reject set is reinforced.

In making decisions about the late set, cognitive dissonance theory suggests that because time and effort have been invested in soliciting information about destinations in the action set those destinations are likely to be regarded more favorably. Hence, potential tourists tend to minimize any negative attributes these destinations may have, including the friction of distance. Destinations in individuals' inaction sets were also expected to be underestimates since they were part of the late set, but because no extra effort had been invested in them, the magnitude of the underestimates was expected to be smaller.
COGNITIVE DISTANCE INFLUENCE

Four hypotheses were developed and tested — One, there is a significant positive relationship between respondents' mental ordering of destinations in the late set and the degree of preference for those destinations. Two, cognitive distance estimates to destinations in the late set will be significantly more accurate than those to destinations in the inert and reject sets. Three, destinations in the late set will be associated with cognitive distance underestimates, while those in the inert and reject sets will be associated with overestimates. Four, the degree of cognitive distance underestimation will be significantly higher for destinations in the action subset of the late set than in the inaction subset of the late set.

Data were collected by a mail questionnaire which was pretested using two expert panels and a student sample. The sample, selected by a systematic random procedure, was comprised of non-student adults who resided in College Station, Texas. After follow-up procedures, 287 usable questionnaires were returned which represented a return rate of 52%.

Respondents were asked five questions related to their late set: (a) name five places in the United States they would definitely consider visiting on a driving pleasure vacation of 7 days; (b) provide distance estimates from College Station, Texas, where they resided, to each named destination; (c) indicate by “yes” or “no” whether they had previously visited each of the five destinations listed; (d) allocate a total of 100 points among the five destinations to reflect their degree of preference for each destination; and (e) indicate by “yes” or “no” if they had ever sought information on each of the listed destinations.

Responses to item (a) were used to identify the content of respondents' late sets; (b) responses provided data for cognitive distance measures; (c) responses were used to categorize destinations in the late set into two classes, destinations which individuals had previously visited and those destinations which respondents had not previously visited. Answers to items (d) were used as measures of respondents' destination preferences; while (e) responses were used to divide destinations in the late destination set into action and inaction sets.

To derive reject sets, respondents were requested to “List 5 destinations in the USA which you would definitely not consider visiting on a driving pleasure vacation of 7 days”. Like the previous late set question, respondents were asked to provide distance estimates to each of these locations they listed and also to indicate by a “yes” or “no” if they had previously visited these destinations. Data on inert sets were derived by asking respondents to “Name 5 destinations in the USA you have never visited, but which you might consider visiting on a driving pleasure vacation of 7 days if you had additional information about them”. In addition, they were asked to provide distance estimates to each of the destinations they listed.

To test the premise underlying the study that distance was an important consideration in the pleasure vacation destination selection process, respondents were given an open-ended question and asked to list the three most important factors influencing their selection of a
destination. Their responses were coded *ex post facto* into ten categories and distance emerged as the most important factor in selecting a destination, confirming the underlying premise.

**Study Results**

*Hypothesis one: there is a significant positive relationship between respondents' mental ordering of destinations in the late set and the degree of preference for those destinations.* Respondents listed the five places which constituted their late set. Using a constant sum scale procedure, they then allocated 100 points among the five destinations to reflect their degree of preference for each alternative destination. The more a destination was preferred, the more points respondents were directed to allocate to that destination.

The order in which respondents listed destinations was used as a surrogate measure of their mental ordering of these destinations. Mean preference scores for each of the five listings were computed. A larger mean value in a particular listing level indicated that respondents had a higher relative preference for these destinations than ones which received a lower proportion of the constant sum score. Table 1 shows the order in which destinations were listed and the mean preference scores associated with each. Results of an analysis of variance test indicated that the mean difference in preference scores associated with the listing levels of destination choice was statistically significant ($F = 13.34; p < .01$). A Duncan's Multiple Range test showed respondents' mean preferences for destinations listed first were significantly higher than their mean preferences for destinations listed second, while their preferences for destinations listed second were significantly higher than those listed third, fourth, and fifth (Table 1). These results suggested that hypothesis one was supported for the first three ordered destinations.

*Hypothesis two: cognitive distance estimates to destinations in the late set will be significantly more accurate than those to destinations in the inert and reject sets.* Data for testing the hypothesis were generated from respondents' cognitive distance estimates for a listing of 7-day pleasure vacation destinations they would consider visiting (late set), not consider visiting (reject set), and destinations on which they had

<table>
<thead>
<tr>
<th>Category</th>
<th>Number</th>
<th>Mean Preference Score</th>
<th>Duncan Grouping</th>
</tr>
</thead>
<tbody>
<tr>
<td>Destination listed 1</td>
<td>250</td>
<td>30.78</td>
<td>A</td>
</tr>
<tr>
<td>Destination listed 2</td>
<td>243</td>
<td>22.15</td>
<td>B</td>
</tr>
<tr>
<td>Destination listed 3</td>
<td>238</td>
<td>18.16</td>
<td>C</td>
</tr>
<tr>
<td>Destination listed 4</td>
<td>226</td>
<td>15.18</td>
<td>C</td>
</tr>
<tr>
<td>Destination listed 5</td>
<td>221</td>
<td>13.05</td>
<td>C</td>
</tr>
</tbody>
</table>
insufficient information to consider driving to (inert set). In situations where respondents listed the names of states rather than specific locations, a city sited in the middle of the state was used to represent the location.

