
Modeling Consumer Health Plan Choice Behavior to Improve Customer Value and Health Plan Market Share

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The ability of health-care providers and insurers to survive in today's highly competitive market requires that they thoroughly understand marketplace needs and use that information to deliver true customer value. The objective of the present study is to illustrate how choice-based conjoint analysis can be used to create health plans that optimize value for consumers and market share for managed care organizations. The use of choice-based conjoint analysis takes the guesswork out of health plan design and promotion. By offering insight into consumer reactions to the range of plan feature choices, the research program presented in this article can help increase consumer satisfaction while aiding health plans to reach their objectives as well. The elimination of crises and ad hoc decision making raises the effectiveness and efficiency of managed care programs. J BUSN RES 2000. 48:247-257. © 2000 Elsevier Science Inc. All rights reserved.

The ability of health-care providers to survive in today's highly competitive market requires that they thoroughly understand the needs of consumers and they deliver true value; that is, managers must effectively use their resources to maximize the perceived value of their product offerings to target customers. Historically, health plans or health insurance programs were designed on the basis of preconceived notions of medical professionals (Ellsbury and Montano, 1990). Satisfaction delivered by such plans was, therefore, a hit-or-miss proposition. Today, decision support systems play an increasingly important role in management's design of health plans for various consumer groups (Forgionne, 1990). The present study supplements prior research by illustrating how choice-based conjoint analysis can be used by managers to create health plans that optimize value for the consumer and market share for the organization offering them.

Background

During the last several decades, numerous developments have produced enormous changes in the health-care industry. First, health care is one of the fastest growing sectors in the service industry. As Follard, Goddman, and Stano (1993) point out, approximately 12.5% of all dollars spend on final goods and services are spent on health care. This is a significant increase from the estimated 8% spent on health care in 1976.

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Second, a more relaxed regulatory environment combined with oversupply (Steiber, 1987) have led to sharply increased competitive pressures for health-care providers (Nelson and Goldstein, 1989). Competitive dynamism is not only evident in the increased number of physicians and hospitals, but also in the emergence of such alternative delivery systems as HMOs and walk-in clinics.

Third, consumers of health-care services have become more informed and sophisticated buyers of these services (Andaleeb, 1994; Nelson and Goldstein, 1989). In addition, customer expectations have grown as their knowledge regarding health-care services has expanded (Oliver, 1980). Thus, for a health-care coverage organization to take a pro-active stance in today's dynamic environment, managers must have knowledge regarding customer reactions to alternative choices (Zeithaml and Zeithaml, 1984). Furthermore, research shows that managers of health-care organizations must continue to monitor customer perceptions over time as the environment changes (Gilbert, Lumpkin, and Dant, 1992). If the environment is neglected, losses of market share and profitability will follow.

This focus on consumer perceptions and expectations by management is a fairly recent development in the health-care industry (Chakraborty, Ettenson, and Gaeth, 1994). In the past, employers offered health benefits to their employees, selecting both the health-care coverage and the provider of that coverage. Consequently, the marketing efforts of health-care coverage providers were limited to convincing employers of the desirability and superiority of their product. The sales model was very simple and focused almost entirely on selling the health-care coverage product to management decision makers in the employer organization. If the selling organization was successful in getting management to buy their product, then they were assured of being able to enroll 100% of the employees, because employers typically offered only a single health-care coverage program. Today, however, more and more employers provide their employees with multiple health-care coverage choices. Employees can exercise their purchasing power by the choices they make between competitive plans (Rogers, 1995).

Increasingly, consumers are shifting their dollars from indemnity to managed care plans (Altman, 1987; Fein, 1986). In 1988, only 29% of the employed and insured population were enrolled in managed care plans. This percentage increased to over 50% in 1994 and is expected to continue to grow rapidly (Davis, Collins, Schoen, and Morris, 1995; Dimmitt, 1995). Thus, providers of health-care coverage are faced with a more complex marketing problem. Their role under the indemnity insurance system is basically restricted to being the payor. However, an organization offering managed care coverage must also manage the delivery system. Management of a managed care organization must also make their product's features (e.g., limited physician networks, access to specialists by referral only, limited hospital networks, and precertification before hospitalization) palatable to the enrollee (Dimmitt, 1995). Successful marketing efforts for these organizations depend on having better knowledge regarding needs and wants in order to design a more desirable product for the target market (Case, 1989; Forgionne, 1985; Forgionne, 1991; Explosive Growth of Medicare, 1986; Weesner, 1990).

