A CATEGORIZATION APPROACH TO MARKET SEGMENTATION

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摘　　要

本文建議一新的市場區隔方法，以消費者的品牌選擇一類別資料，爲區隔基礎。品牌選擇代表消費者對行銷組合的回應，因此，消費者對數種產品的品牌選擇組合應是具潛力的市場區隔方法。首先，將探討有關市場區隔之文獻，接著說明建議的方法及其可能的延伸。

ABSTRACT

An alternative market segmentation approach is proposed. The aggregation process is based on the consumers' brands choice among several product categories. Analysis will be focused on the similarity measures of category data. A review and critique of the commonly used segmentation bases is also presented. Finally, some extensions of the proposed model will be discussed.

INTRODUCTION

Classification is one of the fundamental concerns of science. Facts and objects must be arranged in an orderly fashion before their unifying principles can be discovered and used as a basis for prediction. Many phenomena occur in such variety and profusion that unless some system is created among them, they would be unlikely to provide any useful information (Frank and Green 1968).

Marketing has long recognized the importance of classification, since Wendell Smith introduced the concept of market segmentation in 1956. He defines market

segmentation as ''based upon development on the demand side of the marketer and represents a rational and more precise adjustment of product and marketing effort to consumer or user requirements. In the language of the economist, segmentation is disaggregative in its effects and tends to bring about recognition several demand schedules where only one was recognized before.'' To best fit the needs and wants of consumers, marketers have tried to segment the heterogeneous market into some smaller submarkets and provide specific marketing mix appeal. The bases often chosen to segment or to group consumers include demographics, geographics, lifestyle, benefits sought, usage rate, situations and consumers' responses to marketing mix.

However, most of the research focuses on only one product category, but, in reality, consumers rarely buy only one product from the market. In addition, the brands chosen by consumers seldom act as a segmentation basis although they are the consumers' most observable responses. In this paper, first, we will review the commonly used segmentation bases. Second, to better understand a general market profile, we propose an alternative approach of the grouping process based on the brands chosen among several product categories.

LITERATURE REVIEW

Since Wendell Smith introduced the concept of market segmentation, marketers and academicians have long tried to find useful bases to group consumers. Engel et al. (1972) classify the market segmentation research into two approaches: (1) analysis of consumer characteristics (attribute differences) and (2) analysis of consumer response (behavior differences). A wide range of variables can be used to segment a market. The most widely used predictors fall into five categories, each of which is reviewed in this paper:
1. Demographics
2. Psychographics
3. Product usage
4. Benefit sought
5. Responses to marketing mix

Demographics

Demographic variables are probably the most used in market segmentation

research. It is uncommon to find a segmentation research without specifying any demographic variable. This might attributed to the notion that if segments are not identifiable or accessible, then the market is not segmentable (e.g., Frank 1968; Green 1977; Kotler 1994). Hence, demographics serve not only as bases of segmentation, but as a criterion to evaluate other segmentation bases. However, Winter (1982) argues that if particular benefits, though unidentifiable, really exist in the market, through self-selection strategy, it may still beneficial to segment the market. The high cost associated with the mass marketing may be offset by the high revenue.

In addition, Winter (1984) points out that demographics are not particularly actionable, or causal factors of buying behavior, and thus at best, simply help to define the obvious constraints. Therefore, demographics are not very useful bases of segmentation. They can only provide some insights and descriptions of segments based on other variables. Or the changes of demographic profiles in the long run might indicate some market opportunities. Another application of demographics may fall into the context of industrial market segmentation (Winter 1982).

Psychographic

In a broad sense, psychographic segmentation includes measures of consumers' value system, personality, attitude and lifestyle based on their activities, interests and opinions (AIO). This research stream tries to identify the relationship between psychographic variables and consumer behavior, such as brand purchase, brand loyalty, and store preference, etc. Unfortunately, in general, most psychographic studies result in little value for market segmentation (e.g., Frank 1967; Wells 1975).

However, some researchers argue that the disencouraging results may be simply due to the inappropriate statistical tests or psychographic measures (e.g., White 1966; Bass, Tigert and Lonsdale 1968).