Figure 2. Scatterplots of Cognitive Distance Estimates and Actual Distances in Three Choice Sets
The magnitude of cognitive distance error was measured by comparing each respondent’s distance estimate to a listed destination, with the actual distance to that destination. Scatterplots for each of the three choice sets are shown in Figure 2. Actual distances (miles) of the destinations selected by respondents were traced on the vertical axis, while cognitive distances were traced on the horizontal axis. There was a general linear pattern across the three sets but, as anticipated, the linearity was most pronounced in the late set and least pronounced in the reject set of destinations. It seems likely that this pattern reflects the relative information seeking effort which respondents invested in each set. Most effort is likely to be made in acquiring knowledge about destinations that are under strongest consideration. Since the inert and reject sets were of less interest, there was no reason for respondents to become highly involved in seeking information about them. Hence, greater error between the actual and cognitive distances resulted.

The scatterplots suggest two further points. First, distances increased from the late set, through the inert set, to the reject set. This suggests that the influence of situational constraints appears to be progressively more pronounced in the inert and reject sets, respectively. Second, as distance increases variability increases, reflecting greater error in the cognitive distance estimates. Numerical results of comparisons of destinations in the three choice sets are shown in Table 2. There was a wide difference in the number of those who listed destinations in each of the three sets. Respondents appeared to have most difficulty in identifying destinations which met the requirements associated with the inert set. The table confirms the scatterplot showing that both the mean distance error and the variance were lowest for destinations in the late set and highest for destinations in the reject set.

The late, inert and reject sets were concatenated and analysis of variance was used to test for differences in the mean values of each set. The analysis of variance indicated that there was a significant difference between the means of these three groups ($F = 15.4, p < .001$). A Duncan’s test confirmed that the significant difference was between the late consideration set and the other two sets, and that there was no significant difference in the magnitude of cognitive distance error mean scores between the inert and reject sets. These analyses suggested that the hypothesis was supported. However, there is evidence to suggest that people have a universal tendency to overestimate shorter distances and underestimate longer distances.

<table>
<thead>
<tr>
<th>Set</th>
<th>Number</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Late</td>
<td>243</td>
<td>176</td>
<td>175</td>
</tr>
<tr>
<td>Inert</td>
<td>194</td>
<td>273</td>
<td>216</td>
</tr>
<tr>
<td>Reject</td>
<td>222</td>
<td>283</td>
<td>286</td>
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</tbody>
</table>

Table 2. Cognitive Distance Error (in miles) for the Late, Inert, and Reject Sets
Table 3. Results of Analysis of Covariance

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Sum of Squares</th>
<th>DF</th>
<th>Mean Square</th>
<th>F</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariate (actual distance)</td>
<td>144,518</td>
<td>1</td>
<td>144,518</td>
<td>3.62</td>
<td>.057</td>
</tr>
<tr>
<td>Main effects (sets)</td>
<td>377,428</td>
<td>2</td>
<td>188,714</td>
<td>4.73</td>
<td>.009</td>
</tr>
<tr>
<td>Explained</td>
<td>521,946</td>
<td>3</td>
<td>173,982</td>
<td>4.36</td>
<td>.005</td>
</tr>
<tr>
<td>Residual</td>
<td>25,623,146</td>
<td>643</td>
<td>39,849</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>26,145,092</td>
<td>646</td>
<td>40,472</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A theoretical explanation for this phenomenon is offered by Holyoak and Mah (1982). Thus, errors in cognitive distance may be a function of the actual distance of destinations from College Station rather than of choice set. To address this problem of whether it was actual distance or choice set affecting the estimate of cognitive distance, an analysis of covariance was undertaken to determine whether there were significant differences of cognitive distance estimates between the three sets. In this analysis, cognitive distance was the dependent variable, choice sets were the independent variables, and actual distance was the covariate. Thus, the relationship between cognitive distance and choice sets was considered while holding the actual distance constant. Results of the analysis are shown in Table 3. They confirmed that accuracy of cognitive distance varied significantly with type of choice set ($F = 4.73, p = .009$). The effect of the covariate, actual distance, was relatively insignificant ($F = 3.62, p = .057$). The most accurate cognitive distance estimates were those for destinations in the late set, followed by those in the inert set. A Tukey–Kramer multiple comparison test indicated that the magnitude of cognitive error to destinations in the reject set was significantly higher than that associated with the late set but the greater error to destinations in the inert set was not significant. Hence, hypothesis two was partially supported.

