Davis, Willie Dell, Jr.

AN ANALYSIS OF HEALTH EDUCATION AND COMMUNITY ORGANIZATIONS AS FACTORS IN IMPROVING PREVENTIVE HEALTH BEHAVIOR IN TWO PREDOMINATELY AFRICAN-AMERICAN TOWNSHIPS IN RURAL LAKE COUNTY, MICHIGAN, UTILIZING SELECTED TECHNIQUES OF INTERNATIONAL COMMUNICATION

Michigan State University PH.D. 1982

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By

Willie D. Davis, Jr.

A DISSERTATION

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ABSTRACT

AN ANALYSIS OF HEALTH EDUCATION AND COMMUNITY ORGANIZATIONS AS FACTORS IN IMPROVING PREVENTIVE HEALTH BEHAVIOR IN TWO PREDOMINATELY AFRICAN-AMERICAN TOWNSHIPS IN RURAL LAKE COUNTY, MICHIGAN, UTILIZING SELECTED TECHNIQUES OF INTERNATIONAL COMMUNICATION

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Statement of the Problem

The projection of funding in the Health Care Field is that it will decrease. Preventive health measures adopted by individuals is necessary to improve the health of a community. Additionally the vertical "system" of Health Care has been ineffective in providing the community with an adequate system of community education. An improved system of community education related to Health can be provided by adding a community-based Health Committee to the vertical "system" of Health Care.

Methods

The procedure used for this study is a communication - systems model designed by Bordenave called the people-centered approach. This model utilized the process of a Health Education Model called the "Critical Pathway to Achievement" developed by Isely, Sanwogou and Martin for use in the Cameroon. Multidimensional Scaling Analysis by Ramsey was used to evaluate the above approach's implementation in a rural area of the United States. The research design includes an experimental-group from combined Yates and Webber Townships; two predominately black townships and a control-group from the predominately black township of Covert, Michigan. The experimental-group has a Health Committee which

administered the Health Education Process; the control-group has no Health Committee. Samples drawn from the population were black, poor and elderly. There were forty-five sampled. The statistics employed for hypothesis testing were the Chi-Square for the hypotheses and the t-Test for the subhypotheses at the .05 level of significance respectively.

Results

Although the experimental-group committee's objective was accomplished (i.e., persuading a physician to reside within the community) the data analysis reflects a significant change in attitude-behavior on only two variables when comparing the experimental and control-group; the relationship of Health Programs to the Health Care System and Young People respectively. This change is possibly due to an intervention which is not under the control of this study and variations of which appeared in both the experimental and control-communities; a Hypertension Control Program.

Other specific hypotheses showed no significant differences between the experimental and control-group and overall only the significant difference of the two variables above proved conclusive.

Dedicated To My People

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First I would like to thank my advisor and chairperson who has not only given me guidance and encouragement during all aspects of this dissertation but has helped me in aspects of organization.

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CHAPTER I

INTRODUCTION

One of the means of improving the quality of life of the rural poor in developing nations is the provision of improved health education and/or health information. Among the indicators that measure whether the quality of life has actually improved are longer life spans, less infant mortality, decrease in diseases such as tuberculosis and malaria, provisions for safe water and better nutrition.[1]

Because of the desire to improve health conditions, numerous programs involving health education have been designed to aid the rural poor. However, many of the programs involving health have had limited success in causing significant measurable positive change in the indicators that characterize the quality of life.[2]

In "Community Organization as an Approach to Health Education in Rural Africa," by Raymond Isely, Lardja L. Sanwogou, and Jean F. Martin, a model of health education was used in an attempt to bring about measurable behavioral change in four villages in the Cameroon. Their approach combined the "vertical" system of health care, (i.e., a system where the Ministry of Health designs health care and designates its employees as providers to the villages, without benefit of village inhabitants), with a village Health Committee. The Health Committee

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[1]Willie D. Davis, Jr., "A Plan to Improve the Quality of Life of the Rural Poor" (Unpublished Paper - East Lansing, Michigan, 1978).

[2]Raymond B. Isely, Lardja L. Sanwogou, and Jean F. Martin, "Community Organization as an Approach to Health Education in Rural Africa," International Journal of Health Education 22, Supplement (3) (1979).

(in a co-operative effort) interphased with the National Ministry of Health to provide a health education program to bring about measurable behavior change.

In their article, Isley, Sanwogou, and Martin emphasize several examples of successful programs in health education and they state:

> "These various examples emphasize organization of the people as the key approach to health education and preventive programs generally. As Newell wrote (1975): 'Health for the people is becoming health with the people and eventually health by the people.' The same approach was implemented by the University of Pittsburg-Oceac Project when it began in Cameroon in 1972."[3] Bordenave aptly calls this the "People Centered Approach."[4]

The approach of the University of Pittsburg-Oceac Project required the involvement of the people of a village in improving their own health through "individual and collective change in health and health related behavior."[5] To accomplish this task village committees were established in the Cameroon to plan health education and to train auxillary nurses as village health workers. The village committees consist of heads of the village who assess the health needs of the population, identify health problems, plan and implement health programs, and generally promote health.

The committees interphase with governmental agencies (The Ministry of Health) through two steps: 1) assigning visiting health workers to health centers; 2) keeping officials informed of project developments

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[3] Ibid, p. 5.

[4] Juan E. Diaz Bordenave, Communication and Rural Development (Paris: UNESCO, 1977).

[5] Isely, Sanwogou and Martin, op. cit., p. 3

and involving them in program evaluation using a jury of four Ministry officials who judge the quality of the committee's work. The Ministry in turn recognized that the people's participation was an essential component of any program aimed at improving community health and that this participation is particularly needed to achieve better coverage with regard to preventive care and to encourage current efforts at organizing village health committees in South-Central and Northern Cameroon. Because of the success of this approach the Government of Cameroon and USAID agreed to sign a new contract to extend to other areas of the country the experiences gained in South-Central Cameroon.

Behavioral outcomes of this project included the building of (per village) an average of 15.6 latrines, 3.5 protected springs, 4.1 garbage pits, and 3.4 animal enclosures, and overall showed achievement on five fronts: 1) the establishment of a network of village health workers; 2) a resurgence of self-reliance in some villages; 3) a concrete example of health education in action for future trainees; 4) a decision to make the Mefou Department of the Ministry of Health the site of the project, a "community health" laboratory for the University Center for Health Sciences of the University of Yaounde; and 5) the establishment of (with the support of the World Health Organization), a Regional Health Education Training Center for French-speaking Africa at the University Center for Health Sciences. The process used to achieve the above outcome in the Cameroon Project is called the "Critical Pathway to Achievement" (See Process Chart, p.4).

FIGURE 1 PROCESS CHART

PROCESS CHART

Cameroon progress--Critical Pathway to Achievement	Bordenave Communication System	Sarbaugh's Cross-Cultural Communication	Health Education Model-PRECEDE	Diffusion process--Rogers and Shoemaker
Gathering information Meeting village leaders	Input--Assessing the needs of the community	Four variables to consider for effective communication 1. World view 2. Perceived relationship and intent 3. Code (language) 4. Empathy (accepting norms, roles and values)	Consideration of the quality of life Phase I--1. Social problems II. Health problems	
Gathering information both demographic and on social and health problems	Input		Phase II--epistemiological and medical data collection	Change agent creates needs for client
Organizing a Health Committee (local)	Input		Phase II--rank health problems	
Setting and assessing health problems	Input		Phase II--rank health problems	Change agent analyses problem
Choosing one problem to work on	Process--internal interaction and cooperation through information and interchange		Phase II--with epistemiological and medical data collection select top health problem	
Informing the Committee about the problem	Process--transformation of inputs into outputs		Phase III--assess behavioral causes of health problems-behavior diagnosis	Change agent creates intent for client to change
Assessing local resources	Process--constraint assessment (factor that impede the solving of health problems)		Phase IV--factors that affect health behavior (educational diagnosis) a. predisposing factors--attitudes, beliefs, values, perception. Facilitates or hinders personal motivation for a change b. enabling factors--barriers created by social forces or systems c. reinforcing factors--related to feedback the learner receives from others	System effect norms, social status and hierarchy which impede or facilitate rate of diffusion (constraints)
Setting staged objectives	Process--design of the output and outcomes to be achieved			Diffusion process--characteristics of innovations also functions of diffusions 1. Knowledge 3. Decision 2. Persuasion 4. Confirmation
Setting responsibilities--time schedules	Output--content of the output mode (what the message consists of)		Phase V--decision as to which of the three factors above or combination will be the focus of the intervention	
Implementation	Control of the environment--execution of the output message being sent to the community		Phase VI--development and implementation of the plan (intervention)	Type of example: mass media or interpersonal
Evaluation of results	Feedback--evaluation or modifications necessary		Phase VII--evaluation. There are six plans of evaluation that range simple record to a complex evaluation research project. A choice must be made as to which plan to use.	

The evaluation component of the "Critical Pathway to Achievement" in terms of an assessment of the committee's impact on health attitudes, health related behavior and health status of the population is not currently available. Accomplishments such as latrine building, protecting springs and declarations of intentions for the year to come remains at present the only means of evaluation.

However, this present project (author's study) will use the "Critical Pathway to Achievement," and add an evaluation component with experimental and control conditions. This approach essentially takes the "Critical Pathway to Achievement," translates its components into a communication system like that developed by Bordenave in his "People-centered Approach" (See Process Chart p. 4) which allows for a quantitative evaluation of a process involving a Health Committee.[6]

Need for the Study

Health Education is a very crucial component of the State Health Plan of Michigan. Governor Milliken stated in his State of the State (1979) Message:

> The two main points of focus are (1) health promotion, including health education, fitness, nutrition and prevention of diseases and conditions which result in premature death or disability, and (2) improvement in the nature, structure and cost of the health services delivery system.[7]

"Health Education of the Public: A Statement of Public Policy," also a Michigan document, addresses itself through recommendations and

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[6]Bordenave, op. cit., 1977.

[7]Milliken, William G., "State of the State Message," January, 1979.

goals to a policy statement for Health Education throughout the state and also the relevance of Health Education to racial/ethnic groups by stating:

> Health Education for various racial/ethnic groups is extremely important . . . All aspects of Health Education should be addressed to these groups, taking into account language, cultural and educational differences . . . The goal of the Rural Health Initiative (RHI) is "to emphasize preventive and health education programs."[8]

Evaluation in Health Education is crucial and the need for carrying out evaluation research in health education is important. At the Tenth International Conference on Health Education in London in September, 1979, Maria Antonia Modolo in her summary of the methodology section singled out a Dr. Beni of whom she speaks:

> He stressed the importance of scientific research in Health Education Methodology and the lack of a theoretical basis concerning the solutions to health behavioral problems due to an overemphasis on studies of the problems.[9]

Gunarantne emphasized the adoption of postwar models of the "western" health service delivery systems (of which health education is a part as is the technology of mass media communication) and the underproductiveness of this approach because of its disregard for different cultural, social, political, economic, social and geographical patterns. He states:

> One of the principal limitations of health care is the poverty of research about individual, cultural, societal and health behavior and the nature, motivations and determinants of health learning and change in response to Health Education.[10]

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[8]Michigan State Health Planning Committee Advisory Council and the Office of Health and Medical Affairs, Health Education of the Public (1976) p. 41, 1.

[9]Marie Antonio Modolo, "Theme 3: Methodology". International Journal of Health Education 23(3) (1979).

[10]V. T. H. Gunaratne, "Health for All by the Year 2000; International Journal of Health Education (23) Supplement (3) (1980).

In Health Services Research, Fall, 1978, Arthur Weissman, Senior Vice President of the Kaiser Foundation Health Plan supported this view by this statement:

> In view of the increasing interest in Health Education and the need for changing lifestyles and modifying behavior for disease prevention and health maintenance, research is needed to provide techniques and strategies for motivating people to improve their own health.

And in the same book in an article, Stephen M. Shortell and James P. LoGerfo spoke of health services research while highlighting areas requiring further study:

> Above all, if health services research is to have an increased impact on public policy, there is a need for the development of social science theories and for their application to research in health problems and especially to program evaluation, the latter being particularly important to effective decision making.[11]

In the document mentioned earlier called Health Education of the Public: A Statement of Public Policy, the need for scientific research is again emphasized as one of its goals, that is:

> to expand research in health behavior and health education, including community based evaluation studies focused on target groups, and, . . . innovative approaches in health education need to be tried and tested in order to determine the best methods of delivering health education.[12]

Purpose(s) of the Study

It is the purpose of this study to 1) comparatively evaluate the effectiveness of a community organization (health committee) as a component of health education of an existing health care system Regional

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[11]Arthur Weissman, "Some Issues in Health Services Research"; Stephen M. Shortell and James P. LoGerfo. "Health Services Research and Public Policy"; Health Services Research (13)(3) (1978) pp. 229-234.

[12]Michigan, op cit., pp. 8-21.

Health Care with an existing Health Care System which does not have an education component administered by a Health Committee, 2) serve as a model innovation for health projects in rural areas of the United States and developing countries, 3) add to the body of the literature of non-formal education and its application to health education in improving the life of the rural poor, and 4) be applicable to the body of literature which studies the effect of community organization on health education of the rural poor. The indicators that will be used to measure the effectiveness of a community organization (health committee) are health-related behavior change and attitudes toward existing Health Care Systems.

Problem Statement and Significance

There is great concern developing in the health care field toward preventive health care. With the projections of less and less funding for health care, preventive health measures adopted by the individuals is necessary to improve the health of the community.

Health Care is a vital need of a community and the vertical "system" of health care has not been effective in providing the community with infomation of its services[13] or an adequate system of community education.[14] It is hypothesized that an improved system of health education can be provided by adding a horizontal (A relationship where a Health Committee, in conjunction with a Health Care Agency, designs

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[13]U.S. Department of Health, Education and Welfare, Public Health Service, National Institues of Health, Toward an Educated Health Consumer, by Carter Marshall, Teaching of Preventive Medicien Series, Publication No. (NIH) 77-881 (1977).

[14]Isely, Sanwogou and Martin, op cit.

an education intervention) community-based Health Committee to the vertical "system" of health care.

To test this hypothesis it is proposed that the outcomes of a Health Committee's interactions with the vertical "system" of Health Care be evaluated to measure its effectiveness against a community which has no Health Committee, only a vertical "system" of health care.

Definitions

There are several terms which need to be defined for a proper understanding of the purposes of this study. They are:

Health Education--"A process that informs, motivates, and helps people to adopt and maintain healthful practices and lifestyles and advocates social and environmental changes as needed to facilitate healthful living conditions and behavior."[15]

System--A set of facts, principles, rules, etc., classified or arranged in a regular, orderly form so as to show a logical[functional] plan linking the various parts; a set or arrangement of things so related or connected as to form a unity or organic whole.[16, 17]

Non-Formal Education--"Any organized systematic, educational activity carried on outside the framework of the formal system to provide selected types of learning to particular subgroups in the population, adults

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[15]Michigan, Health Education of the Public, p. 16.

[16]Webster's New World Dictionary of the English Language, second college edition, (1972), p. 1445.

[17]System is also defined for the purposes of this study as "any set of interacting parts that maintains its boundaries while exchanging influences with its environment" as shown in Bordenave's Communication and Rural Development, p. 18. This refers to its usage as a communication system.

as well as children.[18]

Preventive Medicine--Those activities that are the direct responsibility of the individual in the prevention of disease and in the protection and the promotion of himself and his family . . . fall for the most part upon the family health advisor. Usually this person is the private physician, who aid and guides all memebers of the family in all matters pertaining to individual health protection.[19]

Primary Prevention--"Those activities undertaken to prevent the occurrence of disease or illness."[20]

Secondary Prevention--"Those activities undertaken to intervene after disease can be detected, but before it is symptomatic."[21]

Tertiary Prevention--"Those activities undertaken to prevent the progression of symptomatic disease or illness."[22]

Epidemiology--"The field of science dealing with the relationship of the various factors which determine the frequencies and distributions of an infectious process, a disease or physiological state in a human community."[23]

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[18]Phillip H. Coombs and Manzoor Ahmed, "Attacking Rural Poverty, How Non-formal Education Can Help. Baltimore: John's Hopkins University Press, 1974, P. 8.

[19]Wilson G. Smillie, Preventive Medicine and Public Health. New York: The MacMillan Company, 1952, p. 16.

[20]U.S. Department of Health, Education and Welfare, Public Health Service, Office of the Assistant Secretary for Health, Report of the Departmental Task Force on Prevention, September 1978, p. 16.

[21]Ibid., p. 16.

[22]Ibid., p. 16.

[23]Dorland's Illustrated Medical Dictionary, 245th edition, (1965) p. 499.

Epidemic--"Attacking many people in any region at the same time, widely diffused and rapidly spreading. A disease of high morbidity which is only occasionally in a human community. . . . A season of the extensive prevalence of any particular disease."[24]

Endemic--"Present in a community at all times, but occurring in only a small number of cases. . . . A disease of low morbidity that is constantly present in a human community."[25]

Vertical System--A system in which a Health Care System designs the health care delivery system and designates employees as providers to a community without the benefit of a Community-based Health Committee or community inhabitants.

Horizontal System--A system in which a Health Care System designs, in conjunction with a Community-based Health Committee, health care delivery to a community.

Limitations of the Study

Assignment of Subjects to Experimental and Control Groups

There is no random assignment of subjects to the experimental and control-groups. The sample is stratified to include the elderly, poor and black which form a large proportion of the population of Yates, Webber and Covert Townships.

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[24] Ibid., p. 400.

[25] Ibid., p. 486

Random sampling will not suffice for the purposes of this study. In the words of Kerlinger:

> Indeed it is relatively uncommon, at least for describing characteristics of populations and the relations between such characteristics. It is, nevertheless, the model on which all scientific sampling is based.[26]

The stratification of the sample allows us to match the experimental groups only in terms of age, income level, race, and rural status. Inferences to other segments of the population are not valid.

One area in which the groups are not matched is education. This limitation excludes an analysis based on education level as a matching criteria and points to a difference in the two groups.

Control of Intervening Variables

The experimenter has no control of activities generated by any health agency within either of the communities either control or experimental. Variables introduced beyond the control of the experimenter can limit the conclusions drawn in this study.

Delimitations of the Study

This study applies only to rural communities which have a health committee or similar group which utilizes health education to aid the vertical Health Care System in the delivery of Health Services and Health Care. It is further limited to only one aspect of the Health Care System; preventive medicine by the poor, black, and elderly which utilizes Health Education as a method to promote preventive health care. These

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[26]Fred N. Kerlinger, Foundations of Behavioral Research, New York: Holt, Rinehart and Winston, Inc., 1973, p. 129.

limitations are necessary for the purpose of an adequate evaluation of Health Education in a rural community by a single investigator.

CHAPTER II

REVIEW OF THE LITERATURE

This chapter will review the literature of projects, studies and philosophy which underlie the People-centered Approach to Health Education, community orgainzations, Health Education and its relationship to Communication, Communication and its relationship to System and Epidemiologic Studies using classical research designs.

People-Centered Approach

Gunaratne as noted above (Chapter I) emphasizes that the adoption of post-war models of the "Western" health care service delivery system has been unproductive because of its disregard for the study of cultural, social, economic and other patterns as a prerequisite for designing health education strategies. He states:

> . . . health administrators sought to teach the backward, superstitious, uneducated villagers about the virtues of 'modern health services' by employing a corp of well-trained health educators. The results have been unproductive, to say the least in the developed and developing world.[1]

Isely, Sanwogou and Martin[2] while not as harsh in their assessment of "Western" health programs feel that these types of programs have had limited success in causing a positive change in the quality of health care.

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[1]Gunaratne, op. cit.

[2]Isely, Sanwogou and Martin, op. cit.

Developmental theorists, when discussing these types of programs in developing nations, feel that the non-success of these programs is due mainly to their underlying philosophy. Carnoy[3] contends that many developmental projects are used by the developed nations as mechanisms to promote imperialistic designs under the guise of education. Pinar[4] feels that the educational curriculum of these programs do not reflect the needs of the inhabitants of a country nor recognize the rights of the inhabitants to participate in the shaping of their future. Friere[5] contends that "banking" educational systesm (information deposits which the students receive, memorize and repeat) are tools for the domination and domestication of the masses and do nothing to promote the person's growth. Yet Friere contends that this growth must be a dynamic part of any educational system. He contends that the hierarchial (vertical) relationship between the teacher and learner must be eliminated and replaced by a new relationship which projects in roles of teachers and learners, both types of participants. In this way both teacher and learner become communicators of knowledge (horizontal relationship).

Two conditions, according to Friere, are necessary for this dual communication of knowledge; 1) faith in the ability of people to learn, change and liberate themselves from conditions of ignorance, poverty and exploitation and 2) direct contact of the learners with their own reality and its problems and the analysis of the constraints imposed on them by

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[3]Martin Carnoy, Education as Cultural Imperialism: David Mc Company, 1974.

[4]William Pinar, Curriculum Theorizing: The Reconceptulists, Berkley California: McClutcheon Publications, 1975

[5]Paulo Friere, Pedagogy of the Oppressed, England: Penquin Books, 1972.

social structure and official ideology. This is called conscientizacao by Friere, which is defined as learning to perceive social, political, and economic contradictions, and to take action against the oppressive elements of reality.[6]

Minkler and Cox discuss the approach used by Friere and its use in health care. They state:

> Over the several years, applications of the Friere method to the health field in rural areas of Latin America, Africa and in inner-city communities in the United States have demonstrated the effectiveness of this method for improving health conditions while creating in people a critical awareness of the root causes of their problems and a concomitant readiness to take action based on this awareness.[7]

Minkler and Cox discuss two applications of the "Friere Method." In Honduras women were used successfully to promote health through developing radio schools, housewife clubs and training sessions. The Honduran woman's role as Health Worker was secondary to her role as "conscienticizor." The second application occurred in an inner-city community in the "Tenderloin" area of San Francisco, an area populated with 14,000-16,000 elderly persons who rent single rooms and live below the poverty level. The elderly, because of the high crime rate, drug addiction, alcoholism, and prostitution were roombound, forgoing food and medical attention rather than venturing outside. This project did not meet with success. Lack of kinship bonds, lack of sense of group or community, and the existence of competing interest groups who attempted to garner the political visibility and the financial resources that go with serving

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[6] Ibid., p. 19

[7] Meredith Minkler and Kathleen Cox, "Creating Critical Consciouness in Health," International Journal of Health Services, (10) (2), 1980.

this area were given as reasons for failure. Minkler and Cox state:

> The health education project was viewed with suspicion by a powerful element in the existing aid structure of the community and the project grant therefore was not renewed after the first year.[8]

Minkler and Cox compare the people-centered approaches of Friere and Mao Tse Tung of China and their relationship. Both Friere and Mao stress full participation of the people through dialoguing and similar means as essential to effective liberation and change.[8]

Schwartz studied the participation of the Chinese masses in community involvement by analyzing the "mass line strategy" (mass participation and community involvement) which is practiced through the "need to try and serve the masses from their perception of reality by becoming one with them.[10] Using this strategy the Chinese Communist Party, militia and health personnel worked and lived among the local residents. This approach used in preventive mass health campaigns produced great success in controlling schistosomiasis, birth control and veneral diseases. Schwartz compares the mass line strategy with Western health education principles and remarks that they are similar in principle, however the translation of these principles into action is considerably different. He states:

> The mass line contains within it some of the basic principles of health education. If we extrapolate these same health education principles, they lead to practices which have their fullest expression in the PRC (Peoples Republic of China). China therefore, is sine qua non for understanding the practice of fundamental

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[8] Ibid, p. 320.

[9] Ibid, p. 313

[10] Dan Schwartz, "The Mass Line as Consumer Participation and Community Involvement," International Journal of Health Education, 20, Supplement (3) (1977), p. 2.

health education principles as they relate to consumer participation and community involvement.[11]

This view is shared by Rifkin who states:

> Through the use of health teams and auxiliary workers, through the implementation of mass campaigns, through the integration of Western and Traditional medicine and practitioners and through a continuing emphasis on health work in rural areas, the health system sets guidelines for distributing medical resources in order that the majority of people have access to health protection and medical care. For this reason and for many others, the new Chinese medical and health care system will continue to be of interest both to the medical profession and national policy makers who must find solutions for the existing medical problems among the rural peoples of the world.[12]

Finally Bordenave on the issue of people-centered movements, contends:

> On the whole, the behavior of communicators, teachers, change agents, advertising experts, politicians and so on has revealed an orientation that is essentially vertical, directive, aimed at manipulation and indoctrination . . . However in recent years this concept of development (vertical, etc.) has been challenged as a result of repeated failures and a new notion of development, more centered on the people concerned, has been proposed. At the same time, the "modernization" orientation of development communications has begun to be criticized and modified.[13]

Community Organizations

Bordenave believes that the people-centered approach can be internalized through community organizations. If a community can organize behind a need such as vocational skill training or solving problems of health care, it takes them past the stage of contact with their own

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[11] Ibid, p. 12.

[12] Susan B. Rifkin, "Health Care for Rural Areas," Medicine and Public Health in the Peoples Republic of China, John E. Fogarty International Center for Advanced Study in the Health Sciences, U. S. Department of Health, Education and Welfare, Public Health Service, National Institutes of Health, No. (NIH) 72-67 (Wash. D.C.) 1972, p. 147.

[13] Bordenave, op. cit., p. 21.

reality and its problems to an active participation in solving these problems. Awareness is not enough. This active participation can be translated into forming pressure groups, collectives, and/or committees which deal with a topic such as health care and designing a health education program to meet health care needs.