Product Usage

Wendell Smith recognized that all consumers are different in terms of their divergent demand schedules. Nevertheless, many researchers interpret Smith's statement as divergent demand levels. Frank (1968) argues that the differences in average purchase rate among segments is the crucial criterion of segmenting a market. This leads market segmentation to a period that Winter (1982) labels it as "the

Dark Ages" or "15 years of regression." By the help of multiple regression analysis, researchers relate product consumption to demographic variables and try to identify members of each segment in terms of consumer characteristics such as demographics, personality, and media readership. That is, consumers are segmented into nonusers, light users and heavy users and then consumer characteristics of each segment are evaluated. Often, most of the marketing efforts focus on the "heavy half." However, there is no strong evidence that heavy users respond to marketing mix more sensitively than others and therefore a beneficial target. In addition, the heavy versus light user segmentation is very likely to ignore the potential opportunity of changing or increasing consumption habits of light users or even nonusers. Winter (1984) indicates that "the heavy user segment can, however, be attractive depending on whether the market share is changeable."

Another commonly used basis is brand loyalty. Researchers have focused on identifying brand loyal customers in terms of descriptive variables, such as demographic, personality and lifestyle. However, although brand loyalty is a real and reliable phenomenon, there is no evidence that brand loyal customers are different from nonloyal ones in terms of characteristics, demand levels, and sensitivity to marketing mix (Frank 1968).

Benefit Sought

Viewing the underlying disadvantage inherent in the geographic, demographic and product usage segmentation, Haley (1968) introduces benefit segmentation to "identify market segments by causal factors rather than descriptive factors." He claimed that "the belief underlying this segmentation strategy is that the benefits which people are seeking in consuming a given product are the basic reasons for the existence of true market segmentation."

Essentially, benefit segmentation is based on different reasons for buying, such as (1) intrinsic preference, (2) level of performance in the function or application envisaged, and (3) differences in generated-functions, for example, snob appeal, price, reputation, etc. The benefits of a product and the function of a product are closely related. Therefore, based on different reasons (goals, beliefs, wants, choice criteria) for buying, benefit segmentation provides obvious direction for marketing strategy (O'Shaughnessy 1988).

In addition, Haley points out that benefit segmentation has many marketing implications, such as copy direction, media choices, depth-of-sell, packaging, and new product development, etc. Also, it helps marketers to have a distinct

competitive edge since they know exactly what consumers are seeking for, while competitors using traditional segmentation may not even recognize the existence of that benefit segment.

It seems that benefit segmentation is the most direct, customer oriented approach and more actionable than previously reviewed segmentation approaches. However, benefits that consumers are seeking for are difficult to identify. Dickson (1982) also argues that the kind of benefit sought by consumers varies depending on different situations, O'Shaughnessy (1988) states that in a mature market, the primary use and generated functions may be essential for all the products and minor benefits, which can be legion, become the dominant for preference.

Segmentation by Response to Marketing Mix

The basic premise of market segmentation theory is that consumers respond to the marketing mix divergently (Rao and Winter 1979). Therefore, the nature of the marketing mix can itself become the basis for segmenting the market. The most commonly used approach is based on elasticity of demand. Claycamp and Massy (1968) state that "The theory shows that optimal profits can be achieved if the firm uses consumers' marginal responses to price, i.e., price elasticities, to define mutually exclusive segments." Frank and Massy (1965) propose a segmentation of the market based on the elasticity, defined as a summary measure that relates a percentage change in quantity demanded to the associated change in some causal variables like price and/or promotion. It was hypothesized that in most situations management has no information on the actual degree of correlation between measures of level and elasticity of demand. To test this concept, a study was conducted in which segments were defined by using the store of purchase, brand loyalty and product characteristics. Regression analyses revealed that such segments have varying price and promotional elasticities.

Another alternative to research based on elasticity of demand would be to consider the response function coefficients. For example, Rao and Winter (1978) use a conjoint measurement approach, by means of the multivariate probit model, to determine subjects' tradeoffs among possible product attributes. Then, the estimated coefficients of each respondent's multivariate probit function are clustered to form segments. They conclude that "the probit model, the related methodology, and intention measurements offer great potential in terms of product design for divergent segment preferences."

