Leisure market segmentation : an integrated preferences/constraints-based approach

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Leisure Market Segmentation: An Integrated Preferences/Constraints-Based Approach

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SUMMARY. Traditional segmentation schemes are often based on a grouping of consumers with similar preference functions. The research steps, ultimately leading to such segmentation schemes, are typically independent. In the present article, a new integrated approach to segmentation is introduced, which incorporates elements of traditional approaches, albeit in a new and innovative way. The new methodology and its potential managerial and policy relevance is illustrated using the Dutch initiative of reducing car use for leisure trips as an example. [Article copies available from *The Haworth Document Delivery Service*: 1-800-342-9678. E-mail address: getinfo@haworth.com]

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INTRODUCTION

One of the central issues in tourism marketing concerns the identification of target groups. Effective segmentation schemes are considered to be of utmost importance for successfully marketing tourism products or implementing tourism-related policies. In methodological terms, segmentation research has typically followed either of the following two strategies. Market segments can be derived by clustering respondents on the basis of their socio-economic characteristics or overt behavior. Alternatively, segmentation can be based on individuals' preferences for various products.

The latter approach usually involves various steps. First, the attributes influencing tourism-related decisions are elicited. A variety of methods, ranging from factor listing to repertory grid analyses, is available to identify these influential attributes. Once these attributes have been identified, some kind of preference or choice model is used to describe individuals' preference functions. Especially, conjoint and compositional preference models have found ample application in tourism research. The estimated preference functions are then used to identify groups of individuals which are homogeneous in terms of their underlying preference functions.

Although these methodologies are easy to use and have resulted in many interesting and actionable segmentation schemes, they nevertheless have some obvious shortcomings. First, the preference approach described above involves a series of truly independent steps. Often, the sample responding to the attribute elicitation task is different from the sample of respondents involved in the conjoint experiment. While this may be acceptable practice if the focus is on generalizability, it prevents one from segmenting respondents on individual information regarding both the kind of attributes and the nature of the preference function. Of course, this is the direct result of the fact that the two steps are not fully integrated. Secondly, this approach is based on preference only, and does not take constraints on behavior explicitly into consideration. Constraints such as lack of time or money, or pressure imposed by the presence of children, may hinder individuals to choose a preferred alternative, or to participate more often. Consequently, the most valid results would be obtained if one could successfully differentiate between constraints and preferences.

In this paper, a new methodology that has been developed to avoid some of these shortcomings is introduced. It is based on the integrated use of a series of tasks that allows one to elicit the attributes influencing the choice process of interest, classify these attributes into rejection-inducing and hence constraint-type of attributes and trade-off attributes, and estimate a preference function, which can then be used to group respondents

into segments. Some elements of this new suggested methodology are common with traditional approaches, but it differs in terms of the specific combination of tasks and elements. The goals of this paper are to outline the new methodology and illustrate its application in the context of a tourism policy program in the Netherlands to reduce car use for leisure trips.

To this end, the paper is structured as follows. First, the background of the application will be outlined. Then, we will sketch the theoretical framework underlying the analyses. Next, the new integrated method will be introduced and discussed. This method was developed to elicit the factors and constraints influencing leisure consumers' choice behavior, and on this basis of this, to derive consumer segments. Then the results of the analyses are reported on, describing the market segments identified. As a result the possible marketing strategies for each of the identified market segments are discussed, with particular attention to constraints to behavior. The paper concludes with a discussion of the results and design of the study, and suggestions for further research.

BACKGROUND OF THE STUDY

One of the tourism policy issues in the Netherlands is a reaction to the increased awareness that in many densely populated areas in Western Europe, tourists and recreation participants have contributed significantly to an immense mobility growth. On holidays and summer weekends, roads serving the major leisure/tourist sites suffer from traffic congestion and inadequate parking capacity. This in turn has caused poor accessibility of those sites, poor environmental quality, and tourists' annoyance. Total mobility figures show that leisure travel is substantially larger than commuter traffic. Concern about this growing problem has led local planning authorities, transport companies and the leisure industry to propose initiatives to reduce car use to leisure sites. In the Netherlands, some experiments have recently been implemented which attempt to stimulate non-car travel for recreational day trips. These involved the introduction of shuttle bus services from railway stations and large car parks to the leisure sites, and the planning of new leisure sites near major public transport facilities. Furthermore, existing non-car options were promoted by advertising and offering discounts on combined train and entrance tickets. Although these experiments did succeed in increasing the use of public transport to the leisure sites, evaluation research indicated that they did not result in a decrease in motorcar travel. Thus, empirical evidence seems to suggest that the experimental measures have not been very effective in influencing

people's mode choice behavior. Assuming that there is a wide variety of individual demands and desires for leisure travel, the effectiveness of programs for reducing car mobility seems largely dependent on one's success in targeting the leisure consumer. In terms of the process of decision making, leisure travel is not different from any other kind of travel: individuals or households choose leisure destinations on the basis of the utility they derive from such destinations, given the constraints they face to realize their preferences. These utilities or preferences in turn are a function of the attributes of the destinations and the transport modes that may interact with household characteristics and context variables. Hence, it may be that the introduction of the discount tickets allows a particular market segment to make additional trips, rather than changing their transport mode choice. Thus, if one wishes to assess the potential impact of these programs, it is important to understand the choice process of leisure consumers, the nature of their preference functions, the constraints that are influencing their behavior, and the elasticity aspects of leisure travel. A market segmentation approach that incorporates these aspects may assist in optimizing the impact of such car mobility reducing programs.

