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Toward Integrating Qualitative and Quantitative Methods: An Introduction

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Both the qualitative and quantitative paradigms have weaknesses which, to a certain extent, are compensated for by the strengths of the other. As indicated in this article, the strengths of quantitative methods are that they produce factual, reliable outcome data that are usually generalizable to some larger population. The strengths of qualitative methods are that they generate rich, detailed, valid process data that usually leave the study participants' perspectives intact. This article discusses how qualitative and quantitative methods can be combined and it introduces the articles included in this issue.

INTRODUCTION

In designing their studies, health education practitioners, evaluators, and researchers have commonly followed one of two paradigms.¹ The quantitative paradigm uses methods adopted from the physical sciences, including appropriate statistical techniques, to study health behavior or other related social phenomena to determine if and to what extent predetermined study "variables" are causally related. In this paradigm, experimental and quasi-experimental designs are used to collect numerical data on a population sample or a sample of program participants and nonparticipants. Researchers following a quantitative paradigm distance themselves from the people and social phenomenon they are studying in order to maximize objectivity. They administer survey questionnaires with predetermined response categories through in-person inter-

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views, telephone interviews, or mailings. The goal in collecting quantitative data is also to generate measures that are reliable, generalizable, and unbiased.

The qualitative paradigm, on the other hand, applies anthropological research methods to study relevant social phenomena. Researchers using qualitative methods immerse themselves in a culture by observing its people and their interactions; participating in activities; interviewing key people; taking life histories; constructing case studies; and/or analyzing existing documents. The goal in collecting qualitative data is to elicit an “insider’s” view from the group under study.² For a health education or health promotion program, an insider’s view provides an understanding of how people perceive a program, why people react to it the way they do, why the program has specific effects, and what the unanticipated consequences of a program are. By examining why and how programs work or do not work (i.e., process evaluation) health educators are able to improve future programs.

STRENGTHS, WEAKNESSES, AND PURPOSES OF EACH APPROACH

Both the qualitative and quantitative paradigms have weaknesses which, to a certain extent, are compensated for by the strengths of the other. As indicated in Table 1, the strengths of quantitative methods are that they produce factual, reliable outcome data that are usually generalizable to some larger population. The strengths of qualitative methods are that they generate rich, detailed, valid process data that usually leave the study participants’ perspectives intact. Qualitative methods also provide contextual understanding of health behavior and program results.

Some authors refer to quantitative approaches as “the dominant paradigm” because the purposes, procedures, and benefits of quantitative methods are well known and accepted.² In contrast, the purposes, procedures, and benefits of qualitative methods are unfamiliar to many. We, therefore, emphasize qualitative methods in this introduction because we believe that in order to improve the practice of health education and health promotion, program evaluations

Table 1. A Typology of Attributes of Quantitative and Qualitative Evaluation Methods

Quantitative	Qualitative
Deductive	Inductive
Verification and outcome oriented	Discovery and process oriented
Measurement tends to be objective	Measurement tends to be subjective
Reliable	Valid
Technology as instrument (the evaluator is removed from the data)	Self as instrument (the evaluator is close to the data)
Generalizable	Ungeneralizable
The outsider’s perspective	The insider’s perspective
Population oriented	Case oriented

need to examine the internal dynamics between clients and interventions, not just whether the interventions work or not.

Quantitative measures are often most appropriate for conducting some needs assessments, or for when a program has reached a “finished product” stage and has a certain level of maturity and stability. After an intervention progresses through periods of growing pains, and when objectives and methods have been tested and stabilized, then it is appropriate to quantitatively compare outcome and baseline measures.³