At the same time, however, Tollefson and Lessig (1978) explicitly investigate

the performance of elasticities as a basis of segmentation vis-a-vis the following: (1) minimization of the difference in cost between aggregating and not aggregating segments i and j; (2) random assignment to segments; (3) similarity of elasticities; (4) similarity of response function coefficients; (5) similarity of disaggregative allocations; (6) similarity of total response; and (7) similarity of marginal responses. A computer simulation shows that while the first of the foregoing rules did the best, the one that did the next best was similarity of disaggregative allocations. This latter rule basically means that if consumers forming different segments can be marketed to in a similar fashion, this should be done. On the other hand, neither response function coefficients or elasticities performed well. The reason may be the failure to consider any fixed cost associated with the marketing mix. It is assumed that aggregation of two segments will result in profit reduction. This is not necessarily the case.

Mahajan and Jain (1978) try to build on a model incorporating managerial, institutional and resource constraints. A dynamic price model is used to determine the price charged in different market segments in order to maximize the overall corporate model. Further, Winter (1979) suggests a cost-benefit approach that would combine different segments to receive the same optimum marketing mix as long as the reduction in cost exceeds the reduction in profit. These two studies have significantly enriched market segmentation research in practice as well as in theory.

A Critique

Responding to heterogeneity of consumers' needs and wants and imperfect competition, market segmentation is inevitable. However, given a lot of alternatives can be applied, which segmentation variable should be chosen? Wind (1978) suggests that the decision be based on the purpose of study, as shown in Table 1.

From our literature review, generally speaking, segmentation based on consumer attribute differences, i.e., demographic, psychographic seems inefficient. These differences do not directly relate to purchase, lack actionability, and are relatively stable. Their major roles rest on providing deeper insights of the segment formed by other effective predictors. On the other hand, segmentation based on behavior differences seems much more effective, at least for some research objectives. In particular, the study of similarity of marketing mix seems to be a more useful approach.

TABLE 1 The Segmentation Basis for Research Purpose

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1. For general understanding of a market:
   benefit sought (in industrial markets, the criterion used in purchase decision)
   product purchase and usage patterns
   needs
   brand loyalty and switching pattern
   a hybrid of the above variables

2. For positioning studies:
   product usage
   product performance
   benefits sought
   hybrid of above

3. For new product concepts (and new product introductions):
   reaction to new concepts (intentions to buy, preference over current brand, etc.)
   benefits sought

4. For pricing decisions:
   price sensitivity
   deal proneness
   price sensitivity by purchase/usage patterns

5. For advertising decisions:
   benefits sought
   media usage
   psychographic/lifestyle
   a hybrid of above and/or purchase/usage patterns

6. For distribution decisions:
   store loyalty and patronage
   benefits sought in store selection

Source: Yoram Wind, "Issues and Advances in Segmentation Studies," *Journal of Marketing Research*, Vol. 15 (August), 1978.

Using this approach, a specific marketing mix will be developed to appeal to each segment, after the segments have been formed. The final result of this market segmentation process is that our products or brands will be, hopefully, chosen by our target customers. That is, brands chosen will represent the actual responses to a specific marketing mix. Moreover, brands chosen will also reveal the total

configuration of benefits consumers are seeking. Therefore, it seems that the combination of brands chosen by consumers will adequately reflect consumers' divergent responses to marketing treatment and thus may serve as a good segmentation basis. Nevertheless, till today, market segmentation research seldom employs the combination of brand choice as a basis, with one exception of Grover and Srinivasan (1987), which will be discussed later.

Furthermore, previous research in market segmentation has often focused on only one product category, while in reality, consumers always deal with multiple product categories. Therefore, the result may not represent the actual profile of the market under consideration. In addition, Winter and Thomas (1985) point out that there are at least seven generic segments in most products: price-sensitive, performance-sensitive, status-conscious, convenience-oriented, durability-oriented, distribution/retailer-sensitive, and security-conscious. Consequently, consumers may pursue the same benefit when buying different products.

THE OVERALL APPROACH

The basic premise of this approach is that the brand choice in a product class represents the optimal marketing mix a consumer receives in a certain time period. Therefore, consumers with the same brand preferences can be grouped together, since segmentation based on similarity of marketing mix is the optimal approach as mentioned earlier. However, the brand choices of an individual may be heterogeneous depending on varied situations. Thus, several product categories are employed simultaneously and the expectation is that the optimal marketing mix will be convergent. In the language of benefit segmentation, if the brand choice represents the benefits consumers seek, then from their brand choices among several similar product categories, some inferences can be generated about the benefits they are looking for in purchasing several products.

