Foldback Analysis: A Method to Reduce Bias in Behavioral Health Research Conducted in Cross-Cultural Settings

Gregory P. Loos
University of Hawaii at Manoa

Although quantitative methods used in epidemiology and biostatistics are useful for assessing health care needs and the effects of research interventions on improved health status, qualitative methods have long been advocated as the approach of choice to assess health behaviors. Unfortunately, many qualitative methods used are cumbersome and not easily measurable. The author presents an approach, foldback analysis, that combines better the rich detail provided by qualitative studies with the numerical preciseness of quantitative analysis. The individual methods used in the foldback process are not new, but the multimethod combination and sequence is distinct. This article presents the methodology discussing each subprocess and describing the experiences of the author using foldback analysis in health behavior research in cross-cultural settings.

HEALTH BEHAVIOR RESEARCH

> In the history of human thinking, the most fruitful developments frequently occur at those points where different lines of thought meet. These lines may have their roots in different cultures, in different times, in different religious traditions. If these are allowed to meet . . . a new and interesting way of being will emerge. (Heisenberg, 1974, p. 16)

Health behavior research is a part of health systems research in its scope and purpose. It is concerned with finding out what people know, believe, think, and feel about health, and how such cognitive and affective bases are related to what they do (McElroy & Townsend, 1979). A fundamental principle of health behavior research is that the researcher needs to keep in mind the perspectives of the study population and to evaluate people's health behavior in terms of their concept of health uncolored by his own belief system and concepts (Graeff, Elder, & Mills Booth, 1993).

The linkage between individuals and society begins with understanding the felt needs and values of the people living in communities. "Cultural

Qualitative Inquiry, Volume 1 Number 4, 1995 465-480

relativity is the idea that any behavior must be judged first in relation to the context of the culture in which it occurs" (Randall-David, 1989, p. 78). Thus health workers must first relate to the community's interpretations of health and illness from the people's cultural background and belief system before they can intervene effectively (McKenzie & Jurs, 1993). With this in mind, health behavior research affords a viable addition to the epidemiological arsenal necessary to understand both health and disease, as well as to develop cost-optimal interventions founded on the values of the community. Cultural values are the standards that people use to assess themselves and others. A cultural value is a widely held belief about what is worthwhile, desirable, or important for well-being (Kavanagh & Kennedy, 1992).

The salient reasons for studying consumer health values and behaviors, and consumer-provider interactions, are the proximate, operational, and determinant roles they play in the effectiveness of health intervention efforts (Ruzak, 1993). In a specific research context, these sociocultural and attitudinal factors could be considered dependent, intervening, or independent variables (Coburn & Pope, 1974). Regardless of study purpose, however, appropriate methods are needed to describe and interpret accurately the nature of the interface between professional public health and the perceived needs of the community; this is especially true when we are considering the bridge between Western service models and multicultural communities central to the study of international health.

Cross-cultural and client-provider exchanges reflect and are shaped by fundamental differences in the status, power, and culture of the participants in the encounter; these latent dimensions are perhaps even more important in traditional societies (World Health Organization [WHO], 1987). "A cultural broker is a mediator between people or groups from two cultures. In a health care setting, this person understands both the health care beliefs of the client and family as well as the perspective of the biomedical health care culture" (Randall-David, 1989, p. 78). Health behavior research methods must be developed that will record accurately and measure precisely the study population's health values and beliefs without them being distorted by the biases of the researcher; that is, health behavior research must be based on a biopsychosocial model of health (Douglass, 1971); it is concerned with the origins and causes of human behavior in relationship to social, economic, cultural, and behavioral changes affecting health (Michal-Johnson & Bowen, 1992). Study methods are needed to understand the cognitive maps of individuals, providers, and consumers that readily reflect the relationship among and disparities between group cultural values, personal attitudes, social status, and power, because these and other factors can all influence individual health behaviors (Tones, Tilford, & Robinson, 1990).

Foldback analysis, the study approach discussed in this article, is multimethod research interweaving qualitative data collection and analysis strategies to develop and explain survey research. It includes semistructured

or open-ended interviewing, nominal group dialogue, survey and attitude scaling techniques, and multidimensional and cluster analyses used in sequence, where each method is "folded back" into the interpretation of results from the other methods, thus combining the assets and helping to overcome the weaknesses of each method. As such, it is useful for the study of health behavior, particularly in a cross-cultural context.