CONCEPTUAL FRAMEWORK

The theoretical basis for the present study can be viewed as an extension of the framework, previously outlined in Timmermans (1982), and applied to other studies of recreational choice (e.g., Lieber & Fesenmaier, 1984). This framework assumes that leisure destination choice is the result of a cognitive decision process. Based on individual characteristics and decision criteria, individuals (or households) perceive the alternatives in their choice set and derive part-worth utilities from the attributes describing the alternatives. Individuals' perceptions are not necessarily true, nor are individuals familiar with all alternatives. Individuals are assumed to subjectively perceive a subset of choice alternatives and subsequently arrive at an overall preference judgment of the alternative by integrating the separate evaluations of these attributes. In other words, the overall utility of the alternative is a function of the part-worth utilities of its attributes. This process of integration is highly subjective. Individuals are assumed to use certain combination rules to weigh the attributes of the choice alternatives. Combination rules can be either compensatory or non-compensatory. Compensatory rules describe a compensatory decision making process in that a low appraisal of one specific attribute can be compensated, at least partially, by a high score on one or more other attributes. The use of noncompensatory combination rules implies that a

low appraisal cannot be compensated, and will therefore induce the rejection of the choice alternative. Finally, individuals are assumed to arrive at a choice, given their overall preference for the alternative in their choice set, by implementing a choice rule. For example, one can assume that individuals will invariably choose the alternative with the highest overall preference.

In the original conceptual framework, constraints to behavior were not explicitly taken into consideration. In contrast, constraints were seen as operating through some of the other components of the conceptual model. For example, constraints related to personal or household characteristics were seen to operate through the background variables and influence the perception and evaluation of the choice alternatives. Similarly, temporal and spatial constraints were implicitly viewed as exogenous factors influencing the size and composition of individuals' choice sets.

Because the issue of constraints is very pertinent in the present study, it may be relevant to elaborate the original conceptual framework and explicitly incorporate different kinds of constraints. Following Henderson (cf. Jackson, 1988) and Jackson and Searle (1985), we differentiate between intervening and antecedent constraints (see Figure 1). Intervening constraints operate between the individual's preferences and the actual choice. Antecedent constraints prevent an individual to consider an alternative and thus influence his/her choice. The latter type of constraints thus influence the perception, evaluation of the attributes and the combination rule. Another distinction that is useful here is between blocking and inhibiting constraints (cf. Jackson & Searle, 1985: 598). Constraints of the first type induce immediate rejection of the alternative and would be indicative of a noncompensatory combination rule. The latter just make an alternative less preferable or complicate participating; compensation with other (highly preferred) features, or adaptation of the individual is eventually possible. Constraints may cover a latent demand for a certain alternative. Given a valid identification of (the nature of) constraints, the potential demand can be measured.

AN INTEGRATED APPROACH

It is critical to the present analyses to (i) measure the attributes influencing the respondents' leisure travel (destination and transport mode) decisions, (ii) identify the role these attributes play in the decision making process (constraints/rejection inducing attributes or trade-off attributes), (iii) derive a preference function that allows us to position leisure destinations on a preference scale, and (iv) to use these results to identify con-

sumer segments. To this end, we developed a method that is derived from elements of the Repertory Grid methodology, the Decision Plan Nets approach and a choice-based scaling model. It differs from these traditional approaches in that these elements are used in a new, integrated fashion.

The Repertory Grid methodology has been applied to consumer choice problems before, especially in transportation (e.g., Timmermans et al., 1982a) and retailing (e.g., Timmermans et al., 1982b, 1984; Hallsworth, 1988; Coshall, 1985; Hudson, 1980; Opacic & Potter, 1986) and the Decision Plan approach has also been applied in recreation research previously (e.g., Timmermans & Van der Heijden, 1987), but to the best of our knowledge, the integrated method developed for the present study is new.

The Repertory Grid method as originally developed by Kelly (1955) in clinical psychology explores individuals' perceptions by identifying the characteristics by which individuals distinguish between objects. In a Repertory Grid interview, respondents are presented a list of triads of choice alternatives. They are requested to name the features that differentiate one alternative from the other two. That is, they are prompted to name the attributes by which the two choice alternatives are similar and thereby different from the third. Respondents are asked to name these attributes or personal constructs using new triads until no new constructs are mentioned. This results in a list of perceived characteristics the respondents apparently use to discriminate between the presented choice alternatives. These attributes are then assumed to influence individuals' destination choices. The major advantage of this method over other methods is that the task is relatively uncomplicated and that it controls for interviewer bias (cf. Stermerding et al., 1992).

To elicit a valid list of attributes, it is vital to have the respondent consider a diverse set of alternatives. In fact, the number of alternatives is unlimited but not all features of all alternatives are equally important. In this respect, a conventional Repertory Grid method is not very efficient as the triads are generated at random. Therefore, in this study we used a different approach, which is based on choice sets that are constructed according to the principles of the design of statistical experiments.

This new method involves the following steps. First, the potential destinations have to be classified into types. For each type, N destinations are selected. Alternatively, one can use real-world destinations directly. Next, these destinations are placed into choice sets, using the principles of the statistical design of experiments to create choice sets. Each set thus consists of a combination of selected destinations, one for each type. Respondents are then requested to identify the most as well as the least preferred

destination in each choice set, and to name attributes that generated this response. This will result in a list of explicitly positive and explicitly negative aspects of the destinations.

