Report

The Institute for Perception **June 1995**

Maximizing Potential Market Share Based on Product and/or Concept Choices

Product developers and marketers are often faced with the problem of selecting a reduced set of products or concepts from a large array based on consumer choice information. Good examples are selecting sets of chewing gum flavors, flavored beverages or salad dressings. Since individual consumers vary in their likes and dislikes, a difficult challenge is to select those alternatives that maximize *total* market share for a set of new offerings. The top two choices in a set often do not constitute the optimum set, since in many cases the top two choices may appeal to the same type of consumer. In order to maximize total market share potential, the challenge is to find those alternatives which, although they appeal to a smaller number of consumers than the first choice, complement each other and avoid appealing to duplicate consumers.

The problem just described also applies to the task of selecting the optimum combination of product *features* for a complex product such as a computer program, an electronic product or an automobile. In this case, the problem is one of defining a product with broad appeal because is embodies different features that appeal to multiple market segments without having a negative impact on any one segment.

TURF and TURFSTAT

Miaoulis, Free and Parsons (*Marketing Research*, March, 1990: 28-40) introduced the idea of "TURF" (Total Unduplicated Reach and Frequency) analysis as a method for finding sets of product or concept offerings to maximize *reach* and, combined with usage frequency data, maximize potential market share. However, their approach to finding optimum sets depended on exhaustive evaluation of alternative sets and did not provide any statistical tests of the resulting outputs. TURFSTAT is a PC computer program that rapidly identifies optimum product/concept sets and conducts comparative statistical analyses on alternative sets. These analyses are useful in determining whether there is evidence to support differences among sets of alternatives when there are differences in cost or ease of manufacturing these alternatives.

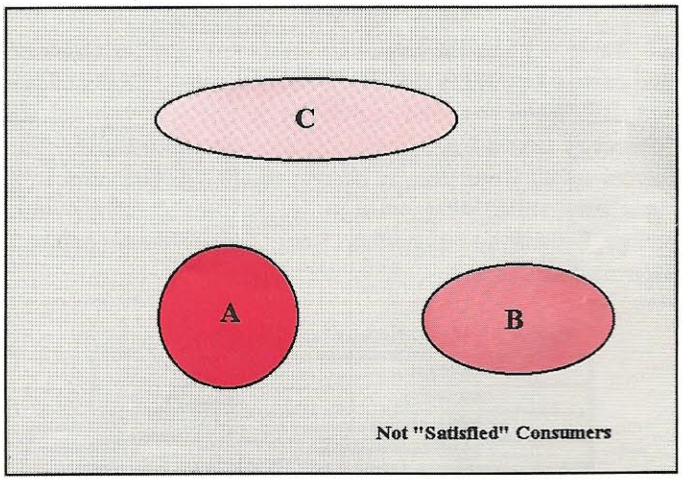
Defining a "Satisfied" Consumer

In order to estimate the *reach* of a product or concept, the first step is to define a "satisfied" consumer. It is very common to rank or rate products and/or concepts on degree of liking or purchase interest. A consumer may be defined as "satisfied" with an alternative if it places in the top 10% of the experimental set. Placement of an alternative in the top one or two categories (boxes) of a liking or purchase interest scale is also a popular method for defining a "satisfied"consumer.

Unduplicated Reach

The rectangle in Figure 1 represents the total market for a product category and the areas of the three ellipsoids represent the *reach* or fractions of the market "satisfied" by products A, B and C . This figure shows no duplication for the *reach* of these products.

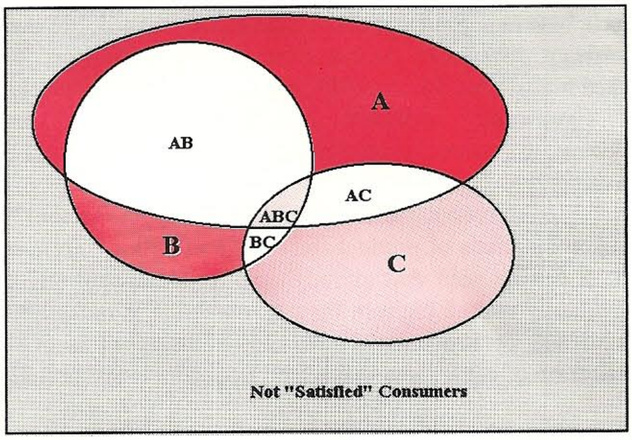
Figure 1. Total market for a product category with segments satisfied by products A, B and C