Community organization and the coordination of available health care resources appear to be a viable way of improving health services if done through a system of health education. The most notable case gives impetus to this study; "Community Organization as an Approach to Health Education in Rural Africa."[14] Here a model was set up to establish village committees in the Cameroon to plan health education and the training of auxiliary nurses as village health workers. The project was successful in getting village communities to plan concretely for the future. One village, in particular, for which data was collected showed a remarkable change in behavior with the villagers building latrines and creating four protected springs. The villages in this project show some remarkable similarities to Yates and Webber Townships (area of study) in these areas of comparison: 1) little agricultural development; 2)exodus of much of the active segment of the population; 3) poverty; 4) elitest education (little relevance to development needs of the area); 5) dependent population, i.e., the elderly, young, and poor.

Bertrand and Bertrand[15] concluded a study in Columbia, South America on a program in community organization which, in response to acute health

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[14]Isely, Sanwogou and Martin, op. cit.

[15]June Bertrand and William Bertrand, "Health Education Among the Economically Deprived of a Columbian City," International Journal of Health Education, 22 (2), 1979.

care needs designed a program which included a series of health topics including preventive medicine and nutrition. This program obtained significant results among those who participated; in greater-knowledge of health concepts, awareness of health hazards, and to some extent, changes in health-related behaviors.

Fehrsen,[16] in an African community, undertook a study which assessed community health needs by village inhabitants. A medium of communication, song, was successfully used to spread health education messages.

Mertens[17] reports a plan in community development in Canada which trained Eskimos and Indians through a Community Health Worker Programme. This program was successful in getting people to adopt and practice recommended health measures and working out solutions to their own problems. The program explains Medical Service Programs to the Indian and the Eskimo, and helps to maintain good liaison links between all agencies and the people.

Ogionwo[18] found the community involvement approach to Health Education to be superior to the individual approach especially in terms of efficiency in factors which influenced acceptance or rejection of recommended health measures (i.e., demographics such as age, marital status and sex, attitudes toward illness, attitudes to life in general, sets of values, degree of social interaction, etc.).

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[16]G. S. Fehrsen, "The Use of Traditional Means of Communication in an African Community," International Journal of Health Education, 22 (3), 1979.

[17]Ethel G. Mertens, "Health Education and Community Development," International Journal of Health Education, 12 94), 1969.

[18]W. Ogionwo, "Socio-psychological Factors in Health Behavior," International Journal of Health Education, 16 (2), 1973.

Cox[19] conducted a study in which the elderly are used as community health workers to educate their peers. She concluded that the elderly are receptive to educational programs presented by their peers and many are interested in undertaking the training themselves.

German[20] supports Health Education for the elderly and her findings have important implications; that the elderly are educable, that the elderly will comply with instructions and that future Health Education programs should be aimed at the elderly because of its high population among the people in this country.

Moore[21] supports this study in a dissertation titled "The Impact of a Health Education Program on Poor Black Elderly Persons," a study involving an experimental and control-group. She exposed the experimental-group to ten two-hour sessions of health education designed to improve their knowledge of health education. The control-group received no health education sessions. A t-Test used to compare the mean scores of the experimental and control groups was significant at the .05 level.

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[19]Carole Cox, "Using the Elderly as Community Health Workers," International Journal of Health Education, 22 (1), 1979.

[20]Pearl S. German, "The Elderly: A Target Group Highly Accessible to Health Education," International Journal of Health Education, 21 (4), 1978.

[21]Emily Louise McClinton Moore, "The Impact of a Health Educational Program on Poor Black Older Persons," (Ph.D. Dissertation University of South Caroïina, 1980).

A Community Health Education Program to control heart disease in the Province of North Karelia, Finland which has the highest documented heart disease rate in the world is discussed in Lehman,[22] Tuomilehto et al.,[23] and Puska et al.[24] Because of their concern for their own health the North Karelians petitioned the government for relief. The result was a comprehensive community program to control cardiovascular disease through primary and secondary prevention. A control-group and an experimental-group were used and the student t-Test was used to test for significance.

The results showed a significant drop in heart attacks by 14 percent and the incidence of stroke among North Karelians aged 30 to 64 dropped 40 percent. Most significantly, 90 percent of the sample group participated in a program whose objective was:

> . . . to carry out a systematic program and reallocate the existing service resources to control this modern epidemic; to integrate the activities of the existing health and social services in the community and to have the full participation of the community; and to have a continuous follow-up of progress and feed back to the community.[25]

Under the auspices of Dr. Victor Sidel and his colleagues in the Department of Social Medicine of Montefiore Hospital and Medical Center

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[22]Phyllis Lehman, 'Health Education' Healthy People: The Surgeon General's Report on Health Promotion and Disease Prevention, U.S. Department of Health, Education and Welfare, Public Health Service, Office of the Assistant Secretary for Health and Surgeon General, DHEW (PHS), No. 79-5510A (Wash. D.D.), 1979.

[23]Jaakko Tuomilehto et al., "Community Programme for Control of Hypertension in North Karelia, Finland," The Lancet, Oct. 25, 1980.

[24]Pekka Puska et al., "Changes in Coronary Risk Factors During Comprehensive Five-Year Community Programme to Control Cardiovascular Diseases" (North Karelia Project,), British Medical Journal (2), 1979.

[25]Ibid, p. 1174.

a program called the Community Health Participation Program, trained interested residents in a Bronx New York Community as Health Coordinators who serve as unpaid health promoters. In a two-year period they initiated projects in their apartment buildings which included:

> . . . counseling individual tenants and families on matters of physical and mental health, referring neighbors to social agencies and community help when needed. . . giving first aid in emergencies. . . and organizing self-help groups and health work shops in a variety of areas ranging from stopping smoking to parenting.[26]

Its affiliation with the hospital has allowed the program to draw upon the hospital's resources for specific assistance when needed.

In Lowndes County, the poorest of 67 counties in Alabama, and the third poorest in the United States, a group of local citizens formed a community corporation, The Lowndes County Health Services Association, in 1973. Through their efforts and others a clinic was opened. After June, 1977, a Health Education project was begun which emphasized Patient Education and community based education under a contract with the Tuskegee Area Health Education Center, a non-profit community-based organization. Its patient education component however was more successful than its community-based educational efforts. The patient education protocol was reproduced in quantity by the Bureau-funded primary care health centers, both urban and rural. Requests are received from other states and countries for master copies of the patient education protocol.[27]

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[26]H. Carson Biggs, ed., "Community Self-Help Program Uses Chinese Model," Self-Help Reporter 2 (1), 1978, p. 1-2.

[27]Bureau of Health Education, Focal Points, U.S. Department of Health, Education and Welfare, Public Health Service, Center for Disease Control, (Atlanta, Georgia, May, 1980).

Community Health Education Studies Using Epidemological Research Methods

There are some studies which have been done in communities without the objective of involving the community in implementing and carrying out strategies of Health Education. These studies use research methods that involve the use of research designs which test the significance of certain types of health educational interventions (i.e., preventive and curative measures to control disease).

Solon et al.,[28] evaluated in the Phillippines, the relative effectiveness of three intervention strategies to control Vitamin A deficiency in Cebu which causes blindness, a condition called Xerophthalmia. One of 662 children aged 1 to 6 were blinded by factors associated with Xerophtalmia. The three strategies used were 1) Public Health and Horticulture including Health Education and a village cooperative pharmacy, 2) supplying Vitamin A in capsule form and 3) putting Vitamin A into a food substance used in soups, stews and other dishes served to young people. A multivariate analysis using multiple regression was used to test for significant results at the 05 level. The third intervention strategy, putting Vitamin A into the food substance proved to be the most effective though the authors recommend a combination of all three strategies for future prevention strategies.

One weakness however, the authors explain, is the absence of a control-group. However, the main objective of the research is to determine the relative effectiveness of the three intervention strategies.

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[28]Florentino Solon et al., "An Evaluation of Strategies to Control Vitamin A Deficiency in the Philippines," American Journal of Clinical Nutrition 32 (July, 1979).

Hudson and Parker[29] in a study to isolate the effects of introducing a new technology using satellite-radio for health education to influence health care delivery in rural Alaska compared nine (9) satellite-radio villages (experimental-group) with four (4) high-frequency radio villages (control-group). Using a t-Test to test for significance, a significant difference was recorded in radio contacts between health aides and doctors and in the number of medical cases treated.

Farquhar et al., in a field experiment in three northern California towns called the Stanford Heart Disease Prevention Program conducted extensive mass media campaigns over a two-year period. One of the communities was used as a control-group. The purpose of this experiment was to reduce the risk of cardiovascular disease through community health education. In the control-community the risk of cardiovascular disease increased and in the the treatment communities there was a substantial, sustained significant decrease in risk. The measure used to test for significance at the .05 level was the multiple logistic function. Lehman[31] supports this study.

Vertinsky et al.,[32] used the Chi Square test of significance at the .01 and .05 level of significance to measure the rate of compliance with a screening program for a genetic disease of Tay-Sachs which effects Jews.

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[29]Heather E. Hudson and Edwin B. Parker, "Medical Communication in Alaska by Satellite," New England Journal of Medicine, 25 (Dec. 20, 1973).

[30]John W. Farquhar et al., "Community Education for Cardivascular Health," The Lancet 1, (June 4, 1977).

[31]Phyllis Lehman, op. cit.

[32]Patricia A. Vertinsky et al., "A Study of Compliance Factors in Voluntary Health Behavior, International Journal of Health Education, 19 (1), 1976.

Their findings in relationship to the preventive aspect of voluntary health behavior showed significant results in determining that social responsibility to the community is a strong indicator of compliance and that health education triggers positive health behavior.

Four studies cited above in the previous section which involve the community in Health Education and Epidemiological Research Designs with statistical significance tests are the studies of Cox[33], Moore[34], Tuomilehto et al.[35] and Puska et al.[36]

Communication and Education

Some of the literature related to Health Education is concerned with communication theory and models. Marshall states:

> To health educators the challenges are two-fold. Successful communication of the belief that the maintenance of good health is an appropriate and achievable individual goal and responsibility. . . . Mass communication may not have a direct effect but it does exert a significant influence through various mediating factors. For example, the health education message urging people to have their blood pressure taken is mediated by individual perceptions of personal susceptability, the severity of the disease . . .[37]

Marshall, in addition, contends that Health Education and communication are related by designing a chart in which he shows that the Communication Task of socializing new members in modern society is done through inter-personal channels involving parents, older children and

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[33]Cox, op. cit.

[34]Moore, op. cit.

[35]Tuomilehto et al., op. cit.

36Puska et al., op. cit.

[37]Marshall, Toward an Educated Health Consumer, U.S. Department of Health, Education and Welfare, p. 3-17, 1977.

professional teachers, and in a mass channel pattern by school systems, publishing and educational media.

Wood and Wylie define Communication and Education as being identical. They state:

> Communication is education. Education is communication. The process is theoretically identical. Formal educational situations can be interpreted basically as institutionalized communication proceedings designed for specific individual and societal purposes—to pass on man's heritage of knowledge and culture, to discover new knowledge, to acquire skills for earning a living, to develop appreciation for certain values and so forth.[38]

Webster defines Education as ". . . knowlege, ability, etc., thus developed . . . " and Communication as " . . . a giving or receiving of information." On a closer analysis of the key words, Knowledge and Information we find they are imbedded in each others definitions. Information according to Webster is " . . . transmission of knowledge, knowledge acquired in any manner, facts, data, learning . . ." Knowledge is defined as " . . . acquaintance with facts, range of information, awareness or understanding, what is known, learning, enlightment."[39] Thus if Education is Knowledge and Information and Communication is Information and Knowledge, Education and Communication are identical.

Friere discusses the relationship between communication and education. His "problem posing" brand of education "intentionally rejects

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[38]Donald N. Wood and Donald G. Wylie, Educational Telecommunications, California: Wadsworth Publishing Company, 1977, p. 11-12.

[39]Webster's New World Dictionary of the English Language.

communiques and embodies communication"[40] and speaks of solidarity in these terms:

> . . . Solidarity requires true communication and the concept by which such an educator is guided, fears and prescribes communication. Yet only through communication can human life hold meaning. The teacher's thinking is authenticated only by the authenticity of the student's thinking. . . . Authentic thinking, thinking that is concerned about reality, does not take place in ivory tower isolation, but only in communication.[41]

Bordenave also addresses the link between education and communication. He quotes Beegle and Loomis' definition of communication in these words:

> Communication was defined as the process by which information, decisions, and directives pass through a social system and the ways in which knowledge, opinions and attitudes are formed or modified.[42]

and states in his own words:

> Present day innovative educational technology is above all a discipline of synthesis and a trend toward synthesis is what seems very much required in development communication studies - both to extend our knowledge of possibilities and potentials, and to humanize the range of earlier theories.[43]

An examination of the process chart (Figure 1, p. 4) gives a visual representation of the relationship between health education and communication models. The Cameroon-Critical Pathway to Achievement,[44] the basic model on the process chart, and PRECEDE[45] are Health Education Models.

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[40] Friere, op. cit., p. 66.

[41] Ibid, p. 63.

[42] Bordenave, op. cit., p. 15

[43] Ibid, p. 21.

[44] Isely, Sanwogou and Martin, op. cit.

[45] Lawrence W. Green et al., Health Education Planning: A Diagnostic Approach, Palo Alto, California: Mayfield Publishing Company, 1980.

The Bordenave Communication System[46], Sarbaugh's Cross-Cultural Communication[47] and the Diffusion Process[48] are examples of Communication Models. (See Figure 1, p. 4) From the chart it can be deduced that the Bordenave Communication System has the analogous components of both Health Education Systems.

The Sarbaugh Cross-Cultural Communication strategy and the Diffusion Process (See Figure 1, p. 4) are important concepts which can be incorporinto the Health Education/Communication model and supports Bordenave's idea of a "Synthesis" discussed above.

Ogionwo[49], Vertinski et al.[50], and Rogers and Shoemaker[51] aforementioned studied the effects of mass media vs inter-personal channels of communication in relation to Health Education.

Miller and Cantor[52] compared the effectiveness of different types of mass media on blacks and whites and found radio to be an effective channel for Health Education Broadcasts for blacks.

System Content

"A system" according to Miller is, " A set of interlocking units with

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[46]Bordenave, op. cit.

[47]L. E. Sarbaugh, Intercultural Communications: A Plan for Study and Practice, Rochelle, New Jersey, Hayden Publishers, 1976.

[48]Everett M. Rogers with F. Floyd Shoemaker, Communication of Innovations, New York: Collier-MacMillan, LTD, 1971.

[49]Ogionwo, op. cit.

[50]Vertinsky et al., op. cit.

[51]Rogers and Shoemaker, op. cit.

[52]M. Clinton Miller, III and Alan B. Cantor, "A Comparison of Mass Media Effectiveness in Health Education," International Journal of Health Education, 23 (1), 1980.

relationships among them.[53]

Bordenave adds to this definition by defining system as "Any set of interacting parts that maintains its boundaries while exchanging influences with its environment."[54] Bates[55] supports the boundary concept.

Systems are further broken into types. Ryan identifies four types:

1. Natural systems: Natural systems include solar systems, mechanical and thermodynamical universes of nature and the human organisms

2. Man-made systems: Man-made systems refer to organizations or structures of related components devised by man, rather than found in the natural state

3. Closed system: A system is closed if there is no import or export of energies in any of its forms, such as information, heat, physical materials, and no change of components

4. Open system: An open system is one in which there is an exchange of materials, energies of information between the system and its environment[56]

Miller describes three types of systems:

> Conceptual system: This system in essence defines the variable and the relationships in functional systems; the Concrete system and the Abstracted system
>
> Abstract system: The units of abstracted systems are relationships constructed or selected by an observer in the light of his interests, theoretical viewpoint or philosophical bias. Some relationships may be empirically determinable by some operation carried out by the observer, but others are not being only his concepts[57]

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[53]James Greer Miller, Living Systems, New York, McGraw Hill, Inc., 1978, p. 16.

[54]Bordenave, op. cit., p. 16.

[55]Erica Bates, "A Systems and Marketing View", International Journal of Health Education, 15 (3), 1972.

[56]Antoinette T. Ryan, System-Techniques for Programs, Introduction to the Systems Approach, Englewood, Cliffs, New Jersey, 1973, p. 48.

[57]Miller, op. cit., p. 19.

The concrete systems include the open and closed systems, man-made systems and the natural system which is "a special subset of all possible concrete systems." They are composed of moneran, protistans, fungi, plants, animal, groups, organizations, societies and supranational systems. They all have the following characteristics: They are open systems, with significant inputs, throughputs, and outputs of various sorts of matter-energy and information."[58]

Bates[59] discusses a definition of a "system and its application to health education. She views health education as a consumer-oriented marketing strategy. Using marketing-oriented research on community attitudes to mental health, a health education program was devised using the "open" system concept.

Redd[60] in using the man-made open system defines the purpose of this type of system,

> When created, the specific system's purpose and content must be identified, and that purpose will dictate the various uses of system components. The specific types of components determine a man-made system content. The nature of component interaction, two-way communication among components will determine system processes and subsequent output.

Diffusion research is concerned with behavioral change. Rogers and Shoemaker in Communication of Innovations define diffusion as "The process by which innovations spread to the members of a social system," and

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[58] Ibid, p. 18.

[59] Bates, op. cit.

[60] Lawrence N. Redd, "A Descriptive Study of the Use of Teleconferencing via a Two-way Cable Television in Racially Unbalanced Schools," (Ph.D. dissertation, Michigan State University, 1976).

says of diffusion research, "But in diffusion research we usually focus on bringing about overt behavior change, that is adoption or rejection of new ideas, rather than just change in knowledge or attitudes."[61]

Change in a social system is social change according to Rogers and Shoemaker, "Change occurs when a new idea's use or rejection has an effect. Social change is therefore an effect of communication. The process of social change consists of three sequential steps: invention, diffusion, and consequences. Invention is the process by which these new ideas are created or developed. Diffusion is the process by which these new ideas are communicated to the members of a social system. Consequences are the changes that occur within a social system as a result of the adoption or rejection of the innovation."[62]

Rogers and Shoemaker take the traditional S-M-C-R- model of communication--a source (S) sends a message (M) via certain channels (C) to a receiver or receivers (R). He modifies this by adding an (E) effects; consequences over time which are knowledge, attitude change, persuasion, and behavioral change.[63]

Bordenave in reviewing the communication model which essentially uses the same concepts as the model developed by Rogers and Shoemaker[64] states:

> Among the many criticisms thrown at the diffusion model were that it does not take account of the constraints imposed by social structures in the developing countries, it pays insufficient attention to the quality of the practices to

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[61] Rogers and Shoemaker, op. cit., p. 12-13.

[62] Ibid, p. 7.

[63] Ibid.

[64] Ibid.

> be diffused and to the competency of adoption agents, and it relies on a dripping-down view of development communication, which fails to provide for feedback and communication from farmers to the source of innovation.[65]

Wilbur, while using the SMCR, speaks of constraints. He calls them barriers to communication. He mentions cross-cultural barriers, overlapping but different backgrounds, interests and loyalties. He quotes Knutson:

> Barriers or potential barriers to effective communication are always present for at least some members of the intended audience. Success in communication depends upon the ability of the communicator to discover these barriers early in order that remedial actions may be taken. Early actions to correct weaknesses may contribute significantly to success.[66]

By introducing the notion of "system", Bordenave[67] transforms the communication model into its present form which takes into account the terms, source, message, etc., and transforms them into input, output, etc. This model is designed for rural areas in developing countries.

Thus, it the concepts of man-made open systems of Ryan[68], Miller[69], and Redd[70] are combined with models of communication by Rogers and Shoemaker[71] and Bordenave[72], we have a system designed for rural areas in "developing" nations and with one further modification a Health Education/ Communication System model for a rural area in a developed nation.

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[65] Bordenave, op. cit., p. 24.

[66] Muriel Bliss Wilbur, Educational Tools for Health Personnel. New York: MacMillan, 1963, p. 27.

[67] Bordenave, op. cit.

[68] Ryan, op. cit.

[69] Miller, op. cit.

[70] Redd, op. cit.

[71] Rogers and Shoemaker, op. cit.

[72] Bordenave, op. cit.

Systems Approach

Redd defines System Approach as "A methodology which empowers man to design, develop, and evaluate complex organized entities."[73]

Braden and Herban discuss the system approach in the study of man in these words:

> The systems theory approach provides a methodology that utilizies a common language which can enhance interdisciplinary communication. . . . The system approach to the study of man can be appreciated as an effort to restore meaning (in terms of intuitively grasped, understanding of wholes) while adhereing to the principles of discipline generalization and rigorous deduction. It is an attempt to make the study of man both scientific and meaningful.[74]

Baric has developed a technique which looks at a system as a whole and the effect of extraneous variables which act upon it. He calls this Operational Research which "is the application of scientific methods, techniques and tools to the problems involving the operations of a system so as to provide those in control of the sytem with optimum solutions to the problems."[75]

The procedure of Operational Research has three components, 1) defines the system; 2) sets up a system model and 3) chooses and applies appropriate techniques of analysis and interpretation of findings (through math and probability theory).

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[73]Redd, op. cit., p. 77.

[74]Carrie Jo Braden and Nancy L. Herban, Community Health: A System Approach, New York: Appleton, Century, Crofts, 1976, p. XII, 3.

[75]Leo Baric, "An Introduction to Operations Research in Health Education," International Journal of Health Education, 11 (2), 1968, p. 50.

Health Education Procedure/Communication

A communication system has as its component parts: input, process, output, control of the environment, constraints and feedback.[76] To be an effective system, it must adhere to these component parts which can each be evaluated (See Figure 1).[77] When this author suggests that a developmental project can be broken into separate interacting parts and each part comparatively called a component part of a system, he is linking development to communication. By then modifying this system by actually taking a development project in health education and comparing its parts or procedures to the component parts of the system, he can effectively make the connection between that project and its operation as a communication system. Because systems will be used as a method of experimental analysis, the project can be so analyzed.

Several rural development plans have been analyzed using this model. Radio Sutatenza, Columbia, succeeded in promoting greater agricultural productivity using the system design through working directly with study groups and adult education utilizing available governmental agencies and the radio. And in Tanzania, a program called Mtu ni Afya (Man is Health) utilized the concept of preventive health education to achieve enornous success in creating behavior change, i.e., building latrines, providing safe water, and establishing preventive measures to control malaria and tuberclulosis. This was accomplished by using group leaders in village

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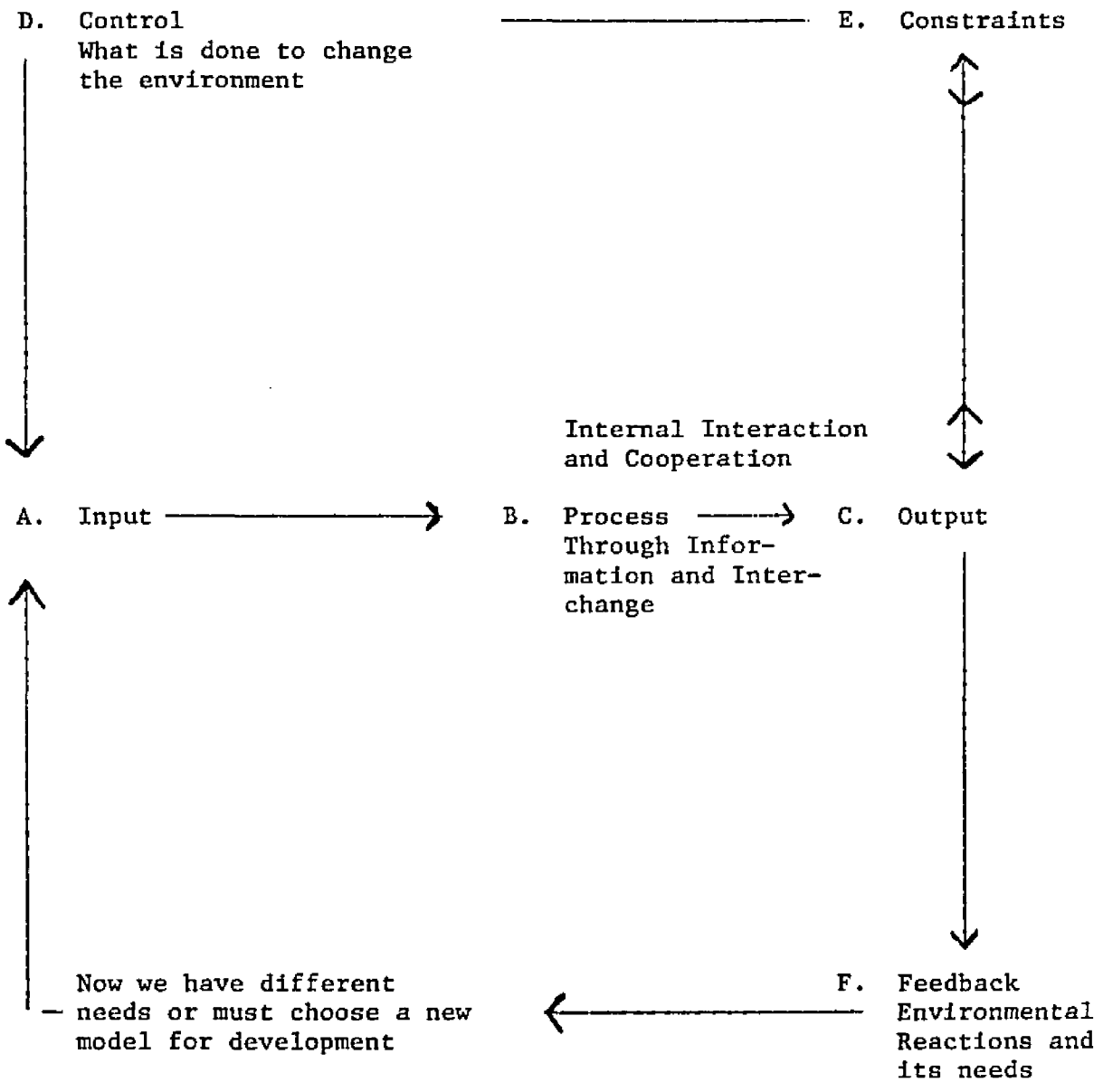
[76]Bordenave, op. cit.