THE USE OF QUALITATIVE METHODS IN HEALTH BEHAVIOR STUDIES

Qualitative methods are best conceptualized as a variety of interpretive techniques that seek to explore, to describe, to decode, to translate, and otherwise to come to terms with the meaning, not the frequency, of certain social phenomena. As such, qualitative methods are not constrained by predetermined categories of analysis; therefore, they contribute to greater depth, openness, and detail in the inquiry. This is precisely what is needed in the study of determinants of health behaviors that might be culturally influenced. Unlike quantitative study methods that begin with well-defined study questions and procedures and focus on the end results of the study, qualitative studies evolve and are focused primarily on the study process. Indeed, many of the study questions are not known until the study is under way (Guba & Lincoln, 1994).

Health behavior research grounded in the values of the target community promises to have great potential for improving health education, research, theory, and practice (McKinlay, 1992). Unfortunately, commonly used quantitative community assessment methods (e.g., aggregate rates of occurrence, survey research) seldom include qualitative "felt need" data from the perspective of the public (Bradshaw, 1977). Even when attempted, the often employed KAP (knowledge, attitude, and practice) pretest/posttest approach has been demonstrated to have high levels of error (Kotler & Roberto, 1989). Indeed, few qualitative study methods are not without their detractors (WHO, 1987).

What is needed is a study approach that marries the cold preciseness of quantitative data with the richness of qualitative data in a systematic manner, that is, a study method that will focus culturally sensitive health interventions by reducing information-rich qualitative data into objective and measurable categories that can be easily manipulated to establish service priorities and to assess health service outcomes from the perspective of the service community. This is particularly true in developing countries and with minority populations where health service resource allocations are limited and where health status needs are great, thus demanding greater precision in the expenditure of fixed assets. Historical deductive methods, popular with the professional medical community, cannot guarantee that they will identify needs and prescribe interventions that are supported by the service community. These

TABLE 1: Foldback Analysis for Small Space Analysis

Conduct, tape, and transcribe one-to-one or focus group interviews, using a "funnel" series of open-ended questions (10-20), with a purposeful sample (N = 20-30) drawn from the target population.

↓

Analyze the content of interview transcripts using a nominal group (N = 8-10) also drawn from the target population but using a different sample from Step 1 above.

↓

Conduct large sample survey (N varies) using attitude-scaling instrument developed by members of the target community.

↓

Construct three-dimensional value maps using multidimensional scaling and cluster analysis.

↓

Define and label value dimensions, and plan community interventions, using a second nominal group (N = 8-10) drawn from the target community

methods emphasize hypothesis testing with little attention devoted to inductive approaches aimed at generating culturally based hypotheses and concepts. The methodology advocated in this article, foldback analysis, promises to correct these shortcomings.

The foldback analytic research model explains health behaviors in rational terms with minimal external bias, but with no lack of procedural rigor. It is a blended assessment model developed and refined by the author, using both qualitative and survey methods to identify and map community health values, and then to improve planned health interventions by making them more culturally acceptable.

FOLDBACK ANALYSIS

This approach to health behavior research has been developed by the author and his international health students through a series of studies conducted during the past several years. A combination of qualitative and quantitative techniques are used in series and iteratively in a foldback analysis throughout the assessment process. At the onset, a survey instrument is developed using a series of procedures, where results from earlier steps are folded back into the formation of the final instrument. Then, as survey results are analyzed, earlier qualitative data are used to interpret the findings (see Table 1). Throughout, the target community is engaged to help translate the results at all stages of the analysis.

Although none of the individual procedures used at each stage of the process are unique, the combination of these techniques into a single study approach is new, and this combination affords both a richer and more usable database than any of the procedures used alone. The foldback analysis of issues raised during initial interviews with the target population, and then selected during the first nominal group process, provide the foundation for the development of the survey instrument used with a larger sample of respondents and later in the interpretation of survey results (Erlandson, Harris, Skipper, & Allen, 1993).

This process is distinct to foldback analysis and is used to reduce the opportunity for inadvertent researcher bias in the study process. To further reduce bias, participants from the study community are engaged wherever possible to assist in the development of study procedures, the collection of data, and the analysis of results. Using typically anthropological methods for health behavior research reduces the opportunity for professional bias and affords a "transdisciplinary" approach for the "definition and analysis of the social, economic, political, environmental, and institutional factors influencing human health and well-being" (Rosenfeld, 1992).