So, there is grouping of consumers as based on their heterogeneous brand preferences, i.e., the brand choice set, of several product classes. Membership in the segments can then be related to descriptive variables, such as demographics, psychographics, and media readership to provide more insights about the segments. The brand choice set of each segment also provides beneficial information of the overall market structure. The relationships among brands of different product categories as well as of the same product class can be identified. Marketers can recognize the competitive strength in each segment and the potential benefit of

bundling promotion or joint promotion strategies. New product opportunities also can be inferred from the existing brands combination in each segment.

Since consumers are grouped by their brand choices, data are conveniently available. In most cases, cross-classification of brands purchased is desirable and it is often available from panel data. However, in this approach, it may be better to select similar product categories, since consumers may respond in a totally different way to significantly different products, such as durable and nondurable goods.

MODELS

Base Model

In the simplest case, we assume that consumers are only loyal to one brand of each product category. Therefore, consumers can be represented by the brands they choose from among several product categories. Then, consumers are clustered to form segments based on their brand choice sets, i.e., consumers whose brand choices are most matched to those of each other are grouped together. Since the brand choice sets are nominal data, this aggregation process can be done, to this author's knowledge, by similarity measures for brand choice data. Other proximity measures, distance measures and correlation measures, are restricted to interval-scaled data. Similarity measures can be explained by the following example. Suppose we segment the market based on the consumers' brand choice among three product categories, each of which has three brands. Consumers then are compared on each of nine brand choices; for example:

	Brand								
consumer	A	B	C	D	E	F	G	H	I
1	0	1	0	1	0	0	0	1	0
2	0	1	0	0	1	0	1	0	0

The fractional match coefficient would be:

$$S_{12} = M / N = 5 / 9,$$

where M denotes the number of brands held in common (matching 1's or 0's)

and N denotes the total number of brands. In the above example, for the nine brand choices, consumer 1 and 2 have the same choices in five brands, i.e., A, B, C, F, and I. Therefore, the fractional match coefficient is 5/9. (For a more detailed explanation, see Frank and Green 1968)

Then, these similarity measures among consumers can be analyzed by some grouping routines, such as multidimensional scaling and cluster analysis, to form segments.

An alternative solution is to use dummy variable cluster analysis, since cluster analysis does not require interval-scaled variables. Thereby, we can use dummy variables to represent consumers' brand choices. For instance, in the previous example, we need two dummy variables for each product category, i.e., we have six dummy variables to represent consumers' choices. Next, consumers are grouped together by traditional cluster analysis based on these dummy variables.

However, these measures may not be sound, since an individual may be similar to totally different consumers on different subsets of brands with the same similarity measure. Wickens (1989) provides a possible solution to deal with multidimensional nominal data, i.e., through multiway contingency tables analysis, we may group people to different segments.

After membership in the segments has been determined, multiway contingency table analysis can be employed to test whether the brand choice patterns are truly different among segments and it can thus verify the effectiveness of this aggregation process.

Finally, consumer characteristics are related to each segment and hence more insights about each segment will be obtained. Moreover, the optimal marketing mixes derived from each segment's distinctive brand choice set may converge. It is then easy to conduct cost-benefit analysis and to maximize marketers' profit.

Extension to Non-Loyal Buying

Some may argue that the assumption of consumer loyalty to each product category is unrealistic. The model can be modified to accommodate this situation. For instance, similarity measures in previous examples will be slightly different, since people can choose more than one brand in each category. Only the value of fractional match coefficient will be changed while the procedure will remain the same. In cluster analysis, we need more dummy variables to represent the brand choice set, since there are at most eight ($=2^3$) combinations in each product category for each person. Therefore, we need 21 ($=3*[8-1]$) dummy variables to solve

the problem. Multiway contingency tables analysis can also be adjusted in the same way.

