





## Faculty Working Papers

VALUE-RESPONSE SEGMENTATION:  
A MARKET SEGMENTATION APPROACH  
TO SOCIAL MARKETING PROBLEMS

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FACULTY WORKING PAPERS

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February 20, 1974

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Value - Response Segmentation: A Market Segmentation Approach  
to Social Marketing Problems

Man's concern over the quality of life has led to a new level of social awareness; this has resulted in a dramatic reorganization of priorities that has affected not only every citizen, but every academic and professional discipline; the marketing discipline is no exception.

Marketing has traditionally focused on the exchange process between two or more parties for the purpose of economic enhancement; the nature of the exchange process involved goods, services, or financial resources. A new application of marketing principles, social marketing, recognizes that an "exchange" takes place in virtually all programs even though the exchange of goods, services, and financial resources may, in part, be substituted with acceptance of ideas, changing behaviors, and the like for the purposes of having some valued impact upon society. Not only are the basic concepts of commercial and social marketing similar, but the nature of the social marketing manager's controllable variables in effecting the exchange are very much parallel to price, promotion, place, and product.<sup>1</sup> The more one investigates the area of launching social programs, the more it seems natural that the planning, analysis, and implementation of such a program belongs in the marketer's hands. Much as attempts by production oriented firms to push goods and

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<sup>1</sup>Philip Kotler and Sidney J. Levy, "Broadening the Concept of Marketing," Journal of Marketing, Vol. 33 (January, 1969), pp. 10-15; and Philip Kotler and Gerald Zaltman "Social Marketing: An Approach to Planned Social Change," Journal of Marketing, Vol. 35 (July, 1971), pp. 3-12.



services onto consumers are doomed to failure, social programs without a marketing backing can be expected to fall short of their goals.

Social marketing managers, like their commercial marketing counterparts, make similar decisions whose impact is very much a function of an uncertain, dynamic environment. As in all marketing systems, the managers are attempting to maximize their particular objective functions (which may be societal good rather than profits in the social sector). Plans are somewhat modified, however, because of constraints due to production, distribution, promotion, and product development costs. In an attempt to deal with the realities of heterogeneous groups of consumers with different needs, wants, and responses, commercial marketing managers have turned to a concept (or philosophy) best described as market segmentation; there is some evidence to indicate that market segmentation may be at least as applicable in the area of social marketing. Numerous articles in the social marketing literature have defined market segments or at least recognized hypothetical groups of target consumers. It is the purpose of this paper to accept the many parallels between social marketing and commercial marketing as given; nevertheless, there is one unique aspect of social marketing that cannot be ignored in social market segmentation.

#### The Concept of Market Segmentation

The concept of market segmentation has grown dramatically from the base provided by Wendell Smith in 1956.<sup>2</sup> In addition to being

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<sup>2</sup>Wendell R. Smith, "Product Differentiation and Market Segmentation as Alternative Marketing Strategies," Journal of Marketing, Vol. 21 (July, 1956), pp. 3-8.



an important managerial and research tool, market segmentation perhaps best reflects the modern marketing philosophy that all consumers are not alike in need and wants. The concept has evolved to a definition similar to the following:

Market segmentation is the disaggregation of market demand (comprised of individuals' heterogeneous demand functions) into groups of individuals with relatively homogeneous demand functions.

Once the marketer has groups of similar individuals he can then design different product, price, place, and promotional packages in order to get the desired response. A calculation of revenue versus costs provides some idea of target groups as well as groups to which it is uneconomical to market. A key point that is often overlooked in market segmentation research and practice is that the concept deals with submarket demand functions or response to the marketing manager's controllable variables. One of the great difficulties in dealing with market segmentation is the inability to measure market response. Only in a few exceptional articles has response been considered and the most prevalent method of resolution is to substitute static consumption quantities, brand loyalty measures, brand preferences, and attitudinal measures as proxy measures of consumer response.<sup>3</sup> For the purpose of this paper it will be assumed that response (or an adequate proxy measure of response) of social market segments can be derived; the choice between true response and a proxy measure is dependent upon the research budget and the hypothesized differences between the two measures.