Growing Importance of Marketing Research for Management Decision Making

The primary mechanism for managers to learn about consumer needs and to monitor their evolving perceptions of health-care coverage options is marketing research. Researchers have used a number of techniques in attempts to understand the health-care coverage choices made by consumers. One such effort was the Employee Health Care Value Survey conducted on behalf of Xerox, GTE, and Digital Equipment Corp. during the fall of 1993 (Allen, Darling, McNeill, Bastien, 1994). The survey was completed by 24,306 employees and was used to develop methods for evaluating corporate health-care benefit strategies. This study made it possible to compare health plans on more than 60 criteria. Another similar effort was undertaken by the Commonwealth Fund in 1994 (Davis, Collins, Schoen, and Morris, 1995). In this

study, 3,000 adults were surveyed regarding their experiences choosing either indemnity or managed care plans and their satisfaction with those plans.

One approach to assessing perceptions is to have consumers rate individual plan attributes (Woodside, Nielsen, Walters, and Muller, 1988). Another approach has been to use open-ended questions that asked consumers why they chose a particular plan (Moustafa, Hopkins, Klein, 1971). Unfortunately, these two approaches fail to capture comprehensively and realistically the bases that consumers use when making health-care coverage decisions. This is because asking consumers to evaluate health plan attributes in isolation from the many attributes that enter into the health care coverage decision is unrealistic. Research has shown that health insurance decisions are based on evaluating combinations of multiple attributes (France and Grover, 1992). Research has also shown that self-reports of attribute importance often provide poor measures of the true importance of those attributes in the consumer's actual decision process (Ettensen, Wagner, and Gaeth, 1988; Fishbein and Ajzen, 1975).

Conjoint Choice Modeling

The limitations cited above have lead managed care marketers to use more sophisticated marketing research techniques to improve their level of understanding of consumer health plan choice behavior. A technique that promises to deliver better decision-making insights for managers is choice-based conjoint analysis.

Conjoint analysis is a multivariate technique used specifically to understand how respondents develop preferences for products or services. It is based on the simple premise that consumers evaluate the value or utility of a product/service/idea (real or hypothetical) by combining the utilities they associate with each level of the attribute. It is unique among multivariate models, because the researcher first constructs a set of hypothetical products or services by combining the possible attributes at various levels. These hypothetical products are then presented to respondents who provide *only* their over-all evaluations of the hypothetical products/service. Thus the researcher asks the respondent to perform a very realistic task—choosing among a set of products. Respondents need not tell the researcher anything else, such as how important an attribute is or their evaluation of the product on a number of attribute ratings. Because the researcher constructs the sets of hypothetical products/services in a specific manner, the importance of each attribute and each level of each attribute can be determined from the over-all ratings provided.

Having determined the contribution of each attribute to the consumer's over-all evaluation, managers take the following steps.

1. Define a health-care plan with the optimal combination of features.
2. Show the relative contributions of each attribute and each level to the over-all evaluation of the health-care plan.
3. Use estimates of purchaser or customer judgments to predict market shares among plans with differing sets of features (other things held constant).
4. Isolate groups of potential customers who place differing importance on the features to define high and low potential market segments.
5. Identify marketing opportunities by exploring the market potential for feature combinations not currently available.

A study by Chakraborty, Ettenson, and Gaeth (1994) illustrates how choice-based conjoint analysis can be used by managers to analyze consumer choice in a multiplan environment. The present research is an extension of this work. First, as suggested by Chakraborty and his co-workers, the present study uses a representative sample of all consumers in a geographic area instead of being restricted to employees of a particular state. Furthermore, the use of random digit dialing approximates a random

sample. Second, the use of both focus groups and quantitative methods to select and refine salient attributes and attribute levels in this study represents an additional improvement. Third, the attribute list and the means of defining and presenting attributes and attribute levels were modified based on consumer input.

Based on our analysis, a number of attributes used by Chakraborty, Ettenson, and Gaeth (1994) were eliminated. Other attributes not included in Chakraborty and his colleagues were added, and levels of several attributes were presented in ways we believe and the qualitative analysis shows are more understandable to consumers and more likely to elicit meaningful responses from them. This issues are discussed in greater detail in the presentation of results.

Finally, the present study carries the research to the next logical step, which is using choice-based conjoint analysis to illustrate how health-care coverage plans can be designed by managers to maximize customer appeal and optimize market share for the health-care coverage provider.

Methodology

The research was conducted in a metropolitan area with a population of more than 1,000,000 in the eastern United States. The research was conducted in five phases.