Another example of the differences between quantitative and qualitative methods in program evaluation is how time and resources must be distributed when each of these methods is used. On the one hand, quantitative methods sometimes fall short when the instruments needed to measure specific knowledge, attitudes, and behaviors do not exist. Developing questionnaire items or scales that are both valid and reliable is a difficult and costly scientific endeavor. Moreover, the pace at which basic researchers hypothesize associations between health attitudes and behaviors often occurs faster than evaluation researchers’ capacities to construct cost-efficient, but yet appropriate, quantitative measures. For example, in an evaluation (that one of the authors conducted) of a program that provided instruction to children and adults about medical self-care, no measures existed for the specific self-care skills that were taught. Two of the program’s four years and several thousand dollars were required to develop, pretest, and revise quantitative measures to adequately assess the behaviors the program was attempting to change.⁴

On the other hand, similar criticisms can be made about techniques for collecting and analyzing qualitative data, which may be less costly initially, but in the long-run are labor intensive and time-consuming. For example, in order to collect ethnographic data, evaluators must often spend many hours and even days “on-site” at one or more locations which can be expensive in personnel and travel costs. Also, qualitative researchers commonly tape-record interviews that they conduct with study participants in order to accurately capture responses to open-ended questions. Each hour of audiotaped interviews may require approximately three to four hours to be transcribed. Thus, transcribing lengthy taped interviews is also time-consuming and costly.

INTEGRATING QUALITATIVE AND QUANTITATIVE METHODS: THE DEBATE

Some philosophers of social science and some social scientists have argued that the purposes of the quantitative and qualitative paradigms are so different that using them together is not possible or desirable.⁵⁻⁷ The basic argument is that, on the one hand, the quantitative paradigm is underscored by the study of social variables that lead to prediction of a social phenomenon. That is, within the quantitative paradigm reality is construed as being composed of causes and effects and it is the social scientist’s role to quantify these in order to predict future events, behavior, or other outcomes.

On the other hand, the purpose of the qualitative paradigm underscores greater understanding or “intelligibility,” that is, qualitative inquiry is not pre-

diction but deciphering the meaning of social phenomena.⁵ This usually implies attempting to understand and define the culture of the individuals and groups that are being studied. In program evaluation terms obtaining "intelligibility" usually means seeing a program from the participants' perspectives, and understanding the meaning that participants attribute to the program. Within the qualitative paradigm, some have argued that the purpose of evaluation and research is to "raise or improve the level of dialogue." That is, the purpose of qualitative research is not to provide answers to empirical questions, but rather to elucidate various viewpoints on important issues.⁸ For example, in a study of new administrative procedures in a school system, it was teachers' responses to the open-ended qualitative questions, and not the closed-ended quantitative questions, that convinced the school board that the new procedures were strongly disliked by some school personnel and should be studied further.²

Those who argue against integrating qualitative and quantitative methods take the position that the two paradigms are so different that any reconciliation between them is bound to destroy the epistemological foundations of each.⁵ Their argument is that the purpose of research is either prediction or intelligibility; it cannot be both. As Rosenberg⁵ suggests, "the extreme views are probably beyond serious adjudication. No one is going to convince a proponent of either extreme that the view all the way across on the other side of the continuum is right. The reason is that the differences between them rest on very fundamental issues of philosophy, claims about epistemology, metaphysics, and ethics; issues that have not been settled in philosophy since they were first raised by Plato twenty-four hundred years ago" (p. 18).

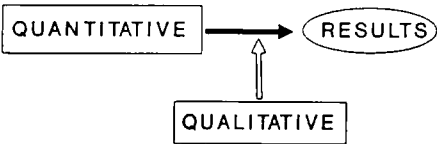
Though we recognize the importance of the philosophical debate for the future development of social science methodology, our position is a pragmatic one. As suggested by Reichardt and Cook,¹ we think it is possible to subscribe to the philosophy of one paradigm but also employ the methods of the other. We agree with the sentiment that "... each method is based on different yet complementary assumptions and each method has certain strengths that can be used to compensate for the limitations of the other"³ (p. 115). In fact, our position is somewhat stronger, we believe that social interventions, such as health education and health promotion programs, are complex phenomena which require the application of multiple methodologies in order to properly understand or evaluate them. We agree with the sentiment that, "... today the issue no longer is whether to use quantitative or qualitative methods, but rather how they can be combined to produce more effective evaluation strategies."³ We also believe that neither the qualitative nor quantitative paradigms are in jeopardy of being eliminated by the other.