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<sup>3</sup>Two comprehensive books on the subject are: Ronald E. Frank, et.al., Market Segmentation (Englewood Cliffs: Prentice-Hall, 1972); and James F. Engel, et.al., Market Segmentation (New York: Holt, Rinehart, Winston, 1972).



Another difficulty in the area of market segmentation involves the decision as to the number and composition of the segments. Theoretically it is possible to have one segment or n segments, each composed of one consumer. As might be expected the number is a function of the homogeneity achieved by partial segmentation. From a managerial standpoint, the level must be a balance between costs and revenues; as the number of segments increases, revenue increases and this may be expected to be accompanied by an increase in costs. Other authors have shown the influence of research costs and legal constraints in determining the theoretically optimal point of segmentation.<sup>4</sup>

Although market segmentation has not been extensively applied to social marketing problems, this is most likely a result of the relatively small amount of social marketing research to date. Some initial work in the marketing of birth control methods has hypothesized the different responses of social market segments.<sup>5</sup> It is important that future social market segmentation not ignore an additional dimension that is necessary for effective segmentation.

#### A Relevant Dimension: Value

While the social marketing literature has indicated that market segmentation strategies and research are in order when

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<sup>4</sup>Henry J. Claycamp and William F. Massy, "A Theory of Market Segmentation," Journal of Marketing Research, Vol. 5 (November, 1968), pp. 388-394.

<sup>5</sup>Julian L. Simon "Strategy and Segmentation of the Birth Control Market: This Side of Family Planning," paper presented at the National Conference on Social Marketing, University of Illinois, Urbana, Illinois, 1972.





marketing societal programs, marketers are led to believe that response is the only basis on which segmentation is to occur. This article is an attempt to introduce an additional dimension: the concept of the value of the response.

In a recent article Kotler states a fundamental axiom about the marketing process:

Axiom 2: At least one of the social units is seeking a specific response from one or more other units concerning some social object.

Kotler goes on to add:

The marketer undertakes these influence actions because he values their consequences.<sup>6</sup>

Thus marketing managers attempt to get responses from consumers because these responses have value. It is on this basis that many social marketing products and commercial marketing products may differ. To a brand manager for laundry soap, a response (along some continuum) represents a certain contribution to profit (e.g. 10¢); furthermore whether Consumer A or Consumer B responds, the value of the response is identical. The social marketer, on the other, may perceive different values for responses from different consumers. Most individuals would agree that the consumption of a high protein soft drink (a response) by a well nourished middle class American is not of equal value to a response from a malnourished 4 year old child in Appalachia.

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<sup>6</sup>Philip Kotler, "A Generic Concept of Marketing," Journal of Marketing, Vol. 36 (April, 1972), pp. 46-54.



The concept of different values of response is certainly not new. Early vasectomy campaigns in India produced a number of older men who responded to the incentive program before restrictions were implemented.<sup>7</sup> In 1967, the Federal Trade Commission indicated its priorities for consumer protection:

A high priority is accorded those matters which relate to the basic necessities of life, and to situations in which the impact of false and misleading advertising, or other unfair deceptive practices, falls with cruelest impact on those least able to survive the consequences -- the elderly and the poor.<sup>8</sup>

It is generally recognized by the commercial marketing sector that different consumers often have different needs and wants; in many social marketing applications there are strong reasons to argue that the responses of different consumers represent differing levels of value to the program. This argument is particularly relevant in the area of birth control marketing, low cost high protein food marketing, and consumer protection programs. More subjective estimates are required to apply the concept of value in religious marketing programs (is one "soul saved" equivalent to another soul being saved?) or political campaigns ("one man, one vote").<sup>9</sup> Nevertheless, the clergy may value

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<sup>7</sup>Philip Kotler, Marketing Management: Analysis, Planning, and Control (Englewood Cliffs: Prentice-Hall, 1972), p. 881.

<sup>8</sup>The Federal Trade Commission, Annual Report, 1967, p. 67.