Hence, our method has in common with conventional repertory grid analysis that subjects are requested to elicit the constructs or attributes they use to differentiate between choice alternatives. It differs in that choice sets, constructed according to experimental design principles, rather than randomly generated triads are used to generate these responses.

Having elicited the attributes influencing leisure destinations choice, the next step involves identifying the specific role of each of these attributes in the respondents' decision making process. This step is based on the Decision Net approach, which traditionally has been applied for this purpose, but as a stand-alone method. Our application thus differs from previous studies in this respect in that the output of the adjusted Repertory Grid method or attribute elicitation task is used as input to the Decision Plan Net (cf. Stemerding et al., 1993).

The Decision Plan Net method (Bettman, 1970, 1979; Park & Lutz, 1982) was originally designed to represent individual decision making processes. Basically, decision nets involve a structured interview in which respondents are invited to list the attributes influencing their decision making. Note that in our application, this step is replaced by the suggested attribute elicitation method. Having listed the influential attributes, respondents are requested to explicate the conditions under which they would no longer consider the choice alternative. Such attributes are called rejection inducing dimensions and refer to noncompensatory combination rules. An alternative will be rejected if a particular attribute does not meet an individual's set of conditions. Such attributes are indicative of constraints in the process. Alternatively, an individual may still consider the choice alternative if this attribute is compensated by better levels of one or more of the other attributes. These trade-off dimensions refer to compensatory combination rules. Finally, relative preference dimensions may be identified. These make the alternative more desirable. Acceptance or rejection of the alternative, however, does not depend on such an attribute. Thus, elements of a decision net approach may be used to identify the kind of constraints that were discussed in the conceptual model.

The attribute elicitation task generates choice frequencies for the destinations included in the choice sets. These frequencies can be aggregated across respondents, which can serve as the input of a scaling model that allows one to position the destinations on a preference scale. If orthogonal designs are used, the experimental design fulfills the sufficient and necessary conditions to estimate a multinomial logit model. Hence, a MNL

model can be used to derive the preference scale. Note that this is not a separate step in the analysis, but follows directly from the adopted method.

Finally, rather than focusing on the preference function, which describes the positioning of the destinations on an overall preference scale without taking constraints into account, the choice frequencies observed across the designed choice sets may be used as input for a clustering algorithm to group the respondents into segments according to their choice patterns as observed under experimental conditions. Any clustering algorithm or other appropriate grouping technique may be used to derive the segments. Note again, that these results are obtained simultaneously as part of the integrated measurement approach. The application of the suggested methodology will be illustrated next, using the Dutch policy of reducing car mobility for leisure trips as an example.

STUDY DESIGN

Data

The data for the present study were collected in the summer of 1993 as part of a survey among 150 randomly selected households in the Eindhoven/Tilburg region in the Netherlands. Respondents were initially contacted by phone and asked a series of questions about their leisure travel activities. Those who said they were frequently involved in leisure activities were invited to participate in a follow up home interview. The average interview took approximately 1 hour to complete, and involved detailed questions about the respondents' perception of leisure destinations, their evaluations, and a structured interview to elicit and identify the nature of their decision making process for leisure travel. Finally, information about their leisure experience and personal background variables was collected.

Analyses and Results

Following the measurement approach described previously, first the potential destinations were classified into four types: zoo, amusement park (family theme park), museum, and beach site. For each type, four destinations were selected (see Table 1). All these destinations were within a distance range of 100 miles (160 kms) of the study area, and were assumed to be well known. The alternatives were presented to respondents not as destinations, but as comprehensive leisure trips, including transport mode, journey both ways and a few hours stay at the destination. To force respon-

TABLE 1. Selected Destinations

(ZO) Zoos:	Zoo Antwerpen, Antwerp, Belgium Burgers' Bush, Zoo and Safari, Arnhem Artis Zoo, Amsterdam Beekse Bergen safaripark
(MU) Museums:	Rijksmuseum Amsterdam Open Air museum, Arnhem Railway museum, Utrecht Kröller-Müller, National Park Hoge Veluwe
(AP) Amusement Parks/Theme Parks:	Efteling, Kaatsheuvel Land van Ooit, Drunen Madurodam, The Hague Walibi, Belgium
(BE) Beaches:	Hoek van Holland Scheveningen Domburg, Walcheren Renesse/Haamstede

dents to explicitly consider attributes of the transport mode, we invited them to perform the same choice/attribute identification task twice. The first series of choice sets represented trips to be made by public transport, the second series was similar and represented trips to be made by car. Consequently, respondents had to take public transport attributes (e.g., complexity and length of trip, accessibility), in combination with the site's specific features, into consideration. Likewise, in the second series of choice sets, car trip attributes (e.g., parking facilities, traffic jam probability) and the site's specific features were jointly considered.

These trip/destination descriptions were varied according to an experimental design. Because we identified four sites for each destination type, and each type can be absent, all combinations of destination types involve a 5^4 full factorial design. Two orthogonal fractions of this design, involving 25 sets were constructed, one for trips by public transport, and one for leisure trips by car. Thus, choice sets varied in size and composition. The maximum size involves one destination for each of the four types of leisure destinations. Choice sets can be smaller if one or more of the destination types is not available. To avoid fatigue, respondents were asked to respond to only 15 choice sets, which were drawn at random. Respondents were requested to identify the most as well as the least

preferred destination in each set of alternatives, and to name attributes that generated this response. This resulted in a list of attributes the respondents used to discriminate between the destinations.