Phase One: Focus Groups

The first phase involved the identification of salient attributes or purchase criteria and the characteristics (relevant levels) of these attributes that the consumers use to select health plans. This phase used a series of eight focus groups in the target city. Participants were adult heads of household who currently had group health-care coverage through an employer. They were recruited at random by telephone and were offered a gratuity to participate.

Phase Two: Telephone Survey

Phase two consisted of a brand/image study of the current market. The first objective of this stage was to obtain demographic data, type of coverage, and self-stated or self-explicated importance ratings of the preliminary attribute list developed from the focus group findings. A second goal was to assess consumer images of the three major health-care coverage providers in the market. These organizations are referred to in the results section as Americare, Health Choice, and ProProvider. The actual names have been disguised to protect proprietary interests. A final goal was to recruit participants for phase three, the choice-based conjoint exercise that was to be sent by mail. A questionnaire was developed to address the objectives of phase two. It was pretested and refined to facilitate respondent understanding and to enhance the validity and reliability of their responses. Qualified respondents had to be 18 years of age or older and involved in making the health-care insurance coverage decisions for their households. They also had to be currently covered by group health-care coverage through an employer. All data were collected by means of central location telephone interviewing using a computer-assisted telephone (CATI) approach. A simple random sample with random digit dialing was used to ensure proper representation of individuals with unlisted numbers. The over-all completion rate with seven callbacks was 74%. In total, 800 interviews were completed with qualified respondents. This sample size produces a sampling error in the range of $\pm 3.5\%$ at 95% confidence.

Phase Three: Choice-Based Conjoint Exercise by Mail

The data gathered in phases one and two provided the input for designing the choice-based conjoint exercise. The 11 attributes and there associated levels were selected on the basis of the focus groups and the

telephone survey. These attributes and levels provide the basis for creating 87,480 unique products (figure obtained by multiplying the number of levels for each attribute together or $3 \times 3 \times 3 \times 3 \times 3 \times 5 \times 3 \times 4 \times 2 \times 3 \times 3 = 87,480$). Obviously, consumers cannot evaluate thousands of products. To make the task more manageable, a design was developed requiring respondents to evaluate only a very small subset of all possible products. Specifically, the design was based on 30 carefully selected choice sets of four product profiles each. The design was blocked into three groups. The final design required individual respondents to only evaluate 10 sets of four profiles. Respondents were randomly assigned to receive one of the three blocks of 10-choice sets. Each of the product profiles in the 30-choice sets is described in terms of specific levels of the 11 attributes identified through the focus groups and the telephone study. A list of attributes and attribute levels is provided in Table 1. A sample of one of the 30-choice sets is provided in Table 2. In summary, the exercise was as follows.

- Respondents were asked to evaluate 10 sets of four health-care coverage products described in full profile.
- The choice-based or discrete choice exercise involved having them indicate which product they would choose from each choice set of four products.
- They were asked to make their choice under the presumption that each set represented the alternative offered by their employer (see Figure 2 for a sample of one of these choice sets).

Table 1. Attributes and Attribute Levels Used in Study.

Attributes/Levels	Attributes/Levels
Carrier providing health care coverage	Cost per Dr. visit
Americare	\$10
ProProvider	\$25
National Company	\$40
Doctor quality	Prescription coverage
Excellent (top 10%)	Pay 50%, no max
Very good (top 25%)	Pay 50%, \$500 max
Good (top 50%)	Pay nothing, \$300 max
	Pay \$10 brand/\$5 generic
Hospital choice	Wellness visits
Any hospital	Covered
Two or three with Metro Hospital	Not covered
Two or three without Metro Hospital	
Monthly premium	Dental coverage
\$100 emp./\$300 family	Check-up with filling
\$150 emp./\$450 family	Check-up only
\$200 emp./\$600 family	Not covered
Physician network	Vision coverage
Choose any doctor	Eye exam and 50% eyewear
Half of the doctors with current personal doctor	Eye exam only
One-fourth of the doctors with current personal doctor	Not covered
Half without current personal doctor	
One-fourth without current personal doctor	

The data for Phase three were collected by means of a mail questionnaire that included one of three groups of 10-choice sets developed as previously described. Questionnaires were mailed to 708 respondents who agreed to complete the mail portion of the exercise in the phase two telephone survey. A mail survey was required because of the need to present the rather complex choice options to respondents so that they could make meaningful selections. A total of 506 consumers returned the mail survey. This produced an over-all response rate of 71.4%. This high level of response was generated with the

help of repeated reminder calls and incentives. In terms of incentives, \$5 was sent with the survey and respondents were given a chance to win one of four \$250 gift certificates. Reminders calls were made to those who did not respond within 3 weeks of the mailing.