One of the major differences between qualitative and quantitative research is the way in which the study sample is selected. Quantitative research focuses on random sampling selection and representativeness. Qualitative samples, in contrast, are typically smaller and are purposefully selected because they are apt to provide information-rich data about the study subject (Kuzel, 1992). Our studies are initiated using small purposeful samples for the initial interviews and the nominal groups; later survey respondents are randomly drawn and larger in number to reflect the profile of the study community.

Interviews

The initial sample of respondents are purposefully drawn from the target population primarily because they are information-rich informants, yet representative of the community profile and ideal participants for the interviews conducted at the onset of the foldback study process (Isaac & Michael, 1989). Interviewing is a qualitative data-gathering technique. It differs from ethnography because the researcher is not expected to participate in the life of the interviewee or live among the target population (Maple, 1985). In our work with foldback analysis, however, interviewers are most often selected from the target community because of their demographic similarity (e.g., age, sex) to the study population. Interviewing also differs from survey research used later in the foldback process by encouraging interaction between researcher and interviewee to discuss, to clarify, and to probe at length into the study topic.

In studies conducted by the author, it was found best to meet with the interviewees in a setting where they felt comfortable and to tape-record their

responses to avoid inadvertent filtering-out of information by the interviewer. Typically, 20 to 30 interviews are sufficient, because repetitive and therefore commonly held aspects of answers to the questions posed become noticeable in the transcripts, and singular or idiosyncratic responses will be recognized as a minority point of view.

Open-ended interviews are particularly well suited to cross-cultural research with less-developed peoples, because orality is a more common form of discourse in many of these populations. We have found that respondents from less technically advanced communities are more likely to launch into lengthy discussions of their feelings and beliefs when the interview is conversational and held in a setting familiar to the interviewee. Although each individual will express him- or herself differently and cite personal aspects related to the study issue, a striking finding we have noticed in our studies is the uniformity of issues raised among members of the same study population when discussing key points central to what unites them as a study group. Careful listening allows the interviewer to introduce nondirective probing questions as the interview proceeds. Thus our open-ended interview techniques are inductive and nonstandardized and may be used to explore people's views of reality and to allow the researcher to generate or test hypotheses, or both.

The open-ended questions may either proceed from the general to the specific, or vice versa; in our studies, however, we have found a "funnel approach" best, that is, from a more general focus to the specific. Using this approach, an icebreaker question is first posed that is easy to answer, thus encouraging openness and conversation. Further, earlier posed questions skirt the key issue(s) and thus avoid tipping our hand in an effort to generate a broad base of related information affording us a wider perspective of the study issue. As in a funnel, information provided at the onset of the interview becomes increasingly more focused as later questions grow more specific and broach the study topic.

Open-ended interviews at the front end of the foldback study process are designed to be conversational and to afford greater connectedness between the researcher and study subjects, thus allowing respondents to be involved more actively with the research (McCracken, 1988). This is preferred because study issues can be described in the language of the interviewees, preserving their vernacular and perceptions. This interviewee-guided investigation of a lived experience is crucial to the particular value of foldback analysis in health behavior research because later stages of the process reduce and quantify the data and meaning is easily lost without the ability to return to the information-rich interview transcripts.

We find that our open-ended questions are best when they are devised in consultation with members of the community, are pilot tested in the community, and are refined before being finalized. We also use these opportunities

to train interviewers from the community to conduct the survey. Questions are piloted extensively with subjects, and interviewers are groomed using audiotape-recorded and videotaped sessions, where their voice tone, inflection, and body posturing can be studied to determine how best to engage subjects and draw responses from them. Training varies in length based on the subject matter, prior experiences, and the natural talent of interviewers, as well as on the type of study population. For example, in one study focused on the needs of severely disabled mentally ill adults, using clients as interviewers, it required numerous trials and coaching sessions. Again, in a second study comparing the needs of pregnant and parenting teens with the needs of parents of older age, the teen interviewers required twice the number of trials than did the interviewers of older age.

Although not easy to accomplish, we strive to engage but not lead or help the respondent to answer questions. Equally, because we are interested in the point of view of the interviewee, we disallow researcher self-disclosure, believing that the interviewer's comments might unduly influence the content and tenor of comments made by the interviewee (Maple, 1985).