**Hypothesis three: destinations in the late set will be associated with cognitive distance underestimates, while those in the inert and reject sets will be associated with overestimates.** Respondents’ mean differences between cognitive and actual distance in miles for the late, inert, and reject considerations sets were $-4.78$ (SD = 159.91), $7.07$ (SD = 224.5), and $41.11$ (SD = 221.98), respectively. One sample $t$-tests were undertaken to determine whether the magnitude and direction of the means for each set were significantly different from zero. The results revealed that there was a tendency for respondents to overestimate distance to destinations in the reject set ($t = 2.67, p < .05$). However, responses in both the late and inert choice sets did not differ significantly from zero ($t = 0.478, p > .1$, and $t = 0.426, p > .1$). In these cases, cognitive estimates to destinations did not vary enough from zero to be considered significant over or under estimates. Hence, hypothesis three was rejected.
Hypothesis four: the degree of cognitive distance underestimation will be significantly higher for destinations in the action subset of the late set than in the inaction subset of the late set. Respondents were asked to indicate by a "yes" or "no" answer whether or not they had ever sought information from any sources on each of the destinations listed in their late set. Those destinations on which information had been sought were assigned into the action set, while those on which no information had been sought comprised the inaction set. Initial data analyses revealed that the action subset was reasonably symmetrical, but the inaction subset was positively skewed. Hence, the assumptions of normality and equality-of-variance were violated. Therefore, a Mann–Whitney U test was used to test hypothesis four. It confirmed the hypothesis, indicating that cognitive distance underestimation was significantly higher for destinations in the action subset than in the inaction subset (p = .049). Hence, hypothesis four was supported.

Cognitive Distance Influence

The positive relationship between respondents' mental ordering of destinations in their late consideration sets and preference for those destinations confirmed the findings reported by Woodside and Wilson (1986), Woodside and Lysonsly (1989), and Bronner and de Hoog (1985). They suggest that the mental ordering of destinations provides an accurate indicator of a destination's preference status relative to its competitors. The integration of a constant sum scale with this procedure enabled relative probabilities to be assigned to the preference rankings and an assessment to be made of whether or not the preference orderings were significantly different.

Cognitive distance estimates to destinations in the late set were significantly more accurate than those to destinations in the reject sets. Estimates to destinations in the inert set were also less accurate than to those in the late set, but the difference was not significant. These findings generally supported hypothesis two. The findings that underestimates were associated with the late set was consistent with hypothesis three. However, contrary to the hypothesis' postulation, the data did not support the notion that destinations in the inert and reject sets would be associated with overestimates.

In both the late and reject sets, respondents were more likely to list destinations they had previously visited than destinations they had not visited. Approximately 60% of destinations in the late set and 56% of those in the reject set had been previously visited. The high proportion of destinations previously visited in the late set was surprising, given the conventional wisdom that novelty is an important motive for pleasure vacations (Bello and Etzel 1985; Cohen 1972; Crompton 1979; McIntosh 1977; Mayo and Jarvis 1981). This suggests that many respondents become genuinely attached to a destination and are prone to considering repeat visitation. If a destination has not been visited, it is less likely to become part of a tourist's late set. This finding suggests
that marketing strategies focusing on inducing repeat visitation from existing customers may be more cost-effective than those directed at potential tourists who have never visited a destination.

Support was found for hypothesis four that the degree of cognitive distance underestimations will be higher for destinations in the action set than the underestimations associated with inaction set destinations. Cognitive dissonance theory suggests that because respondents have initiated some action to contact destination marketers in the action subset of the late consideration set, they would need to justify such an action. This justification is provided by exaggerating distance underestimation, the outcome of which is to place destinations in the action set more within respondents' defined distance threshold than destinations in the inaction set. This finding confirms the utility of the concept of action and inaction sets which postulates that destinations in the action set are better placed to become the final selected vacation destination than those in the inaction set.

The importance of the role of cognitive distance in the evolution of vacation choice sets was confirmed by these respondents, since they reported that distance was the most important factor in their consideration of vacation destinations. There are two possible outcomes from cognitive distance distortions both of which may adversely impact a destination. First, distance to a destination from potential tourists in a given market may be overestimated. In this case, the magnitude of distance constraint is increased and the probability of the destination being visited is reduced. Alternatively, distance may be underestimated. Ostensibly, this may appear to be advantageous because it reduces the distance constraint and makes visitation more likely. However, this is a myopic perspective. The expectancy paradigm proposes that expectations provide a baseline which determines level of satisfaction. Dissatisfaction occurs when the experience does not match expectations. In the underestimation distortion case, the expectations of a shorter travel distance will not be met when the trip is undertaken leading to a negative reaction by visitors. If distance distortions can be identified, then destinations can make efforts to rectify the distortion effect in their promotion efforts.

Most of the vacation choice set research which has been reported in the tourism literature has focused on the size and structure of sets (Thompson and Cooper 1979; Woodside and Lyonski 1989; Woodside and Sherrell 1977; Woodside, Ronkainen and Reid 1977). Now that their parameters have been delineated, the next step is to understand the processes involved in their formulation. Such an understanding would appear to be a prerequisite to successfully positioning a destination so it has a high probability of selection. The study reported here was intended to contribute to this understanding by focusing on the role of cognitive distance in the evolution of choice sets. Future efforts may usefully investigate the role of budget and time constraints, social-psychological factors, and the attraction features of destinations in vacation set formation. ☐ ☐
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