Phase Four: Value or Utility Estimations

Conjoint analysis permits researchers to evaluate the tradeoffs that consumers make between product features. This is accomplished by having them evaluate and compare sets of products described in terms of multiple attributes and analyzing the choices they make. Based on the choices made by the respondents, it is possible to estimate the relative value or utility that respondents must have associated with each level of each product attribute to have made these choices. Weighted least-squares regressions was used to develop these estimates (see Table 3 for results).

Phase Five: Simulation of Market Response

The estimated utilities were then used to predict the percentages of consumers that would choose each product from sets including any combination of all unique products that can be constructed with attributes and attribute levels employed for this study. Products in a particular simulation run normally include those with profile (attribute levels) that march the profiles (attribute levels) of all major products in the market and at least one product with a profile matching a new product that the client organization is considering. The model predicts share for each product by estimating the value that each respondent associates with each product included in the particular simulation. This enables managers to predict market shares of various alternative plans.

For the simulations, we used a share of preference model. This model recognizes that consumers do not always choose the product that has the highest utility. One explanation for this suboptimal behavior is that they may buy without making the detailed calculations implicitly assumed in these models. They may make choices based on less precise evaluations of the utility or value offered by different products. However, on average, they are more likely to choose the product with the highest utility. The share of preference model assigns nonzero preference shares to all products based on their total utilities. The model uses a logit transformation to translate utilities into preference shares. The logit model we used is as follows:

$$P_{ik} = \frac{e^{bU_{ik}}}{\sum e^{bU_{jk}}}$$

where U_{ik} = the k th respondent's total utility for the i th product; P_{ik} = the preference for the i th product for the k th respondent; and b = constant estimated for each respondent; and, the sum in the denominator is for all products being simulated.

A second goal of the analysis was to identify and profile, based on demographic and psychographic characteristics, subgroups of consumers most receptive to certain types of health-care coverage products (e.g., those that do not require referral to see a network specialist). This analysis enables managers to segment the market based on consumer preference.

Table 2. Sample Choice Set

Attribute	Plan 1	Plan 2	Plan 3	Plan 4
Insurance Company	National	Americare	ProProvider	National
Choice of doctors	Choose from a list that includes 50% of the doctors in the area (1,000 doctors).	Choose from a list that includes 50% of the doctors in the area (1,000 doctors).	Choose from a list that includes 50% of the doctors in the area (1,000 doctors).	Choose from a list that includes 50% of the doctors in the area (1,000 doctors).
Your personal doctor	Your current personal doctor IS covered in the program.	Your current personal doctor IS NOT covered in the program.	Your current personal doctor IS covered in the program.	Your current personal doctor IS NOT covered in the program.
Quality of providers	Quality of affiliated doctors and hospitals is EXCELLENT—the top 10% in the area.	Quality of affiliated doctors and hospitals is EXCELLENT—the top 10% in the area.	Quality of affiliated doctors and hospitals is EXCELLENT—the top 10% in the area.	Quality of affiliated doctors and hospitals is VERY GOOD—the top 25% in the area.
Hospitals covered	Select from two or three hospitals in the area NOT including ABC Memorial.	Select from two or three hospitals in the area including ABC Memorial.	Select any of the eight hospitals in the area.	Select from two or three hospitals in the area including ABC Memorial.
Monthly premium	Employee only \$100/ employee and spouse \$200/ family \$300.	Employee only \$200/ employee and spouse \$400/ family \$600.	Employee only \$150/ employee and spouse \$300/ family \$450.	Employee only \$150/ employee and spouse \$300/ family \$450
Cost for routine doctor visits	\$25 per visit.	\$10 per visit.	\$40 per visit.	\$25 per visit.
Prescription coverage	You pay 50% of prescription costs. There is NO MAXIMUM limit on the amount insurance company will pay.	You pay nothing for the first \$300 in prescriptions. Above \$300 you pay the entire amount.	You pay \$10 for branded drugs and \$5 for generic drugs with no maximum limits.	You pay 50% of prescription costs. Insurance company pays a maximum of \$500 per year, above that you pay 100% of costs.
Physical exams, annual female exams, well baby visits, and immunizations	Not covered.	Covered.	Covered.	Not covered.
Dental coverage	Not covered.	Covers ONLY annual cleaning and check-up.	Covers annual cleaning and check-up, plus fillings. Does not cover braces and cosmetic items.	Covers ONLY annual cleaning and check-up.
Vision/eye care coverage	Covers eye exam every 2 years, but not eyewear.	Covers eye exam every 2 years, plus 50% of cost for eyewear.	Not Covered.	Covers eye exam every 2 years, but not eyewear.
Please circle the health plan you would prefer	Plan 1	Plan 2	Plan 4	Plan 4