<sup>9</sup>Two interesting articles on these subjects are: James F. Engel and Roger D. Blackwell, "Communicating Religious Truth in a Changing World," paper delivered at the American Marketing Association meeting, Boston, 1970; and Richard M. Johnson, "Market Segmentation: A Strategic Management Tool," Journal of Marketing Research, Vol. 8 (February, 1971), pp. 13-18.



church attendance by the disbeliever more than that of the believer, and certainly campaign managers in a national election may attach more value to individuals in high electoral vote states where the outcome is expected to be close.

In a society where many more resources are available to commercial marketing programs than social marketing programs, a careful allocation of social marketing resources is mandatory. Not only do benefits have to be weighed against costs, but responses (and values) of one group must be compared with responses (and values) of other groups. Unfortunately, the literature in the social marketing area has concentrated only on response (i.e., the group most likely to respond) or on value (e.g., ghetto residents, the elderly).<sup>10</sup> A combination of these two components can be expected to produce synergistic effects beyond that of either one approach.

#### The Determination of Value

In commercial marketing the value of a response (such as a purchase) is very much a function of the objectives of the firm; thus issues of satisficing versus optimizing, profits versus market share, and similar considerations play an important role in the assignment of value. A similar situation

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<sup>10</sup>An example of the response orientation is the Simon paper, previously cited, or: Edward H. Asam and Louis P. Bucklin, "Nutrition Labeling for Canned Goods: A Study of Consumer Response," Journal of Marketing, Vol. 37 (April, 1973), pp. 32-37; the value oriented approach is exemplified by Burton H. Marcus, "Similarity of Ghetto and Non-Ghetto Food Costs," Journal of Marketing Research, Vol. 6 (August, 1969), pp. 365-368.



exists in social marketing; the objective functions of the social change agency dictate the assignment of value to consumer response. Consider, for example, two agencies marketing birth control. Agency A's objective is to reduce the number of births per se; in this case potential consumers who desire more children may represent greater value than those who desire no additional children. Agency B's raison d'être may be to reduce the number of unwanted pregnancies; thus potential consumers who do not desire more children may be of greater value than their counterparts. The point is that organizations seemingly devoted to the same objective may, in fact, have divergent value structures. In reality, birth control organizations most likely consider both objectives worthwhile and also consider parameters such as the current number of children, the ability to support additional children, and current methods used to control the family population.

While the birth control example does indicate the subjectivity involved in the assignment of response values, numerous examples of cases with more objective means of value assignment do exist. If a social program is designed to reduce the level of malnutrition (perhaps by nutritional education or the marketing of high protein foods), it might assign value accordingly:

$$V_i = f(PD_i)$$

where

$V_i$  = value of individual  $i$

$PD_i$  = protein deficiency of individual  $i$  and is equal to  $PR_i$  (protein requirement of individual  $i$ )





minus  $PC_i$  (protein consumption of individual  $i$ )  
 $f(PD_i)$  = a functional form to indicate the gravity of  
 protein deficiency to individual  $i$ .

The simple form presented indicates that protein deficiency equals protein requirements minus current protein consumption. As might be expected, current protein requirements are readily available (See Figure 1 which indicates protein requirements for different demographic variables). Current consumption can be easily determined by measuring the daily diet and using appropriate conversion tables. In the case of family units, assumptions would have to be made about per capita consumption; it would also be necessary to sum values for all family members to arrive at a value for the family unit. In spite of the required computational procedures, the data are measurable, and demographics are standard measurements that are taken in most market segmentation studies. An assessment of the daily diet also serves two purposes: these data can be used to determine consumption as well as suggest product forms which will facilitate adoption of high protein foods.<sup>11</sup>

The functional form,  $f(PD_i)$ , is a bit subjective but there has been some research that indicates malnourished children, particularly those younger than 6 months of age, are especially susceptible to irreversible physical and mental retardation.

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<sup>11</sup>A number of articles reporting the advantages introducing foods compatible with existing consumption patterns are reported in Jagdish N. Sheth and Seymour Sudman, "Malnutrition and Marketing," paper presented at the National Conference on Social Marketing, University of Illinois, Urbana, Illinois, 1972.