The choice to use one-to-one or focus group interviews is something else that is tested beforehand to determine if responses are qualitatively different and richer using one or the other method (Morgan, 1991). For example, with some topics, conversation may be either suppressed or enriched in a group situation. During interviewer training and pilot testing of the interview questions, we use both methods interchangeably to determine whether we get qualitatively different answers and if either approach produces greater participation and content. A second consideration is the time required to coordinate a group meeting versus the time necessary to conduct multiple separate interviews.

Nominal Groups

Although we advocate that open-ended interviewing is important for correcting the patriarchal bias of quantitative research in health behavior studies (McElroy & Townsend, 1979) and that interview transcripts provide a vivid portrayal of the study issue as viewed by the subject population, the wealth of interview data is too cumbersome for analysis and must be reduced systematically; however, this reduction must be accomplished without great loss of quality and accuracy. Therefore, the information-rich data from the initial qualitative sample are first transcribed verbatim and then analyzed using nominal group techniques, with a second qualitative sample from each community that is used to reduce and categorize the wealth of interview data into meaningful clusters of information. Nominal groups are asked to itemize issues found in the transcripts and to assemble issues, keeping the language,

vocabulary, and vernacular consistent with that of the target population. These clusters are then folded back to develop the survey questionnaire that is used with the larger, randomly drawn sample in each community.

Nominal group techniques provide a structured group process for qualitative issue exploration, which is particularly applicable to the subjective and judgmental character of the perception of health and illness. In combination with the initial in-depth interviews, the nominal group process affords a qualitative understanding of the major parameters of targeted issues as perceived by the reference population and an organized approach to the development of later, large-sample data-collection measures.

Juxtaposed between the interviews and the large sample survey, and again following the survey, in order to assist with the interpretation of the survey results, nominal groups are used to study the cultural interpretation of the data through the lens of the target community. Inductive or interpretive content analysis by the nominal group selected from the target population reduces the opportunity for researcher bias. In foldback analysis, the nominal groups are asked to conduct a series of content analyses to distinguish objects, events, and relationships systematically by counting them or interpreting the themes contained in the interview transcripts and later in the survey results.

Unlike brainstorming, nominal groups are far less freewheeling and interactive and far more structured; therefore, they are considered to be "groups in name only" (Van de Van & Delbecq, 1972). In foldback analysis, the nominal group technique is used with groups having varied opinions, or among different stakeholder factions in a community, or where certain group participants tend to overshadow others, in an effort to give equal weight to each participant's point of view.

In a face-to-face meeting, a group facilitator presents an issue for consideration by the nominal group, for example, "What needs did you hear stated frequently in the transcripts?" Using this initial statement, group members respond following a prescribed series of steps and group rules for interaction, for example, allowing a limited time for individual responses and disallowing interruptions or negative comments regarding the ideas raised by other nominal group members. These "ground rules" are discussed and agreed on by the group before they begin analyzing the transcript data.

Typically, in a round-robin or turn-taking fashion, selected aspects of the study issue are discussed in sequence, with each participant afforded a limited period of time to express an opinion. The facilitator records[1] and posts comments for the group to view.[2] Finally, using rank ordering, item scoring, or a similar process, groups decide among the alternative ideas discussed (Loos, in press).

Using these processes throughout foldback analysis with participants drawn from the target community, the nominal groups are requested (a) to read transcripts from the initial interviews to identify key issues and to group

issues by common themes; (b) to formulate, to pilot, and to refine a survey instrument using the issues identified in consultation with the researcher; and later in the study, after the survey is administered, the group is reconvened (c) to interpret survey results; (d) to label identified value dimensions; and (e) to plan service interventions.

Survey Method

Because qualitative study methods, such as interviews and nominal groups, are a labor-intensive and thus costly study methodology, they must be limited typically to a small purposeful population. This can allow untested generalizations to develop. To offset these shortcomings of small sample size, there must be appropriate quantitative evidence to compare and track issues that the nominal group identifies from the interviews. In our health behavior studies using foldback analysis, we used survey research for precisely this purpose, that is, to dispel the complaints common to qualitative methods that statements of a particular respondent are idiosyncratic. Survey research can also be used to measure the magnitude of values surrounding issues, to weigh and rank-order the importance of these issues, and to measure changes in values over time and across publics.