In Figure 2, all three products satisfy some of the same consumers (ABC) or pairs of them do so (AB, BC and AC). Although A and B satisfy the largest groups of consumers, they also overlap extensively. In order to maximize unduplicated *reach* for a product introduction involving two of the products, one would choose A and C rather than A and B because

$$A + C - AC > A + B - AB .$$

Figure 2. Products A and C optimize unduplicated *reach*



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In the case of three alternatives, calculating the number of satisfied consumers in each ellipsoid is straightforward. However, with large numbers of products and concepts an efficient algorithm is required. It would also be very useful to know if sets of products differ significantly in their *reach* so that product/concept sets that maximize equivalent numbers of consumers can be identified. The computer program TURFSTAT evaluates up to 100 products/concepts with a user specified definition of "satisfied" and gives sets of alternatives that maximize or minimize *reach*.

Example

Table 1 gives the results of an experiment for flavored, low calorie beverages using a 5-point purchase interest scale and defining a "satisfied" consumer as one who chooses the "definitely would buy" option for a product alternative. The flavors tested were: Apple, cherry, peach, apricot, raspberry, strawberry, blackberry, mango, plum, kiwi, lemon, lime, orange, banana, and tangerine. Results are given as random 3 digit product codes.

Table 1. % "Satisfied" for beverage flavors

Product Flavor	% Satisfied
803	28.2
927	24.8
126	21.8
324	14.0
465	12.2
538	8.4
586	6.0
746	5.8
837	4.8
847	3.6
632	3.4
794	1.4
934	0.2
545	0.2
296	0.2

TURFSTAT Analysis of the Beverage Data

Table 2 gives the results of an analysis of the top five low calorie beverage products taken individually. There are many significant differences among these products. The products ranked highest are 803 and 927, but the top three products are not significantly different based on Bonferroni tests. However, the extent of duplicated reach is not evident from this table.

Table 3 gives the results using TURFSTAT to find the best combinations of products taken two at a time. From this table it can be seen that although products 803 and 927 are individually ranked highest, their combination is ranked third behind 803 & 126 and 927 & 126. This result is due to duplication of consumers "satisfied" by products 803 and 927. However, none of these three sets of products are significantly different from one another. In fact, of the top five pairs of products, only one comparison is significant using Bonferroni tests.

Table 2. Comparisons among individual beverage products

Product	% Satisfied	Product	% Satisfied	Probability
803	28.2	927	24.8	0.15
803	28.2	126	21.8	0.08
803	28.2	465	14.0	0.00
803	28.2	324	12.2	0.00
927	24.8	126	21.8	0.26
927	24.8	465	14.0	0.00
927	24.8	324	12.2	0.00
126	21.8	465	14.0	0.00
126	21.8	324	12.2	0.00
465	14.0	324	12.2	0.41

Comparisons are significant if the probability is < 0.005, which is the Bonferroni criterion required to ensure that experiment-wise error is <0.05.

Table 3. Comparisons among pairs of beverage products

Product Sets	% Satisfied	Product Sets	% Satisfied	Probability
803 126	43.4	927 126	41.4	0.34
803 126	43.4	803 927	40.4	0.16
803 126	43.4	803 465	39.6	0.07
803 126	43.4	803 324	37.4	0.00
927 126	41.4	803 927	40.4	0.65
927 126	41.4	803 465	39.6	0.52
927 126	41.4	803 324	37.4	0.12
803 927	40.4	803 465	39.6	0.68
803 927	40.4	803 324	37.4	0.11
803 465	39.6	803 324	37.4	0.25

Comparisons are significant if the probability is < 0.005, which is the Bonferroni criterion required to ensure that experiment-wise error is <0.05.

In this example, product sets of two were chosen. However, much larger product sets can be evaluated for cases in which the goal is to assess an extensive array of product offerings. An important consideration in choosing the components of these sets is whether there is any difference between them. In order to achieve a given *reach*, there may be many equally satisfactory sets of alternatives. TURFSTAT identifies these alternatives.

We thank **Peryam & Kroll Research Corp.** (6323 N. Avondale Ave., Chicago, IL 60631; 800-747-5522) for introducing us to TURF and for encouraging us to conduct research in this area.

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