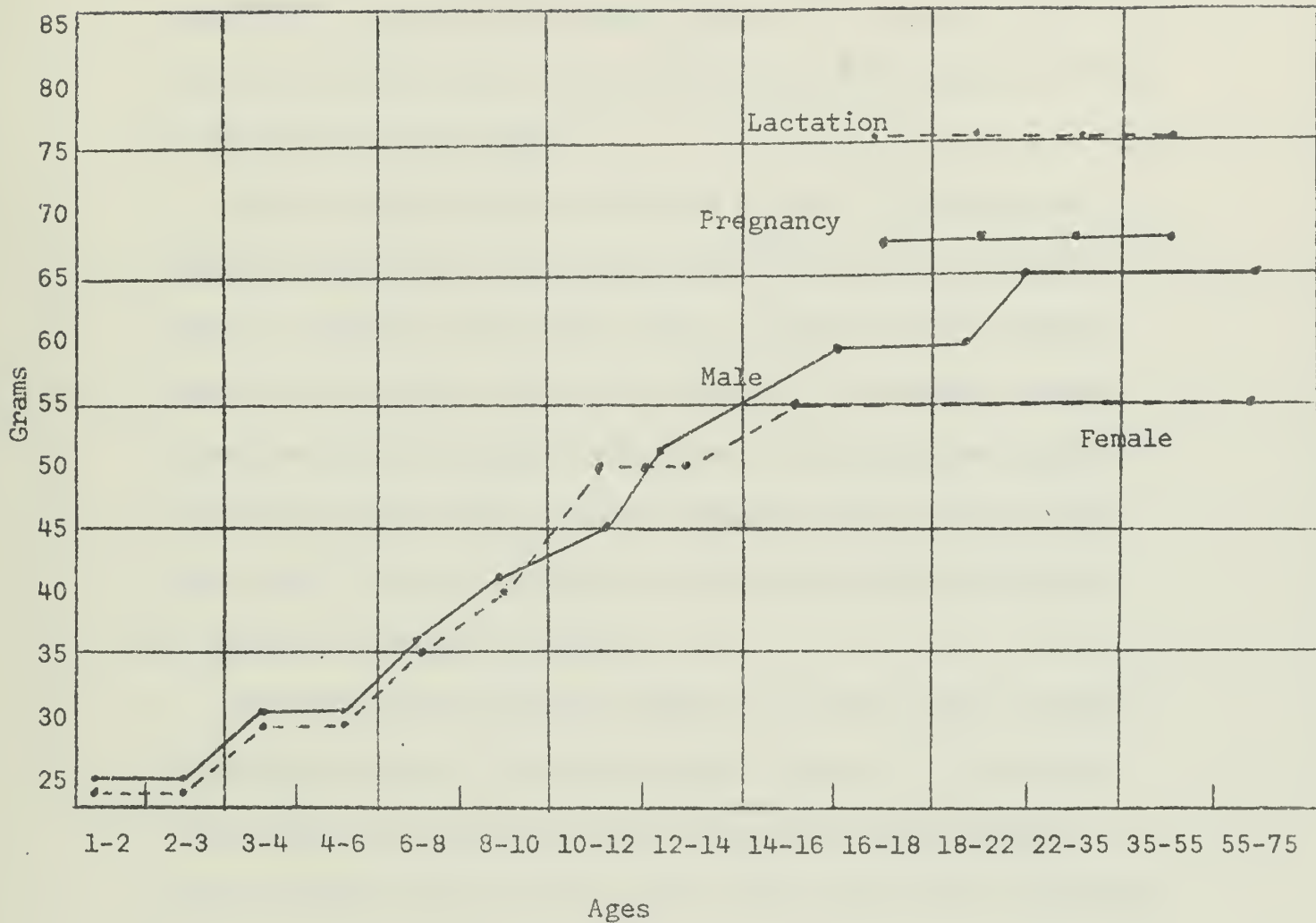


FIGURE 1. Recommendation Dietary Allowances (RDA) for Protein Throughout the Life Cycle (Grams per Day)

Source: Food and Nutrition Board, National Research Council, "Recommended Dietary Allowances," Publication 1694 (Washington, D.C.: National Academy of Sciences, 1968).