Using the behavioral issues identified and clustered during content analysis by the nominal group and in the terminology used by the interviewees, an anthropologically based, community-centered scaler attitude survey instrument is developed, piloted, and refined. The researcher, in cooperation with community groups, field-tests the survey instrument and makes formatting changes, but no wording of items or other changes are made without the prior consensus of the nominal group.

Because statistical techniques exist for generalizing from a small sample to a larger population, surveys are used to provide data for statistical analysis. Survey-based prevalence data are useful for demonstrating how an issue is distributed in a particular way in the target community. Distribution profiles may suggest factors that contribute to the issue and how best to intervene to shape the issue (Isaac & Michael, 1988). Statistics developed from survey data are powerful in part because they are concise and easy to comprehend and remember. Their brevity makes them easily communicated to policymakers, the media, and stakeholder groups and thus affords a legal force that the interview and nominal group data lack.

Attitude Scaling and Analysis

By incorporating attitude scaling into our surveys, we increase the level of statistical analysis that can be undertaken (Henerson, Morris, & Fitz-Gibbon,

1987). Whereas statistical descriptions are blunt and often colorless, attitudinal studies are important to health behavior research because they allow one to demonstrate (a) value constructs that underlie survey responses and (b) the specific reasoning influencing the decision making of the survey participants. As such, they are more qualitative than survey statistics alone, but more concise and measurable than the original interview data.

Multidimensional attitude scaling (MDS) and cluster analyses provide a means to map community values. Three-dimensional value maps permit the researchers to visualize the structure of values and how individual value subsets (e.g., health, child care) relate to other subsets (e.g., income, education). More important, the multidimensional scaling provides an estimate of how much variance underlying the development of values rests on each dimension.

MDS is a procedure for transforming ratings of similarity or preference into a three-dimensional graph or map. As such, large and complex data sets can be reduced for easier comprehension and interpretation. When the progression of items along each dimension is studied from items at one end point to items at the opposite end point, each dimension is given an arbitrary label. These dimensions intimate common value structures that underlie survey respondent answers.

This interpretation is possible using MDS because the two- and three-dimensional plots are formed after several iterations of individual (unidimensional) rank orderings of the data by each respondent, achieving the best fit honoring the response pattern of each person. Unlike factor analysis, which considers the best fit of stimuli, MDS seeks to find the best fit for the responses of subjects. By viewing the multidimensional maps created by MDS, respondent preference vectors can be located by considering the alignment of stimuli and subjects, and labeled intuitively by viewing the items at opposite ends of each dimension on the plots and determining how they differ. These end points (e.g., named stimuli) note the opposite extremes of a common value dimension of the entire sample because they accommodate the responses of each individual in the sample but present them as an aggregate whole. In our studies we have frequently used *MDPREF* (Carroll & Chang, 1968), now incorporated as part of the *Statistical Package for Social Sciences* (*SPSS*).

MDS produces a visual and quantitative representation of the data, which can be analyzed by the researcher solely as a test of a hypothesis, can be returned to for further exploration and commentary by informants (Johnson, 1990), or both. In foldback analysis, we do both. The rank ordering or scaling of issues by survey respondents produces an unconstrained aggregate array of data that is representative of a cultural taxonomy, which can than be transformed into individual and composite distance matrices using MDS analysis (Subkoviak, 1975). The aggregate matrix produces an averaged group view of the relationships among variables. MDS arranges survey stimuli and respondents in two- and three-dimensional space around the

value center of the community. This information provides health service agencies with needed insight into the structure of community-based values as they relate to health care, enabling them to understand better health-related behavior and tailor health services using values most central to the community.

Surveys and attitude scales can be powerful tools, but their information can be misused precisely because of the great authority they carry. Survey-based information can be erroneously or purposefully misinterpreted, and once this occurs it is difficult to eradicate public opinion once formed. Also, data can be used to incite or avoid action depending on the perspective of the reader and the issue under study. The foldback study process permits the researcher to combine both the survey data and the wealth of qualitative data supplied at the front end of the study process for analysis by a second nominal group, permitting the statistical data to be explained from the point of view of the community.