[77]Redd, op. cit.

FIGURE 1

BORDENAVE COMMUNICATION MODEL



Model adapted from Communication and Rural Development, Juan E. Diaz Bordenave

communities, radio, and printed materials. Two million people were involved. In addition, a 20 percent gain in knowledge of health matters was observed using a multiple choice testing design.[78]

This combined health education procedure/communication program has been actualized in rural areas of some of the "developing" nations. The above Health Education Communication System will be used as a model for health education in rural areas of a "developed" nation (See Figure 1).

Summary

This study relates to several areas and this literature review attempts to tie these areas together using theory and practical situations. The concepts of Health Education, Community Organization and People-centered Approach have been joined through a review of studies. Other studies have tied together the notions of Communication, Education and System. A third area has sought to tie together Health Education, Community Organization and classical Experimental Condition. With this background this study was conducted in order to test Health Education under experimental conditions administered through a Communication System with the goal; the participation of the people it is trying to reach. The study used experimental conditions including an experimental and a control-group.

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[78]Bordenave, op. cit.

CHAPTER III

METHODS AND PROCEDURES

This chapter will explain the analytic procedure of multi-dimensional scaling which will be used to assess attitude-behavior changes in the townships of Yates and Webber (experimental) and Covert (control-group). Also the "semantic differential" and its application to multi-dimensional scaling will be discussed. Additionally the process of the system approach, sample determination, Research Design, Hypotheses and Sub-hypotheses will be examined.

Multi-Dimensional Scaling (MDS)

Multi-dimensional Scaling (MDS) is an analytic tool which can be used to assess both attitude and behavior change. MDS operates on the premise that there is a direct relationship between the psychological concept of dissimilarity (among objects) and the mathematical concept of distance. Semantically this notion of dissimilarity can be represented in terms of magnitude. Magnitude in mathematical terms can be described as a measure of distance (Euclidean distance).[1]

Battistich states that:

> Basically, multidimensional scaling is a means of representing the relationships within a set of objects through a geometric or

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[1]James O. Ramsey, Multiscale: For Programs for Multi-dimensional Scaling by the Method of Maximum Likelihood, Chicago International Educational Services, 1978.

> spatial model. Any scale (such as an attitude scale, for example) may be thought of as a dimension which orders objects according to some criterion. The location of the object on the dimension represents its "strength" in terms of the underlying criterion, which the distance between any pair of objects ordered along the dimension represents their "similarity" in terms of the criterion.[2]

Subjects, however, generally use more than one criterion to judge objects or concepts (i.e., more than one judgment scale). Thus multiple dimensions will be needed to represent the dissimilarity relations and each object will have a location on each dimension.[3]

Using a special application of the "semantic differential" (discussed later in this section) objects are paired with each other on a questionnaire and each subject is asked to rate the degree of dissimilarity between concepts on a numerical scale (i.e., 0-10, 0-100, etc.); the greater the degree of perceived dissimilarity, the greater the scaled numerical value. A dissimilarity matrix is created from this process consisting of m(m-1) elements, m is the number of objects or concepts. For the purpose of this study we examine the half matrix m(m-1)/2.

Multi-dimensional scaling analysis has several properties and advantages useful for research in attitude and behavior change. Among its properties are included the ability to analyze individual differences (individually perceived) between subjects, the strength each dimension contributes to the distance approximates each subject's data and defines which object of an object-concept pair is most precisely located within

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[2]Victor A. Battistich, "Multidimensional Scaling," Center for Evaluation and Assessment, College of Social Science, Department of Psychology, Michigan State University, East Lansing, Michigan, p. 1.

[3]Ibid.

the conceptual framework of the subject. The advantages are, in relationship to traditional data analysis, one, non-evaluative dissimilarity data which lessens the ambiguity associated with wording a questionnaire. Ramsey states, "Dissimilarity judgements do not appear to predispose these evaluative reactions on the part of the subject to anything like the same degree [reference to traditional data analysis]." A second advantage is that the dissimilarity data is semantically neutral. Ramsey again asserts "Judgements of this sort do not predispose the subject to use any particular property. Thus the properties they use are a natural consequence of the judgemental context." A third advantage is that MDS programs all have the capability for assessing the internal consistency of responses to ascertain whether a subject is responding in a haphazard or confused fashion and a fourth advantage is that the data to parameter ratio is typically better for dissimilarity data. Ramsey's final statement on this subject is:

> By this is meant that one is usually collecting more independent observations for each scale value estimated when dissimilarity data are employed than when one asks direct questions concerning these scale values. This is due to the fact that the number of pairs of stimuli increases as the square of the number of stimuli (object-concepts), and so, as a consequence, do the number of observations per parameter to be estimated. This statistical advantage is precisely what makes hypothesis testing so much more a possibility for MDS programs than ins the case for other types of data.[4]

Barnett, Serota and Taylor discuss the relationship between attitude change and multi-dimensional scaling analysis. They begin by describing the Woelfel-Saltiel theory of attitude change. They state:

> At its simplest level, the theory suggests that an attitude is the joint effect of a set of messages, x, x2 . . . xn.

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[4]Ramsey, op. cit., p. 13-14.

> The consequent attitude is the linear sum of the messages divided by a number(n) of messages. This is represented as $a = \Sigma_1^n \underline{x}i$ . . . Attitude change, then is treated as a single quantitative function of the number of messages an individual has received about a given attitude object.[5]

Messages can come from several different sources when influencing an attitude just as a subject's responses on a semantic scale can be influenced by more than one judgment scale.[6] Barnett, Serota and Taylor digress on this subject:

> . . . all information from all media can be seen as contributing to the magnitude, balance and mass of an attitude and the observation of attitude can be treated as a longitudinal activity rather than a discrete event, and change can be treated, mathematically, as motion in multi-dimensional space.[7]

Thus the Woelfel-Saltiel attitude theory lends itself nicely to analysis by a multi-dimension scaling process.

Barnett, Serota and Taylor tested the Woelfel-Saltiel theory in a longitudinal study on changing political attitudes and predicting the behavior of voters. Data was analyzed using Multi-dimensional Scaling Analysis. Baseline data was collected from a stratified random sample of registered voters, and from this data the position of each candidate was assessed relative to the voters and campaign issues. From this analysis it was suggested that the candidate design his campaign to present himself as close as possible to the voters and the issues that they considered important. Two later surveys to assess the campaign

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[5]George A. Barnett, Kim B. Serota, James A. Taylor, "Campaign Communication and Attitude Change: A Multi-dimensional Analysis," Human Communication Research. New Brunswick, N.J.: Rutgers University, 1976, p. 227-228.

[6]Battistich, op. cit.,

[7]Barnett, Serota, Taylor, op. cit., p. 228.

design were conducted using separate samples and at different times. The election of the candidate over the incumbent indicated the success of this approach. Three of the four hypotheses initiated by the Woelfel-Saltiel theory were supported. The authors state:

> By working with various analytic techniques (such as the voter prediction equation) and seeking improvements from experience with prior studies, it has been possible to begin to make the transition from attitude measurement to behavioral prediction.[8]

Barnett[9] uses the Galileo method of Multi-dimensional Scaling Analysis to measure organization culture. He cites two studies by Seigel and by Barnett and Carson. Seigel found that students attending professional schools of accounting saw themselves closer to Big and Firms (object-concepts) and Sole Practitioners (object-concept) than student majors in departments of accounting. These findings came from matched samples of eight schools of each type and represent the first year of a longitudinal study of the organizational culture of the accounting profession. These results may help decide future recruitment policies of several large firms as well as the educational policies of the profession.

Barnett and Carson used the Galileo method to study the organizational culture in the profession of technical writing/communication. This study showed that on the two-dimension continuums of science-humanities and print-electronic media, subjects located themselves much closer to humanities than science and far from the electronic media. These findings suggest that members of this profession move themselves toward science and electronic media.

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[8]Barnett, Serota and Taylor, op. cit., p. 241.

[9]George A. Barnett, The Measurement of Organizational Culture, New York Rensselor Polytechnic Institute, (Unpublished paper, date unknown).

Semantic Differential

"The semantic differential (SD) is a method of observing and measuring the psychological meanings of concepts."[10] This measurement tool was invented by Osgood[11] to measure the connotative meanings of concepts as points in what he has labeled as semantic space. Battistich[12] earlier discussed the notion of multi-dimension scaling and that object concepts could be located at points on dimensions in multi-dimensional space. An example would be a graphic two-dimensional model using the notion of a linear relationship and a co-ordinate representation. An object-concept would have a value on each axis (dimension) forming an ordered pair [i.e., (x, y)]. Any number of axes (dimensions) can be used to describe an object's location in multi-dimensional space. A three dimensional representation of an object's location would have the co-ordinates of (x,y,z).

Osgood's[13] semantic space is determined by three basic dimensions, evaluation, potency and activity. They account for 69 percent, 15 percent and 13 percent respectively of the variance in semantic-differential analysis.[14] Osgood states:

There is no question about identification of the first

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[10]Kerlinger, op. cit., p. 566.

[11]Charles E. Osgood, George J. Suci, Percy H. Tannenbaum, The Measurement of Meaning. Urbana, Illinois: University of Illinois Press, 1957.

[12]Battistich, op. cit.,

[13]Osgood, Suci, Tannenbaum, op. cit.

[14]Frank R. Hartman, "A Behavioristic Approach to Communication: A Selective Review of Learning Theory and a Derivation of Postulates," Audio Visual Communication Review, (11)(5), 1963.

> dimension of the semantic space—an evaluative factor is first in magnitude and order of appearance in both analyses. . . . The potency determinant in semantic judgments displays the poorest corresponsdence between factor and dimension, but even here the evidence is fairly satisfactory. . . . It is also clearly interpretable as an activity determinant on a qualitative basis.[15]

In communication studies the semantic-differential is very useful as an instrument of evaluation. Hartman contends:

> Of the existing instruments for measuring the various aspects of meaning, only the semantic-differential appears useful to the practical communicator.[16]

Osgood, on the measurements of communication effects asserts:

> Communication effects are changes in the meaning of concepts central to the message, changes in the location of these concepts in the (potentially) n-dimensional space provided by a semantic-differential. Such changes may be measured in toto by applying the D-measure between pre and post-message scores on all factors, or they may be assayed on the unidimensional (or even single scale) basis. In either case, a greater wealth of information derives from such a multi-dimensional instrument.[17]

The D-measure mentioned above is a measure of distance. Kerlinger states:

> If two concepts are close together in semantic space, they are alike in meaning for the individual or group making the judgment. Conversely if they are separated in semantic space, they differ in meaning. What is needed is a measurement of the distance between any two concepts. Osgood and his colleagues therefore use the so-called D-statistic, a very simple measure which is defined: $Dij = \sqrt{\Sigma\, dij^2}$ [Note the similarity between this formula and the earlier formula of Barnett on the linear sum of an attitude] where D is the linear distance between the coordinates of i and j on the same factor (Evaluation, Potency, Activity).[18]

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[15] Osgood, Suci and Tannenbaum, op. cit., p. 44-45.

[16] Hartman, op. cit., p. 185.

[17] Kerlinger, op. cit., p. 574.

[18] Kerlinger, op. cit., p. 574

Instrument Development

The format for this survey is a designed application of the semantic-differential and uses multi-dimensional analysis to measure the distance between concepts of health-related items. Osgood, Suci and Tannenbaum distinguish this application of the semantic-differential from other applications by stating:

> Instead of limiting one's attention to separate pairs of concepts (or subjects) as above, all (m(m-1))/2 [m = number of concepts] pairs can be studied simultaneously. Using formula (1), the distance between each concept and every other concept can be calculated and entered into a mXm matrix. This matrix represents the semantic structure of the set of m concepts, giving the distances or similarity relations among all objects. The set of distances representing the semantic structure are "plotable" in a space having the same or fewer dimensions as the number of dimensions represented in the measuring instrument.[19]

The concepts developed for this measuring instrument were generated from questions asked of the citizens of Webber and Yates Townships. These questions were 1) What do you think of health care?, 2) Who is in need of health care?, and 3) What Health and Community Organizations are available? These questions were open-ended to elicit broad and varied responses. In addition, Regional Health Care, The District Health Department, The Chamber of Commerce of Yates Township and an Interagency Brown Bag Meeting of various organizations in Lake County were visited and asked these three questions. From these contacts the ten most commonly used concepts in relationship to three proposed dimensions of, 1) health education, 2) community organization (Independent Variables) and 3) behavior-attitude change (Dependent Variable) were

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[19]Osgood, Suci and Tannenbaum, op. cit., pp. 93-94.

generated and paired. The concepts to be scaled were 1) Community Organizations, 2) Regional Health Care, 3) Young People, 4) Health Education, 5) District Health Department, 6) Disease Prevention, 7) Old People, 8) Yourself, 9) Seeking Medical Help, 10) Health Programs. The order of concepts above came as a result of random selection with replacement. The concepts were then paired in this fashion: Concept 1 with Concept 2, Concept 1 with Concept 3 . . . 4 . . . until each concept had been paired with each other (See Appendix 1). There are various survey forms which use this pairing format.

Three types of analysis are indicated using the semantic-differential as a measuring instrument for both individuals and groups, 1) differences in factor or dimension scores across time for individuals and groups 2) the significance of different D scores across time for individuals and groups and 3) differences between and within conceptual structures between individuals and groups.[20]

Reliability and Validity of Semantic Differential

Standard reliability procedures for linear regression were applied to the semantic-differential which represents the data obtained through dissimilarity judgments. The relationship between dissimilarity and distance is essentially linear.[21] The Multi-dimensional scaling analysis (MULTISCALE) produces regression co-efficients and standard errors for both individuals and groups.[22] The method used to determine

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[20] Ibid.

[21] Ramsey, op. cit.

[22] Ibid.

the reliability co-efficient for linear regression[23] is similar to Kerlinger's treatment for determining the reliability co-efficients for analysis of variance.[24] Barnett, Serota and Taylor[25] suggest that we aggregate the data to determine the reliability co-efficients. The reliability co=efficients using aggregates from the pre- and post-tests for the experimental-group (Yates and Webber Townships, Lake County) were .93 and .97 respectively. The reliability co-efficients for the pre - and post-tests for the control-group (Covert Township, Van Buren County) are .85 and .94 respectively.

The semantic-differential has been found to be sufficiently reliable and valid for many research purposes.[26] In this study it has content validity. The concepts were generated from responses garnered from the experimental population from a questionnaire given randomly. The Pearson product moment correlation co-efficient was used to measure construct validity. Kerlinger[27] and Napior[28] suggest that using correlation between concept pairs (scales) can be used to test validity correlations. Co-efficients for the ten concepts ranged as follows: Experimental Group pre - and post-tests; .63-.80 and .73-.88 respectively. Control Group pre - and post-tests; .65-.91 and .66-.93 respectively. These were significant at the .001 level.

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[23]William L. Hays, Statistics for the Social Sciences, (New York: Holt, Rinehart and Winston, Inc., 1973)

[24]Kerlinger, op. cit.

[25]Barnett, Serota and Taylor, op. cit.

[26]Ibid.

[27]Ibid.

[28]David Napiro, "Nonmetric Multidimensional Techniques for Summated Ratings" Multi-Dimensional Scaling, New York: Seminar Press, 1972, pp. 158-178.

Sites

Experimental Group Rural Lake County: Yates and Webber Townships

Lake County is the poorest county in Michigan.[29] It is underdeveloped and sparsely populated. It has little or no major manufacturing, agricultural industries or businesses.

In addition 22.9 percent of the inhabitants have an income below the officially defined poverty level, 29.4 percent of the inhabitants have an income below the officially defined poverty level of 125 percent and 889 families of approximately 1,400 receive some aid from ADC (Aid to Dependent Children).[30] Lake County also faces a growing number of elderly persons as a percentile of its population. The age group 20 to 44 years of age is only 20.6 percent of the population as compared to 31.4 percent for the state.[31] This is primarily due to the out migration of the younger population in search of employment, educational facilities and interesting worthwhile acitivites.

In the crucial matter of health and health care, these problems exist: There is a higher death rate for Lake County when compared to the rest of the state for almost all kinds of disease except for influenza, penumonia, alcoholism, cirrhosis of the liver, arteriosclerosis and stroke. Diabetes and heart disease rank especially high

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[29]David I. Verway, ed., Michigan Statistical Abstract, East Lansing, Michigan: Michigan State University, 1978.

[30]Michigan, 1970 Census.

[31]Shyamalendu Sarkar, Some Economic Aspects of Lake County Health Industry: Characteristics, Revenues and Expenditures, Facility and Problems, (East Lansing, Michigan, Agricultural Experiment Station, Michigan State University, 1975).

for the county.[32]

Lake County has no hospitals and there are only four doctors in Lake County. This ratio of 1 to 1,775 people can be compared to a statewide ratio of 1 to 984 (The Michigan Health Council's recommendation for doctor to person ratio is 1 to 600). The situation is similar for registered nurses in Lake County—there are only five.[33] (1 to 1,400 people)

There is only one health care facility in Lake County, Regional Health Care which is located in the Village of Baldwin. It is open from 8 a.m. to 5 p.m. Monday through Friday. For hospital or nursing care a person must leave the county. For major surgery operations, they must go to Grand Rapids which is 80 miles away.

Regional Health Care (RHC) in its proposal for funding from the Rural Health Initiative (a federal program), defined as one of its problem areas for 1979-80:

> Because of its rural location and limited exposure through the mass media, Regional Health Care lacks the capability of adequately informing the community of its services and does not have an effective method of providing community education.[34]

In Yates Township (part of Lake County), according to the 1970 census, 72 percent of the heads of the household earned less than $6,000 dollars per year, 53.3 percent earned less than $5,000 per year, and 45.3 percent earned less than $3,000 per year. 30.7 percent of the families are below the official poverty level in yearly income. Additionally,

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[32] Ibid.

[33] Michigan Department of Public Health, Office of Statistics Research and Evaluation and Vital Statistics, 1978.

[34] Michigan, "Regional Health Care, Inc., Rural Health Initiative Continuation Grant Application," prepared by Regional Health Care (Baldwin, Michigan, 1979-80).

61.1 percent of persons 14 years and older receive public assistance, social security or railroad retirement.[35]

In comparison Webber Township presents comparable statistics. Eighty percent of the heads of household earned less than $6,000 dollars per year, 75.9 percent earned less than $5,000 per year, 52.6 percent earned less than $3,000 per year and 39.2 percent of persons 14 years and older receive public assistance, social security or railroad retirement.[36]

Control Group - Van Buren County: Covert Township

Van Buren County's median income consistently ranks lower than that of the state. Of the families in Van Buren County, 35.6 percent earned less than $7,000 per year in 1970 and also in that year the county ranked 34th out of 83 counties in Michigan in the percentage of families receiving welfare assistance. In an eight county Health Service Area, it is last in per capita income.[37]

Because of out migration of the young population, Van Buren County faces a growing population of elderly people; 35.7 percent of its population is over 60 and 30.6 percent of those over 65 have an income below the poverty level.[38]

In the area of Health and Health Care, heart disease, cancer and cerebrovascular disease all rank higher than their counterparts across

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[35] Michigan, 1970 Census.

[36] Ibid.

[37] Jane Miller, "Community Assessment, Bangor, Michigan," (Masters Thesis Wayne State University, 1979.)

[38] Ibid.

the state as a cause of death. In the Bangor area where many of the people from Covert Township go for medical help, one doctor said "the rate of hypertension has reached epidemic proportions." Diabetes ranks as a high disease category in terms of numbers.[39]

Health care facilities exist at Bangor, Hartford, and South Haven. The Health Center at Bangor is small and designed for migrants, though permanent residents use it. The hospital in South Haven has the reputation of being of poor quality and offering poor health care services. The County Health Department handles immunizations and has small clinics. None of these facilities has an adequate health education system according to administrators at these facilities.

There is one doctor for every 2,025 people and one active registered nurse per 510 people, much lower than the state's recommendations (1 to 600 for doctors to persons).

Covert Township (control group), according to the 1970 census: 49.5 percent of the heads of households earned less than $6,000 per year, 42.1 percent of the heads of households earned less than $5,000 per year, and 29.4 percent of the heads of households earned less than $3,000 per year. In addition, 35.8 percent of persons 14 years and older receive public assistance, social security, or railroad retirement.[40]

Covert is a large rural township, yet has no health facilities; only one small manufacturing firm, and few retail businesses.

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[39] Ibid.

[40] Michigan 1970 Census.

From this preliminary research, this author suggests that Covert Township will serve as a suitable control group to compare with Yates and Webber Townships.

Sample

The samples chosen for this study are an example of purposive sampling[41] and has certain limitations (see earlier reference to limitations of the study). However, randomness was introduced to determine which site would serve as an experimental or control-group (coin flip).

Final samples consist of 23 heads of households in the control-group and 22 heads of households in the experimental-group. This is reduced from a sample size of 38 subjects in the control-group and 37 subjects in the experimental-group. The final samples are those subjects who were administered the post-test. The reduced sample is due to these factors: 1) Several in each sample were removed because of lack of understanding the test; 2) Moved from the area; 3) Husbands refused to allow wives to take the post-test; 4) Not interested; 5) Sick and unable to respond. The final sample consisted of the following characteristics:

Experimental Group

> Sixty percent earned less than $5,000 per year, 78 percent earned less than $7,000 per year. 47.6 percent were over 60 years old and 76.2 percent were over 45 years old. 58.8 percent were females and 95.2 percent were black and 63.6 percent had less than a high school education.

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[41] Kerlinger, op. cit., p. 129.

Control Group

60.8 percent earned less than $5,000 per year and 65.2 percent earned less than $7,000 per year. 47.8 percent were over 60 years old and 87 percent were over 45 years old. 65.2 percent were female and 100 percent were black and 30.4 percent had less than a high school education. (See Table 2)

Procedure

The following procedure is analogous to the "Critical Pathway to Achievement" and its communication system counterpart;" "The Bordenave System Design" (See Page 4). It uses the terms of the Bordenave System as division headings with the exception of the term constraints which are assessed at each level or division. The analogous portions of the Critical Pathway to Achievement are entered under each division term. The outline below will demonstrate the procedure. (See Appendix 4 for Detailed Intervention by the Health Committee)

Procedure

1. Input-Assessing the Needs of the Community

    a. Gather information, both demographic and on social and health problems.

    b. Meet township leaders.

    c. Organize Health Committee.[42]

    d. Arrange a meeting at which the survey results will be reported.

        1. Ask for priority problems.
        2. Analyze potential obstacles (constraints).
        3. During this meeting and subsequent meeting, problems will be prioritized.

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[42]After attempting to form a Health Committee in Yates Township, the investigator discovered the existence of the Lake County Health and Services Association, a non-profit community corporation in existence since 1964.

TABLE 2

DEMOGRAPHIC DATA FOR EXPERIMENTAL AND CONTROL GROUPS

	EXPERIMENTAL GROUPS (n=22)	CONTROL GROUPS (n=23)
Earned less than $5,000/year	60%	60.8%
Earned less than $7,000/ year	78%	65.2%
Age over 60 years	47.6%	47.8%
Age over 45	76.2%	87.0%
Females	58.8%	65.2%
Males	41.2%	34.8%
Less than High School Education	63.6%	30.4%
Race (Black)	95.2%	100%

2. Process—Internal Interaction and Cooperation Through Information and Interchange

   a. Inform the committee about preventive measures applying to each problem, the relative cost of various approaches; their feasibility and effectiveness (constraints are considered).

   b. The committee choose one problem to work on. Inform the committee of feasible ways of working on the problem.

   c. Assess local resources—the committee makes the decision of what local resources to use.

   d. Planning the work and setting—the committee plans the output; the methodology of handling the health process. The committee assesses methods of communication which best fit their particular community.

3. Output—Setting Responsibilities and Time Schedules

   a. The responsibility of carrying out health education shall be assigned to those who will implement it. Manual and intellectual activities are assigned.

   b. Time schedules shall be set to establish deadlines for completion of health education programs according to needs priority. The responsibility for the design of the message and the method of sending out the message is finalized (output).

4. The Execution of Health Education Messages; Control of The Environment

   a. Health education and actual environmental behavior, health prevention measures, use of health facilities.

   b. Constraints are encountered, evaluated, and a plan to deal with them is designed.

5. Evaluation—Feedback; Effects of Constraints, Degree of Success of the Program of Health Education

   a. A post-test will be given to assess the degree of health prevention behavior and the use of health care facilities.

Experimental Design

A two group before and after (pre-test, post-test) experimental Design will be used and is shown in the chart on the next page. This design has certain weaknesses. The most notable is that subjects are not assigned randomly. The assumption of homogeneity of variance between the experimental and the control group will be tested at the .01 level of significance.

Experimental Design

	Pre-Test	Treatment Health Education by Health Committee	Post-Test
Experimental Group Yates and Webber Township* Lake County	n=22	Intervention by Committee Who Implement Health Education	n=22
Control Group Covert Township Van Buren County	n=23		n=23

N = 45

Independent Variable = Health Education

Dependent Variable = Behavior Change (Health Preventive Measures and the Use of Health Care Facilities)

*Yates and Webber are combined because the Health Organization is the Lake County Health Services Committee.