The pattern of choices across the choice sets served as input for a hierarchical clustering algorithm to group the respondents into segments. In general, if an orthogonal fractional factorial design is used and all respondents express their choices for the same choice sets, the responses to all choice sets can be used directly as input for the clustering routine. In some applications, such as this one, the number of choice sets may be too large, and consequently, the reliability of the responses may be at risk. To avoid fatigue and patternized response patterns, one can construct a fraction of the factorial. If one is willing to assume that pairwise choice probabilities are independent from the existence of any other alternative in the choice set, then the aggregated choice frequencies for each destination can still be used as input for the clustering algorithm. If, as in our case, a randomization procedure has been used to select the choice sets that are presented to respondents, one no longer has strict control over the number of times a particular destination is presented to respondents. The proportion of times a destination is chosen, given the number of times it has been presented, is a more reliable measure to perform the segmentation. This option was chosen in the present study. Because respondents were requested to make choices for each of the 16 leisure sites when travelling by public transport and when travelling by car separately, their adjusted response patterns to 32 profiles were used as input for the cluster analysis. The *average linking within groups* method was used to group the respondents. This method groups respondents such that the average Euclidean distance between all members of the resulting cluster is as small as possible.

Four segments resulted from this procedure. First, we described each segment in terms of the personal characteristics of their members, and their average use of the destinations types. For each segment separately, a multinomial logit choice model was also estimated, which positioned each of the leisure sites on a preference scale. This analysis was conducted twice, once for the public transport scenario and once for the car scenario. The aggregated choice frequencies were used as the dependent variable of the choice model, the leisure sites were represented by a set of dummy variables. Iterative reweighted least squares analysis was used to estimate the preference scales.

The results of these analyses are presented in Tables 2 and 3. These tables indicate that the market segments can be characterized as follows:

Segment #1 (N = 40): Members of this segment are attracted to zoos and the amusement park *De Efteling*, and have recently made relatively

TABLE 2. Preference Results for the 4 Different Segments

SEGMENT #1 (N = 40)				SEGMENT #2 (N = 21)							
PUBLIC TRANSPORT		CAR TRIP		PUBLIC TRANSPORT		CAR TRIP					
par. value	std. error	par. value	std. error	par. value	std. error	par. value	std. error				
1. ap efteling	2.38**	26	1. ap efteling	1.28**	.23	1. ap efteling	1.83**	.32	1. ap efteling	307**	.58
2. zo burgers'	2.22**	.26	2. zo burgers'	0.92**	.21	2. ap madurodam	1.34**	.30	2. ap madurodam	0.68*	.28
3. zo antwerp	1.99**	.26	3. zo antwerp	0.89**	.21	3. ap land van ooit	1.03**	.30	3. ap land van ooit	0.68*	.29
4. zo beekse bergen	1.83**	.25	4. zo beekse bergen	0.22	.19	4. zo burgers'	0.99**	.29	4. mu open air	0.55	.36
5. zo artis	1.75**	.25	5. zo artis	0.21	.20	5. mu kröller-müller	0.31	.30	5. ap walibi	0	
6. be scheveningen	1.13**	.26	6. ap walibi	0.00		6. mu railway	0.22	.30	6. mu kröller-müller	-0.18	.31
7. ap madurodam	0.87**	.28	7. ap madurodam	-0.13	.21	7. zo beekse bergen	0.21	.31	7. zo beekse bergen	-0.33	.28
8. ap land va ooit	0.74*	.28	8. mu open air	-0.26	.29	8. ap walibi	0		8. zo burgers'	-0.66*	.32
9. be hoek v.holland	0.26	.30	9. ap land van ooit	-0.34	.23	9. mu open air	-0.15	.32	9. zo antwerp	-0.72*	.34
10. mu railway	0.18	.30	10. be scheveningen	-0.66**	.25	10. zo artis	-0.18	.31	10. mu railway	-0.89**	.29
11. mu rijksmuseum	0.15	.27	11. be walcheren	-0.93**	.26	11. be scheveningen	-0.40	.33	11. zo artis	0.99**	.32
12. ap walibi	0.00		12. be hoek v.holland	-1.03**	.25	12. be hoek v.holland	-0.41	.36	12. be renesse	-1.08**	.35
13. be walcheren	-0.09	.28	13. be renesse	-1.04**	.26	13. zo antwerp	-0.65*	.35	13. be walcheren	-1.22**	.36
14. mu open air	-0.15	.32	14. mu rijksmuseum	-1.19**	.29	14. mu rijksmuseum	-1.17*	.33	14. be scheveningen	-1.45**	.35
15. be renesse	-0.55	.35	15. mu kröller-müller	-1.56**	.30	15. be walcheren	-1.85*	.39	15. be hoek v.holland	-1.81**	.41
16. mu kröller-müller	-1.07*	.45	16. mu railway	-1.95**	.28	16. be renesse	-1.78**	.52	16. mu rijksmuseum	-2.10**	.48

* denotes significance at the .1 level

** denotes significance as the .01 level

TABLE 2 (continued)