To assure culturally appropriate interpretations of the MDS and cluster results, the researcher returns to the nominal group and the original transcripts drawn from the initial in-depth interviews, folding back the qualitative data into the translation of the survey results. Working in concert, the researcher and the target community decipher the three-dimensional value maps and plan culturally acceptable education and intervention services to reach out to the service population in a manner that reflects the value constructs of that population. This is an unobtrusive method of health behavior research that is particularly appropriate for work in cross-cultural and international health settings, because those who supply and interpret study data have their own ideas, models, or frameworks for attributing meaning and explanations to the world they experience, including health and illness.

As cross-cultural researchers, we are particularly interested in the cultural artifacts as something produced by the study population itself. These products stem from the nominal group's private, popular, social worldviews; are important for understanding health-related behaviors; and provide the text for our research and interventions to improve health status. The nominal-group-identified cultural context that underlies the community's health value constructs invites research grounded in the community worldview, if the researcher allows the analysis to emerge from the artifacts themselves.

SUMMARY

Ramalingaswami (1986), former chairman of the WHO's Advisory Committee on Health Research, called for greater application of social science to deal effectively with health problems: "The future lies in broadening the horizon of the interplay between the biomedical and social sciences and in the transdisciplinary synthesis of science and technology with society's needs and values" (p. 21).

Knowledge of cultural beliefs and their influence on practices is essential to address specific desired and/or noncompliant problems (Forbes & Wegner, 1987) and to develop and plan minority health programs to eliminate health status disparity. Simson and Wilson (1991a, 1991b) studied health status disparity among minority populations by eliciting responses from 50 minority health organization providers through a Delphi survey. Respondents indicated that cultural issues dominated the list of possible factors influencing health care. Other factors of high rank were awareness of low-income problems, ethnic sensitivity, cultural relativity, and cultural training (Simson & Wilson, 1991a, 1991b). What is even more important is the participation of the community in any health survey. The WHO and the American Public Health Association strongly encourage public participation in health promotion and disease prevention "in order to enable individuals [and communities] to determine for themselves the means to achieve optimal health" (Stoto, Behrens, & Rosemont, 1990). Therefore, our study approach uses active community participation at each stage of the study process.

The primary goal of health behavior research is an ethical one: to promote participatory health development. The term *health-promoting behavior* must be seen as a result of the interaction between users and providers as a way to give voice to the values of people within the health system, while working to remove barriers to greater utilization of available services. Ultimately, the users of health systems are the most decisive group, because if they do not perceive the need to use services, the work of planners, directors, and health service providers will have no impact at all.

Of the many determinants of health behavior, the concept of barriers to health care is of particular interest because it helps to define the interface between the consumer, the provider, and the system. Barriers can be considered in either subjective or objective terms, as perceptions of the consumer and provider, or as observable characteristics of the system. Health behavior models consider the consumer's self-perceptions and those held by the providers and the service system.

Included in most models analyzing health behaviors is a consideration of health beliefs and attitudes, that is, the seriousness and causes of disease and one's degree of perceived susceptibility. In addition, models often include structural factors such as the availability of resources and factors that influence service utilization, for example, demographic factors (age, ethnicity, or sex). These factors are often hypothesized to influence health beliefs and readiness to use formal services. However, one of the least frequently considered factors is the value placed on health behaviors in relationship to competing demands of daily living.

During the past 10 years, eight studies have been conducted using fold-back analysis while we have refined the process. These studies include assessments of health worker recruitment and retention in underserved

communities; public health practice combining academic public health with state departments of health and with community health centers to determine the needs of chronically mentally ill adults, teen and older pregnant and parenting groups; and values influencing preventive health behaviors of native Hawaiians in Hawaii and of Samoans living in Hawaii and American Samoa.[3]

By highlighting issues important to the community and the primary dimensions underlying community values, foldback analysis using attitude scaling promises to provide a basis for planning cost-effective marketing strategies by reducing trial-and-error approaches. From improved understanding of the target population, community agencies can reconfigure their services to encourage greater participation by consumer groups. Further, by studying the alignment of services within three-dimensional space, service agencies are provided with a framework for crafting powerful social marketing strategies to influence the value structure of the target population.

Influencing the value structure of populations, as displayed in three-dimensional space, is easy to accomplish by connecting low-ranked but professionally preferred services with high-ranked consumer-valued services. The impact of outreach messages will be heightened when two target services are coupled with services that lie graphically between them in the three-dimensional space. As a result, value constructs of the target population will reconfigure and targeted issues will move closer together.