Extension to Stochastic Buying

Some may also argue that consumer behavior is a stochastic choice process. For example, Grover and Srinivasan (1987) assume that the probabilistic brand choice process is stationary and zero order, and then consumers are grouped according to the probabilities of choosing the different brands in a product class. Furthermore, through empirical findings the above approach is shown to have substantial validity and merit in marketing implications. Therefore, our approach can also extend to stochastic choice behavior by adopting this method. However, since Grover and Srinivasan (1987) only deal with one product class, the extension of present study to multiple product classes will require further investigation

Another alternative is to apply Item Response Theory (or Latent Trait Model) from educational psychology measurement literature. Item response theory was developed for studying the relationship between the response to an item from an individual and characteristics of the item and the individual. For example, whether an examinee answers a test item correctly or incorrectly is largely determined by the difficulty level of the item and the ability of the examinee. If the ability of the examinee exceeds the level required to answer the test item, the probability that the examinee will correctly answer this item will be higher than otherwise. Thereby, from examinees' responses to a test, we make inferences about the characteristics of each item and individual examinees. An item is considered difficult if most examinees answer it incorrectly; an examinee is considered to have high ability if the proportion of correct answers is high.

In marketing, we often study the characteristics of a brand in a product category and individual consumer differences by means of consumers' responses to a measurement instrument. For example, the perceptual space of a product category and segmentation of consumers can be derived from consumer surveys utilizing several multivariate analysis techniques, such as multidimensional scaling, factor analysis, discriminant analysis, etc. Consequently, IRT is applicable to marketing research as well as to testing. For instance, when consumers are asked to indicate their preference for various brands, the brands are analogous to the items of a test, and the consumer is analogous to an examinee. The value provided by the brand is the counterpart of the difficulty of an item, and the reference points or expectations of the consumer are equivalent to the ability of an examinee. Thus, a consumer's

attitude toward a brand can be formulated as a response determined by the gap between the value of a brand and the consumer's expectation. If the value is greater than the consumer's expectation, his/her attitude toward this brand should be more favorable. IRT thus has the potential to provide the same information about the relative position of products and the characteristics of consumers as conventional multivariate techniques. That is, we can then segment the market based on the consumers' latent characteristics and simultaneously draw the product space based on the product characteristics, derived from decomposing their overt responses. In addition, Item Response Theory has been proven to be robust to context effects and thus it has the potential in marketing application. (Lou 1993, Teas and Wong 1992)

CONCLUSION

The ultimate aim of segmentation is to achieve what amounts to a "relational classification". We seek to group wants on a relational basis in the sense that all the wants in a segment should be related, via similarity of response, to the same marketing strategy or offering. (O'Shaughnessy 1988)

Market segmentation is one of the most important concepts developed by marketing academicians instead of borrowing from other disciplines. In addition, market segmentation is fundamental to marketing strategy, since the target segment chosen will determine the subsequent marketing mix. Much of the effort in market segmentation studies has contributed to the choice of segmentation bases. There is no one best variable to segment the market, and the merits and limitations of each basis depend on the product in question and on managerial objectives. However, in general, segmentation based on benefits sought and similarity of marketing mix seems more effective. Nevertheless, the question of how to measure the benefits consumers are looking for and how to identify the optimal marketing mix of each individual are not easy to answer in practice.

On the other hand, brand choice, the ultimate goal of any marketing effort, receives relatively little attention. Most of the past research has focused on brand loyal segmentation. Researchers have tried to distinguish consumers with brand loyalty from those who are not loyal, and the result has not been encouraging. Moreover, most research concerns only one product class and thus the whole picture of the

market may be missing or even misleading.

The alternative approach we propose seems theoretically and practically sound. We consider the brand choice as the optimal marketing mix to which consumers respond during a certain period. Therefore, market segmentation based on consumers' choices among several product classes is actionable and even accessible, since each segment is characterized by the similar marketing mix. Furthermore, through the distinctive brand choices of each segment, marketers may recognize the benefits sought in each segment and may modify the marketing mix to better fulfill the needs and wants of target segments.

Another merit of our approach is that it will help marketers to examine the inter- and intra- product category competition, i.e., market structure analysis can be conducted at the same time. For instance, the competition of brands in each segment can be recognized and the association relationship among brands can also be revealed. Thus, the effectiveness of bundling and joint promotion strategies can be more accurately evaluated. New product opportunities may also be discovered in the specific target segment. In media decisions, this approach can be used to reveal which kinds of media are most related to each segment, and marketers will thereby reach their targets more efficiently.

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