SEGMENT #3 (N = 26)

PUBLIC TRANSPORT

CAR TRIP

par. value

std. error

1. be walcheren

3.48**

.43

1. be walcheren

2.34**

.34

2. be hoek v.holland

2.69**

.41

2. be scheveningen

1.89**

.32

3. be renesse

2.57**

.42

3. be renesse

1.52**

.32

4. be scheveningen

2.43**

.40

4. mu open air

1.25*

.37

5. ap efteling

2.32**

.43

5. ap efteling

1.16**

.35

6. zo beekse bergen

2.25**

.42

6. be hoek v.holland

0.83**

.32

7. mu kröller-müller

1.92**

.43

7. zo beekse bergen

0.67*

.31

8. zo antwerp

1.54**

.43

8. mu rijksmuseum

0.31

.35

9. zo burgers'

1.36**

.44

9. ap walibi

0.00

10. mu open air

1.10**

.41

10. ap madurodam

-0.05

.36

11. mu rijksmuseum

1.04*

.46

11. zo antwerp

-0.07

.37

12. zo artis

0.92*

.42

12. zo burgers'

-0.16

.38

13. ap madurodam

0.74

.49

13. mu kröller-müller

-0.28

.38

14. mu railway

0.34

.52

14. mu railway

-0.62

.37

15. ap walibi

0.00

15. zo artis

-0.77

.41

16. ap land van oit

-0.20

.58

16. ap land van oit

-1.57*

.50

16. be renesse

-0.45

.60

16. ap walibi

0.00

16. be renesse

-0.45

.60

 

0.00

 

*denotes significance at the .1 level

**denotes significance at the .01 level

TABLE 3. Number of Destinations from the Choice Set Visited Over the Past Two Years

	Mean	Standard Deviation	Zoo	Museum	Amusement Park	Beach
Total Sample (N = 150)	3.41	2.2	.81	.61	.89	1.11
Segment #1 (N = 40)	3.42	2.1	1.17	.23	1.03	1.00
Segment #2 (N = 21)	3.05	2.7	.62	.43	1.29	.71
Segment #3 (N = 26)	2.92	1.9	.62	.27	.77	1.27
Segment #4 (N = 63)	3.73	2.2	.71	1.05	.71	1.25

many trips to these sites. The group's preference for museums is low. The 30-39 age group is overrepresented, as are families with children. The education level of the respondents is below average; the income level is in the median group.

Segment #2 (N = 21): Amusement park fans. Compared to the first segment, this group is even more strongly oriented to amusement parks. The socio-demographic profile of this segment is quite similar to that of segment #1; only age and income are slightly lower.

Segment #3 (N = 26): Beach fans. They are exclusively attracted to beach locations, which is reflected in their behavior. The education level of this segment is below average.

Segment #4 (N = 63): A large group of culture enthusiasts. They love museums, and to a lesser degree, zoos. Families with children are underrepresented, while income is above average, and education levels are well above average. Seventy-six percent of the segment (compared with 57 percent of the total sample) is over 40 years of age, while 43 percent (35 total sample) is over 50.

As illustrated by Table 2, the segments differ in terms of preference for the leisure destinations. One would assume that the distinguished segments should be more homogeneous than the sample as a whole in terms of their preferences. Therefore, some additional analyses to test this hypothesis were performed. A first test involved running separate choice models. If the segments have different preference functions, a model incorporating segment-specific constants should perform better than the preference models for the total sample. A model with a segment-specific

constant would of course still assume that the form of the preference function would be the same. Therefore, we also estimated a third model that allows the preference scales for the leisure sites to differ between market segments. Models were estimated for the public transport and car options separately.

The results are presented in Table 4. It demonstrates that adding segment-specific constants significantly improves the fit of the model for both the car and public transport options. The market segments differ significantly in terms of preference (see also Table 5). The model with segment-varying preference functions performs even better, as indicated in Table 4. Thus, these results suggest that the derived market segments exhibit different preference structures.

Another test is related to the consistency of the derived preference scales. We assumed that respondents belonging to the same segment would be more homogeneous than the total sample in terms of their preference for a particular type of leisure destination. Hence, we hypothesized that similar destinations will have similar positions on the derived preference scales. One way of testing this assumption is to examine the patterns of preference rankings for each type of leisure destination. In the ideal case, the first four rankings would all relate to the same type of destination, the second set of four rankings to another type, etc. That is, we are

TABLE 4. Model Comparisons with Their Associated Statistics

		<u>G2</u> ¹	<u>DF</u> ²	# Choice Sets
PUBLIC TRANSPORT	model 1, without segmentation	637	15	96
	model 2, segment specific constants	723	18	96
	model 3, segment specific preference scales	2456	60	96
CAR	model 1, without segmentation	495	15	100
	model 2, segment specific constants	598	18	100
	model 3, segment specific preference scales	2147	60	100

¹G2 = $-2[\text{LL}(0) - \text{LL}(B)]$; likelihood ratio test statistic, chi square distributed

²Degrees of Freedom (# of parameters) with G2

TABLE 5. Segment Significance, Compared with Segment #4 (Model 3)

	PUBLIC TRANSPORT		CAR	
	t-statistic	Probability ($Z > t $) ¹	t-statistic	Probability ($Z > t $) ¹
Segment #1	-4.966	.0000	-6.971	.0000
Segment #2	-7.424	.0000	-8.355	.0000
Segment #3	-2.788	.0053	-2.481	.0131

¹The probability that the parameter values of the segment constants differ from segment #4.

testing whether our segmentation is primarily driven by the type of destination. Therefore, a simple measure of consistency would be to take the observed total difference in preference rankings between all destinations belonging to a particular type, and express this as a proportion of the maximum range. In the present study, the minimum total difference between preference rankings of the destinations of the same type is 10, and hence 40 for the total set of destinations. A completely inconsistent pattern would result in a value of 160 for the total set of destinations; for one type (4 destinations in a table of 16) this maximum value is 58.