Figure 1 illustrates four ways that qualitative and quantitative methods might be integrated in health education research and program evaluations. In the first possible approach (model 1) qualitative methods are used initially to help develop quantitative measures. For example, it is now common practice to conduct focus groups before developing a structured questionnaire. In the second approach (model 2), a study or evaluation is predominantly quantitative and qualitative results are used to help interpret and explain the quantitative findings. The third approach (model 3) is the reverse of model 2 in that quantitative results are used to help interpret predominantly qualitative findings. Anthro-

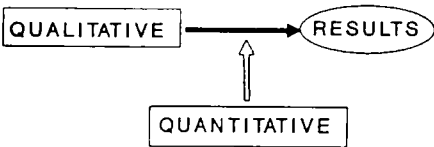
Model 1
Qualitative methods are used to help develop quantitative measures and instruments.



Model 2
Qualitative methods are used to help explain quantitative findings.



Model 3
Quantitative methods are used to embellish a primarily qualitative study.



Model 4
Qualitative and quantitative methods are used equally and parallel.

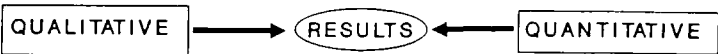


Figure 1. Four possible ways that qualitative and quantitative methods might be integrated.

pologists often use this approach at the conclusion of an in-depth ethnography when they conduct a survey of members of the community they have been studying. The final possible approach (model 4) is when the two methodologies are used equally and parallel. When both methods are used equally, often the results from each approach are used to cross-validate the study findings. That is, researchers and evaluators analyze the results of each method separately and then decide if the results from each method suggest the same conclusions. If they do then the researcher's confidence in the results and conclusion is strengthened. If they do not, then the researcher tries to understand why, and tries to determine which results are the more valid. This procedure is sometimes termed triangulation of methods.^{2,3}

STATE OF THE ART

We initiated this theme issue of *Health Education Quarterly* because we were curious about the state of the art of integrating qualitative and quantitative methods in health education research and evaluation. We wondered if other researchers and evaluators were struggling with the same methodological issues that we were and, if so, how they were attempting to resolve them. In particular, we wondered which, if any, of the possible models of integration were currently being used, and which one(s) might predominate.

Table 2 characterizes the seven manuscripts that are included in this theme issue. A variety of health problems, settings, and qualitative and quantitative methods are illustrated in these seven manuscripts. The health problems studied or programs evaluated include chronic diseases, acquired immunodeficiency syndrome (AIDS) prevention, antimalarial chemoprophylaxis during pregnancy, occupational stress, smoking policy, smoking prevention, and substance abuse prevention. The settings in which the studies occurred are both domestic and international and include communities, clinics, worksites, and schools. Qualitative methods used in these studies include ethnographic interviews, open-ended and in-depth interviews, ethnographic field notes, focus groups, open-ended questions on surveys, and participant observation. The most frequently used quantitative method was closed-ended questionnaires, other quantitative methods include epidemiological data collected through a closed-ended questionnaire, physical examinations, attendance logs, clinical tests (blood and urine), and closed-ended interviews.

Each of the seven selected manuscripts illustrates at least one of the four possible models of integration depicted in Figure 1. Model 1 is illustrated by the Bauman and Greenberg Adair, Hugentobler et al., and de Vries et al. articles; model 2 is illustrated by the Hugentobler et al. and Gottlieb et al. articles; model 3 is illustrated by the Dorfman et al. and Buchanan articles; and model 4 is illustrated by the Helitzer-Allen and Kendall article. The variety of health problems, settings, and research methods illustrated in these manuscripts suggests that methodological integration is currently being attempted and struggled with at least by some health education researchers and evaluators.