Typical methods for assessing the perceptions of consumer groups, such as survey and questionnaire designs, only outline consumer preferences; they fail to guide provider actions to better understand the values that underlie people's perceptions. Ethnographic techniques are frequently used to understand value systems and behavior practices qualitatively; interviews and focus groups are among the most used qualitative methods. All these traditional methods can be enriched through the use of attitude scaling and cluster analysis. These added analytic methods not only enhance the depth of study efforts and expand the possibilities for later interventions but they also provide a quantitative foundation for the measurement of sociocultural values and differences.

These same procedures can be used to measure the influence of services by tracking changes in values over time or between groups. For example, percentage variation of dimensions underlying community values could be enumerated and compared across study subgroups, and/or before and after interventions. Further, study results can be used as a baseline to devise and revise outreach efforts, educational and training programs, and service interventions.

Repeated use of pre-/postintervention attitude scaling procedures permit follow-up and evaluation studies to determine if services positively influenced targeted behaviors, to measure the social impact of interventions on the cultural value system, or both. These same techniques have been used for years by commercial marketing to vend merchandise and by campaign

managers to sell politicians. Similarly, they can be used to understand populations and to market social products.

Three-dimensional value maps permit researchers to visualize the structure of people's values and how individual value subsets (e.g., health, child care) relate to other subsets (e.g., income, education). Further, multidimensional methods of attitude scaling estimate the amount of variance underlying the formation of values that can be attributed to each dimension. Coupled with the interview and nominal group data used in foldback analysis, there is sufficient information to qualify and interpret the survey results. This information provides service agencies with needed insight into the structure of community-based values, enabling them to better understand service-related behavior and tailor services using values most central to the community.

To effectively reach out to target populations, human care services must incorporate community-based, family-centered, coordinated care packages that include both the public and private service sectors to be comprehensive. To be cost beneficial at this level of sophistication will require that service providers tailor their interventions to the felt needs and the perceived service priorities of individual communities and groups in order to optimize service utilization.

Qualitative research designs, such as foldback analysis, although typically more costly up front, afford the potential for tremendous cost savings over time through improved acceptance and utilization of human care services by targeted communities. Qualitative study techniques permit providers to package services that match the perceptions of the community, and must be considered as cost-optimal planning strategies in an era of health care reform and cost containment.

NOTES

1. To date, nominal group discussions have not been audiotape-recorded as are the initial interviews.

2. We are considering using computer-assisted analysis in a future study, where nominal group participants are computer literate and have access to computers. In one recent study nominal group that we conducted, participants read the transcripts twice, the first time to agree on issue categories and the second time, using colored Magic Markers™ to color code transcripts by category. The color-coded data were then collated using *Ethnograph* (Version 3.0) and fed back to the nominal group at a third meeting, where they finalized their delineation of categories. This was a time-consuming process and did not produce great differences in categories; however, group fatigue was possibly also a factor influencing lack of changed opinions.

3. Copies of these reports are available from the author on request.

REFERENCES

Bradshaw, J. (1977). The concept of social need. In N. Gilbert & H. Specht (Eds.), *Planning for social welfare: Issues, models, and tasks* (pp. 290-296). Englewood Cliffs, NJ: Prentice-Hall.

Carroll, J. D. & Chang, J. J. (1968). *Program INDSCAL*. Murray Hill, NJ: Bell Telephone Laboratories.

Coburn, D., & Pope, C. (1974). Socioeconomic status and preventive health behavior. *Journal of Health and Social Behavior, 15*, 67-77.

Douglass, C. (1971). A social-psychological view of health behavior for health services research. *Health Services Research, 6*, 6-14.

Erlanson, D. A., Harris, E. L., Skipper, B. L., & Allen, S. D. (1993). *Doing naturalistic inquiry: A guide to methods*. Newbury Park, CA: Sage.

Forbes, K. R., & Wegner, E. L. (1987). Compliance by Samoans in Hawaii with service norms in pediatric primary care. *Public Health Reports, 102*(5), 508-511.

Graeff, J. A., Elder, J. P., & Mills Booth, E. (1993). *Communication for health and behavior change: A developing country perspective*. San Francisco: Jossey-Bass.