The consistency values for the four segments and the total sample are presented in Table 6. It clearly demonstrates that the segments are more consistent than the sample as a whole. Segment #1 is the most consistent. A separate analysis of the leisure types shows that the segments' preferences are primarily consistent for the high ranking types. All preferences on the less preferred types are less consistent, which may suggest that the segments indeed are primarily based on type of destinations, and that trade-offs between type of destination and other attributes are more common for the less preferred type of destinations. Alternatively, the lower consistency of the less preferred types may also suggest some degree of indifference toward these types.

The derived segment can be a useful marketing tool as it identifies the consumer preference and their socio-demographic characteristics. One could argue that this segmentation scheme provides information about the latent demand for each of the identified destination types and the selected sites. Having identified these segments and their preference structures, the question then becomes whether this latent demand can actually be realised given the constraints the consumers are facing. In order to identify the

TABLE 6. Consistency of Preference Patterns

		zoo ¹	museum ¹	amus.pk ¹	beach ¹	total ²
whole sample (N = 150)	public transport	0.21	0.33	0.83	0.13	0.60
	car	0.35	0.56	0.83	0.25	0.80
segment #1 (N = 40)	public transport	0.00	0.23	0.50	0.44	0.50
	car	0.00	0.31	0.31	0	0.25
segment #2 (N = 21)	public transport	0.42	0.42	0.25	0.17	0.50
	car	0.06	0.63	0.06	0.00	0.30
segment #3 (N = 26)	public transport	0.19	0.25	0.52	0.00	0.38
	car	0.31	0.56	0.44	0.13	0.58
segment #4 (N = 63)	public transport	0.19	0.25	0.38	0.15	0.38
	car	0.48	0.21	0.50	0.19	0.55

¹for single type maximum difference = 58²for all types maximum difference = 160

impact of constraints, the next step of the analysis involved identifying the specific role of each of the elicited attributes in the respondents' decision making process, using the Decision Net approach. That is, the elicited attributes were used as input in a decision net task. Respondents were requested to explicate the conditions under which they would no longer consider the destination. In addition, they were requested to name compensating attributes or attribute levels, or identify the attributes as a relative preference dimension.

The dimensions derived from the Decision Plan Net task were used to identify constraints within market segments. Rejection inducing dimensions were viewed as conditions which need to be satisfied to accept a destination. In other words, a trip that does not feature a particular rejection-inducing attribute at the acceptable level, will not be made. Because the Decision Nets were constructed for public transport and car trips separately, we were able to identify the specific rejection inducing dimen-

sions for public transport trips, and hence evaluate the car use reducing policy. This enabled us to demonstrate whether certain mode change strategies are feasible for a particular market segment.

In principle, a constraints analysis can be performed at the level of individual attributes. Such an analysis would highlight the idiosyncracies of the respondents. For the present article, we decided to categorize the attributes into eight types, as listed in Table 7: personal taste, accessibility by public transport and car, situational aspects, specific requirements for children, costs, experience and time/distance. In order to compare the findings between the car and public transport scenarios, and between respondents, travel time, cost and number of transfer (in the public transport option), were introduced into the Decision Nets *a priori*. This categorization was used because the impact of policy schemes and marketing strategies will vary by constraint. Constraints originating from personal taste and aspirations are the least likely to be influenced, whereas a lack of time or money, or special requirements for children can possibly be overcome by policy measures.

Constraints analysis then involves whether consumer preferences can actually be realized. That is, one first has to determine whether a particular attribute is a rejection-inducing dimension, and then, if it is, whether the conditions pertaining to a particular leisure sites act as a constraint, preventing consumers from choosing that particular destination. In this article, we first consider the responses on the travel time and number of transfers attributes. Respondents have explicated their maximum acceptable values. These individual threshold values were compared against the

TABLE 7. Categories of Attributes Relevant to the Destination and Transport Mode Choice

-
1	personal taste specifically related to the site
2	accessibility by public transport
3	accessibility by car
4	situational aspects
5	special requirements for children
6	cost aspects
7	experience with the trip
8	aspects of time and distance

objective attribute values of the top four destinations of the segment that individual belongs to (Table 8a). These real travel time values were obtained from the official public transport time tables, measured between the public transport terminal closest from the respondent's home and the leisure site. Thus, allowing for driving or taking a taxi to the first major railway station, travel time and transfers to reach this station from home were not accounted for initially. The 'unlikely' label was for all trips that would not allow for one extra transfer or 30 minutes to reach the closest railway station from home. A trip that could not be realized within the maximum travel time or number of transfers as suggested by the respondent's decision net, was considered to be 'impossible.'