In reviewing all the manuscripts that were submitted for this theme issue, it appears to us that a weakness seems to be that when qualitative and quantitative methods are both used in the same project they each tend to be reduced to their elementary forms. With all due respect to the authors of the manuscripts included in this theme issue, and to the other authors who submitted manuscripts for review, it appears that one of the improvements needed when methodological integration is attempted is to increase the level of sophistication of each of the methods. On the qualitative side, none of the manuscripts included in this issue (or those submitted for review) illustrate complex qualitative case study methodology, such as the type of methodology described by Yin,⁹ nor do they illustrate ethnographies as described by Fetterman.¹⁰ On the quantitative side, analyses tend to employ simple descriptive statistics. With a few notable exceptions (Hugentobler et al., Gottlieb et al.), the quantitative data and results tend not to include advanced inferential statistical applications, nor the quantitative testing of complex hypotheses.

In studies which employ both qualitative and quantitative methods, more

Table 2. Summary of Manuscripts Included in this Issue

Author	Health Problem/Program Focus	Setting/Population	Qualitative Methods Used	Quantitative Methods Used
Bauman and Greenberg Adair	Chronic diseases	Community Mothers and Children	Ethnographic interviews	Closed-ended questionnaire items
Dorfman et al.	AIDS prevention	Community Sex workers (women)	Open-ended interviews Ethnographic field notes	Epidemiological data via a closed-ended questionnaire Physical examinations Attendance logs Clinical tests (blood, urine) Closed-ended interviews
Helitzer-Allen and Kendall	Malaria during pregnancy	Clinic Village women	In-depth interviews Focus groups	Closed-ended questionnaire items
Hugentobler et al.	Occupational stress Employee health	Worksite Employees	In-depth interviews Focus groups Field notes Open-ended questionnaire items	Closed-ended questionnaire items
Gottlieb et al.	Passive smoking Smoking policy	Worksite Employees	Open-ended questionnaire items Interviews Focus Groups Focus groups Open-ended questionnaire items	Closed-ended questionnaire items
de Vries et al.	Smoking prevention	Schools Adolescents	Focus Groups Open-ended questionnaire items	Closed-ended questionnaire items
Buchanan	Drug abuse prevention	Schools Adolescents	In-depth interviews	Closed-ended questionnaire items

advanced applications are therefore warranted. This may not occur for several reasons: lack of sufficient funds, time, and/or expertise. Seldom do researchers or evaluators have the necessary resources to employ both advanced qualitative and quantitative methods. Alternatively, because it takes many years of learning and practice of each method in order to be able to conduct sophisticated studies, by attempting to be experts in two broad paradigms and methodologies, investigators may not learn the intricacies and finer points of either and, thus, lack the necessary expertise.

If methodological integration is going to progress, the use of each paradigm, within a given study or intervention project, must become both more accepted and more refined. No single solution can be offered for this complex methodological problem, but a number of steps could be taken. First, funding agencies must recognize the need for both perspectives and be willing to allocate sufficient resources so that the use of qualitative and quantitative methods in the same project is supported. Second, health educators, evaluators, and researchers should be trained in both paradigms. Presently, graduate training programs emphasize quantitative methods; only rarely are qualitative methods included. A third approach to enhancing methodological integration is teamwork. In a given project, it would be better to utilize teams of investigators composed of experts in the application of each paradigm, rather than having only one or two investigators who employ methods representing both paradigms.

Finally, a potential hindrance to the continued development of methodological integration is the animosity towards each paradigm by the adherents of the alternative approach. Until such time as there is mutual acceptance and respect, prospects for advancing integration will remain limited. It is our hope that the manuscripts included in this theme issue will serve to illustrate the value of methodological integration in health education evaluation and research, and will bring the adherents of each paradigm closer together.

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