This same body of research also suggests that malnourished pregnant and lactating mothers (who in addition, have high protein requirements) produce retarded children.<sup>12</sup> Therefore it is not inconceivable that some value weighting method could be derived to reflect response values.

Value assignments can similarly be made in the area of consumer protection even though the methods used may be more obtuse. Weighting would most likely consider the per capita income of each family, the susceptibility to deceptive advertising and other fraudulent practices, the per capita expense (including repair costs) for the commodity, etc. These value units could then be considered in light of possible responses to insure a successful program.

Undoubtedly the question arises as to what units are used in the measurement of consumer response value. In the ideal case, dollar units would be most appropriate since benefits must be compared with the very real dollar costs and constraints that face all social marketing programs. Thus the question of what an unavowed birth is worth is very much a relevant issue. The value of unavowed births to an economic system has been calculated by economists<sup>13</sup>, but the methods used apply to all

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<sup>12</sup> Nevin S. Scrimshaw and John E. Gordon, Malnutrition, Learning, and Behavior (Cambridge: M.I.T. Press, 1968). See specifically Miguel A. Guzman, "Impaired Physical Growth and Maturation in Malnourished Populations," pp. 42-54; Seymour Levine, "Endocrines and the Central Nervous System: Hormones in Infancy and Adult Behavior," pp. 151-161; R.J.C. Stewart and B.S. Platt, "Nervous System Damage in Experimental Protein - Calorie Deficiency," pp. 168-180; John Dobbing, "Effects of Experimental Undernutrition on Development of the Nervous System," pp. 181-202.

<sup>13</sup> Julian L. Simon, "The Value of Avoided Births to Underdeveloped Countries," Population Studies, Vol. 23 (March 1969), pp. 61-68.



births, and also are somewhat of a sterile nature. While the effect of births on the national income may be relevant to underdeveloped countries, assigning a dollar value to the quality of life may be necessary in other environments. While this problem is non-trivial it is also not new; most of the conflicts between the environmentalists and industrialists can pretty much be resolved into one central issue: what price should be paid for cleaner air and water?

An alternative to assigning dollar values, is to attach utility values to consumer response. This approach, unfortunately, does not allow direct comparison with real dollar costs, but the social change agent is better able to attach priorities to certain consumer groups. Thus the only requirement to determine program priorities is that values of consumer response be assigned on some subjective ratio scale.

While the value assignment procedure is subjective in nature, it should by no means be inferred that value should be deleted from analysis and decision-making. The argument for the inclusion of value estimates is similar to that offered by proponents of Bayesian expected value decision making; to exclude estimates of relevant parameters is to ignore important inputs to the decision. Thus, decisions will be made in which the imputed parameter values may surely be in conflict with the analyst's perceptions. In addition, some of the techniques used in Bayesian analysis may be used to derive value estimates; for example, the social change agent may be asked how many responses of one homogeneous value group he





would trade for another value group. Sensitivity analysis may then be useful in assessing the impact of slight deviations from estimates upon program planning.

#### Value-Response Market Segmentation

Market segmentation is based on the concept that potential consumers differ in their response to the manager's controllable variables. The previous discussion indicates that the value (to the social change agent) of a response by different segments may differ. Thus of major concern is the functional relationship between value and the controllable variables:

Define:

$MR_i$  = marginal response of segment  $i$  to controllable variables. Response is considered a function of a controllable variable (i.e.,  $r_i = g_i(cv)$ )

$MV_i$  = marginal value of a response by segment  $i$  assuming that value is a function of response (i.e.,  $v_i = f_i(r)$ )

$MVR_i$  = marginal value response to controllable variables (i.e.,  $MVR_i = \frac{dv_i}{dcv}$ )

Therefore it can be seen that

$$MVR_i = \frac{dv_i}{dcv} = \frac{dv_i}{dr} \cdot \frac{dr_i}{dcv} = MV_i \cdot MR_i$$

An obvious improvement on traditional market segmentation is to form homogeneous groups of potential consumers on the basis of MVR scores. This is in contrast to the traditional approach



of clustering on the basis of homogeneous group of MR scores and is equivalent to a simple weighting of responses prior to clustering. Figure 2 illustrates the nature of the marginal value response segments, and if the convention is adopted that a low subscript indicates a large value,  $MVR_1$ , members can be designated as the most promising group. It is this group that is most likely to respond and involves a response that is perceived as valuable by the change agent. In the segmentation research tradition these segments can be examined for their magnitudes and analyzed on the basis of their differences in identifiable characteristics.

