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Beyond "Commensense segmentation" - A systematics of segmentation approaches in tourism

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Abstract

Market segmentation is an accepted tool in strategic marketing. It helps to understand and serve the needs of homogeneous consumer sub-populations. Two approaches are recognized: a priori and data-driven (a posteriori, Mazanec, 2000; post-hoc, Wedel & Kamakura, 1998) segmentation. In tourism there is a long history of a priori segmentation studies both in industry and academia. These lead to the identification of tourist groups derived from dividing the population according to prior knowledge ("commonsense segmentation"). However, due to the wide use of this approach, there is not much room for competitive advantage to be gained by using a priori segmentation. This article (1) reviews segmentation studies in tourism, (2) proposes a systematics of segmentation approaches, and (3) illustrates the managerial usefulness of novel approaches emerging from this systematics. The main aim is to offer academics and practitioners a "menu" of exploratory techniques that can be used to increase market understanding.

Keywords

market segmentation, segmentation systematics, a priori, a posteriori segmentation

Disciplines

Business | Social and Behavioral Sciences

BEYOND "COMMONSENSE SEGMENTATION" – A SYSTEMATICS OF SEGMENTATION APPROACHES IN TOURISM

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ABSTRACT

Market segmentation is an accepted tool in strategic marketing. It helps to understand and serve the needs of homogeneous consumer sub-populations. Two approaches are recognized: *a priori* and data-driven (*a posteriori,* Mazanec, 2000; *post-hoc*, Wedel & Kamakura, 1998) segmentation. In tourism there is a long history of *a priori* segmentation studies both in industry and academia. These lead to the identification of tourist groups derived from dividing the population according to prior knowledge ("commonsense segmentation"). However, due to the wide use of this approach, there is not much room for competitive advantage to be gained by using *a priori* segmentation. This article (1) reviews segmentation studies in tourism, (2) proposes a systematics of segmentation approaches, and (3) illustrates the managerial usefulness of novel approaches emerging from this systematics. The main aim is to offer academics and practitioners a "menu" of exploratory techniques that can be used to increase market understanding.

Keywords:
market segmentation, segmentation systematics, *a priori*, *a posteriori* segmentation

REVIEW OF SEGMENTATION STUDIES

The *Journal of Travel Research* is the major outlet for segmentation studies within the field of tourism. In order to evaluate the representation of different forms of segmentation studies in this field, all articles on segmentation published in the *Journal of Travel Research* in the last 15 years have been reviewed and can conceptually be grouped into four kinds of segmentation approaches: pure commonsense segmentations, purely data-driven segmentations, combinations of both where typically one commonsense segment is chosen and further split up into data-driven subgroups, and a sequence of two common sense segmentations.

The first group of studies includes Baloglu & McCleary (1999) who investigate differences between visitors and non-visitors of a certain destination with regard to the image of this particular tourist region; Goldsmith (1999) contrasting heavy users and light users; Kashyap (2000) exploring systematic differences between business and leisure tourists with respect to value, quality and price perceptions; Smith & MacKay (2001) who are interested in age differences in pictorial memory performance for advertising message targeting; Israeli (2002) who profiles the perceptions of destinations from the perspective of disabled versus non-disabled visitors; Klemm (2002) investigating one particular ethnic minority in the UK and describing in detail their vacation preferences and interests; McKercher (2002) exploring systematic differences between tourists who spend their main vacation at a destination on the one hand and tourists who only travel through this same town or city on the other; Meric & Hunt (1998) profiling the ecotourist; Court (1997) grouping tourists initially by their intention to visit a destination and then searching for significant differences between those commonsense groups; and finally Arimond & Lethlean (1996) who group visitors to a campground according to the kind of site rental taken and investigate differences. In terms of the share of pure *a priori* studies among all segmentation articles published, these commonsense segment descriptions amount to more than half of all investigations (53 percent).

Only one representative of the second group in its pure form (data-driven segmentation) could be identified among the articles reviews: Bieger & Lässer (2002) construct or identify data-driven segments among Swiss population. The starting point is the entire population of Switzerland and not a particular group within this population. Groups are constructed / identified on the basis of different travel motivations. This very strict definition of data-based segmentation leads to the conclusion that only this one study can be included for our purposes, amounting to 5 percent of the studies published over the last 15 years.