Among the four market segments, considerable differences occur in the ability to reach the favorite destinations by public transport. Segment #3 has expressed the highest relative demands for public transport trips. However, due to their expressed constraints, the top four preferred trips, all to beach locations, are all impossible to reach within the limits provided by the respondents. Consequently, the favorite trips are possible for only half the segment. Furthermore, when in addition the maximum number of transfers (see Table 8b) is also taken into consideration, this proportion drops even further: only a third of the segment can make the trips. Similar trends can be observed for the other market segments, although in these cases, the absolute levels of the proportions are higher, often because the favorite leisure sites are located closer to the study area.

When travelling by car, few constraints are relevant, as is indicated by Table 8c. To account for possible delays caused by traffic jams and parking problems, we considered a trip as unlikely within a margin of 30 minutes from the threshold value. As Table 8c shows, travel-time related constraints have far less impact on leisure trips by car. Again, segment #3 scores lowest, but still higher than the highest of the public transport scenarios. Whereas nearly all respondents are not constrained in time to make their favorite trips by car, a considerable number is constrained to make the most preferred trips by public transport.

The segments' results on other rejection inducing dimensions generally confirm the findings derived for the travel time and transfer attributes. Again, segment #3 (the beach lovers) emerge as the most constrained. The highest average number of rejection inducing dimensions is reported for this segment (see Table 9). This group scores high on the attributes of the public transport facilities (more than half of the segment reports rejection inducing dimensions on this category), and on time and distance aspects. A noteworthy proportion of segment #1 reports constraints related to chil-

dren's requirements. A relatively large proportion of segment #4 mentions rejection inducing dimensions that specifically relate to the site.

MARKET SEGMENT STRATEGIES

The derived knowledge of the relevant preferences, constraints and background profiles of the segment members enables one to suggest relevant, segment specific marketing strategies. These can be expressed in terms of the appropriate planning or marketing and promotion initiatives to change mode choice behavior in favor of public transport. As Tables 1 and 2 show, destinations well accessible by public transport tend to rank higher on the public transport list, while inaccessible destinations tend to perform better

TABLE 8a. Feasibility of Preferred Leisure Trips by Public Transport: Travel Time

	Top 4 of Trips	Impossible	Unlikely ¹	Possible	Possible/Total
segment #1 (N = 40)	1. ap efteling	0	1	39	0.98
	2. zo burgers'	6	7	27	0.68
	3. zo antwerp	6	7	27	0.68
	4. zo beekse bergen	1	3	36	0.90
segment #2 (N = 21)	1. ap efteling	0	0	21	1.00
	2. ap madurodam	5	3	13	0.62
	3. ap land van ooit	0	3	18	0.86
	4. zo burgers'	5	1	15	0.71
segment #3 (N = 26)	1. be walcheren	14	1	11	0.42
	2. be hoek van holland	13	1	12	0.46
	3. be renesse	15	2	9	0.35
	4. be scheveningen	8	6	12	0.46
segment #4 (N = 63)	1. mu rijksmuseum	11	8	44	0.70
	2. mu open air	11	8	44	0.70
	3. mu kröller-müller	19	5	39	0.62
	4. zo burgers'	9	5	49	0.78

¹unlikely: maximum of 30 minutes from home to station

TABLE 8b. Feasibility of Preferred Leisure Trips by Public Transport: Travel Time and Transfers

	Top 4 of Trips	Impossible	Unlikely ¹	Possible	Possible/Total
segment #1 (N = 40)	1. ap efteling	0	4	36	0.90
	2. zo burgers'	10	8	22	0.55
	3. zo antwerp	9	9	22	0.55
	4. zo beekse bergen	1	5	34	0.85
segment #2 (N = 21)	1. ap efteling	0	2	19	0.90
	2. ap madurodam	5	5	11	0.52
	3. ap land van ooit	1	5	15	0.38
	4. zo burgers'	7	2	12	0.57
segment #3 (N = 26)	1. be walcheren	18	1	7	0.27
	2. be hoek van holland	14	2	10	0.38
	3. be renesse	18	2	6	0.23
	4. be scheveningen	9	7	10	0.38
segment #4 (N = 63)	1. mu rijksmuseum	12	15	36	0.57
	2. mu open air	14	12	37	0.59
	3. mu kröller-müller	27	6	30	0.48
	4. zo burgers'	13	8	42	0.67

¹unlikely: maximum of 30 minutes from home to station, or no interchange between home and station

TABLE 8c. Feasibility of Preferred Leisure Trips by Car: Travel Time

	Top 4 of Trips	Impossible	Unlikely ¹	Possible	Possible/Total
segment #1 (N = 40)	1. ap efteling	0	0	40	1.00
	2. zo burgers'	0	2	38	0.95
	3. zo antwerp	0	0	40	1.00
	4. zo Artis	1	2	37	0.93
segment #2 (N = 21)	1. ap efteling	0	0	21	1.00
	2. ap madurodam	1	1	19	0.90
	3. ap land van ooit	0	0	21	1.00
	4. mu open air	0	5	15	0.76

	Top 4 of Trips	Impossible	Unlikely ¹	Possible	Possible/Total
segment #3	1. be walcheren	2	4	20	0.77
(N = 26)	2. be scheveningen	2	1	23	0.88
	3. be renesse	2	4	20	0.77
	4. mu open air	1	1	24	0.92
segment #4	1. mu kröller-müller	0	6	57	0.90
(N = 63)	2. zo antwerp	0	0	63	1.00
	3. mu open air	0	3	60	0.95
	4. zo burgers'	0	3	60	0.95

¹unlikely: margin of 30 minutes

on the car option table. The segments show some differences on this point. While segment #1 does not differentiate that much between the two transport options, segments #3 and #4 do distinguish more clearly between the public transport and car options. Again, it should be noted that deviations on the high ranking destinations are the most important; the respondents demonstrated an indifference toward the other, less preferred sites.