Guba, E. G., & Lincoln, Y. S. (1994). Competing paradigms in qualitative research. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (pp. 105-117). Thousand Oaks, CA: Sage.

Heisenberg, W. (1974). *Schritte über Grenzen* [Across the frontier] (Peter Heath, Trans.). New York: Harper & Row.

Henerson, M. E., Morris, L. L., & Fitz-Gibbon, C. T. (1987). *How to measure attitudes*. Newbury Park, CA: Sage.

Isaac, S., & Michael, W. B. (1989). *Handbook in research and evaluation*. San Diego: EdITS.

Johnson, J. C. (1990). *Selecting ethnographic informants*. Newbury Park, CA: Sage.

Kavanagh, K. H., & Kennedy, P. H. (1992). *Promoting cultural diversity*. Newbury Park, CA: Sage.

Kotler, P., & Roberto, E. L. (1989). *Social marketing: Strategies for changing public behavior*. New York: Free Press.

Kuzel, A. J. (1992). Sampling in qualitative inquiry. In B. F. Crabtree & W. L. Miller, *Doing qualitative research* (pp. 31-44). Newbury Park, CA: Sage.

Loos, G. P. (in press). *Field guide for international health planners and managers*. London: Janus.

Maple, F. F. (1985). *Dynamic interviewing: An introduction to counseling*. Beverly Hills, CA: Sage.

McCracken, G. (1988). *The long interview*. Newbury Park, CA: Sage.

McElroy, A., & Townsend, P. K. (1979). *Medical anthropology: In ecological perspective*. Boulder, CO: Westview.

McKenzie, J. F., & Jurs, J. L. (1993). *Planning, implementing and evaluating health promotion programs*. New York: MacMillan.

McKinlay, J. B. (1992). Health promotion through healthy public policy: The contribution of complementary research methods. *Canadian Journal of Public Health, March-April*(Suppl. 1), S11-18.

Michal-Johnson, P., & Bowen, S. P. (1992). The place of culture in HIV education. In T. Edgar, M. A. Fitzpatrick, & V. S. Freimuth (Eds.), *AIDS: A communication perspective* (pp. 147-172). Hillsdale, NJ: Lawrence Erlbaum.

Morgan, D. L. (1991). *Focus groups as qualitative research.* Newbury Park, CA: Sage.

Ramalingaswami, V. (1986). The art of the possible. *Social Science and Medicine, 14*(1-2), 19-22.

Randall-David, E. (1989). *Strategies for working with culturally diverse communities and clients.* Washington, DC: Bureau of Maternal and Child Health and Resources Development, Department of Health and Human Services.

Rosenfeld, P. L. (1992). The potential of transdiciplinary research for sustaining and extending linkages between health and the social sciences. *Social Science and Medicine, 35*(11), 1343-1357.

Ruzak, S. B. (1993). Towards a more inclusive model of women's health. *American Journal of Public Health, 83*, 6-8.

Simson, S. P., Wilson, L. B. (1991). Planning and evaluating minority health programs for the future. *Evaluation and Program Planning, 14*, 209-210.

Simson, S. P. & Wilson, L. B. (1991). Planning and evaluating minority health programs to eliminate health status disparity. *Evaluation and Program Planning, 14*, 211-219.

Stoto, M. A., Behrens, R., & Rosemont, C. (Eds.). (1990). *Health people 2000: Citizens chart the course.* Washington, DC: National Academy.

Subkoviak, M. J. (1975). The use of multidimensional scaling in educational research. *Review of Educational Research, 45*(3), 387-423.

Tones, K., Tilford, S., & Robinson, Y. K. (1990). *Health education: Effectiveness and efficiency.* London: Chapman & Hall.

Van de Van, A. H., & Delbecq, A. L. (1972, March). The nominal group process as a research instrument for exploratory health studies. *American Journal of Public Health,* 337-342.

World Health Organization. (1987). *Concepts of health behavior research.* New Delhi: WHO Regional Office for South East Asia.

Gregory P. Loos, trained in cognitive psychology, public health, planning, and education, is an assistant professor of public health and distance learning and public health practice coordinator at the Hawaii School of Public Health. A 20-year resident of Hawaii, he formerly served as division chief for Family Health Services at the Hawaii State Department of Health, a planner with the Department of Education, and an associate researcher with the Kamehameha Educational Research Institute in Honolulu.