The third group is commonly thought of as data-driven segmentation. However, strictly speaking the publications described in this paragraph have a different starting point. The starting point is already a sub-grouping of the population of tourists. This essentially means that commonsense segmentation is conducted first. Next, one of the groups emerging from this first step is chosen. In the third step a data-driven segmentation is then conducted using data for the selected commonsense segment only. The danger of this approach is that market structure analysis is restricted to a selection of customers, thus limiting the horizon and risking the possibility that new potential market segments will not to be detected at all. Examples

from the literature review include Silverberg, Backman & Backman (1996) who emphasize the group of nature-based tourists only and further split these tourists up into data-driven segments according to the benefits they are seeking. Furthermore, Dodd & Bigotte (1997) choose the special interest group of winery visitors and derive data-driven segment within this group on the basis of demographic profiles. Visitors of a cultural-historical event in Italy were chosen by Formica & Uysal (1998) as the starting point for their data-driven study based on motivations. By doing so, the authors investigate *a posteriori* segments within another group of tourists clearly defined by a specific vacation activity, namely attending the event. Kastenholz, David & Paul (1999) concentrate in their investigation on visitors of rural areas only. On the basis of this sub-group selection the authors study the existence and nature of benefit groups. Moscardo *et al.* (2000) select the commonsense segment of visitors of local friends and relatives as their initial segment. Within this group patterns of behavior are investigated in a data-driven manner. Focusing on senior motor coach travelers only as an initial *a priori* segment, Hsu & Lee (2002) group those travelers according to 55 motor coach selection attributes. Thus, 32 percent of all segmentation studies published in the *Journal of Travel Research* are found to follow this pattern of describing sub-groups that might be of managerial interest.

One study reports on two market segments, which are derived by initially choosing a common sense segment and – in a second step – splitting this segment up by another *a priori* criterion. This study was conducted by Field (1999) and explores domestic versus foreign students within the segment of student travelers. Horneman *et al.* (2002) has to be classified into this group as well, because the initial sub-segment on which their study focuses is the group of senior travelers. In a second step, the authors derive six segments based on answers to specific questions (most preferred holiday choice). This accounts for 11 percent of the segmentation studies.

A SYSTEMATICS OF SEGMENTATION APPROACHES

On the basis of the two fundamental segmentation approaches that are available, a systematics of conceptual approaches can be constructed. This systematics is outlined in Figure 1. It is based on sequential processing of the fundamental segmentation approaches. Clearly, this systematics can easily be extended further to represent simultaneous application of the two fundamental building blocks.

_____   FIGURE 1   _____

The publications described in the literature review would thus be assigned to concept 1, concept 2, concept 5 and concept 3, respectively. However, in addition to the classification of segmentation studies published in the *Journal of Travel Research*, two conceptual approaches

to segmentation emerge which have so far not been empirically studied. Both these concepts use a data-driven segmentation as their starting point and build another grouping on this initial solution. This second solution can either be a commonsense grouping (concept 4) or another data-driven segmentation (concept 6). These two approaches are introduced as valuable extensions of the toolbox of the exploratory segmentation techniques and illustrated next.

ILLUSTRATING NOVEL SEGMENTATION CONCEPTS

Data from the Austrian National Guest Survey (conducted by the Institute of Tourism and Leisure Studies at the University of Economics and Business Administration in Vienna) collected in the summer seasons of 1994 and 1997 is used for illustrative purposes. The sample includes 14571 respondents. Among these, 7967 were questioned in 1994, and 6604 in 1997. Personal interviews were conducted following a quota sampling procedure that identified destination regions, countries of origin and segment of accommodation.

Segmentation concept 4 – the usefulness of commonsense segment analysis following data-driven groupings of consumers

Segmentation concept 4 implies a data-driven segmentation in the first stage of analysis and a commonsense segmentation in the second step. In the first step, psychographic segments are constructed on the basis of the survey data set. The data basis for this task consists of 22 binary statements about the motivation for taking this particular vacation.

The respondents are grouped using topology representing networks (TRN, Martinetz & Schulten, 1994). Clearly, any other partitioning technique or modeling approach appropriate to the data could be used at this point. TRNs belong to the family of unsupervised neural networks. The number of groups has to be predefined and starting points for the iterative process have to be picked at random (or provided on the basis of previous calculations). Then, the TRN-network processes the data on a row-by-row basis, assigning respondents to starting points. For each case, the closest starting vector is identified, declared the winner and allowed to adapt vector values of the "segment representatives" towards the input vector values. Additionally, all other starting points are updated in a way that monitors proximity (nearly located starting points are allowed to adjust to a higher extent). This latter step is responsible for the topological ordering of groups at the end of the partitioning process. The Austrian National Guest Survey data was analyzed by picking the best starting points from 100 random draws. Training of the TRN network was allowed for 100 epochs (indicating that each respondent was presented to the algorithm 100 times for the purpose of learning the data representation) and Euclidean distance was used as a proximity measure. TRN32 (available at http://charly.wu-wien.ac.at/software/) was used to undertake this calculation.