Nevertheless, MVR segmentation presents some difficulties that can be overcome by segmentation based on simple cross-classification of MV and MR segments (See Figure 3). This form of segmentation can be viewed as the disaggregation of MVR segmentation. Although this approach is more complex, cross classified MV, MR segments may produce segments that are more homogeneous in identifiable characteristics, a key input to strategy formulation. For example the two segments  $MV_4, MR_1$  and  $MV_1, MR_4$  might be aggregated under the MVR segmentation approach. It is pure speculation to suggest that these segments may not be homogeneous, but the nature of the discrepancies between the MR and MV scores does increase the probability of heterogeneity.

The framework of the MV, MR segmentation is useful in describing cases where the proposed bases of segmentation converge with traditional segmentation. It can be seen that MV, MR





FIGURE 2. Marginal Value Response (MVR) Segments



	$MV_1$	$MV_2$	$MV_3$	$MV_4$	.....	$MV_m$
$MR_1$					.....	
$MR_2$					.....	
$MR_3$					.....	
$MR_4$					.....	
.	.	.	.	.		
.	.	.	.	.		
.	.	.	.	.		
.	.	.	.	.		
.	.	.	.	.		
$MR_P$						

FIGURE 3. Marginal Value (MV) Segments Cross Classified With Marginal Response (MR) Segments





segmentation and traditional segmentation will yield equivalent results if: 1) the value of response (i.e., MV) is identical for all consumers, or 2) marginal value of a response (MV) is a monotonically increasing function of marginal response (MR). Previous discussion has attempted to build a case for the rejection of condition 1. Furthermore there appears no strong a priori reasons for acceptance of condition 2; on the contrary, the literature is suggestive that, in some cases, value may be a monotonically decreasing function of response.<sup>14</sup> In addition to being a useful framework for viewing the market for a social good, later discussion indicates that MV, MR segmentation does offer a useful method to control the social marketing program that can eventually lead to program modification or termination.

#### The Dynamics of Marginal Value, Marginal Response Segments

Traditionally marketers have somewhat ignored the issue of segments that change with time; nevertheless, it seems most plausible that marginal responses are subject to a number of effects and this may lead to changing magnitudes and compositions

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<sup>14</sup> Although not conclusive of a decreasing function, the following articles indicate that those with the greatest value may be the least responsive: John J. Wheatley and Guy G. Gordon, "Regulating the Price of Consumer Credit," Journal of Marketing, Vol. 35 (October, 1971), pp. 21-28; H. B. Thorelli, "Concentration of Information Power Among Consumers," Journal of Marketing Research, Vol. 8 (November, 1971), pp. 427-432; and Orville C. Walker, Jr., Richard F. Sauter, and Neil M. Ford, "The Potential Secondary Effects of Consumer Legislation: A Conceptual Framework," unpublished working paper, 1972.



within the segments. The dynamics of market segments is particularly important in MV, MR segmentation since the objectives of a social program are closely related to segment changes.

It is possible to hypothesize at least three types of effects that can lead to change in segment composition:

1. The social marketing program effect -- since the purpose of a program is to effect change, the successful program will reduce marginal values (e.g., consumers are now adopting nutrition, are practicing birth control, etc.). At the same time some consumers can be expected to increase or decrease in marginal response as programs are implemented.
2. Environmental effect -- consumers are subjected to a variety of other stimuli that can be expected to modify response and value; the recent energy crisis is an example.
3. Time effects -- the mere passage of time may alter values and responses an example of this is decay where consumers who are not continually reinforced may decay to their original segments.