Hypotheses and Subhypotheses

The hypotheses* and subhypotheses were generated from three areas; 1) The Multidimensional Scaling Process itself, 2) Attitude-Behavior Change and 3) Health Education. The hypotheses and subhypotheses (where appropriate) were presented with the rationale on which they are based and the statistical procedure by which they are tested. Hypothesis 2 is stated in its general form and nine subhypotheses were generated from it.

Hypothesis 1: The data will be interpretable using three dimensions

This hypothesis is crucial to multi-dimensional scaling analysis; the number of dimensions used to interpret the solution of the overall test. The survey questionnaire (Appendix I) is designed to examine three dimensions; 1) Health Education, 2) Attitude-Behavior Change, and 3) Community Organization. Therefore a three-dimensional structure is hypothesized to emerge from processing the data. The statistic employed was the Chi-Square variable at the .05 level of significance.

Hypothesis 2: Interaction of a community-based health committee with the vertical Health Care System will cause an increase in positive health-related behavior. There will be a significant difference between pre-test and post-test scores in the experimental group.

This hypothesis is generated from research in the area of attitude and behavior change. Earlier Barnett, Serota and Taylor[43] alluded to

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[43] Barnett, Serota and Taylor, op. cit.

*Hypotheses and Subhypotheses are stated in the alternative form rather than the null for for ease of interpretation.

the point that there can be a transition from attitude measurement to behavior prediction. Smith, in his dissertation, discusses two positions, one defining attitude as a predisposition to behavior and one defining attitude as behavior. He notes:

> Jordan (1971a) however, believes that attitudes and behavior are not separate of disparate entities, but are varying along the same continuum; hence, he uses the hyphenated term, attitude-behavior, to connote a synthesizing of what has previously been two separate and distinct entities. The new usage was in part derived from Guttman's (1950a) definition of attitude as a "delimited totality of behavior with respect to something" (Jordan 1971b).[44]

In effect, attitude-behavior is treated as one concept operating on a continuum. Positive health-related attitude-behavior is indicated by a reduction in the distance (magnitude) between two concepts relating to the attitude-behavior continuum. The statistic employed is the the Chi-Square variable at the .05 level of significance. Several subhypotheses are generated from hypothesis 2. The statistic employed for all sub-hypotheses is the t-Test for equality of means at the .05 level of significance. An F-Test for homogeneity of variance for the control and experimental group is tested at the .05 level at the pre - and post-test stages.

Subhypothesis 2A: There is a decrease in the magnitude (distance) between Concept 9 (Seeking Medical Help) and Concept 2 (Regional Health Care).

Attitude toward Regional Health Care is the underlying factor whether a community resident seeks help from Regional Health Care. If the attitude toward Regional Health Care is influenced by a Health/

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[44]Winfred Joseph Smith, "A Guttman Facet Analysis of Racial Attitudes in Kenya, Nigeria, South Africa, and the United States," (Ph.D. Dissertation, Michigan State University, 1975) p. 11.

Education intervention strategy it is hypothesized that the semantic distance between the concepts Seeking Medical Help and Regional Health Care will decrease significantly.

Subhypothesis 2B: There is a decrease in the magnitude between Concept 6 (Disease Prevention) and Concept 8 (Yourself).

Smillie[45] linking prevention to the private physician and the Departmental Task Force on Prevention[46] defined three different types of prevention, (primary, secondary, and tertiary) in the context of the physician practicing preventive medicine. The Lake County Health and Services Association defined as its number one priority to bring a private physician into the community. Thus, if a physician enters the community and decides to remain, it is hypothesized that the magnitude between Yourself and Disease Prevention would decrease.

Subhypothesis 2C: There is a decrease in the magnitude between Concept 6 (Disease Prevention) and Concept 2 (Regional Health Care).

The above discussion which emphasizes Smillie[47] and the Departmental Task Force on Prevention[48] provide the rationale for this subhypothesis essentially because the new physicians work for Regional Health Care. It is hypothesized that the semantic distance between the two concepts will decrease.

Subhypothesis 2D: There is a decrease in the magnitude between Concept 8 (Yourself) and Concept 2 (Regional Health Care).

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[45] Smillie, op. cit.

[46] U.S. Department of Health, Education and Welfare, op. cit.

[47] Smillie, op. cit.

[48] U.S. Department of Health, Education and Welfare, op. cit.

The Woelfel-Saltiel Theory which states that "all information, from all media, is seen as contributing to the magnitude, valence and mass of an attitude"[49] forms the basis for this subhypothesis. Health education messages generated from Regional Health Care are hypothesized to improve the attitude toward Regional Health Care in a positive direction by a decrease in the magnitude between the two concepts in semantic space.

Subhypothesis 2E: There is a decrease in magnitude between Concept 4 (Health Education) and Concept 2 (Regional Health Care).

According to the above discussion, if Regional Health Care institutes a media approach and an interpersonal approach to create positive attitude-behavior change a decrease between these two concepts in terms of magnitude is hypothesized.

Subhypothesis 2F: There is a decrease in magnitude between Concept 4 (Health Education) and Concept 1 (Community Organization).

Rogers and Shoemaker[50] discuss Interpersonal Communication as a method of information diffusion. It is hypothesized that a Community Organization (The Lake County Health and Services Association) using interpersonal channels of communication to effect attitude-behavior change will cause a decrease in the magnitude between the two concepts.

Subhypothesis 2G: There will be a significant decrease in magnitude between Concept 2 (Regional Health Care) and Concept 7 (Old People).

The majority of the respondents are over 60 years of age. It had earlier been postulated that a decrease in magnitude between Concept 8

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[49]Barnett, Serota and Taylor, op. cit.

[50]Rogers and Shoemaker, op. cit.

(Yourself) and Concept 2 (Regional Health Care) would manifest itself significantly. Thus, if Yourself is identified with Old People then it can be postulated that the distance between Concepts 2 and 7 will decrease significantly.

Subhypothesis 2H: There is a decrease in magnitude (distance) between Concept 2 (Regional Health Care) and Concept 10 (Health Programs).

Subhypothesis 2I: There will be a decrease in magnitude (distance) between Concept 1 (Community Organization) and Concept 2 (Regional Health Care).

Regional Health Care and the Lake County Health and Services Association collaborated on the Health Education Project. It is postulated that the attitude-behavior between these two organizations would increase in a positive direction by moving closer together in semantic space.

CHAPTER IV

ANALYSIS OF THE DATA

This study investigated several hypotheses and subhypotheses concerned with changes in attitude-behavior in two predominately black townships in Lake County Michigan. A method called Multi-Dimensional Scaling Analysis used scales utilizing the Semantic-Differential was used in both pre-test and post-test situations.

Analysis Procedure

The data were analyzed on the CDC Cyber 170 Model 750 at the Michigan State University Computer Center. A recent software program called MULTISCALE performs multi-dimensional scaling analysis. Table 3 contains the variable list.

Statistical Analysis

The MULTISCALE Program analyzes data from individual and group perspectives. It allows for comparison between groups and uses an approximation to the Chi-Square distribution statistic to test for significance. For the purpose of this study the level of significance was set at .05. Within the grouped data if a significant difference is found, an analysis of the visual plots of concepts will be examined for differences between pre-test and post-test. Co-ordinates of concepts on the graphic plots will be examined for attributes of each of the factors and other descriptive statistics will be used in the analysis. To determine the significance of the specific subhypotheses the t-Test was

TABLE 3

VARIABLE LIST

V 1 = Community Organization and Regional Health Center *#
V 2 = Community Organization and Young People
V 3 = Community Organization and Health Education
V 4 = Community Organization and District Health Department
V 5 = Community Organization and Disease Prevention
V 6 = Community Organization and Old People
V 7 = Community Organization and Yourself
V 8 = Community Organization and Seeking Medical Help
V 9 = Community Organization and Health Programs
V 10 = Regional Health Care and Young People
V 11 = Regional Health Care and Health Education
V 12 = Regional Health Care and District Health Department
V 13 = Regional Health Care and Disease Prevention
V 14 = Regional Health Care and Old People
V 15 = Regional Health Care and Yourself
V 16 = Regional Health Care and Seeking Medical Help
V 17 = Regional Health Care and Health Programs
V 18 = Young People and Health Education
V 19 = Young People and the District Health Department
V 20 = Young People and Disease Prevention
V 21 = Young People and Old People
V 22 = Young People and Yourself
V 23 = Young People and Seeking Medical Help
V 24 = Young People and Health Programs
V 25 = Health Education and the District Health Department
V 26 = Health Education and Disease Prevention
V 27 = Health Education and Old People
V 28 = Health Education and Yourself
V 29 = Health Education and Seeking Medical Help
V 30 = Health Education and Health Programs

TABLE 3 - Continued

V 31 = District Health Department and Disease Prevention
V 32 = District Health Department and Old People
V 33 = District Health Department and Yourself
V 34 = District Health Department and Seeking Medical Help
V 35 = District Health Department and Health Programs
V 36 = Disease Prevention and Old People
V 37 = Disease Prevention and Yourself
V 38 = Disease Prevention and Seeking Medical Help
V 39 = Disease Prevention and Health Programs
V 40 = Old People and Yourself
V 41 = Old People and Seeking Medical Help
V 42 = Old People and Health Programs
V 43 = Yourself and Seeking Medical Help
V 44 = Yourself and Health Programs
V 45 = Seeking Medical Medical Help and Health Programs

*Regional Health Center is also known as Regional Health Care in Lake County.

#Regional Health Center has been changed to the Bangor Health Center for Van Buren County.

used to determine whether there is a significant change in mean scores in all of the variables included for subhypotheses review.

Hypothesis I: The data will be interpretable using three dimensions. The statistic employed was the Chi-Square at the .05 level. MULTISCALE[1], a multi-dimensional scaling program on Michigan State University's computer system allows for the determination of dimensions to be used in its analysis process. It prints as part of its summary statistics the Log Likelihood, unbiased standard error estimate and the number of paramenters for a particular analysis. (See Table 4) Ramsey[2], the creator of MULTISCALE, for hypothesis testing uses the three above parameters to determine whether increasing dimensional solutions is of value. If the unbiased standard error decreases appreciably when analyzed by adding dimensions, the added dimension(s) will be instrumental in the solution of the problem. This was tested at the .05 level by using the Chi-Square distribution by taking twice the difference of the Log Likelihoods of the different dimensional solutions and using the difference in parameters of the two solutions as the degrees of freedom. Chi-Square statistics respectively for the experimental pre - and post-tests were 30.732 and 30.562 at seven degrees of freedom. Chi-Square statistics respectively for the control group pre- and post-tests were 43.050 and 54.466 at seven degrees of freedom (See Table 5). These Chi-Square values were significant at the .001 level. Ramsey, however, discounts

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[1]Ramsey, op. cit.

[2]Ibid.

the value of this procedure when there is only a modest or small improvement in unbiased standard error estimate or Log Likelihood and a review of the configuration plots support his contention (See Figures 2-13). After viewing the solution in the three dimensions, Dimensions I and II were well defined whereas Dimension III is uninterpretable. Dimension I shows a dimensional aspect of age ranging from Concept 7 (Old People) to Concept 3 (Young People). Dimension II shows a dimensional continuum which goes from Self-Care (Behavioral terms, 6-Disease Prevention, 4-Health Education and 9-Seeking Medical Help) to Institutional Care, (Regional Health Care, 5-District Health Department). Ramsey suggests that when a sample is small and relatively homogeneous three or four dimensions are usually sufficient for data analysis. In addition, this author hypothesized that due to the nature of the stimuli, three dimensions would emerge (Community Organization, Health Education and Behavior Categories). However after inspection of the data Age became one dimensional quality and Type of Care Dimension II and an undeterminable third dimension. Plots involving a third dimension will be used to further define the two dimensional solution and summary data from the three dimensional solution is used for hypothesis testing.

FIGURE 2 EXPERIMENTAL GROUP POST-TEST DIMENSION 2 VS DIMENSION 1

LEGEND

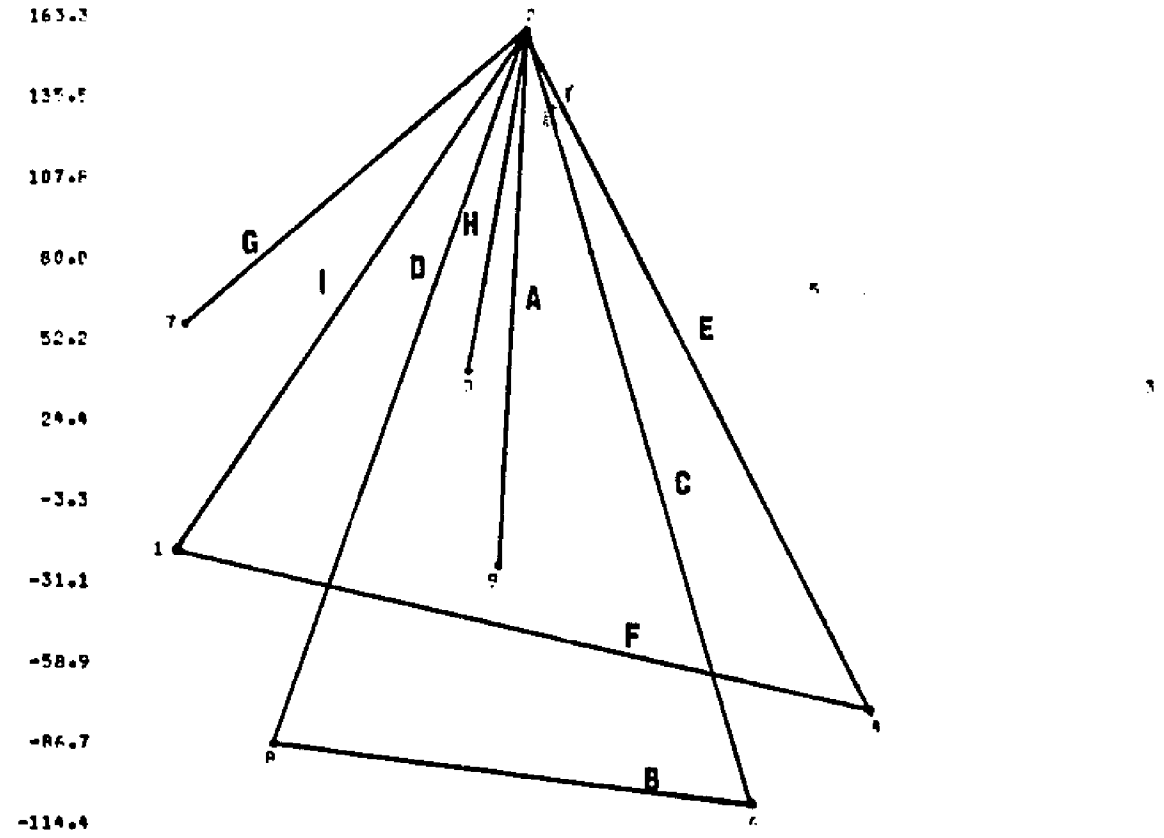
1. Community Organizatuon
2. Regional Health Care
3. Young People
4. Health Education
5. District Health Department
6. Disease Prevention
7. Old People
8. Yourself
9. Seeking Medical Help
0. Health Programs

FIGURE 3 EXPERIMENTAL GROUP PRE-TEST DIMENSION 2 VS DIMENSION 1

LEGEND

1. Community Organization
2. Regional Health Care
3. Young People
4. Health Education
5. District Health Department
6. Disease Prevention
7. Old People
8. Yourself
9. Seeking Medical Help
0. Health Programs

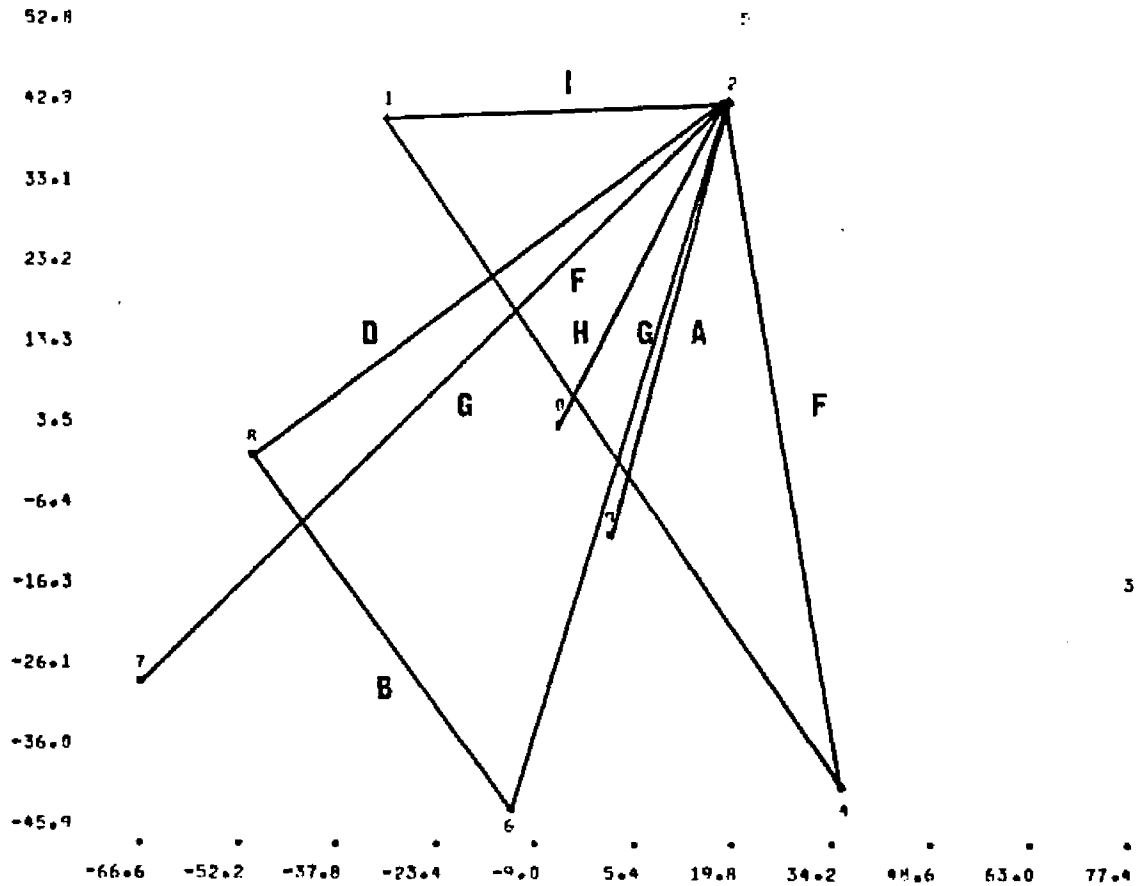
SECTION 4. CONFIGURATION PLOT(S)



PLOT OF DIMENSION 2 (VERTICAL AXIS) AGAINST DIMENSION 1

YAWF?

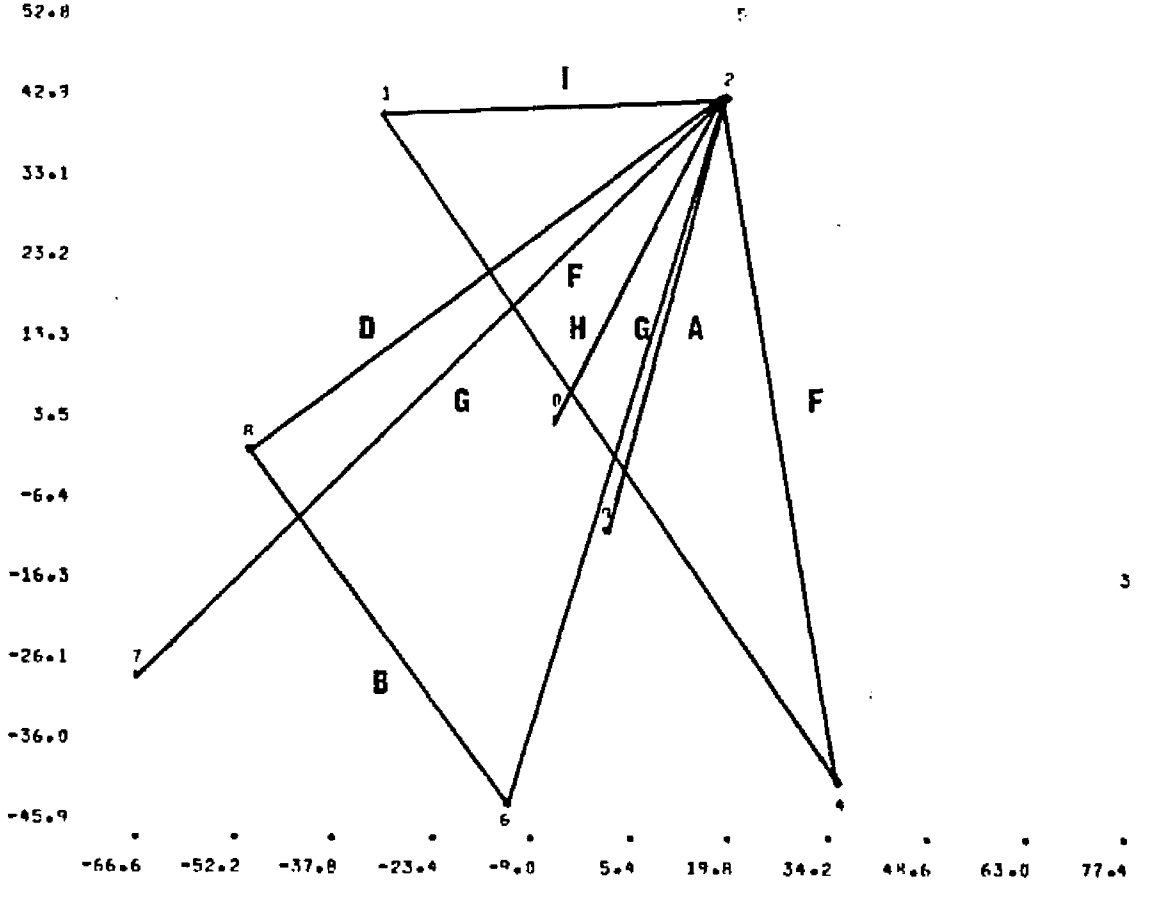
SECTION 6. CONFIGURATION PLOT(S)



PLOT OF DIMENSION 2 (VERTICAL AXIS) AGAINST DIMENSION 1

YAWE1

SECTION 6. CONFIGURATION PLOT(S)



PLOT OF DIMENSION 2 (VERTICAL AXIS) AGAINST DIMENSION 1
YAWE1

FIGURE 4 CONTROL GROUP POST-TEST DIMENSION 2 VS DIMENSION 1

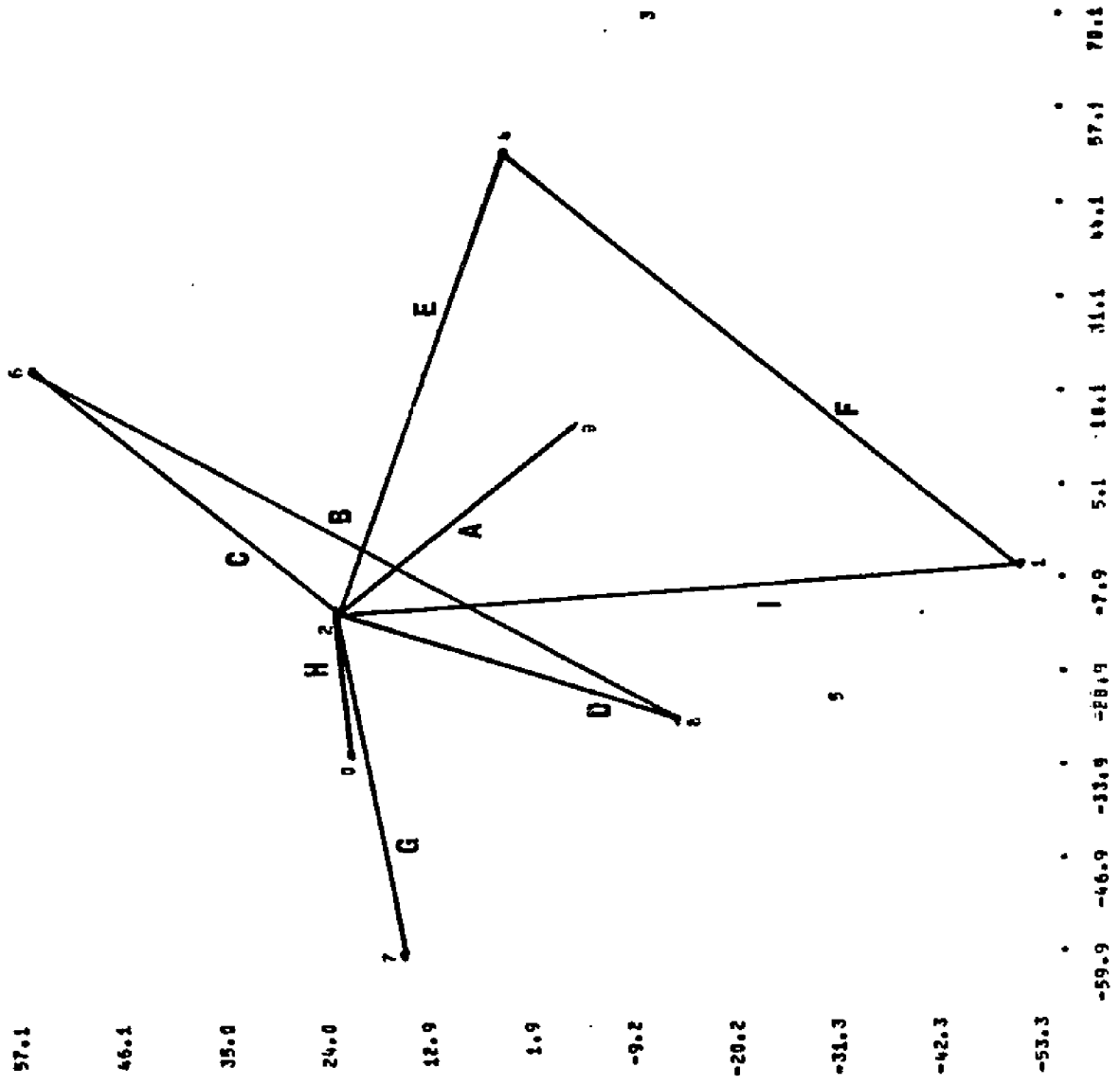
LEGEND

1. Community Organization
2. Regional Health Care
3. Young People
4. Health Education
5. District Health Department
6. Disease Prevention
7. Old People
8. Yourself
9. Seeking Medical Help
0. Health Programs