Using such results, the following strategies can be suggested for the segments. Segment #1, the group of zoo enthusiasts, primarily require capacity to accommodate families comfortably, because half of the constraints reported by this segment related to children, whereas only a third of this segment reports the attribute travel time as rejection inducing. As far as segment #2 is concerned, Table 9 suggests that the four selected categories of rejection inducing dimensions are equally important to this small group of amusement park fans. As this group is largely similar to segment #1, the same strategy may apply. However, travel time is more important, as 43 percent of the group considers this as rejection inducing.

Segment #3, the beach fans, reports the highest number of rejection inducing dimensions. They have high demands for the public transport mode itself, and for travel time. Members of this segment have visited relatively few of the selected sites over the past two years. For this group, public transport connections with beach locations should not be complicated, easy to find and as direct as possible. Because of the relatively large distance from the respondents' homes to the beaches, a public transport experiment with this market segment will be difficult to implement. There is discrepancy between the public transport and car options, and a high proportion has rejection inducing dimensions on the second category. This

TABLE 9. Rejection Inducing Dimensions, Public Transport Option

	mean N of rejection inducing dimensions (RID)	% of respondents score RID on categories. ¹⁾			
		1: personal taste	2: access- ibility by public transport	5: requirements for children	8: time, distance
segment #1	3.4	75	40	50	32
segment #2	3.1	62	43	43	43
segment #3	4.4	77	58	38	58
segment #4	3.5	84	38	29	32

¹⁾: see TABLE 8

suggests that inaccessible locations will not be traveled by public transport.

Finally, segment #4 is the highly active group of well-off cultural seniors. Few constraints are reported, the most important of which are the site specific (taste) attributes. However, the group does make a clear distinction between the public transport and car options (cf. Table 2, the ranking of *Rijksmuseum* in Amsterdam). It suggests that destinations well accessible by public transport, are more likely to be visited by public transport. The appropriate promotion of these sites may support this result.

DISCUSSION

Market segments can be considered as target groups to whom the appropriate marketing mix of promotion, measures and other initiatives need to be applied. Programs are likely to have dissimilar effects on different types of leisure participants. Some of this variation may be explained by households' socio-economic characteristics, but leisure preference and constraints are likely to vary across socio-economic groups (e.g., Loker & Perdue, 1992; Spotts & Mahoney, 1991; Finn & Louviere, 1990). Therefore, we require segmentation into subgroups with coherent patterns of behavior, to be targeted efficiently by specific (marketing) strategies. In this study, we therefore identified clusters of potential visi-

tors of specific leisure destinations. The resulting segments are then described in terms of constraints and their demand of leisure trips by non-car transport. In addition, personal and socio-economic profiles of the segments support the development of marketing strategies.

In this study, market segments were formed on the basis of a new integrated approach which simultaneously allows one to identify the attributes influencing leisure trip decisions, identify the nature of each of these attributes in general, and constraints in particular, position leisure destinations on a preference scale, and cluster respondents into market segments. The suggested methodology can replace a series of independent steps, based on unrelated methods. The findings of the present study and the experience obtained with administering the new method suggest that it potentially offers a reliable and valid alternative to currently applied methods. It is also easy to administer and easy to use. Unlike the repertory grid method, it has the additional advantage that the elicited attributes are directly based on choices rather than perceptual dimensions. Consequently, the elicited attributes are likely more valid.

It should be emphasised however that the suggested method can be improved. For example, the clustering of the respondents is still based on preferences. Constraints are used to describe the segments. Alternatively, one could develop a clustering algorithm that would take both preferences and constraints into consideration simultaneously. This might improve the managerial or policy relevance of the market segments as one would have segments that would be more homogeneous not only in terms of preferences but also in terms of constraints. Furthermore, the preference scaling model is based on first choice only. The suggested approach however also yields information about the least preferred alternative. Future research therefore will examine how this additional information might be analysed to derive preference functions.

In order to maximize the impact of car reducing initiatives, it is necessary to develop different strategies for the target groups. Therefore, having considered the socio-economic backgrounds of the segment members and their leisure practices, suggestions for separate strategies for the segments were outlined. Because the segments' preferences discriminate between the four selected leisure types, the strategies imply some relevant measures to be taken at the destinations. These involve fast and direct connections to museums. For public transport connections with amusement parks and zoos, accommodation for families (children, luggage) needs to be accounted for. Zoos located in well accessible cities have far better chances of attracting visitors by public transport. Since all market segments contain more unconstrained individuals than the modal split sug-

gests (more people could travel by public transport than in the present situation), a promotion of the existing public transport alternatives may already achieve good results. The results of this study do not present measures to be taken at beach sites. The segment of beach devotees within our sample (region of Eindhoven/Tilburg), were most constrained by the relatively great distance to the beach locations. We consider this as a local problem; those beach fans who live closer to the shores are probably less constrained to travel by public transport, assuming that they would express equivalent thresholds.

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