It should be noted that before we ran any simulations, we checked our model and estimated parameters by seeing whether the model would correctly predict market shares for products currently available in the market (predictive validity). We did this by selecting product profiles that best represented current products and running simulations with those profiles. The model produced estimates that were remarkably similar to actual shares for the major products in the market.

Table 3. Choice Based Conjoint Results Showing Estimated Utilities, *p* Values, and Attribute Importance

Attribute	Importance	Utilities	<i>p</i> Value
Carrier providing health care coverage	0.05		
Americare		0.15	0.01
ProProvider		0.18	0.00
National Company		0.00	
Doctor quality	0.10		
Excellent (top 10%)		0.36	0.00
Very good (top 25%)		0.01	0.92
Good (top 50%)		0.00	
Hospital choice	0.06		
Any hospital		0.24	0.01
Two or three with Metro Hospital		0.18	0.01
Two or three without Metro Hospital		0.00	
Monthly premium	0.11		
\$100 emp./\$300 family		0.41	0.00
\$150 emp./\$450 family		0.20	0.01
\$200 emp./\$600 family		0.00	
Physician network	0.20		
Choose any doctor		0.73	0.00
Half of the doctors with current personal doctor		0.59	0.00
One-fourth of the doctors with current personal doctor		0.59	0.00
Half without current person doctor		0.23	0.02
One-fourth without current personal doctor		0.00	
Cost per Dr. visit	0.13		
\$10		0.48	0.00
\$25		0.15	0.01
\$40		0.00	
Prescription coverage	0.13		
Pay 50%, no max		0.13	0.09
Pay 50%, \$500 max		0.10	0.14
Pay nothing, \$300 max		0.00	
Pay \$10 brand./\$5 generic		0.50	0.00
Wellness visits	0.11		
Covered		0.42	0.00
Not covered		0.00	
Dental coverage	0.07		
Check-up with fillings		0.26	0.00
Check-up only		0.06	0.36
Not covered		0.00	
Vision coverage	0.04		
Eye exam and 50% of eyewear		0.15	0.02
Eye exam only		0.13	0.11
Not covered		0.00	

Results

Attributes and Levels

The attributes and their associated levels are shown in Table 1. There are 11 attributes identified by means of the process described in the Methodology section. The qualitative exercised used included

having participants name the most important features and attributes. The focus group tapes were carefully reviewed, and the items mentioned, their frequency of mention, and the discussion of each item were carefully noted. In addition, after completing the open-ended exercise, participants were asked to rate the importance of each of the items mentioned in the discussion on a 10-point scale where 10 was defined as “very important and 1 was defined as “very unimportant. The 11 attributes listed in Table 1 emerged as the key drivers of consumer choice among health-care coverage alternatives on the basis of the qualitative and the more structured exercises previously described. In addition, the list was further refined on the basis of the attribute rating obtained from the telephone survey.

Although we used the attribute list developed by Chakraborty, Ettenson, and Gaeth (1994) as a point of departure, our list differs markedly from theirs. First, a number of attributes were eliminated. For example, the attributes *waiting time in physician’s office* and *office hours for physicians* were dropped, because in an IPA environment, these items are outside the direct control of the health plan. (IPA stands for independent practice association. An IPA is made up of independent physicians that contract with the HMO to provide care to its members. Members of the IPA may contract with other HMOs’ managed care plans. Members of the IPA are not employees of the HMO and operate from their own offices.) The attributes *travel time to physician* and *travel time to hospital* were dropped based on analysis of distances and travel times for various physician network scenarios. This analysis indicated that the various network configurations for physicians and hospitals would have no significant effect on travel times in comparison to those found in a *no network* (go to any physician or hospital) situation. The attribute *wellness and education programs* was dropped because of its very low importance in Chakraborty and colleagues and in the focus groups and telephone interviews we conducted. The same was true of *communication with plan participants*. *Coverage for hospitalization* was dropped, not because it was unimportant, but because it is not a point of difference between plans. All health-care coverage programs in the market, indemnity and managed care, provide high levels of coverage for hospitalization.