FIGURE 5 CONTROL GROUP PRE-TEST DIMENSION 2 VS DIMENSION 1

LEGEND

1. Community Organization
2. Regional Health Care
3. Young People
4. Health Education
5. District Health Department
6. Disease Prevention
7. Old People
8. Yourself
9. Seeking Medical Help
0. Health Programs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46.1
35.0
24.0
12.9
1.9
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-20.2
-31.3
-42.3
-53.3
-59.9
-46.9
-33.9
-20.9
-7.9
5.1
18.1
31.1
44.1
57.1
70.1

SECTION 6. CONFIGURATION PLOT(S)

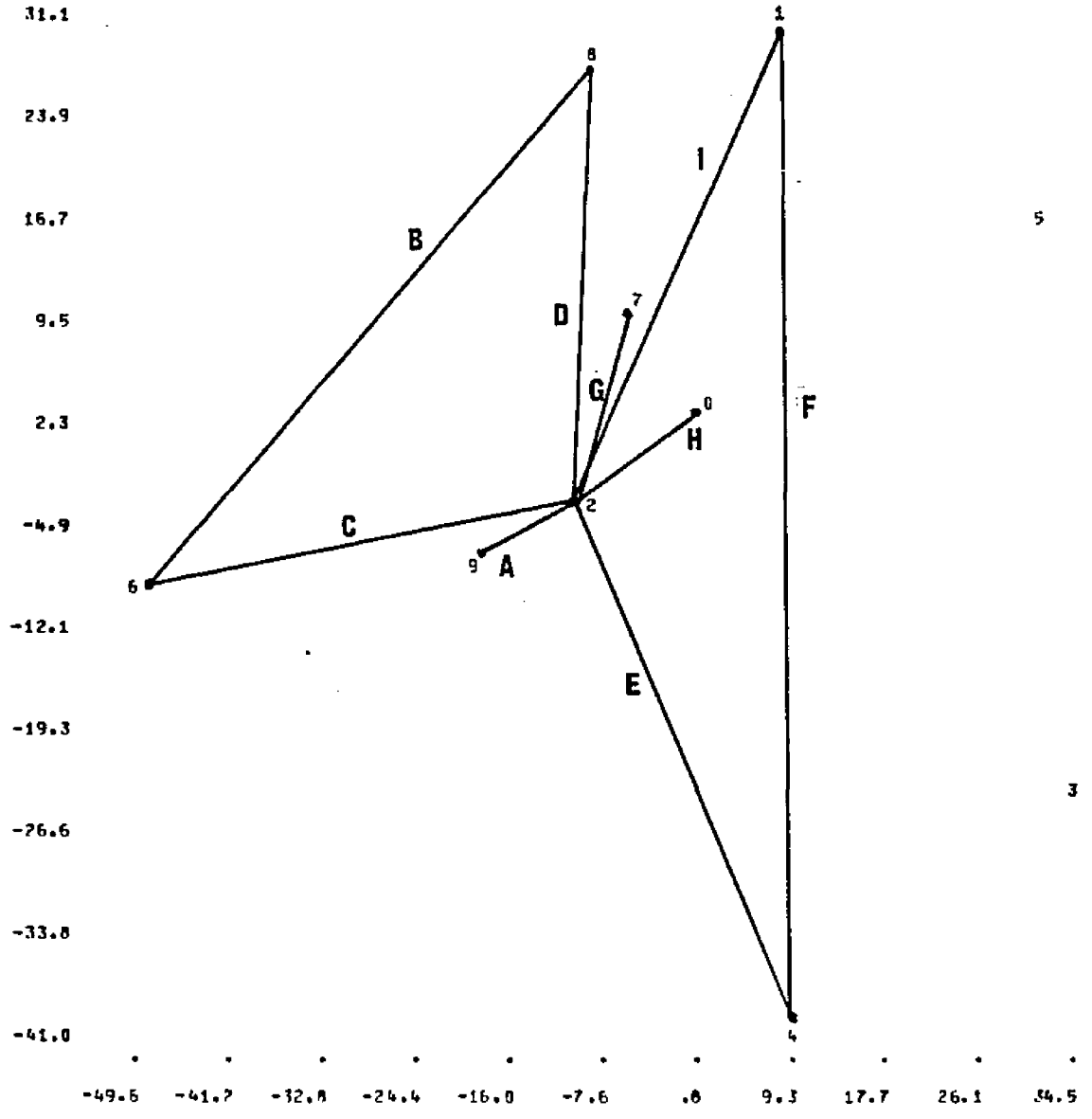


FIGURE 6 EXPERIMENTAL GROUP POST-TEST DIMENSION 3 VS DIMENSION 1

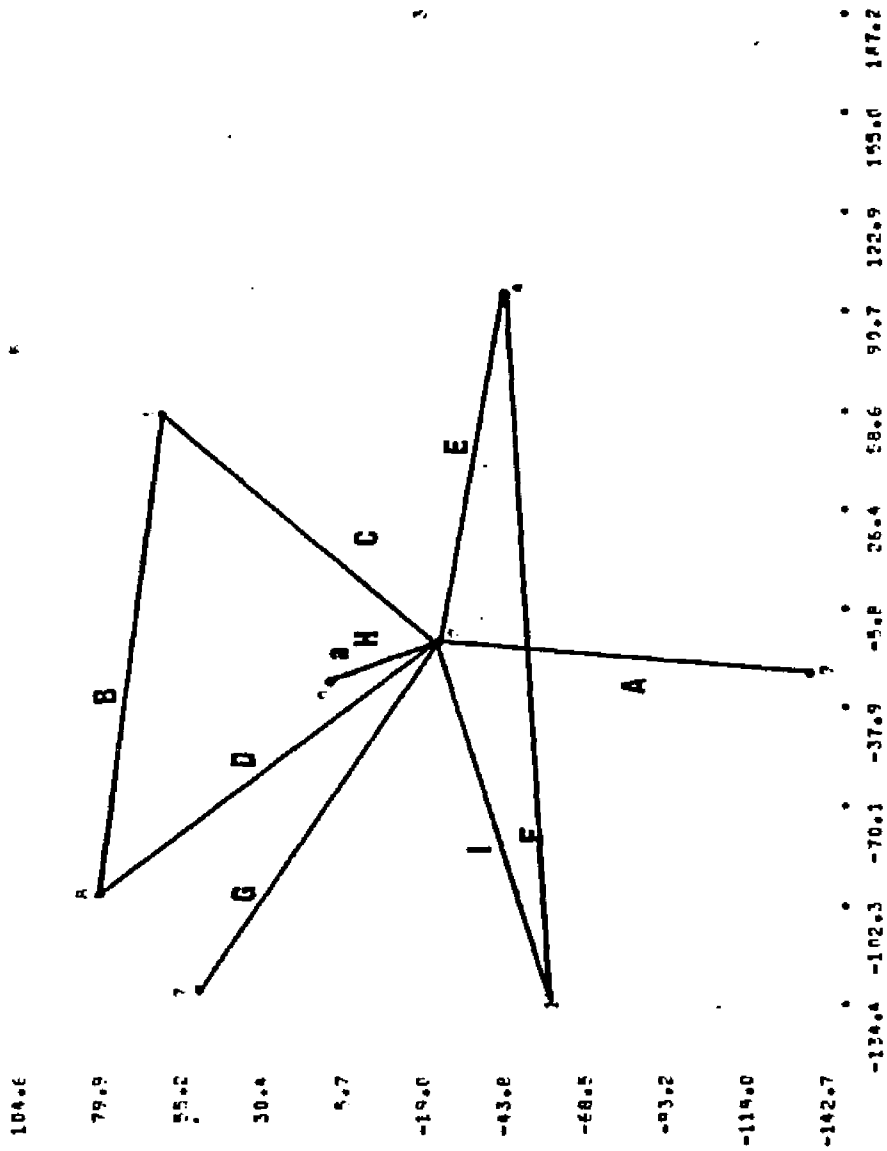
LEGEND

1. Community Organization
2. Regional Health Care
3. Young People
4. health Education
5. District Health Department
6. Disease Prevention
7. Old People
8. Yourself
9. Seeking Medical Help
0. Health Programs

FIGURE 7 EXPERIMENTAL GROUP PRE-TEST DIMENSION 3 VS DIMENSION 1

LEGEND

1. Community Organization
2. Regional Health Care
3. Young People
4. Health Education
5. District Health Department
6. Disease Prevention
7. Old People
8. Yourself
9. Seeking Medical Help
0. Health Programs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55.2
30.4
5.7
-19.0
-43.8
-68.5
-93.2
-118.0
-142.7
-134.4
-102.3
-70.1
-37.9
-5.8
26.4
58.6
90.7
122.9
155.0
187.2
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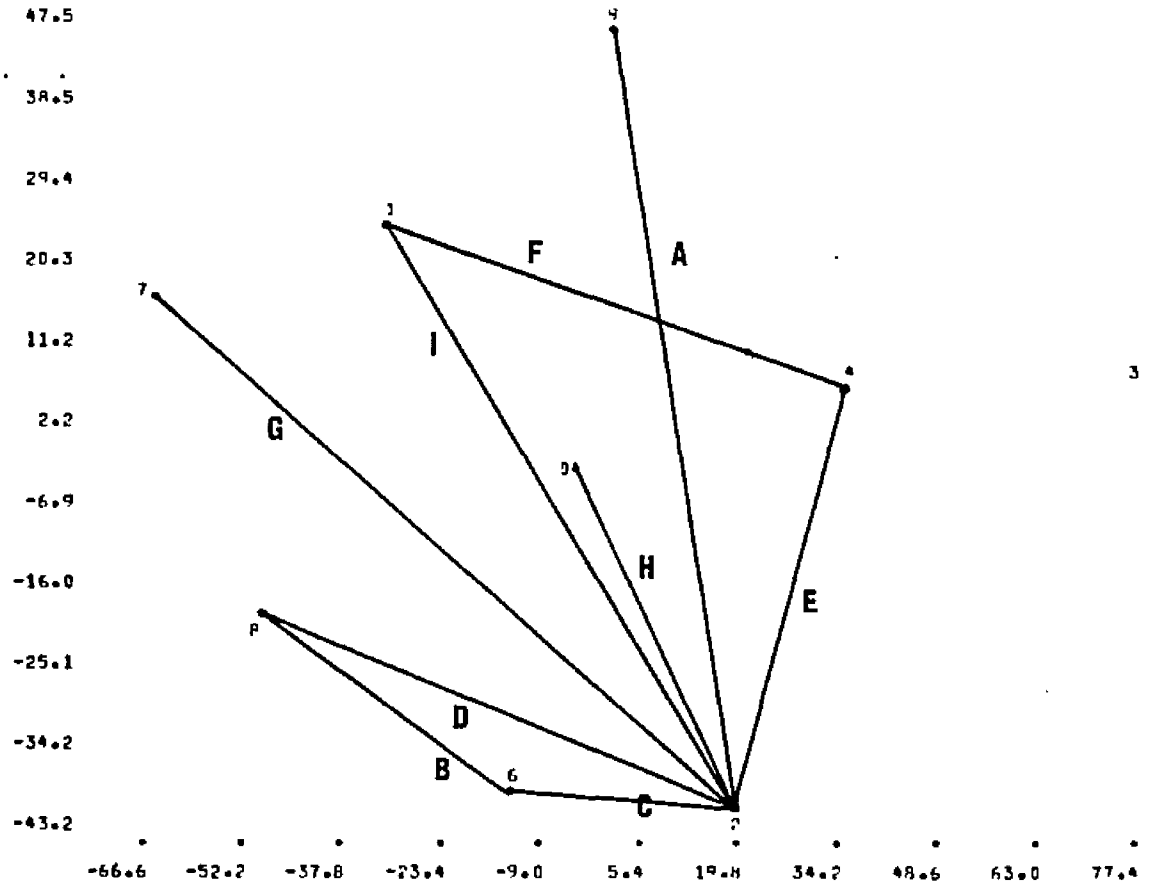
a
PLOT OF DIMENSION 3 (VERTICAL AXIS) AGAINST DIMENSION 1
YAWE2



PLOT OF DIMENSION 3 (VERTICAL AXIS) AGAINST DIMENSION 1
YAWE)

FIGURE 8 CONTROL GROUP POST-TEST DIMENSION 3 VS DIMENSION 1

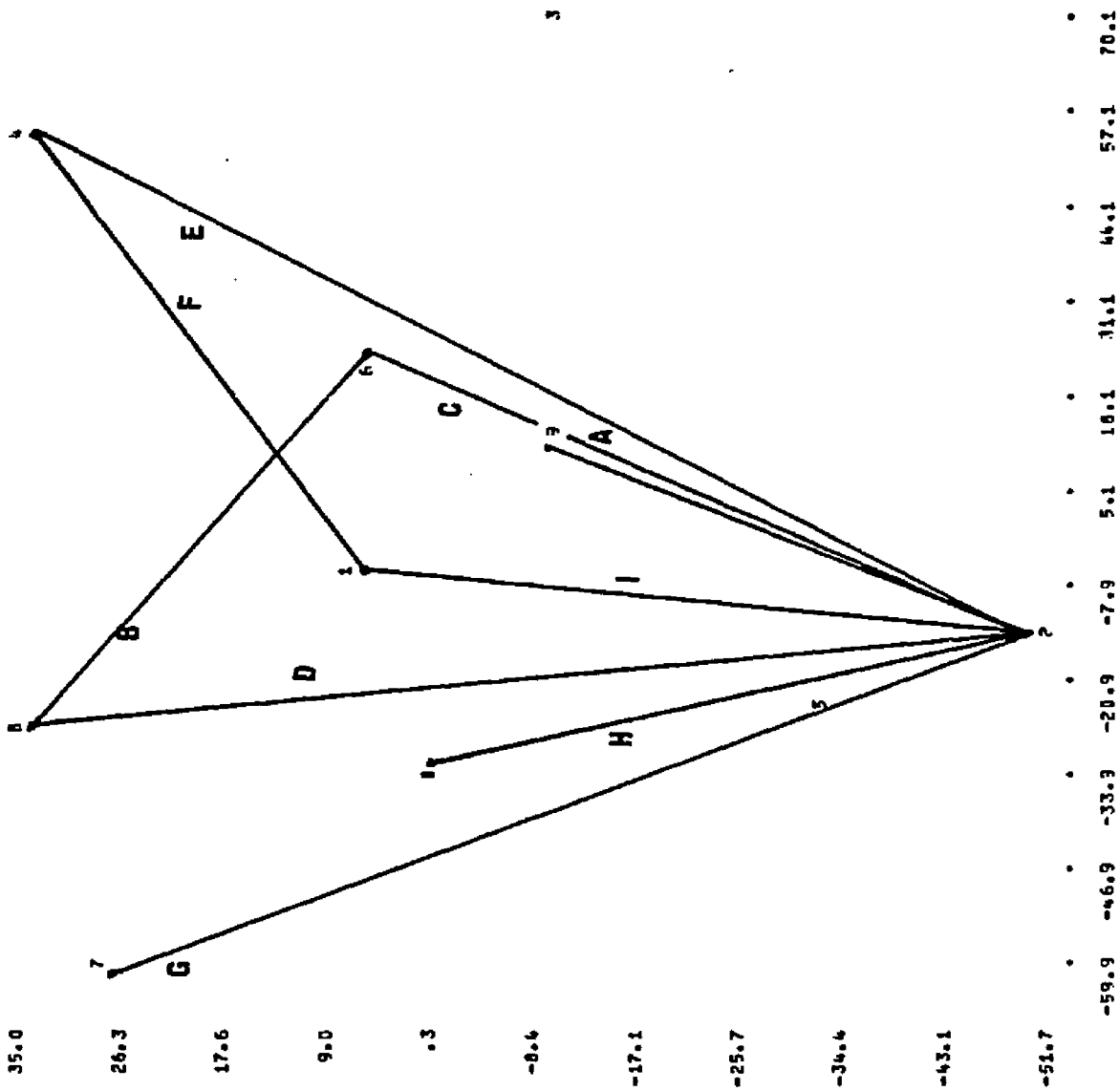
LEGEND

1. Community Organization
2. Regional Health Care
3. Young People
4. Health Education
5. District Health Department
6. Desease Prevention
7. Old People
8. Yourself
9. Seeking Medical Help
0. Health Programs

FIGURE 9 CONTROL GROUP PRE-TEST DIMENSION 3 VS DIMENSION 1

LEGEND

1. Community Organization
2. Regional Health Care
3. Young People
4. Health Education
5. District Health Department
6. Disease Prevention
7. Old People
8. Yourself
9. Seeking Medical Help
0. Health Programs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-33.9
-20.9
-7.9
5.1
18.1
31.1
44.1
57.1
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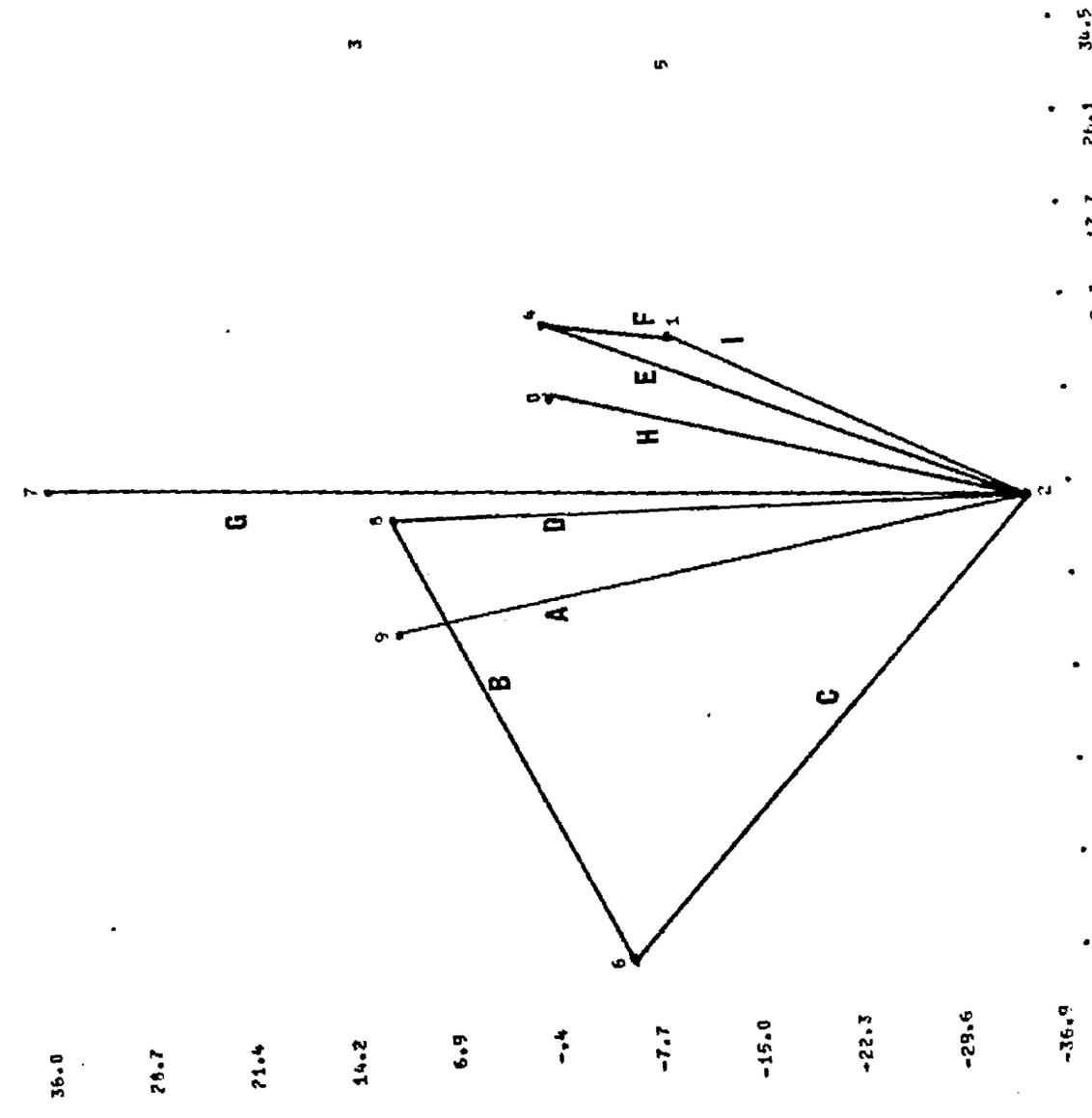
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-29.6
-36.9
-49.5
-41.7
-12.8
-24.4
-16.0
-7.6
.8
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17.7
26.1
34.5
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FIGURE 10 EXPERIMENTAL GROUP POST-TEST DIMENSION 3 VS DIMENSION 2

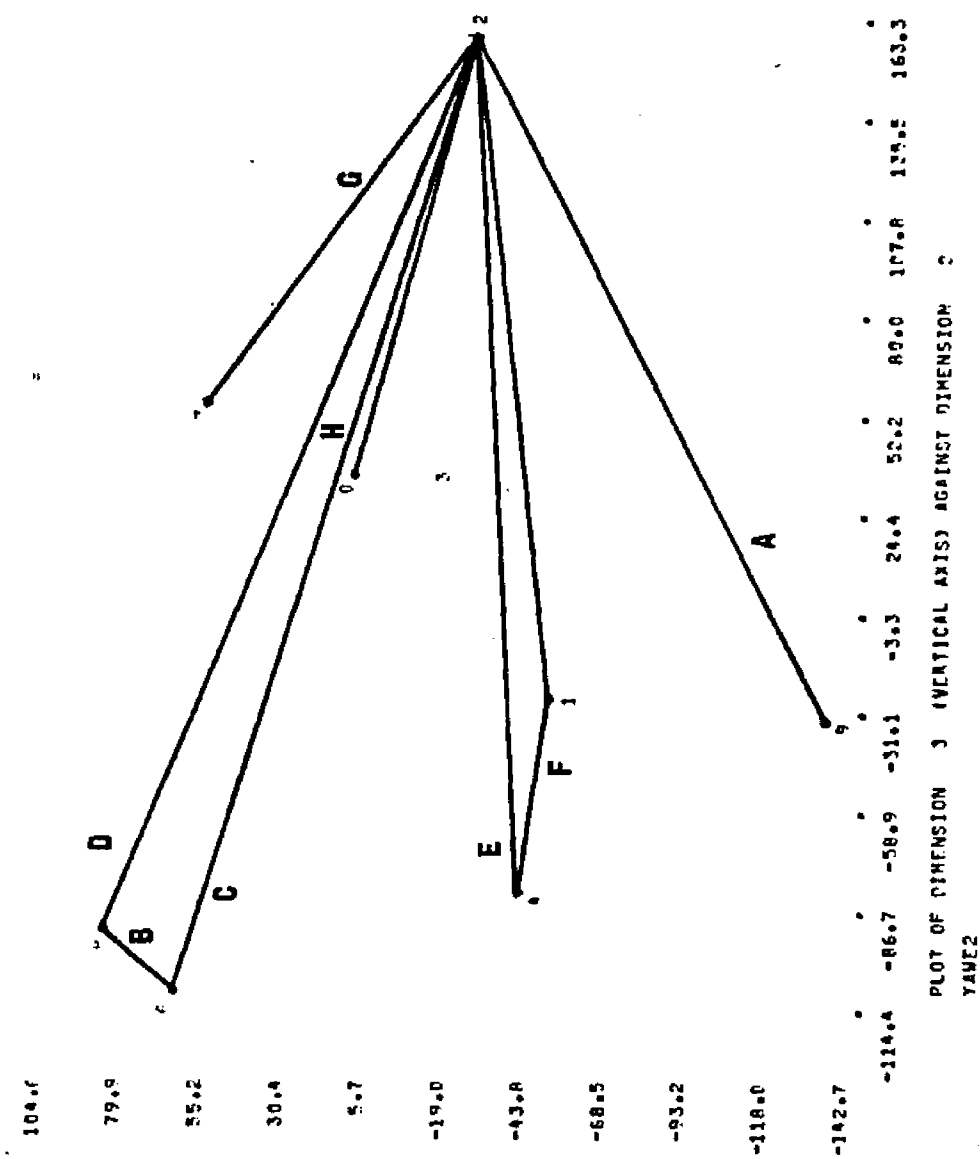
LEGEND

1. Community Organization
2. Regional Health Care
3. Young People
4. Health Educatuon
5. District Health Department
6. Disease Prevention
7. Old People
8. Yourself
9. Seeking Medical Help
0. Heakth Programs