This process was repeated 10 times with different numbers of segments (from three to seven). Based on the stability of the solutions within each number of segments (number of pairs of respondents assigned to the same segment repeatedly), the six-cluster solution turned out to

yield the best results with regard to compliance of repeated calculations and was therefore chosen as the data-driven segmentation solution for this particular data set.

The resulting market segments among tourists visiting Austria during the summer seasons of 1994 and 1997 are illustrated in Figure 2, where the line indicates the total sample average and the bars give the proportion of respondents within each particular segment that agree with each statement.

_____   FIGURE 2   _____

Psychographic segment 1 contains 19 percent of the respondents and is characterized by a high interest in relaxing during the vacation. In addition, the locals, the natural environment, the safety, and the sustainability of the destination, play an important role for these tourists. The second group interested in relaxing is segment 4 (20 percent). In this case, relaxation seems to be the only driving force of the vacation with no other statements accepted more often than is the case on average. Segments 2 (18 percent) and 6 (13 percent) have to be interpreted with care. The first agrees with all statements above average, the latter with none. These segments thus have to be understood as a mix between actual responses and answer patterns. Psychographic segment 3 (13 percent) is very distinct and defines the sports-oriented holidaymakers who love sun and water and appreciate a challenge. Finally, segment 5 (18 percent) includes the culture-interested respondents.

In the second step it is informative for managers to investigate the differences within one of these segments over time, for example, the identification of the sports tourist who spends the vacation in Austria during summer. Splitting the data-driven segments that way is a commonsense approach based on year, which is apparently most useful to a lakeside resort that caters to a high proportion of these holidaymakers and needs to know how this group develops over time. A simple cross tabulation of data-driven segment membership and year is constructed for this purpose and a Chi-square test is computed. This procedure results in a highly significant result (p-value = 0.000). The proportion of sports tourists is shown to increase from 42 percent in 1994 to 58 percent in 1997.

Besides this purely quantitative trend, a number of qualitative differences between the sports tourists of 1994 and 1997 can be identified. The average age of this segment increased by two years from 42 to 44 years (ANOVA p-value = 0.000). So did the number of overnight stays; in 1994 these holiday-makers spent 10 nights in Austria, 8.5 days in the region and 8.1 days at the destination, whereas in 1997 these numbers significantly increased (ANOVA p-values = 0.003, 0.000, 0.000) to 10.8, 9.6 and 9 nights, respectively. With regard to vacation activities pursued by this segment, the picture remains fairly stable over time. The only significant shift that can be detected is that there seems to be less interest in mountaineering but more interest in hiking.

Clearly, these commonsense segments could be further compared in detail to study how tourists with this particular motivational background differ with regard to other descriptive pieces of information. Such a breakdown could be highly useful to management (in terms of information sources used, amount of money spent, activities pursued, accommodation chosen, shopping behavior, etc.).

By following segmentation concept 4, destination management in this example avoids mixing sports tourists from two consecutive waves by averaging background information over all of the members of this psychographic segment. Note that the same results would not have been achieved by separately partitioning the data by years. Thus, the decision makers not only learn about the potentially interesting target market of sports tourists but also gain insight into both quantitative and qualitative changes occurring in this group over time.

Segmentation concept 6 – the usefulness of two consecutive data-driven consumer groupings

In case of concept number 6, two data-driven segmentation studies are conducted sequentially. This does not lead to the same result as increasing the initial number of segments. As illustration, the data-driven segments from step 1 in concept 4 are used as a starting point again. The focus of interest remains the segment of sports-interested tourists. Therefore, in the second step, only these tourists are studied, accounting for 13 percent of the total visitors to Austria in summer. This is achieved by constructing another data-driven segmentation based on this sub-sample alone and using the same psychographic criteria (clearly, for the second data-driven segmentation another segmentation base could be chosen as well). Again, TRN is used as a partitioning method and cluster numbers from 3 to 12 are explored with regard to stability of results. The maximum stability is reached in the 10 clusters solution. The resulting segments vary in size from 7 percent of the sample to 12 percent. For the purpose of the present segmentation study not all ten of them will be described in detail. However, two will be chosen as potentially interesting niche segments for destinations catering for sports tourism and aiming at differentiating themselves. The psycho-graphic profiles of these two segments are given in Figure 3. Segment 1 is unique due to the high agreement among members (99 percent) that taking care of their health and beauty is very important to them during this vacation. The extraordinary feature of segment 9 is that the one thing that seems to matter more than anything else is fun.