In addition, we modified the way in which several sets of attribute levels were presented to make them more meaningful to consumers. For example, Chakraborty, Ettenson, and Gaeth (1994) included *hospital choice* in their attribute list as we did. However, they presented this attribute as *quality of affiliated hospitals* and offered *excellent*, *very good* and *good*. Others have noted that the use of terms such as *excellent*, *very good*, and *good* to describe quality attributes is not desirable (Moore and Pessimer, 1993; Hu, 1996). In the focus groups and in the initial telephone interview, we asked participants to name the best hospital in the market and to rate all of the hospitals in the market in terms of quality. Based on this analysis, we identified one clearly outstanding hospital in the market. There was little difference in the perceived quality of the remaining four. Therefore, our presentation of the hospital attribute was based on having different combinations of two of four hospitals with similar quality ratings with and without one hospital perceived as outstanding.

We also changed the way the dental coverage attribute was presented. The levels in the Chakraborty, Ettenson, and Gaeth (1994) study are *full coverage*, *preventative and diagnostic coverage only* and *not covered*. Our analysis showed that consumers did not understand what was included under the attribute *preventative and diagnostic coverage only*. This was evident in the focus groups and the initial telephone interview. Therefore, we used terminology that we found consumers more readily understood. The levels we used are *check-up and fillings*, *check-up only*, and *not covered*. Similar comments can be made in regard to other attributed. The basic point is that we tested the levels and identified levels that were clear and meaningful to target individuals.

Telephone Survey Results

The telephone survey had a number of objectives. First, we compared the characteristics of the sample with known characteristics of the market. This analysis showed that the characteristic of consumers in our sample closely matched the characteristics of the commercially insured population in the market.

This was true in regard to demographic characteristics (percentage male/female, income distribution, age, etc.) and psychographic characteristics (percentage in different PRIZM clusters). In addition, the percentages with different types of health-care coverage in the sample was very similar to the actual percentages in the market. HMO coverage of the IPA type is the dominant coverage type, with most two-thirds of the surveyed sample reporting they have this type of coverage. Finally, market shares for the major health-care coverage providers in the sample generally match the actual percentages for those organizations in the market. These findings lead to the conclusion that the sample obtained provides an appropriate basis for the analysis to follow and for extrapolation of that analysis to the total market.

Second, the telephone survey results provided information that proved very useful in attribute selection and refinement and attribute level selection. Changes in the attributes and attribute levels that were at least partially based on the attribute importance ratings from the telephone survey were discussed above.

Choice-Based Conjoint Results

The results from the aggregate weighted least-squares regression (Louviere and Woodworth, 1983) model, used to estimate utilities, are provided in Table 3. All of the attributes were found to be statistically significant ($p < .10$ or better) in determining customer choice. The most important attribute is the *physician network size/physician choice* attribute followed, in order of importance, by *prescription drug coverage*, *cost for routine doctor visit*, *coverage of wellness visits*, and *monthly premium*. The *network size* and *physician choice* (choose any physician/choose from list of physicians provided by the HMO) attributes were consolidated in the estimation process. These are the five most important plan features for target consumers in the market. The second five, from the highest to the lowest importance are *doctor quality*, *dental coverage*, *hospital choice*, *company providing coverage*, and *vision coverage*.

The preeminent role of the physician is indicated by the very high importance that consumers assign to the freedom to *choose any doctor* in their decision-making process. This attribute has the highest utility of any attribute level of the 32 tested. The results show that, as might be expected, smaller and more restrictive networks do not present a problem, as long as the individual's physician is included in the network. Obviously, the smaller the network, the less likely it is that a particular individual's physician will be included. The real issue is whether or not a more restrictive network forces the individual to change physicians. Examining the utilities associated with the doctor quality attribute indicated that limiting choice cannot be compensated for by high clinical quality if consumers are forced to change doctors.

Prescription drug coverage is second in importance. Consumers expressed a strong preference for a prescription drug benefit with fixed co-payments of \$10 for branded drugs and \$5 for generic drugs and no annual limit. The other alternatives all included relatively low annual limits or heavy out-of-pocket costs.

The *cost of a doctor visit* is the third most important attribute with the \$10 co-payment by far the most preferred level. *Coverage of wellness visits* (annual physical, annual female exams, and well-baby visits) is fourth in importance. *Monthly premium* rounds out the top five attributes. The one thing all these attributes have in common is that they relate to, for the most part, routine visits and services. These are the services that nearly all consumers expect to use and expect other family members covered by the program to use over the period of a year. Obviously, these are features that must be successfully addressed in any new product.