The methodology for dealing with these effects is complex.

Techniques to be considered range from an analytical, restrictive Markov analysis to complex simulations; in either case, continuous sampling would be required for parameter estimation and to account for parameters whose values cannot be forecasted (such as environmental events).

If response is adequately defined, horizontal transition probabilities may be considered deterministic. In the nutritional



example, a response may be considered the level of protein consumption. A change in response will then define a new level of consumption which will lead, deterministically, to a new level of value. Other products, taken in the context of the MV, MR segmentation approach, may have various deterministic components; in a campaign to promote vasectomies, the zero MV segment (have already been treated) will obviously remain at zero.

The need for continued sampling depends upon the models' abilities to track the size and composition of the segments over time. Although continual sampling can be used exclusively, models can provide the insight into the future as an aid to the control and planning processes.

A key input to the control and planning process is the establishment of program objectives and guidelines for program modification. In this respect the conceptual framework of MV, MR segmentation (Figure 3) is most useful. From a control point of view, the objective of a social marketing program are readily apparent; a program is designed to move consumers to the lowest value segment (i.e.,  $MV_m$ ) using the fewest resources and/or the least amount of time. When all consumers are classified in the  $MV_m$  segment, the program can be abandoned (or at least redesigned only to combat decay or environmental change). In the vernacular of the social marketing, this is equivalent to saying that all consumers are adequately protected from fraudulent practices, are practicing birth control, or are receiving required levels of protein.



A social marketing program may, however, be discontinued or modified prior to the time when all consumers reach the  $MV_m$  segments. A low response anticipated by the non-zero  $MV$  segments might very well justify discontinuance or investigation of response to other marketing controllable variables. This suggests another reason for the disaggregated conceptual framework of Figure 3 as opposed to the simplified version in Figure 2. The simplified segmentation approach cannot distinguish between low value (justifying program discontinuance) and low response (justifying program discontinuance or program modification).

It can be seen that a successful social marketing effort will involve the conversion of consumers to lower value segments; thus, one can expect decreasing efficiency as the program continues over time (another reason for decreasing efficiency that is purely speculative is that the segments can be expected to increase in heterogeneity). This decrease in efficiency must be weighed against program costs (in real dollar units) for an adequate decision to be reached regarding program continuance, modification, or discontinuance. It is, therefore, imperative that some dollar value be assigned to the utility units incorporated in the  $MV$  value assignment. Hopefully future research will deal with cost of capital assessment and benefit calculations for social programs; until work is completed in this important area, decision-makers must be content with subjective estimates.





## Summary and Conclusions

A number of articles have recently encouraged marketers to expand their social contribution by applying their skills to furthering social causes. It is possible to derive fundamental parallels between a commercial marketplace and a "social" marketplace. Hopefully, the marketing community will continue to serve as a key input so that social causes are "marketed" rather than "engineered".

As in the commercial marketing sector, social marketing programs face constraints in terms of the number of resources available to effect change. One method of dealing with limited resources is to focus on target groups of potential consumers. In this manner market segmentation may be a very appropriate strategy.

Traditional market segmentation dictates that consumers be clustered into groups that are relatively homogeneous with respect to response. This is enacted on the premise that response by any consumer is linearly related to the marketers objective; it is on this basis that social market segmentation must be different from its commercial counterpart. In social marketing programs it is more likely that consumers' responses differ in their value to the social marketer.

Value-response market segmentation proposes that consumers be cross classified on the basis of marginal response and marginal value. In reality, marginal value is really a function to relate marginal response to the marginal gain to the program's objective



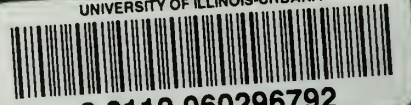
function. It is hoped that assignments of values to responses will direct marketing attention to the groups that both respond and involve a response of value to the social marketer. Unfortunately previous research has focused on only high response groups or high value groups.

Market segments are dynamic and value-response segments are no exception. In addition to defining target groups, disaggregate value-response segmentation provides a conceptual framework by which the social marketing manager can make decisions regarding program continuance, modification, or termination.





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