FIGURE 11 EXPERIMENTAL GROUP PRE-TEST DIMENSION 3 VS DIMENSION 2

LEGEND

1. Community Organization
2. Regional Health Care
3. Young People
4. Health Education
5. District Health Department
6. Disease Prevention
7. Old People
8. Yourself
9. Seeking Medical Help
0. Health Programs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5.7
-19.0
-43.8
-68.5
-93.2
-118.0
-142.7
-114.4
-86.7
-58.9
-31.1
-3.3
24.4
52.2
80.0
107.8
135.5
163.3
PLOT OF DIMENSION 3 (VERTICAL AXIS) AGAINST DIMENSION 2
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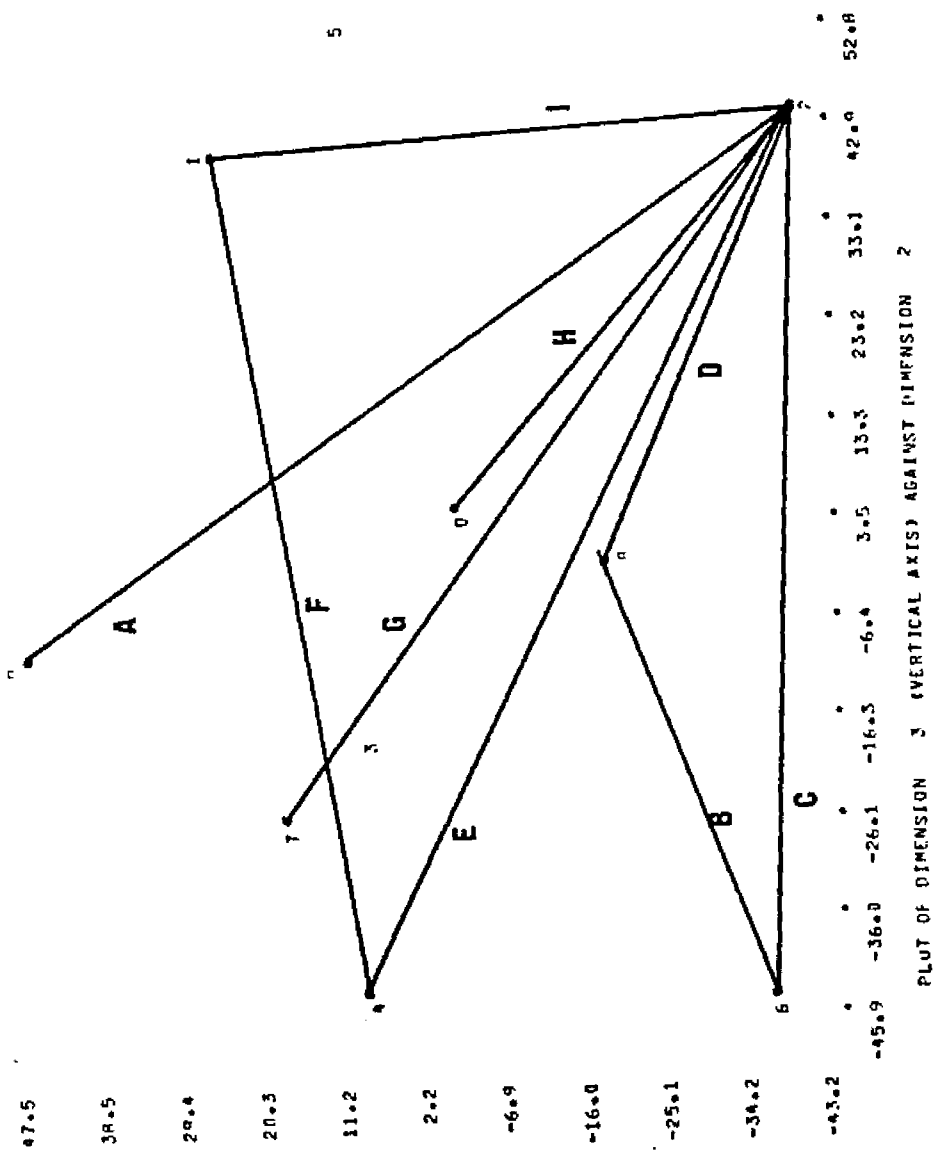
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38.5
29.4
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-6.9
-16.0
-25.1
-34.2
-43.2
-45.9
-36.0
-26.1
-16.3
-6.4
3.5
13.3
23.2
33.1
42.0
52.8
PLOT OF DIMENSION 3 (VERTICAL AXIS) AGAINST DIMENSION 2
YAWF1

FIGURE 12 CONTROL GROUP POST-TEST DIMENSION 3 VS DIMENSION 2

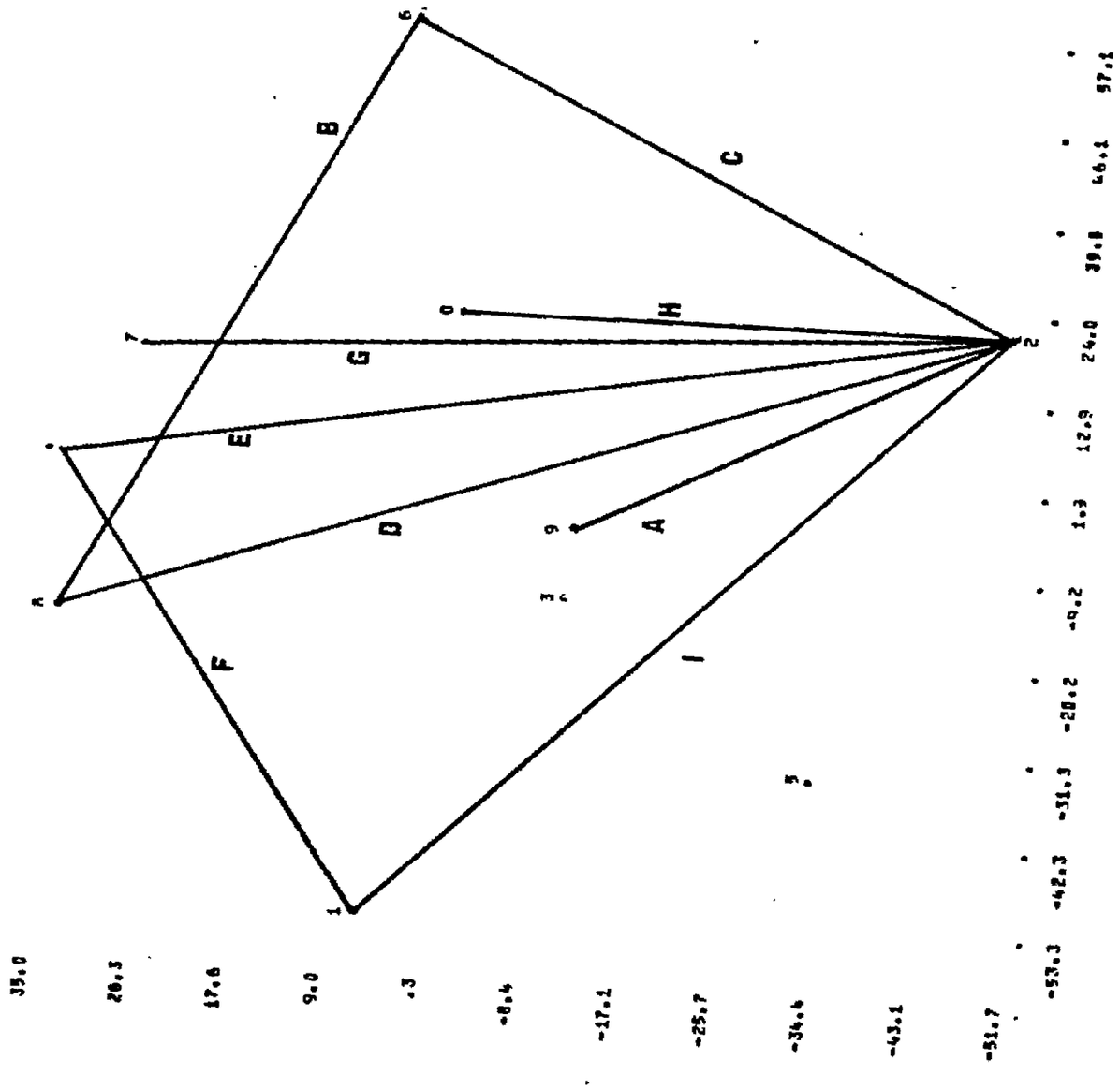
LEGEND

1. Community Organization
2. Regional Health Care
3. Young People
4. Health Education
5. District Health Department
6. Disease Prevention
7. Old People
8. Yourself
9. Seeking Medical Help
0. Health Programs

FIGURE 13 CONTROL GROUP PRE-TEST DIMENSION 3 VS DIMENSION 2

LEGEND

1.Community Organization
2. Regional Health Care
3. Young People
4. Health Education
5. District Health Department
6. Disease Prevention
7. Old People
8. Yourself
9. Seeking Medical Help
0. Health Programs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17.6
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-8.4
-17.1
-25.7
-34.4
-43.1
-51.7
-53.3
-42.3
-31.0
-20.2
-9.2
1.3
12.9
24.0
35.8
46.1
57.1

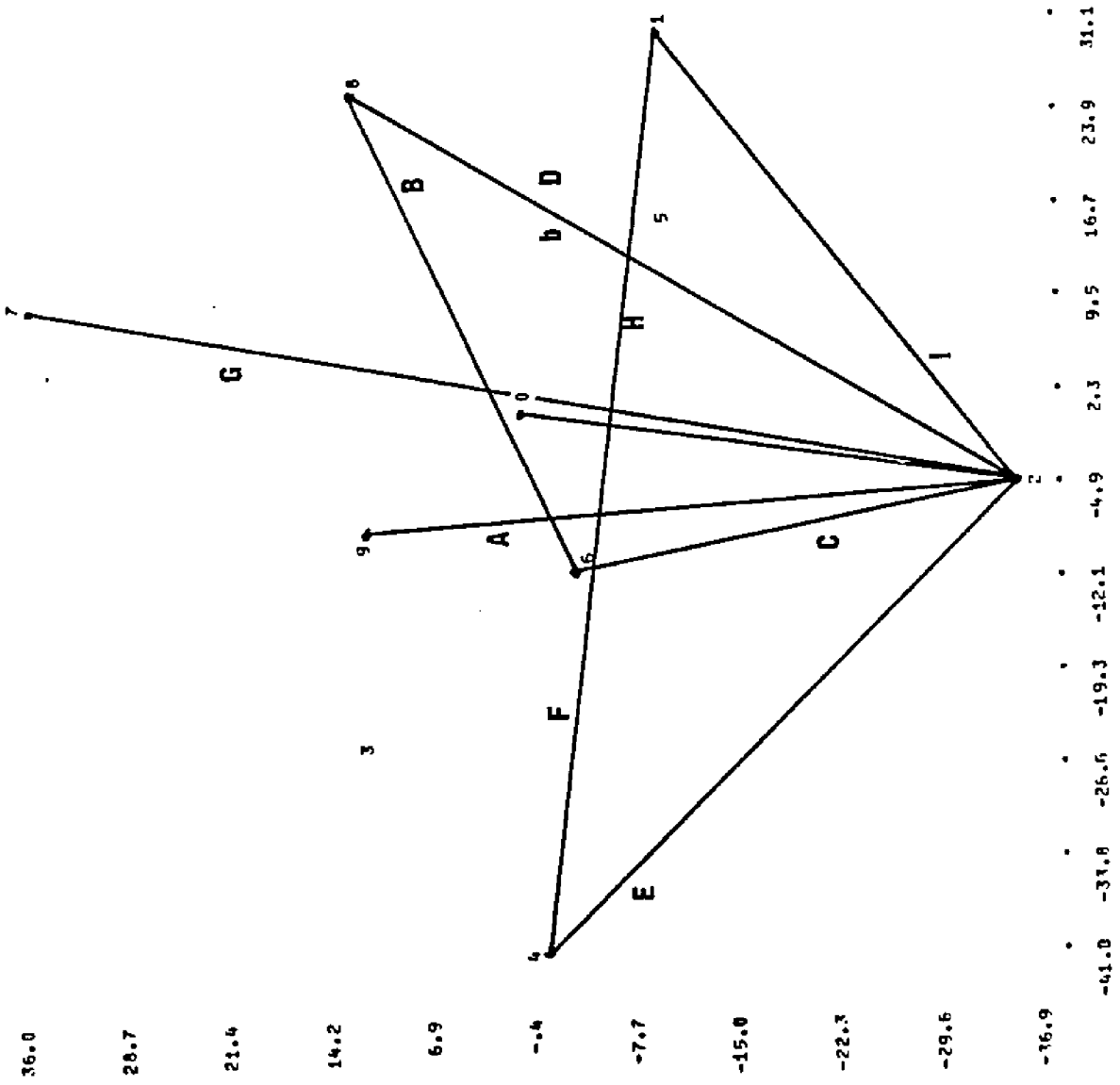
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TABLE 4

SUMMARY STATISTICS (Three Dimensions)

	Experimental Group		Control Group	
	Pre-Test	Post-Test	Pre-Test	Post-Test
Log Likelihood	70.938	391.926	112.962	172.108
Total Iterations	52	67	177	58
Final STD Error Estimate	.564	.408	.679	.504
Unbiased STD Error Estimate	.585	.422	.704	.524
Number of Parameters	67	67	69	69
Number of DF for Errors	918	921	926	858

TABLE 5

Analysis of Dimensionality Using The
Chi-Square Test for Pre-Tests and Post-Tests
for The Experimental and Control Groups

Pre-Tests

	Experimental Group (n=22)		Control Group (n=23)	
	Two Dimensions	Three Dimensions	Two Dimensions	Three Dimensions
Unbiased STD Error	.592	.585	.717	.704
Log Likelihood	55.572	70.938	-134.487	-112.962
Number of Parameters	60	67	62	69
Degrees of Freedom	7		7	
Chi-Square	30.732		43.050	

Post-Tests

	Experimental Group (n=22)		Control Group (n=23)	
	Two Dimensions	Three Dimensions	Two Dimensions	Three Dimensions
Unbiased STD Error	.427	.428	.543	.524
Log Likelihood	376.645	391.926	144.875	172.108
Number of Parameters	60	67	62	69
Degrees of Freedom	7		7	
Chi-Square	30.562		54.466	

Hypothesis 2: There will be a significant difference between pre-test and post test scores. The Chi-Squate test for significance will be used at the .05 level. The pre-test and post-test was designed to measure the changes in attitude-behavior in three dimensions; Health Education, Community Organization and Behavior. It was postulated that a significant change would occur between these two tests due to an education intervention (i.e., Health Education implemented by a Health Committee). If the hypothesis is confirmed not only should there be a significant difference between the pre-test and post-test of the experimental-group but that it will be significant when compared to the control-group. Chi-Square values of 76.684 and 65.341 with 23 degrees of freedom at the .001 level showed significant results for the experimental and control groups respectively (See Table 6). An F-test for homogeneity of variance was administered to the data for the experimental and control groups at the pre-test level. The F-statistic of 1.028 is not significant at the .05 level and the groups' variances are not significantly different. The F-statistic of 1.61 is not significant at the .05 level for the experimental and control groups. Degrees of fredom were 21 and 22 for the experimental and control groups respectively (See Table 7). Thus the hypothesis is not confirmed. That both groups changed significantly is noteworthy. A further examination of the data indicates an intervening variable may have entered which may explain some of the results.

TABLE 6

Analysis of Significance of Differences
Between Pre and Post Test for the Experimental and
Control Groups in Three Dimensions Using the Chi-Square

Experimental Group

	Combined Pre-Test, Post-Test Statistics	Addition of Pre-Test, Post-Test Statistics
Number of Subjects	44	44
Unbiased STD Error	.513	
Log Likelihood	386.180	462.864
Number of Parameters	111	134
Degrees of Freedom	23	
Chi-Square	76.684*	

Control Group

	Combined Pre-Test, Post-Test Statistics	Addition of Pre-Test, Post-Test Statistics
Number of Subjects	46	46
Unbiased STD Error	.627	-
Log Likelihood	-6.195	59.146
Number of Parameters	115	138
Degrees of Freedom	23	
Chi-Square	65.341*	

*Significant at .05 level of significance

TABLE 7

ANALYSIS OF HOMOGENEITY OF VARIANCE FOR THE EXPERIMENTAL AND CONTROL GROUPS AT THE PRE-TEST AND POST-TEST LEVELS

PRE-TEST	EXPERIMENTAL GROUP	CONTROL GROUP
Number of Subjects	22	22
Mean	4.99	4.34
$\Sigma x'^2$	1227.8	897.1
Variance	30.939	30.086
Degrees of Freedom	21	22
F-Statistic	1.028*	

POST-TEST	EXPERIMENTAL GROUP	CONTROL GROUP
Number of Subjects	22	23
Mean	4.95	4.06
$\Sigma x'^2$	1128.3	764.17
Variance	26.74	16.73
Degrees of Freedom	21	22
F-Statistic	1.6*	

*Not significant at the .05 level

Intervening Variable

During the period between the pre- and post-test administration both control and experimental communities experienced a program which provided hypertension screening and control. The experimental-group's program was financed through Regional Health Care and the control-group's program was administered from an out-county source through the Covert Community Center. This program also included diabetes control. The development prompted an observation that examined whether 1) Health Programs would move toward Regional Health Care in the experimental-group and 2) Health Programs would move toward the Community Health Center in the control-group. The former was significant in the experimental-group (discussed later as Subhypothesis 2H). However it is not significant for the control-group. (See Tables 8 and 9, Variable 17)

In addition to the effect created between Regional Health Care and Health Programs it appears from the data that a relationship exits between Young People and Health Programs. The hypertension program specifically sought to detect hypertension in youth and the middle-aged in the experimental-community. The comparison of t-Tests for the variable matching Young People and Health Programs showed a significant result for the Experimental Group. However, this does not hold true for the Control Group. (See Tables 8 and 9, Variable 24)

Overall this hypothesis fails to be supported. The overall difference appears to be attributed to a variable other than the designed variable which represented inducing a physician to stay in the community. However, the hypertension program administered by Regional Health Care had the full support of the Health Committee which agreed to spread the educational message by interpersonal channels.

TABLE 8

Analysis of the Quality of Means for the Pre-Test Vs Post-Test for the Experimental Group by Variable

Variable	Pre-Test Mean	Post-Test Mean	t Value	Degrees of Freedom	1-Tail/ Probability
V 1	5.500	5.818	- .38	42	.353
V 2	6.136	5.591	.65	42	.259
V 3	4.773	5.591	- .98	42	.166
V 4	5.227	5.818	- .66	42	.257
V 5	5.7273	4.955	.88	42	.192
V 6	4.046	4.773	- .81	42	.212
V 7	4.546	5.1364	- .60	42	.277
V 8	3.8636	4.6364	-1.03	42	.155
V 9	5.409	4.500	1.15	42	.130
V 10	5.864	5.636	.27	42	.393
V 11	5.955	5.773	.24	42	.404
V 12	5.591	6.136	- .66	42	.255
V 13	5.773	5.091	.95	42	.174
V 14	4.409	3.955	.58	42	.282
V 15	6.227	5.3182	.90	42	.186
V 16	5.091	4.636	.50	42	.312
V 17	6.682	5.136	1.86	42	.035*
V 18	5.818	5.455	.49	42	.314
V 19	5.909	6.00	- .12	42	.451
V 20	7.046	5.909	1.56	42	.063
V 21	6.591	6.455	.17	42	.433
V 22	3.546	4.182	- .88	42	.192
V 23	6.0455	5.3182	.81	42	.212
V 24	6.9091	5.6364	1.78	42	.042*
V 25	4.909	5.318	- .60	42	.277
V 26	4.864	5.182	- .44	42	.333
V 27	4.318	3.818	.71	42	.240
V 28	3.955	4.3182	- .45	42	.329

*Significant at the .05 level

TABLE 8 Continued

Variable	Pre-Test Mean	Post-Test Mean	t Value	Degrees of Freedom	1-Tail/ Probability
V 29	4.0901	4.182	- .13	42	.449
V 30	4.773	4.727	.07	42	.474
V 31	5.046	5.182	- .20	42	.421
V 32	4.455	4.273	.27	42	.395
V 33	5.000	5.596	- .65	42	.259
V 34	5.364	5.091	.35	42	.362
V 35	5.136	5.091	.06	42	.477
V 36	5.273	5.000	.37	42	.357
V 37	3.455	4.091	-1.03	42	.155
V 38	3.682	3.864	- .36	42	.361
V 39	4.773	4.818	- .07	42	.474
V 40	2.909	3.5000	- .87	42	.194
V 41	3.636	4.046	- .60	42	.275
V 42	4.455	4.864	- .55	42	.293
V 43	3.409	3.227	.24	42	.405
V 44	4.091	4.636	- .69	42	.248
V 45	4.137	4.682	- .78	42	.221

TABLE 9

Analysis of the Equality of Means for the Pre-Test Vs Post-Test for the Control Group by Variable

Variable	Pre-Test Mean	Post-Test Mean	t Value	Degrees of Freedom	1-Tail/ Probability
V 1	4.652	4.652	.13	44	.449
V 2	6.0870	4.783	1.45	44	.077
V 3	4.957	4.696	.34	44	.369
V 4	4.348	4.217	.16	44	.436
V 5	5.391	5.130	.26	44	.396
V 6	2.826	3.348	- .66	44	.258
V 7	2.957	3.391	- .57	44	.285
V 8	4.044	3.696	.40	44	.347
V 9	4.044	4.478	- .56	44	.289
V 10	5.261	4.739	.53	44	.299
V 11	4.130	4.696	- .54	44	.297
V 12	3.217	3.379	- .58	44	.284
V 13	4.261	3.609	.67	44	.254
V 14	4.044	4.000	.04	44	.483
V 15	7.1304	5.522	1.40	44	.085
V 16	4.783	4.261	.50	44	.309
V 17	4.957	3.957	.98	44	.168
V 18	4.957	4.826	.16	44	.438
V 19	5.218	5.391	- .22	44	.412
V 20	5.130	4.435	.75	44	.230
V 21	6.391	5.609	.95	44	.173
V 22	2.565	3.174	- .94	44	.176
V 23	4.522	4.391	.17	44	.434
V 24	5.391	4.609	.90	44	.187
V 25	4.957	4.391	.63	44	.266
V 26	4.652	3.566	1.25	44	.109
V 27	4.391	4.130	.35	44	.365
V 28	3.435	3.435	0	44	.500

TABLE 9 Continued

Variable	Pre-Test Mean	Post-Test Mean	t Value	Degrees of Freedom	1-Tail/ Probability
V 29	3.739	3.435	.37	44	.358
V 30	4.217	3.261	1.13	44	.132
V 31	4.391	3.783	.70	44	.243
V 32	3.522	3.739	- .29	44	.388
V 33	5.826	4.087	1.64	44	.054
V 34	4.044	4.217	- .19	44	.425
V 35	3.913	4.217	- .37	44	.359
V 36	4.913	4.522	.45	44	.329
V 37	3.000	3.391	- .47	44	.320
V 38	3.609	3.348	.35	44	.366
V 39	5.044	4.130	.98	44	.166
V 40	2.661	2.566	- .54	44	.296
V 41	3.435	3.130	.41	44	.344
V 42	4.435	3.739	.87	44	.194
V 43	2.783	2.565	.28	44	.390
V 44	4.174	4.174	0	44	.500
V 45	3.435	3.913	- .62	44	.272

Subhypotheses

A series of subhypotheses were developed relative to hypothesis 2. They were statistically analyzed at the .05 level of significance by use of the t-Test comparing means (Tables 8-9). They will also be analyzed using multi-dimensional scaling from observation of the two-dimensional plots.

Subhypothesis 2A: There is a significant decrease in the magnitude between Concept 9 (Seeking Medical Help) and Concept 2 (Regional Health Care). From inspection of the two-dimensional plots for the experimental-group the two concepts appear to move closer to each other on the horizontal axis, further apart on the vertical axis and further apart in two-dimensional space. The t-statistics for the experimental and control-group respectively are .50 and .50 which indicates a decrease in the magnitude of the means but the decrease was not statistically significant (See Tables 8 and 9, Variable 16). Therefore the hypothesis is not confirmed for either experimental or control group.

Subhypothesis 2B: There is a decrease in the magnitude between Concept 6 (Disease Prevention) and Concept 8 (Yourself (Variable37)). Earlier Smillie[3] linked Prevention to the private physician and the Departmental Task Force on Prevention[4] defined the different types of prevention; primary, secondary and tertially in the context of a physician practicing preventive medicine. The Lake County Health and Services Association defined as its number one priority to bring a private

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[3]Smillie, op. cit.

[4]Departmental Task Force, op. cit.

physician into the community. Thus if a physician enters a community it is hypothesized that the magnitude between Yourself and Disease Prevention would decrease. An examination of Figures 1 and 2 do not show a decrease in the semantic space between Concept 6 and 8. In contrast it shows a movement apart from each other. The t-statistics for the experimental-group and control-group respectively are -1.03 and -.47 which shows no significant relationship at the .05 level. This hypothesis is not supported by the data.

Subhypothesis 2C: There is a decrease in the magnitude (distance in semantic space) between Concept 6 (Disease Prevention) and Concept 2 (Regional Health Care (Variable 13)). According to Smillie's[5] definition if the perceived source of preventive Health Care is located within Regional Health Care the semantic distance between the two concepts should decrease. An examination of Figure 2 and Figure 3 shows no appreciable decrease in semantic space, however in a three dimensional representation which shows an added plot which represents Dimension 3 vs Dimension 1, Figure 6 and 7 show a comparably short distance between Concepts 6 and 2. Please note that Concept 2 and 6 provide a dimensional axis in and of itself. The movement toward similarity when tested through the t-Test shows a decrease in means but is not significant at the .05 level. An examination of the two-dimensiona representations of the control-group (Figures 4, 8 and 5) shows no appreciable decrease between Concepts 2 and 6. The t-statistics for the experimental and control groups respectively are .95 and .67 which shows no significant difference

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[5]Smillie, op. cit.

at the .05 level. Therefore this hypothesis is not supported.