_____   FIGURE 3   _____

Further analysis shows that the resulting market segments after two steps of data-driven segmentation significantly differ with regard to age (ANOVA p-value = 0.000), the number of persons on the trip (ANOVA p-value = 0.000), the number of nights spent in Austria (ANOVA p-value = 0.003), the daily expenditures per person (ANOVA p-value = 0.004), and the expenditures for sports and entertainment (ANOVA p-value = 0.000). The differences and

significances of the ordinal-scaled background variables on the segments of interest are given in Table 1.

Segment 1 (health-oriented sports tourist) is the oldest group of summer sports tourists in Austria. The average age is 49 years, which is 5 years more than the average among all sports tourists studied. The segment is attractive from the perspective of the duration of stay. Together with segment 4 this group stays one day longer than the average (12 days). With regards to expenditures, however, this segment lies in the average range. These tourists have much prior experience with Austria as a holiday destination and therefore cannot be surprised easily. Three quarters of the members of this groups state that their vacation has been just as they expected it to be. With regard to vacation activities, segment 1 specifies visiting spas significantly more often than the average. They also identify hiking and going for walks as part of their vacation entertainment.

Segment 9 (fun-driven sports tourists) is the youngest group, with an average age of 36 years. The fun-driven sports tourists have the shortest duration of stay among the constructed groups. The shorter duration of stay, however, is compensated by the highest daily expenditures per person. Members of segment 9 spend 20 percent more money at the destination every single day. This can be distilled even further to expenditures on sports and entertainment. In this category of expenditures, segment 9 spends 134 percent more than the average sports tourist in Austria. From the perspective of a sports or entertainment organization at the destination this segment thus seems to be an optimal target for marketing action. Segment 9 has average prior experience with Austria, more often feels positively surprised by the vacation experience and has a high proportion of groups of friends traveling together. With regard to vacation activities, this group is far more active than the sports tourist average in Austria. Also as a target group for evening entertainment this group is excellently suited.

_____   TABLE 1   _____

Using segmentation concept 6 helps to detect two highly interesting niche markets among sports tourists – markets that have unique characteristics and therefore lend themselves perfectly to targeted marketing action. These segments could not have been the result of a one-stage data-driven segmentation process because other features dominating the total sample would have led to a different grouping.

CONCLUSIONS

Market segmentation is one of the most crucial long-term strategic marketing decisions a destination or organization makes. It is therefore of utmost importance to explore the market structure as thoroughly as possible in order to derive the most promising market segments

both with regard to the attractiveness of the segment and the matching potential of the segment's needs and the destination's or organization's strengths. The competitive advantage that can be gained from thorough market structure analysis is not fully exploited at present, with more than half of the segmentation studies published in the *Journal of Travel Research* within the last 15 years simply splitting tourists up by "commonsense information" and describing the resulting *a priori* segments. Most probably the proportion of such studies in the industry is far higher than 53 percent.

In this paper a systematics of possible one and two-step segmentation concepts is proposed. By considering a wider variety of possibilities available for exploratory market structure investigations, management can gain deep insight into the market structure from various perspectives. This leads to an improved basis for market research-driven decisions. The proposed systematics excludes three-step concepts as well as simultaneous combinations of the two fundamental building blocks "data-based" and "commonsense segmentation". However, such an extension is straightforward and bears potential for additional insights.

The two segmentation concepts, which – to the author's knowledge – have so far not been empirically conducted, were illustrated using Austrian National Guest Survey data. In the case of segmentation concept 4 (data-driven segmentation followed by commonsense segmentation), an initial grouping was formed on the basis of motives for the vacation. In a second step the sports-focused segment was selected and systematic differences between the sports tourists in 1994 and 1997 have been explored. Concept 6 was illustrated by using the same initial psychographic segmentation. The second data-driven segmentation was conducted selecting the sports tourists only and splitting them up into 10 sub-groups, two of which have been found to be very distinctly profiled and thus market niches, which might be of high interest to a tourist destination or organization that can serve these particular needs well. For both these concepts the managerial usefulness of the approach was outlined, where the main advantage is that another perspective of market structure analysis is added that cannot be achieved by either one of the other approaches in the systematics used to date.