Interestingly, although there was much discussion of the importance of quality in the focus groups, the *doctor quality* attribute was only sixth in importance. This attribute was presented to consumers as a clinical quality measurement, which is the only real measure of physician technical quality available today. It seems that nearly all consumers believe that their current physician is a quality physi-

cian, and the focus of group discussion suggested that they were somewhat skeptical of physician quality measurement being used by hospitals and managed care organizations today.

A *dental benefit* offering coverage for check-ups and fillings is seen as valuable to consumers, although the attribute is seventh in importance. *Hospital choice* is far less important to consumers than doctor choice. Many recognize that when they choose a physician they are effectively choosing a hospital, because their primary care physician probably has staff privileges at only one or two hospitals. In addition, may recognize that their physician is likely to refer them to specialists affiliated with those same hospitals.

In this particular market, with a very limited number of companies offering health-care coverage, *brand name* of the health-care coverage provider is ninth in importance. The importance of this attribute may be significantly greater in other markets with different sets of health-care coverage providers. Of the attributes tested, *vision coverage* is last in importance. We hasten to add that this does not mean that it is an unimportant attribute, only that it is last in importance among the salient attributes. This attribute could be an important basis for differentiation in a situation involving products that are the same or similar on other salient attributes.

Market Simulations

One of the great advantages of the conjoint analysis approach from a managerial perspective is that, in addition to providing estimates of the value consumers associate with various product features, it also provides a tool that can be used to simulate market response to different product offerings. Simulations can be done for new products being considered by the company sponsoring the research or for new products introduced by the competition. The estimated utilities provide the basis for estimating market shares for competitive products or different versions of new products being considered by the sponsoring organization. All that is required is to define the products to be included in the simulation in terms of specific levels of the attributes and the attribute levels in question.

There are several steps in the process of running the market simulation. First, it is necessary to identify the product profiles that match the existing products in the market place. In other words, we need to describe the current products in terms of the attributes and attribute levels used in the study (see Table 1). The market where this research was conducted is perhaps unique, given that only three companies, each offering a single product at the time of the study, controlled nearly 90% of the group health-care coverage business. These products are offered by fictitious companies Americare, ProProvider, and National. Attribute levels for these three products are shown in Table 4.

Second, the sponsor of the research, ProProvider, wanted to use the results to estimate the market potential for a new product. The new product differed from existing products, because it was based on a more limited network of the highest quality physicians in the market. The identification of physicians for this limited network product was based on clinical measures of technical quality. The initial product design for the new ProProvider product is shown in Table 4 along with the profiles for the three existing products in the market. Of course, ProProvider management was very interested in determining the extent to which the new product would take market share away from its existing product, as compared to the extent to which it would take market share from competitive products.

Third, after profiling the existing products and the new product, we ran the market simulations. For the simulations, we used the share of choice approach and an additive model. However, before running the simulations for the existing products and the new product, we ran the simulation for the existing products only. This was done to evaluate the predictive validity of our model. If the model produced results similar to the known market share for the three existing products, then we could feel more comfortable about using it as a tool to estimate the potential for the new product. The results of this exercise,

shown in Table 5, indicate that the simulation model using the estimated utilities produced estimates of the market shares for the three existing products very similar to the known market shares for these products.

Table 4. Profiles for Existing Product and New Product

Attribute	Americare	National	ProProvider	ProProvider New
Carrier providing health care coverage				
Americare	X			
ProProvider			X	X
National Company		X		
Doctor quality				
Excellent (top 10%)		X		
Very good (top 25%)	X		X	X
Good (top 50%)				
Hospital choice				
Any hospital				
Two or three with Metro Hospital	X	X	X	
Two or three without Metro Hospital				X
Monthly premium				
\$100 emp./\$300 family				X
\$150 emp./\$450 family	X	\$175/\$525	X	
\$200 emp./\$600 family				
Physician network				
Choose any doctor		X		
Half of the doctors with current personal doctor			X	
One-fourth of the doctors with current personal doctor				
Half without current person doctor	X			X
One-fourth without current personal doctor				
Cost per Dr. visit				
\$10				
\$25	X		X	X
\$40		X		
Prescription coverage				
Pay 50%, no max		X		X
Pay 50%, \$500 max	X			
Pay nothing, \$300 max				
Pay \$10 brand./\$5 generic			X	
Wellness visits				
Covered	X		X	X
Not covered		X		
Dental coverage				
Check-up with fillings				
Check-up only				
Not covered	X	X	X	X
Vision coverage				
Eye exam and 50% of eyewear				
Eye exam only				X
Not covered	X	X	X	