Subhypothesis 2D; There is a decrease in the magnitude (distance in semantic space) between Concept 8 (Yourself) and Concept 2 (Regional Health Care (Variable 15)). Health Education messages under the Woelfel-Saltiel Theory[6] generated from Regional Health Care is hypothesized to improve the attitude toward Regional Health Care and thus decrease the magnitude in semantic space between the two concepts. An examination of the three-dimensional plots shows no appreciable change in semantic space. The t-statistics for the experimental-group and control-group respectively are .90 and 1.40. Though there is a considerable change in means (See Tables 8 and 9), there is no significant difference at the .05 level. Thus this hypothesis is not supported.

Subhypothesis 2E: There is a decrease in magnitude between (Concept 4 (Health Education) and Concept 2 (Regional Health Care (Variable 11)). It follows that if Regional Health Care institutes a media approach and/or an interpersonal approach to create positive behavior change, a significant difference in magnitude in semantic space would manifest itself. Neither graphic representation nor t-statistics of .24 and -.54 for the experimental and control groups respectively at the .05 level of significance support this hypothesis

Subhypothesis 2F: There is a decrease in magnitude between Concept 4 (Health Education) and Concept 1 (Community Organization (Variable 3)).

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[6]Barnett, Serota and Taylor, op. cit.

Interpersonal communication is the form used to change behavior by the Lake County Health and Services Association; a community organization. An examination of Figures 2 and 3 which involve the experimental-group shows no appreciable decreases in magnitude between the two concepts. The t-statistics for the experimental-group and control-group respectively are -.98 and .34 which confirms this conclusion at the .05 level of significance. Thus the hypothesis is not supported.

Subhypothesis 2G: There is a significant decrease in magnitude between Concept 2 (Regional Health Care) and Concept 7 (Old People (Variable 14)). There is a close relationship between the Concept Old People and Yourself (the shortest distance measure of all concept pairs). The same relationship between Concept 8 and Concept 2 should hold true for Concept 2 and Concept 7. It has been postulated that the decrease would be significant. A review of Figures 2 and 3 shows a semantic decrease in space for the experimental-group. The t-statistics for the experimental and control groups are .58 and .04 respectively and not significant at the .05 level. The hypothesis is not supported.

Subhypothesis 2H: There is a decrease in magnigude (distance in semantic space) between Concept 2 (Regional Health Care) and Concept 0[7] (Health Programs (Variable 17)). Messages geared toward an increase in positive attitude toward Regional Health Care and the knowledge of physicians at the Center should lessen the semantic space between Health Programs and Regional Health Care. These two concepts seem to

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[7]Concept 10 is labeled as Concept 0 on the graphs (Figures 2-13).

be placed on the same dimension. On closer examination Concept O appears close to the origin in all three dimensions. It appears not to move as close to Concept 2 as to moving away from Category 6. However the t-statistic for the experimental-group of 1.86 is significant at the .05 level. The Figures for the control-group show some movement toward each other but the t-statistic of .98 is not significant at the .05 level. Thus the hypothesis is supported for the experimental-group and is not supported for the control-group.

Subhypothesis 2I: There is a decrease in magnitude between Concept 1 (Community Organizations) and Concept 2 (Regional Health Care (Variable 1)). Regional Health Care and the Lake County Health and Services Association collaborated on the Health Education Project and the design of the education intervention. Because of this relationship it had been postulated that the attitude between these two organizations would increase on the positive side and that they would move closer together in semantic space. The two-dimensional plots do not indicate such a movement and the t-statistics for the experimental and control groups of -.38 and .13 show no significant difference at the .05 level. This hypothesis is not supported.

CHAPTER V

SUMMARY, DISCUSSION AND RECOMMENDATIONS

Summary of the Study

This chapter will briefly review the purpose of the study, explain the main parts of the literature review and the type of analysis and summarize the results of the data hypotheses, and subhypotheses. The final portions of this chapter will discuss the implications and recommendations for further research.

Purpose

The main purpose of this study is to comparatively evaluate the effectiveness of a community organization (health committee called the Lake County Health & Services Association) as a component of health education of an existing health care system. Additional purposes are to serve as a model innovation for health projects in rural areas, form part of the literature of non-formal education and communication organizations as they relate to health education of the rural poor in developed nations.

Literature Review

The literature review includes an explanation of the people-centered approach, literature relating to this approach, literature reviews on community organizations, community development, community health education and communication and education. A theoretical review linking the notion of system with communication is also included. The literature review has shown that a Health Education intervention can be tested experimentally. In addition, the review provided a rationale which tested a rural communication effort.

Methods and Procedures

Multi-dimensional Scaling, the method of analysis and the form of the testing instrument is explained in this section. Additional explanations of related procedures and theory are given concerning the semantic differential and attitude-behavior change. Hypotheses and subhypotheses are presented with the explanation of their generation as are the samples for the experimental and control-groups and a research design which includes pre- and post-tests.

Data Analysis

Multi-dimensional Scaling Analysis allows for comparisons between groups. It tests the dimensionality of group responses on attitude-behavior scales. A visual representation of the magnitude or distance between object-pairs is presented in graph-form and statistics are generated to do hypothesis and subhypothesis testing.

The emphasis during analysis is the degree of change between pre- and post-test scores for the experimental-group and this degree of change is contrasted with the degree of change between pre- and post-test scores of the control-group.

For hypothesis testing the Chi-Square is used and for subhypothesis testing the t-Test for equality of means is used.

Research Findings

The results indicate that there is only a small, if any, change in the experimental population due to the Health Education intervention strategy implemented by the Health Committee (The Lake County Health and Services Association). Hypothesis 1 is supported, Subhypothesis 2H which predicted a decrease in magnitude between Regional Health Care and Health Programs is supported.

However Hypothesis 2 was not generally supported. Subhypotheses 2A (Seeking Medical Help and Regional Health Care), 2B (Disease Prevention and Yourself) and 2C (Disease Prevention and Regional Health Care) which involve the Behavior Aspect of the attitude-behavior continuum were not supported. Subhypotheses 2D (Yourself and Regional Health Care), 2G (Regional Health Care and Old People), and 2I (Community Organizations and Regional Health Care) which involve the attitude end of the attitude-behavior continuum were not supported. Subhypotheses 2E (Health Education and Regional Health Care) and 2F (Health Education and Community Organization) which involve Health Education were not supported.

Discussion

Hypothesis 1 tests whether three dimensions is an appropriate number of dimensions in which to test the responses of the subjects. It was found across both experimental and control-groups that three dimensions provided the best number to approximate the data. This was confirmed by use of the Chi-Square variable at the .05 level of significance.

The design of the questionnaire sought to define the three dimensions as Health Education, Behavior and Community Organization. However, three other dimensions emerged, two easily defined and one which is uninterpretable on the basis of data collected. Dimension 1 is an age continuum going from Old People to Young People; Dimension 2 is a continuum which goes from Institutional Care to Self Care.

Hypothesis 2 tests whether the Health Education Intervention has any impact on attitude-behavior of the subjects. It was found that across both the experimental and control-groups that some changes had occurred. Because there was a significant change in the control-group

just as there was a significant change in the experimental-group it can be concluded that the change is not due to the Independent Variable, Health Education. However, the result of the Health Education Intervention was positive; one of the doctors decided to remain in the community. This was evidenced by the doctor verbally and the purchasing of a house within the county although not in Yates or Webber Township.

The Chi-Sqaure Test indicated a significant difference between the pre-test scores and post-test scores on both the experimental and control-groups. To test which variables accounted for the difference, sub-hypotheses were developed. One important difference emerged from this strategy. The t-Test applied to the means of the forty-five individual variables showed no significant t-scores for any of the variables in the control-group at the .05 level, while two of the forty-five variables were significant at the .05 level for the experimental-group. (See Table 8) However, only one of these two significant results were predicted via hypothesis, a decrease in the distance (Semantic Space) between Health Programs and Regional Health Care. A confounding variable; the introduction of the Hypertension Program should not have an effect on the total variable scores for the experimental and control-groups because it was introduced in both communities. However, the program at Regional Health Care was extended to various points in the community whereas the program in the control-group was always in the same spot. A second interesting observation was the relationship which exists in the variable which measures the distance between Young People and Health Programs. A significant difference appeared in the experimental-group whereas none appeared within the control-group. It would appear that several differences exist between the two hypertension programs; 1) The outreach portion of the Lake County Program, 2) The targeted area and 3) The aid

of the Lake County Health and Services Association. This may be a negligible effect but for future studies this may prove interesting.

Overall it must be concluded that there is only a small difference attributed to the Health Education Intervention. Confounding variables make it difficult to assess what caused the change in attitude-behavior among the respondents.

Subhypothesis 2A tests whether subjects associate Disease Prevention with themselves and whether this change is a result of Health Education. However, the subhypothesis is not supported. It is suspected that the general population does not associate having a physician available with Disease Prevention as is the case with the Lake County Health and Services Association. Another explanation is that the messages emanating from the Health Committee or Regional Health Care had no impact on them. Another possible explanation is that not enough time elapsed between the Open House to welcome the physicians and the Post-Test to allow for a significant change in attitude-behavior in relationship to Regional Health Care. This rationale applies to Subhypothesis 2C (Disease Prevention and Regional Health Care) though there is a slight decrease in means from pre-test to post-test.

Subhypotheses 2A (Seeking Medical Help and Regional Health Care), 2B (Disease Prevention and Yourself) and 2C (Disease Prevention and Regional Health Care) involve the behavior end of the attitude continuum. The data suggests that there was not a significant behavior change. Time may be a factor inasmuch as not enough time has elapsed to test the effect of the intervening variable. Secondly, the educational message may not have been comprehensive enough and third the educational message may have had no impact. Time appears to be the factor which needs to be

expanded and accounted for in any experiment of this type.

Subhypotheses 2D (Yourself and Regional Health Care), 2G (Regional Health Care and Old People) and 2I (Community Organization and Regional Health Care) show no significant results. These subhypotheses relate generally to the attitude end of the attitude-behavior continuum. In essence they support the Woelfiel-Saltiel Theory which relates to the mass of an attitude and its resistence to change. Time and number of messages are suggested as having fallen short in their ability to change attitude-behavior. Change in mean scores of Subhypothesis 2D may be attributed to the Hawthorne effects or knowledge that an experiment is being done. Indeed the test may have served as an educational or informational source. In the control-group some of the subjects related that they knew nothing of the Bangor Health Center. Though the changes are considerable in means there is no significance at the .05 level. Thus it must be concluded there is no significant effect attributed to the intervention in the experimental-group or control-group. Moreover, the t-Test shows no significant results. Overall results for these three subhypotheses can be attributed essentially to the factor of not enough time in which to overcome the mass accumulated by previous attitudes toward Regional Health Care.

Subhypotheses 2E and 2F test whether Health Education moves statistically closer to Regional Health Care and Community Organization. However neither of these subhypotheses are supported. From responses by both the control-group and the experimental-group the term education appeared to be associated with the concept of <u>school</u> and <u>young people</u> through Health Education, especially in the non-formal vein, was understood by the Health Committee and the Lake County Health and

Services Association. The indications are not the same for the samples from the experimental and control populations.

Subhypothesis 2H (Regional Health Care and Health Programs) is the only subhypothesis supported by using the t-Test for equality of means. One other variable; the concept pairs, young people and health programs, shows a significant result when the means of pre- and post-tests were compared on the experimental sample. Subhypothesis 2H results appear to be due to the hypertension program mentioned earlier in discussion on Hypothesis 2. The hypertension program may have involved the notion of "intent" described as part of the diffusion process (See Figure 1, page 4). It is a change agent initiated strategy, not community initiated as the Health Education Strategy. An intent to create change was not tested however it may be the factor which contributed to the significant results. A possible explanation for the relationship between young people and health programs is that the hypertension program was intended to reach younger persons age 24 to 44. The screening sites were in places where younger people congregate; pool halls, functions and programs, grocery stores, banks, etc. Thus these two findings contribute to the overall significance of the experimental group.

Observations

The test instruments' design and the rationale behind the Multi-Dimension process was to measure attitude-behavior change. The decision-making process of the Health Education Model allows the Health Committee to define a health problem and construct objectives to facilitate the problem. Unfortunately the Committee chose an objective which is not conducive to the measurement of attitude-behavior change in the community. This researcher was uncomfortable in measuring the impact

of the Health Committee's Educational Intervention on the community through the test instrument. The instrument did not have a question which included the measurement of the Committee's objective.

The Committee's objective (i.e., persuading a physician to remain in the community was accomplished). There was an attitude-behavior change in both the experimental and control group at an .05 level of significance as attested by the Chi-Square Test (See Table 4, p. 64). However, there was no significant differences between the experimental and control group except on the two variables. The impact of the doctor's decision to remain in the community may be assessed as the community's reaction to his continued residency. The factor of time is an appropriate discussion to undertake at this point.

Alluded to earlier in this section only a shor time elapsed between the Open House which welcomed the physicians to the community and the administration of the Post-Test. It is postulated that not enough time passed for adequate diffusion of information on the success of the Open House and the decision of the physician to stay within the community.

There is a scarcity of sources with which to diffuse information in the experimental community. The only form of media is a weekly newspaper and the nearest radio and television station is over thirty miles away. In contrast the control-group has access to two daily newspapers from South Haven and Benton Harbor, two cities within seven and twenty miles respectively, of the control group. Benton Harbor has a television station and both Benton Harbor and South Haven have radio stations.

The channels of information may account for the different educational levels of the two communities. The control-group has almost twice as many high school graduates (96.9% to 36.4%, see Table 2, p. 54). This

factor may prove to be a conclusive factor.

Conclusion

The Health Education Strategy appears to have little effect upon the experimental community. The two variables; Variables 17 (Regional Health Care and Health Programs) and 24 (Health Programs and Young People) were the only onew with significant t-statistics. However these variables were significant only in the experimental group. This factor may be due in part to "intent," interaction with the Health Committee or other factors, however neither warrants a definite conclusion.

Overall both experimental and control-groups experienced significant changes. There were no significant differences between the pre-tests of the experimental and control-groups in terms of variance nor a significant difference between post-tests of the experimental and control-groups in terms of homogeneity of variance. This supports the conclusion that the Health Education Strategy had no effect upon the experimental group.

The study of the visual plots of the concepts were inconclusive in trying to analyze differences between pre- and post-tests of the experimental-group and control groups respectively. Chi-Square tests confirm these conclusions. The Chi-Square test also confirms the number of dimensions necessary to analyze the data. The content of the dimensions are somewhat different than expected yet plausible and help to explain the perceptions of the respondents to the survey.

Recommendations

It is recommended that for greater results in terms of more significant findings, a study of this type be spread over a longer time

frame (i.e., a longitudinal study which may be evaluated at several points in time), using a greater variety of types of educational messages and a greater emphasis on Health Education and Health Prevention and Promotion for the Young and Middle-aged Population.

Time plays an integral role in the adoption of or change in attitude-behavior. Rogers and Shoemaker call this the innovation-decision period. They have labeled the recipients of an innovation as early adopters, late adopters and laggards according to the amount of time it takes to adopt a particular innovation. This fact should be taken into consideration for future studies of this type.

It is also recommended that a greater variety of types of educational messages be used in a Health Education project of this type. During the administration of the pre-test, both the experimental and control-group subjects tended to relate Health Education to school situations and to the young. This suggests that a Health Education project utilizes both formal and non-formal channels of communication.

This approach may take into consideration the Woelfiel-Satiel Theory about attitude-mass and provide a study which lessens the present attitude-mass and cause a change in attitude-behavior.

An area which also revolves around education is the difference in educational achievement between the experimental and control-group. It was earlier stated that 63.6 percent of the experimental-group had less than a high school education and only 30.4 percent of the control-group had less than a high school education. This factor appears to be the only one which markedly separates the two groups from an examination of the demographic data. The unbiased standard errors and the log likelihoods are considerably different across experimental and control-groups and pre- and post-tests. However, the change in unbiased standard error from

pre-test to post-test is .163 for the experimental-group and .180 for the difference between pre-test and post-test for the control-group, a difference of .017! It would be interesting to analyze how much difference between experimental and control-group is attributed to educational level of the respondents.

It is recommended that a study of this nature be reproduced in a Caribbean nation which manifests the demographics of either the Cameroon or the characteristics of a rural area in the United States. The experiment can be expanded to include two areas of a country which may be similar or resemble two settings with dissimilarity differences such as those that exist between the Cameroon and Webber-Yates Township, i.e., emphasis on Chronic versus Communicable diseases. Another area might be the Rural versus Urban dissimilarity. Comparison studies such as these would add other examples of the applicability of this method to the literature.

The last recommendation is that a study of this type put greater emphasis on Health Education and Health Prevention for the young. The make-up of Dimension I provides the basis for the relationship of young people to health-related items. An additional factor to support such a study is the hypertension program which focused on youth as its target population and has been advanced as the reason for the significant t-score for the variable combining the concepts Young People and Health Programs.

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APPENDICES

APPENDIX A SURVEY PRE-TEST

SURVEY PRE-TEST HEALTH EDUCATION-COMMUNITY ORGANIZATION

(Do Not Write In This Area)

(01-08) 0 1

Township_____

Ex/Con Group_____

Code: ☐☐☐☐☐☐☐☐

Date: ☐☐☐☐ (Mo. Day)

Time Interview Began: ☐☐☐☐☐

Time Interview Ended: _____

Minutes: ☐☐☐

Interviewer (Initials): ☐☐☐

Comments:

_____

_____

_____

INTRODUCTION

HELLO:

My Name Is _____ (Please Print) and I am here to ask you some questions about Health Education and the community.

We are conducting a study in this county and I would like to talk to the head of the household.

We would like to find out what people in Lake County think about this community and Health, Education.

So, I would like to ask you some questions that will help us get a clear understanding of <u>your</u> ideas about Health Education and your community.

I will read you some pairs of Health Education and community words Please tell me how similar or different the following pairs are using the 0 to 100 scale. * Remember, the difference between a telephone and a television is 50.

How different -that is how far apart are:

(Do Not Write In This Area)

Community Organization and Regional Health Center	Same 0 10 20 30 40 50 60 70 80 90 100 Completely Different	0102 1-3
Community Organization and Young People	Same 0 10 20 30 40 50 60 70 80 90 100 Completely Different	0103 4-6
Community Organization and Health Education	Same 0 10 20 30 40 50 60 70 80 90 100 Completely Different	0104 7-9
Community Organization and District Health Department	Same 0 10 20 30 40 50 60 70 80 90 100 Completely Different	0105 10-12
Community Organization and Disease Prevention	Same 0 10 20 30 40 50 60 70 80 90 100 Completely Different	0106 13-15
Community Organization and Old People	Same 0 10 20 30 40 50 60 70 80 90 100 Completely Different	0107 16-18
Community Organization and Yourself	Same 0 10 20 30 40 50 60 70 80 90 100 Completely Different	0108 19-21
Community Organization and Seeking Medical Help	Same 0 10 20 30 40 50 60 70 80 90 100 Completely Different	0109 22-24
Community Organization and Health Programs	Same 0 10 20 30 40 50 60 70 80 90 100 Completely Different	0110 25-27
Regional Health Center and Young People	Same 0 10 20 30 40 50 60 70 80 90 100 Completely Different	0203 28-30
Regional Health Center and Health Education	Same 0 10 20 30 40 50 60 70 80 90 100 Completely Different	0204 31-33
Regional Health Center and the District Health Department	Same 0 10 20 30 40 50 60 70 80 90 100 Completely Different	0205 34-36

Regional Health Center and Disease Prevention	Same 0 : 10 : 20 : 30 : 40 : 50 : 60 : 70 : 80 : 90 : 100 : Completely Different	0206 37-39
Regional Health Center and Old People	Same 0 : 10 : 20 : 30 : 40 : 50 : 60 : 70 : 80 : 90 : 100 : Completely Different	0207 40-42
Regional Health Center and Yourself	Same 0 : 10 : 20 : 30 : 40 : 50 : 60 : 70 : 80 : 90 : 100 : Completely Different	020843-45
Regional Health Center and Seeking Medical Help	Same 0 : 10 : 20 : 30 : 40 : 50 : 60 : 70 : 80 : 90 : 100 : Completely Different	0209 46-48
Regional Health Center and Health Programs	Same 0 : 10 : 20 : 30 : 40 : 50 : 60 : 70 : 80 : 90 : 100 : Completely Different	0210 49-51
Young People and Health Education	Same 0 : 10 : 20 : 30 : 40 : 50 : 60 : 70 : 80 : 90 : 100 : Completely Different	0304 52-54
Young People and the District Health Department	Same 0 : 10 : 20 : 30 : 40 : 50 : 60 : 70 : 80 : 90 : 100 : Completely Different	0305 55-57
Young People and Disease Prevention	Same 0 : 10 : 20 : 30 : 40 : 50 : 60 : 70 : 80 : 90 : 100 : Completely Different	0306 58-60
Young People and Old People	Same 0 : 10 : 20 : 30 : 40 : 50 : 60 : 70 : 80 : 90 : 100 : Completely Different	0307 61-63
Young People and Yourself	Same 0 : 10 : 20 : 30 : 40 : 50 : 60 : 70 : 80 : 90 : 100 : Completely Different	0308 64-66
Young People and Seeking Medical Help	Same 0 : 10 : 20 : 30 : 40 : 50 : 60 : 70 : 80 : 90 : 100 : Completely Different	0309 67-69
Young People and Health Programs	Same 0 : 10 : 20 : 30 : 40 : 50 : 60 : 70 : 80 : 90 : 100 : Completely Different	0310 70-72

(Do Not Write In This Area)

Health Education and the District Health Department	Same 0 : 10 : 20 : 30 : 40 : 50 : 60 : 70 : 80 : 90 : 100 :	Completely Different	0405 73-75 (BEGIN CARD TWO)
Health Education and Disease Prevention	Same 0 : 10 : 20 : 30 : 40 : 50 : 60 : 70 : 80 : 90 : 100 :	Completely Different	0406 1-3
Health Education and Old People	Same 0 : 10 : 20 : 30 : 40 : 50 : 60 : 70 : 80 : 90 : 100 :	Completely Different	0407 4-6
Health Education and Yourself	Same 0 : 10 : 20 : 30 : 40 : 50 : 60 : 70 : 80 : 90 : 100 :	Completely Different	0408 7- 9
Health Education and Seeking Medical Help	Same 0 : 10 : 20 : 30 : 40 : 50 : 60 : 70 : 80 : 90 : 100 :	Completely Different	0409 10-12
Health Education and Health Programs	Same 0 : 10 : 20 : 30 : 40 : 50 : 60 : 70 : 80 : 90 : 100 :	Completely Different	0410 13-15
District Health Department and Disease Prevention	Same 0 : 10 : 20 : 30 : 40 : 50 : 60 : 70 : 80 : 90 : 100 :	Completely Different	0506 16-18
District Health Department and Old People	Same 0 : 10 : 20 : 30 : 40 : 50 : 60 : 70 : 80 : 90 : 100 :	Completely Different	0507 19-21
District Health Department and Yourself	Same 0 : 10 : 20 : 30 : 40 : 50 : 60 : 70 : 80 : 90 : 100 :	Completely Different	0508 22-24
District Health Department and Seeking Medical Help	Same 0 : 10 : 20 : 30 : 40 : 50 : 60 : 70 : 80 : 90 : 100 :	Completely Different	0509 25-27
District Health Department and Health Programs	Same 0 : 10 : 20 : 30 : 40 : 50 : 60 : 70 : 80 : 90 : 100 :	Completely Different	0510 28-30
Disease Prevention and Old People	Same 0 : 10 : 20 : 30 : 40 : 50 : 60 : 70 : 80 : 90 : 100 :	Completely Different	0607 31-33

(Do Not Write In This Area)

		(Do Not Write In This Area)
Disease Prevention and Yourself Same 0 10 20 30 40 50 60 70 80 90 100 Completely Different		0608 34-36
Disease Prevention and Seeking Medical Help Same 0 10 20 30 40 50 60 70 80 90 100 Completely Different		0609 37-39
Disease Prevention and Health Programs Same 0 10 20 30 40 50 60 70 80 90 100 Completely Different		0610 40-42
Old People and Yourself Same 0 10 20 30 40 50 60 70 80 90 100 Completely Different		0708 43-45
Old People and Seeking Medical Help Same 0 10 20 30 40 50 60 70 80 90 100 Completely Different		0709 46-48
Old People and Health Programs Same 0 10 20 30 40 50 60 70 80 90 100 Completely Different		0710 49-51
Yourself and Seeking Medical Help Same 0 10 20 30 40 50 60 70 80 90 100 Completely Different		0809 52-54
Yourself and Health Programs Same 0 10 20 30 40 50 60 70 80 90 100 Completely Different		0810 55-57
Seeking Medical Help and Health Programs Same 0 10 20 30 40 50 60 70 80 90 100 Completely Different		0910 58-60
Telephone and a Television Same 0 10 20 30 40 50 60 70 80 90 100 Completely Different		61-63
Same 0 10 20 30 40 50 60 70 80 90 100 Completely Different		
Same 0 10 20 30 40 50 60 70 80 90 100 Completely Different		

1. What are the most important problems in your community. 9-15

_____

_____

_____

_____ _____ _____

(Do Not Write In This Area)

2. I will read you a list of information sources and I'd like you to tell me which *one* of these gives you most of your Health education information. 17-21

_____ (1) T.V.
_____ (2) Newspaper
_____ (3) Radio
_____ (4) Magazines
_____ (5) Brochures
_____ (6) Workshops/Presentations
_____ (7) Meetings
_____ (8) Informal Conversations
_____ (9) Other: _____

3. From which one of these same sources do you get the best information on Health education? 23-27

_____ (1) T.V.
_____ (2) Newspaper
_____ (3) Radio
_____ (4) Magazines
_____ (5) Brochures
_____ (6) Workshops/Presentations
_____ (7) Meetings
_____ (8) Informal Conversations
_____ (9) Other: _____

These are the last questions that I will ask you. I need to know what your income is. Please tell me if it falls within these ranges.