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Which group is described first?	
A subgroup of the total tourist population determined by an a priori or commonsense criterion	A subgroup of the total tourist population determined by data-driven segmentation on multivariate basis
CONCEPT 1 = commonsense = *a priori* segmentation	CONCEPT 2 = data-driven = *a posteriori* = post-hoc segmentation

Which groups are explored next?			
A subgroup of the total tourist population determined by an a priori or common sense criterion		A subgroup of the total tourist population determined by data-driven segmentation on multivariate basis	
CONCEPT 3 = commonsense / commonsense segmentation	CONCEPT 4 = data driven / commonsense segmentation	CONCEPT 5 = commonsense / data-driven segmentation	CONCEPT 6 = data-driven / data-driven segmentation

Figure 1: A systematics of segmentation approaches
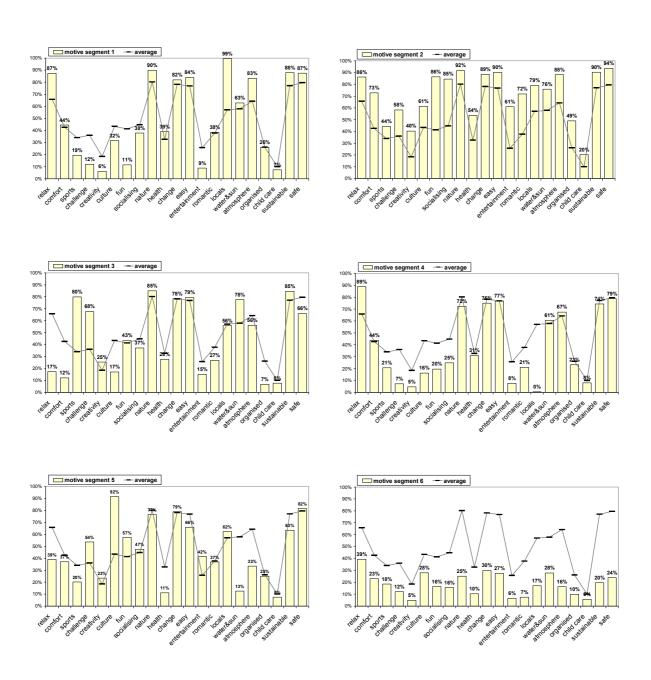
Figure 2: Psychographic profiles of data-driven market segments
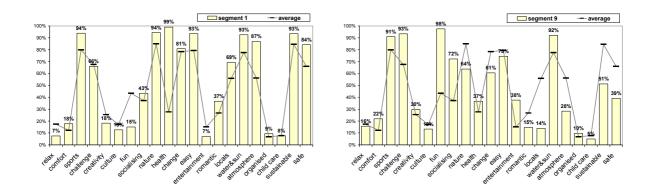
Figure 3: Psychographic segments 1 and 3 among sports tourists

13

Table 1: Background information on the segments of interest

		segment 1	segment 9	avg.	Pearson Chi2 p-value	Bonferroni corrected
intention to revisit Austria in summer	very probable	34	33	33	0.000	0.001
	probable	37	35	39		
	not probable	18	26	21		
how often in Austria before	never	5	14	13	0.000	0.000
	once	9	7	9		
	twice and more	86	79	78		
the vacation was	better than expected	22	31	25	0.000	0.000
	as expected	75	66	73		
	worse than expected	3	3	2		
on vacation with friends	no	83	63	81	0.000	0.000
	yes	17	37	19		
sex	male	59	72	63	0.004	n.s.
	female	41	28	37		
tennis	not at all	96	75	89	0.000	0.000
	sometimes	3	15	8		
	often	1	10	2		
cycling	not at all	53	42	55	0.000	0.000
	sometimes	22	23	19		
	often	25	35	26		
swimming	not at all	40	17	33	0.000	0.000
	sometimes	30	37	35		
	often	30	46	32		
spas	not at all	80	92	89	0.005	n.s.
	sometimes	13	5	8		
	often	7	2	3		
windsurfing	not at all	97	78	93	0.000	0.000
	sometimes	1	13	4		
	often	2	9	3		
boating	not at all	84	64	74	0.000	0.001
	sometimes	14	31	22		
	often	1	5	4		
mountaineering	not at all	81	73	79	0.004	n.s.
	sometimes	8	16	10		
	often	10	11	11		
hiking	not at all	14	34	20	0.000	0.000
	sometimes	15	31	23		
	often	70	35	56		

14

going for walks	not at all	8	16	10	0.000	0.001
	sometimes	29	43	32		
	often	62	41	58		
going out in the evening	not at all	36	32	33	0.000	0.000
	sometimes	34	34	37		
	often	29	34	30		