Estimated market shares for the existing products and the new ProProvider product (see Table 4 for definition) are shown in the first line of Table 6. These results show that the new product can be expected to garner a market share of 13.6%. Review of results (compare actual shares in second line of Table 5 to estimated shares in first line of Table 5) shows that 3.3% comes from the current ProProvider product, 7.3% comes from Americare, and 3.0% comes from National. In total, 10.3% comes from the competition and only 3.3% comes from ProProvider and that ProProvider's total share increases from 19.2 to 29.5%.

Table 5. Actual and Estimated Market Shares

Group	National	Americare	ProProvider Current
Estimated	29.5%	51.3%	19.2%
Actual	31.2%	48.7%	20.1%

The simulation model can also be used to estimate market share for the current and new products in different subgroups. A sample of the results for this type of analysis is provided in Table 6. Results are shown for those under 35 and those over 55 years of age and for two different psychographic groups as defined by PRIZM clusters. Finally, the model can be used to estimate the effect of market share of various changes in the specification of the new product. Some sample results are shown in Table 7.

Table 6. Estimated Market Shares

Group	National	Americare	ProProvider Current	ProProvider New
All	26.5%	44.0%	15.9%	13.6%
Under 35 years	25.1%	33.8%	16.3%	24.9%
Over 55 years	28.8%	43.9%	17.8%	9.5%
PRIZM S3	9.9%	44.6%	22.1%	23.4%
PRIZM R3	19.8%	27.2%	28.4%	24.6%

Health-Care Marketing Management Implications

The market for health-care coverage is characterized by intense competition at all levels. Cost of health-care services and coverage are not likely to decrease dramatically in the near future. As a result, consumers are likely to become even more discerning when making health-care coverage decisions. Thus, the key to survival of any health-care coverage provider in the long run is high-quality decision-making information. This paper illustrates how managers can use carefully developed information to satisfy target consumers and improve their market positions. This paper also illustrates how managers can alter the attributes of their products and estimate how that impact these changes will have on market share. They can, of course, modify their products by adding benefits not previously offered (e.g., vision benefits) or by modifying the level of existing benefits (e.g., prescription coverage).

Table 7. Predicted Market Share for ProProvider New Product Based on Adding \$10 Brand/\$5 Generic Prescription Co-pay Benefits Plus Other Changes

Other Modifications	Estimated Share
No change in premium	18.9%
Increase premium to \$130	17.0%
Increase premium to \$130	15.8%
Increase premium to \$130	13.4%
No vision coverage, \$100 premium (base)	17.0%
No vision coverage, \$150 premium	14.1%
No vision coverage, \$200 premium	11.9%

Once managers understand how target consumers will react to different features of their products, they can use this knowledge to promote the most desired features of their existing products and downplay the less attractive features. This “repositioning” of an existing plan can provide a strategic advantage.

Alternately, managers may attempt, through promotion, to alter the importance target consumers place on a specific attribute (Fishbein and Ajzen, 175). For example, physical and occupational therapy was generally perceived as a less important feature of a health plan in this research. If an existing plan includes this provision, and management has decided not to eliminate it, then they may be able to use

market communications to change the importance of the feature in the mind of target consumers. For example, market communications might feature the benefits and necessity of occupational therapy after a serious accident or hip replacement surgery.

The use of choice-based conjoint analysis helps take the guesswork out of health plan design and promotion. By offering insight into consumer reactions to various health plan choices, the research program presented in this article can help increase consumer satisfaction, while also helping the health plan organization reach its objectives. The elimination of reactive and *ad hoc* decision making raised the effectiveness and efficiency of health plan management.

Limitations

One limitation of the present study is that the sample of respondents was drawn from a single geographic market. Therefore, care should be taken in generalizing the specific results of this research to other geographic markets of interest. First of all, competitive conditions and the products offered may be quite different between the area where the research was conducted and other areas. Second, attributes other than those included in the present study might emerge as salient in other areas based on differences in competitive environments, products offered in the market, or other factors. Finally, the importance of the attributes and utilities associated with various levels of the attributes may vary markedly from those found in this study. However, the basic methodology is general and can be readily applied in other markets.

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