29

0-$5,000_____1

$5,001-$7,000_____2

$7,000-$9,000_____3

$9,001-$12,000_____4

$12 001-$15,000_____5

$15,001-$20 000_____6

Over $20,000_____7

No answer_____8

What age range do you fall in.

31

Under 18_____1

18-25_____2

26-30_____3

31-35_____4

36-45_____5

46-60_____6

Over 60_____7

No answer_____8

Sex(Identify by voice)

33

Female_____1

Male_____2

What is your race or nationality

35

Black_____1

White_____2

Hispanic_____3

Asian_____4

Other_____5

What is your level of education?

37

Below eighth grade_____1

Eighth_____2

Ninth_____3

Tenth_____4

Eleventh_____5

Graduated(H.S.)_____6

Some College_____7

Diploma_____8

Graduate School_____9

No Answer_____0

We may do some further work with health care needs. Do you think you would be available for a short session at your own convenience if we decide to go further? Could I have your name, address and telephone number?

Name_____

Address_____

Telephone Number_____

THANK YOU VERY MUCH FOR YOUR CO-OPERATION.

APPENDIX B SURVEY POST-TEST

SURVEY POST-TEST HEALTH EDUCATION-COMMUNITY ORGANIZATION

(Do Not Write In This Area)

(01-08) 0 1

Township_____

Code: ☐☐☐☐☐☐

Ex./Con Group_____

Date: ☐☐☐☐ (Mo. Day)

Time Interview Began: ☐☐☐☐☐

Time Interview Ended: _____

Minutes: ☐☐☐

Interviewer (Initials): ☐☐☐

Comments:

_____

_____

_____

INTRODUCTION

HELLO:

My Name Is _____ (Please Print) and I am here to ask you some questions about Health Education and the community.

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So, I would like to ask you some questions that will help us get a clear understanding of your ideas about Health Education and your community.

I will read you some pairs of Health Education and community words. Please tell me how similar or different the following pairs are using the 0 to 100 scale. * Remember, the difference between a telephone and a television is 50.

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(Do Not Write In This Area)

Community Organization and Regional Health Center	Same 0 10 20 30 40 50 60 70 80 90 100 Completely Different	0102 1-3
Community Organization and Young People	Same 0 10 20 30 40 50 60 70 80 90 100 Completely Different	0103 4-6
Community Organization and Health Education	Same 0 10 20 30 40 50 60 70 80 90 100 Completely Different	0104 7-9
Community Organization and District Health Department	Same 0 10 20 30 40 50 60 70 80 90 100 Completely Different	0105 10-12
Community Organization and Disease Prevention	Same 0 10 20 30 40 50 60 70 80 90 100 Completely Different	0106 13-15
Community Organization and Old People	Same 0 10 20 30 40 50 60 70 80 90 100 Completely Different	0107 16-18
Community Organization and Yourself	Same 0 10 20 30 40 50 60 70 80 90 100 Completely Different	0108 19-21
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Community Organization and Health Programs	Same 0 10 20 30 40 50 60 70 80 90 100 Completely Different	0110 25-27
Regional Health Center and Young People	Same 0 10 20 30 40 50 60 70 80 90 100 Completely Different	0203 28-30
Regional Health Center and Health Education	Same 0 10 20 30 40 50 60 70 80 90 100 Completely Different	0204 31-33
Regional Health Center and the District Health Department	Same 0 10 20 30 40 50 60 70 80 90 100 Completely Different	0205 34-36

Regional Health Center and Diease Prevention												
Same	0	10	20	30	40	50	60	70	80	90	100	Completely Different
Regional Health Center and Old People												
Same	0	10	20	30	40	50	60	70	80	90	100	Completely Different
Regional Health Center and Yourself												
Same	0	10	20	30	40	50	60	70	80	90	100	Completely Different
Regional Health Center and Seeking Medical Help												
Same	0	10	20	30	40	50	60	70	80	90	100	Completely Different
Regional Health Center and Health Programs												
Same	0	10	20	30	40	50	60	70	80	90	100	Completely Different
Young People and Health Education												
Same	0	10	20	30	40	50	60	70	80	90	100	Completely Different
Young People and the District Health Department												
Same	0	10	20	30	40	50	60	70	80	90	100	Completely Different
Young People and Disease Prevention												
Same	0	10	20	30	40	50	60	70	80	90	100	Completely Different
Young People and Old People												
Same	0	10	20	30	40	50	60	70	80	90	100	Completely Different
Young People and Yourself												
Same	0	10	20	30	40	50	60	70	80	90	100	Completely Different
Young People and Seeking Medical Help												
Same	0	10	20	30	40	50	60	70	80	90	100	Completely Different
Young People and Health Programs												
Same	0	10	20	30	40	50	60	70	80	90	100	Completely Different

(Do Not Write In This Area)

0206 37-39

0207 40-42

020843-45

0209 46-48

0210 49-51

0304 52-54

0305 55-57

0306 58-60

0307 61-63

0308 64-66

0309 67-69

0310 70-72

Health Education and the District Health Department												
Same	0	10	20	30	40	50	60	70	80	90	100	Completely Different
Health Education and Disease Prevention												
Same	0	10	20	30	40	50	60	70	80	90	100	Completely Different
Health Education and Old People												
Same	0	10	20	30	40	50	60	70	80	90	100	Completely Different
Health Education and Yourself												
Same	0	10	20	30	40	50	60	70	80	90	100	Completely Different
Health Education and Seeking Medical Help												
Same	0	10	20	30	40	50	60	70	80	90	100	Completely Different
Health Education and Health Programs												
Same	0	10	20	30	40	50	60	70	80	90	100	Completely Different
District Health Department and Disease Prevention												
Same	0	10	20	30	40	50	60	70	80	90	100	Completely Different
District Health Department and Old People												
Same	0	10	20	30	40	50	60	70	80	90	100	Completely Different
District Health Department and Yourself												
Same	0	10	20	30	40	50	60	70	80	90	100	Completely Different
District Health Department and Seeking Medical Help												
Same	0	10	20	30	40	50	60	70	80	90	100	Completely Different
District Health Department and Health Programs												
Same	0	10	20	30	40	50	60	70	80	90	100	Completely Different
Diease Prevention and Old People												
Same	0	10	20	30	40	50	60	70	80	90	100	Completely Different

(Do Not Write In This Area)

0405 73-75
BEGIN CARD TWO

0406 1-3

0407 4-6

0408 7- 9

0409 10-12

0410 13-15

0506 16-18

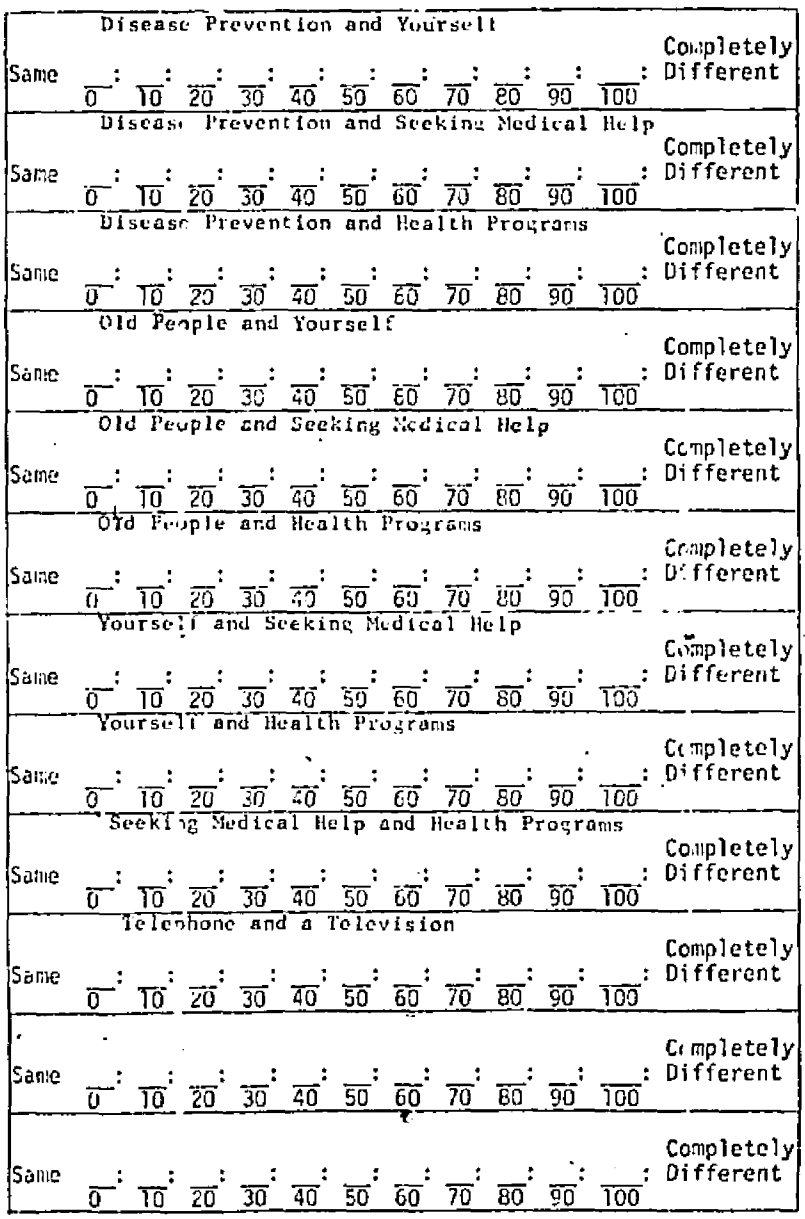
0507 19-21

0508 22-24

0509 25-27

0510 28-30

0607 31-33



(Do Not Write In This Area)

0608 34-36

0609 37-39

0610 40-42

0708 43-45

0709 46-48

0710 49-51

0809 52-54

0810 55-57

0910 58-60

61-63

APPENDIX C SURVEY PRELIMINARY TEST

SURVEY PRELIMINARY TEST HEALTH EDUCATION-COMMUNITY ORGANIZATION (Do Not Write In This Area)

(01-08) 0

Township_____ Code: ☐☐☐☐☐☐☐☐

Ex/Con Group_____ Date: ☐☐☐☐ (No. Day)

Time Interview Began: ☐☐☐☐☐

Time Interview Ended: _____

Minutes: ☐☐☐

Interviewer (Initials): ☐☐☐

Comments:

_____

_____

_____

INTRODUCTION

HELLO:

My Name Is _____ (Please Print) and I am here to ask you some questions about Health Education and the community.

We are conducting a study in this county and I would like to talk to the head of the household.

We would like to find out what people in this area think about this community and Health Education.

So, I would like to ask you some questions that will help us get a clear understanding of your ideas about Health Education and your community.

1. What are the most important problems in your community. 9-15

_____

_____

_____

_____ _____ _____

(Do Not Write In This Area)

2. I will read you a list of information sources and I'd like you to tell me which one of these gives you most of your Health education information. 17-21

_____ (1) T.V.
_____ (2) Newspaper
_____ (3) Radio
_____ (4) Magazines
_____ (5) Brochures
_____ (6) Workshops/Presentations
_____ (7) Meetings
_____ (8) Informal Conversations
_____ (9) Other: _____

3. From which one of these same sources do you get the best information on Health education? 23-27

_____ (1) T.V.
_____ (2) Newspaper
_____ (3) Radio
_____ (4) Magazines
_____ (5) Brochures
_____ (6) Workshops/Presentations
_____ (7) Meetings
_____ (8) Informal Conversations
_____ (9) Other: _____

These are the last questions that I will ask you. I need to know what your income is. Please tell me if it falls within these ranges.

29

0-$5,000_____1

$5,001-$7,000_____2

$7,000-$9,000_____3

$9,001-$12,000_____4

$12 001-$15,000_____5

$15,001-$20 000_____6

Over $20,000_____7

No answer_____8

What age range do you fall in.

31

Under 18_____1

18-25_____2

26-30_____3

31-35_____4

36-45_____5

46-60_____6

Over 60_____7

No answer_____8

Sex(Identify by voice)

33

Female_____1

Male_____2

What is your race or nationality

35

Black_____1

White_____2

Hispanic_____3

Asian_____4

Other_____5

What is your level of education?

37

Below eighth grade_____1

Eighth_____2

Ninth_____3

Tenth_____4

Eleventh_____5

Graduated(H.S.)_____6

Some College_____7

Diploma_____8

Graduate School_____9

No Answer_____0

We may do some further work with health care needs. Do you think you would be available for a short session at your own convenience if we decide to go further? Could I have your name, address and telephone number?

Name_____

Address_____

Telephone Number_____

THANK YOU VERY MUCH FOR YOUR CO-OPERATION.

APPENDIX D

Input

During this phase a survey was administered randomly to citizens in Yates and Webber Townships to assess social and health problems (See Appendix 2). This survey identified problems of health, sources of communication about health and demographic information about age, sex, income, etc. The subjects were also asked to identify leaders of activities within Yates and Webber Townships. In addition the Chamber of Commerce, Regional Health Care, The District Health Department and an Interagency Group were visited. From these visits letters of support for this project were solicited from the Yates Chamber of Commerce and the Western Michigan Health Systems Agency.

From this procedure the investigator sought to compose a committee to address the health care problems of the Yates-Webber Township Community. However it was discovered that a health committee was already in existence and had been since 1964; the Lake County Health & Services Association, which was comprised of local citizens.

Brief History of the Lake County Health & Services Association

This committee was organized on April 23, 1964 and incorporated in October of that year. In 17 years they have had five presidents, five secretaries and one treasurer. Their goal was to improve the living and health conditions in Lake County and surrounding counties. Two of their most notable accomplishments were the aiding in the construction of the early Health Unit built by OEO in the 1960's and the present Regional Health Care Center. They steer-headed the drive to build the present nursing home, through calling for millage elections and contacting private groups for this purpose. They fought a lengthy court battle to retain the land for the nursing home. Their meeting room is now located within the nursing home.

The investigator attended one of these meetings in August of 1980. The purpose of his research was expalined and the Committee agreed to allow him to present his proposals at the next regular meeting which met in October. At this meeting the investigator gave the results of his survey; asked the Committee to priortize the health problems and to look at particular obstacles (constraints). A discussion ensued and the Committee agreed to make a decision at the next meeting.

Process

During the next four meetings, one was canceled due to the weather; the Health Committee decided that the number one priority was to recruit a doctor for the community. All available material was gathered to aid in this area including two documents from the U.S. Department of Health,

Education and Welfare[1,2]. From various conversations with the Health Care Agencies it was discovered that Regional Health Care was expecting two doctors to come to the community under the National Student Health Corp Program.[3] The Director of Regional Health Care was then invited to attend the next meeting of the Health & Services Association.

The next several meetings involved the devising of strategies to persuade at least one of the doctors from the Health Corp to remain in the community rather than strategies to recruit a physician. The documents mentioned earlier, prior experiences of the Health Committee, advice from the Director of Regional Health Care and Health Education strategies were reviewed. In addition an assessment was made of local resources especially media and interpersonal communication. From this information the Health Committee decided that the community would be informed that two doctors would be coming and Regional Health Care through an educational campaign using the county newspaper, posters, flyers and interpersonal communication through the churches (See Figures 1-4). These activities would culminate in an open house to welcome the doctors shortly after they arrived. The date for the Open House was July 12, 1981.

Output

Regional Health Care handled the media portion of the Health Education process. They wrote the article for the newspaper, designed flyers and spread messages through their center activities and outreach programs. The Committee contacted churches, made announcements and spread the educational message verbally. The Committee also organized the program for the Open House to be held at Regional Health Care.

Control of the Environment

The culmination of the Health Education/Communication process was the Open House. One degree of success of the project would be the number of people who attended. Over 100 people attended. Another indicator of success would be whether a doctor would remain in the community after his two-year period was over. Shortly after the Open House one of the doctors purchased a house within the community. This is not an indicator that the doctor will remain but is an indication in the right direction.

---

[1]U.S. Department of Health, Education and Welfare, Public Health Service, Health Services Administration, Bureau of Community Health Services, "Establishing a Health Care Practice in Your Community," no date.

[2]U.S. Department of Health, Education and Welfare, Public Health Service, Health Services Administration, Bureau of Community Health Services, "Finding a Doctor for Your Community," Publication No. (HSA) 77-6005 (1977).

[3]The National Student Health Corps (NHSC) is authorized by Congress to upgrade or help establish health care practices in areas designated to have a shortage of health manpower. Physicians who have borrowed monies from the Federal Government to finance their education generally pay back their loans by working for two years in the Health Corps.

Evaluation

Post-Test results were only slightly positive. A total explanation is contained in Analysis of the Data Section of the main body of the paper.

FIGURE D1

LAKE COUNTY Health & Service Association

Health & Service Association

P. O. Box 118 BALDWIN, MICHIGAN, 49304

To the people of Lake County and the surrounding counties please mark your calendars for August 12, 1981, when the Health and Service Association will sponsor an Open House at Regional Health Care in appreciation for the two new Doctors that will be taking care of the patients at the Health Center. As you know we are in dire need of doctors in Lake County and we are so grateful for those that are coming. The Open House starts at 1 o'clock until 5 p.m. We trust we will have a packed house that day.

The Health and Service Association hold their meetings on the 2nd Thursday in each month at the Oak Village Nursing Home, in the Extrom Room at 8 p.m. Everyone is welcome to attend our meetings. This organization is responsible for Oak Village Nursing Home in Baldwin. We are working to do many things in Lake County. Please come and join us we need your support and help. Thank you kindly.

Mr. Vern Ivez, President
Rev. Ellis Davis, Vice President
Mrs. Willie, Instructor
Ms. Olivia Withers, Acting Secretary.

FIGURE D2

Lake County Star

Serving Lake County since 1873

$.20

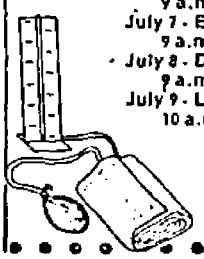
THURSDAY, JULY 2, 1981 TWENTY PAGES VOLUME 108 NO. 9

REGIONAL HEALTH CARE HYPERTENSION CONTROL PROGRAM

FREE Blood Pressure Screening, Referral, Follow-Up

Clinic Available this week at these sites:

July 6 - Lake-Osceola State Bank
9 a.m. to 5 p.m.
July 7 - Ed's I.G.A.
9 a.m. to 5 p.m.
July 8 - Dept. of Social Services
9 a.m. to 12 noon
July 9 - Luther Meals Site
10 a.m. to 2 p.m.



For Further Information Call: 745-1621

Open House at RHC

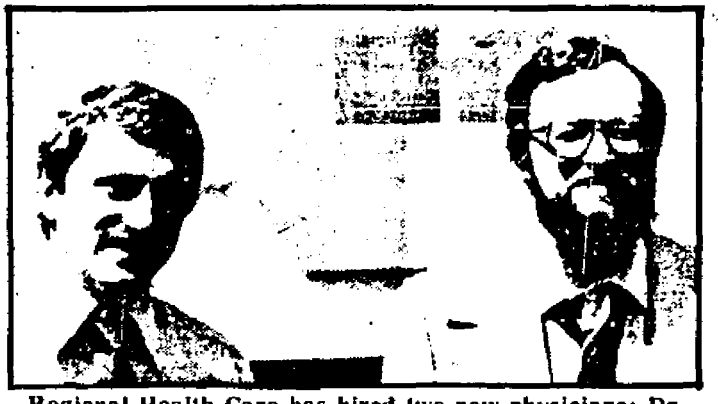
The public is invited to attended an open house at *Regional Health Care* in Baldwin on Sunday, July 12 from 2:00 p.m. to 5:00 p.m.

The open house will be held to welcome two new physicians in the community. The public may also tour the facility. Refreshments will be served.

FIGURE D3

THE LAKE COUNTY STAR

16-THURSDAY, JULY 9, 1981



Regional Health Care has hired two new physicians: Dr. Keith Newall and Dr. Wally Storm. The public is invited to an open house on Sunday, from 2:00 p.m. to 5:00 p.m. to meet the community's newest members and tour the RHC facility.

FIGURE D4

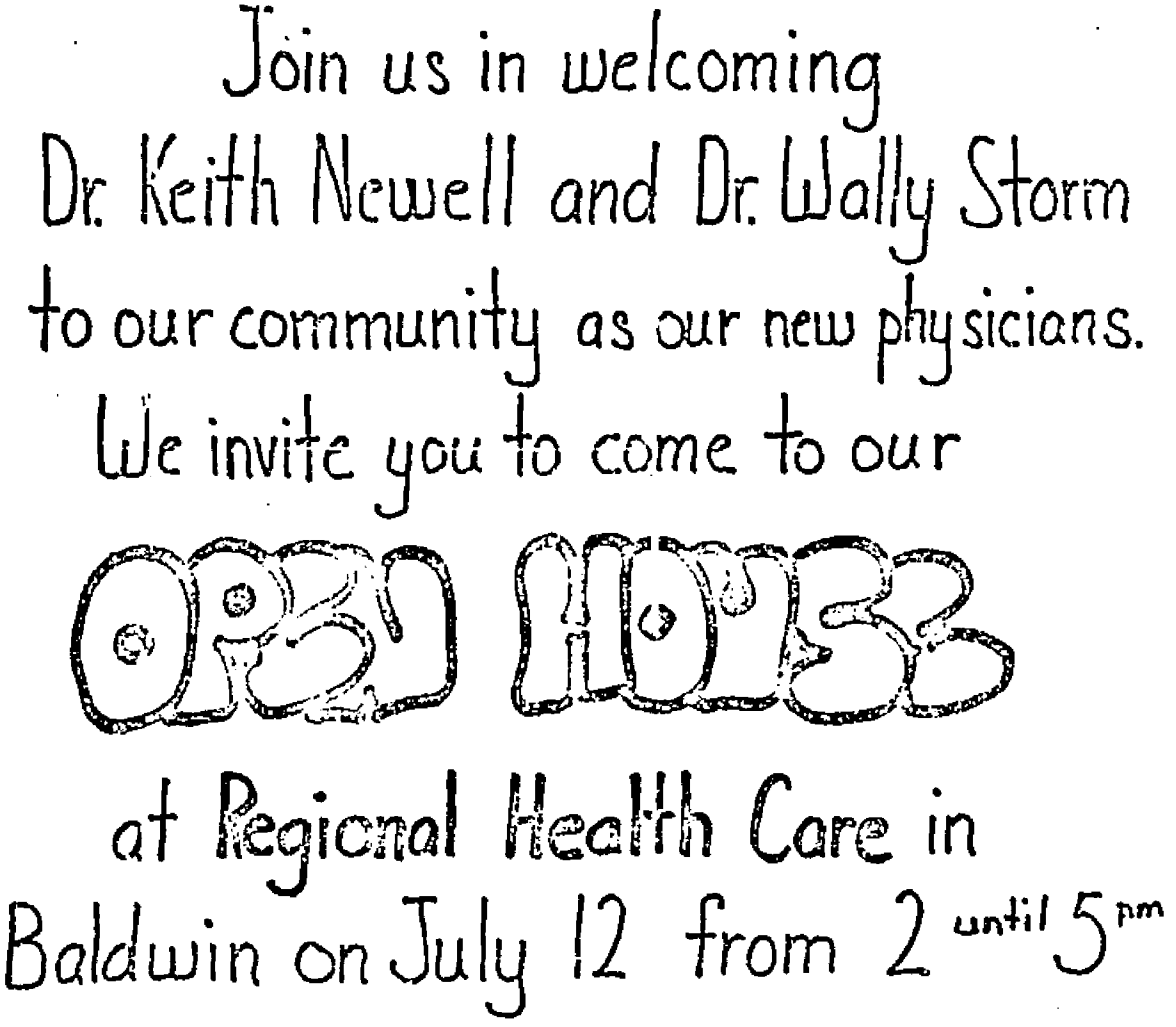

Join us in welcoming
Dr. Keith Newell and Dr. Wally Storm
to our community as our new physicians.
We invite you to come to our
OPEN HOUSE
at Regional Health Care in
Baldwin on July 12 from 2 until 5 pm

FIGURE D5

Discussed at the Interagency Council Meeting

July 12th an open house will be held at Regional Health Care from 2:00 a.m. to 5:00 P.m. The purpose of the open house is to welcome our two new physicians: Dr. Keith Newell and Dr. Wally Storm. We are hoping for a good turn out as a show of support for the physicians. As a medically underserved community the recognition of the importance of attracting and keeping these physicians in our area can not be underplayed.

Besides our lack of health providers for the community we deal with an increased need. Just to give you an example of why our need is greater consider these points of examples. Our high percentage of elderly citizens increases the rate of chronic diseases. Chronic disease processes need to be closely monitored. The low socio-economic status in general leads to certain health problesm, such as anemia in children, increasing the demand for health care.

The two new physicians are National Health Service Corp physicians. This is a real financial advantage to the community. The physicians will be relatively inexpensive to Regional Care helping allow the sliding fee scale for services to be in the budget. Past data has pointed to the community being to poor to support private physicians and the the comprehensive health service needed.

I think we should all take a responsibility for both our health and health care as we cannot separate one from the other. One method of taking responsibility for our health care would be to support these new physicians by our acceptance. I am in hopes that you will take this information and flyers back to your agencies to pass on to community leaders.

Discussion followed.