

AGENCY FOR INTERNATIONAL DEVELOPMENT
 WASHINGTON, D. C. 20523
 BIBLIOGRAPHIC INPUT SHEET

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Batch 65

1. SUBJECT CLASSIFICATION	A. PRIMARY	TEMPORARY
	B. SECONDARY	

2. TITLE AND SUBTITLE:
 Current practice and future directions of nutrition education in developing countries, a research and policy assessment

3. AUTHOR(S):
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4. DOCUMENT DATE 1977	5. NUMBER OF PAGES 78p.	6. ARC NUMBER ARC
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7. REFERENCE ORGANIZATION NAME AND ADDRESS
 AED

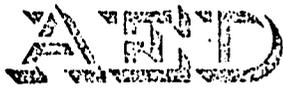
8. SUPPLEMENTARY NOTES (Sponsoring Organization, Publishers, Availability)

9. ABSTRACT
 (HEALTH R&D)

Assesses the present state of nutrition education research and practice in developing countries and makes suggestions for future directions in the field. This report reviews recent efforts in research and action programs in nutrition education, noting developments that caused important changes to be made in the field in the early 1970's. The implications of these developments are discussed with a focus on trends in the purpose and scope of the field, specific themes and objectives, audiences, and methodologies. Recent policy statements and actions by major international agencies providing assistance to nutrition programs in LDCs are explored. The findings of the study suggest that these statements and actions comprise a new type of policy which will guide international assistance in health and nutrition. Developments are researched which bear directly on the practice of nutrition education in related fields such as development communication, family planning, applied anthropology, and social marketing. Recommendations for future research and programming in the field are: gathering comprehensive data in LDCs, continued testing of methodologies, cost-benefit studies, and basic research on behavior change.

10. CONTROL NUMBER PN-AAE-112	11. PRICE OF DOCUMENT
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12. DESCRIPTORS Education Health Nutrition Policies Research	13. PROJECT NUMBER
	14. CONTRACT NUMBER AID/ta-BOA-1377 GTS
	15. TYPE OF DOCUMENT



ACADEMY FOR EDUCATIONAL DEVELOPMENT

CURRENT PRACTICE AND FUTURE DIRECTIONS
OF NUTRITION EDUCATION IN DEVELOPING COUNTRIES:
A RESEARCH AND POLICY ASSESSMENT

Prepared for

The Office of Nutrition
and The Office of Education and Human Resources,
Technical Assistance Bureau
Agency for International Development

by Mark Rasmuson

June 1977

This study was conducted under the guidance of Dr. Anthony J. Meyer, Office of Education and Human Resources. Consultant reports to the study were also submitted by Dr. Joyce D. Nash of Stanford Heart Disease Prevention Program, Stanford University School of Medicine, and Ms. Jan Alexander, of the Institute for Communication Research, Stanford University, and Ms. Katja Janovsky, School of Public Health, Harvard University. The Study was funded under Contract No. AID/ta-BOA-1377, Task Order No. 1, between the Office of Education and Human Resources and the Academy for Educational Development.

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EXECUTIVE SUMMARY

This report attempts to assess the current state of nutrition education research and practice in developing countries and to suggest those directions in which it may be most fruitfully guided in the near future.

Section I, Experience to Date, briefly reviews past efforts in both research and action programs in nutrition education and notes those developments that prompted important changes in the field in the early 1970s. The earliest nutrition education programs of international significance undertaken in developing countries were the applied nutrition programs conceived by UNICEF in the late 1950s, which are still conducted extensively today. A substantial amount of applied research had preceded UNICEF's initiative. But this research, carried out largely in the United States following the National Research Council's pioneering work during World War II on food habits, had little relevance for educational efforts in developing countries; it was conducted mostly in formal educational settings and to the end of disseminating information rather than inducing changes in food habits.

Aside from the applied nutrition programs, nutrition education activities in developing countries during the 1950s and 1960s were typically appendages of other types of nutrition or other social interventions, such as nutritional rehabilitation, supplementary feeding, adult literacy, agricultural extension, and community development programs. These educational activities necessarily had a limited impact, relying as they did on traditional educational techniques -- that is, person-to-person didactic instruction. What precise impact they did have is virtually unknown, since few of the many programs carried out during these years attempted in any rigorous fashion to assess their successes or failures.

Certain developments in the early 1970s, however, began to significantly alter the theory and practice of nutrition education. Increasing recognition of the "nutrition factor" in the process of socioeconomic development and the change in programming emphasis among international health agencies from a curative to a preventive orientation elevated nutrition planning and all types of nutrition interventions to a position of new importance. And new mass media strategies of nutrition education efforts -- their limited outreach and impact.

Section II, Emerging Trends: Nutrition Education, discusses the implications of these developments and of subsequent ones which characterize the field today. This assessment of the current state-of-the-art in nutrition education in developing countries discusses trends in the purpose and scope of the field, specific themes and objectives, audiences, and methodologies.

As a result of the systems perspective which was incorporated as a tool of national nutrition planning, the scope of nutrition education programming was considerably enlarged; new educational objectives were derived from a number of points in the nutrition system besides food consumption, such as the improvement of food production and storage techniques and the promotion of sanitary habits. Certain objectives have emerged as priority considerations, especially the promotion of breast feeding and the early introduction of supplementary foods for infants. Changes in actual food-related behavior and in nutritional status, rather than simply knowledge or attitude, have become firmly established as the ultimate criteria of educational success.

New audiences for nutrition education have been identified, such as government officials, health workers, community leaders, and other

influentials, who, it is hoped, will serve as "multipliers" and facilitators of the changes sought by nutrition programs. And new strategies and techniques of nutrition education have emerged. Most notable among these are the mass media approaches, such as social marketing strategies, which utilize face-to-face instruction; and community-based approaches, which view community participation as a necessary prerequisite to the success of any social intervention.

In Section III, *Emerging Trends: Donor Agency Policy*, a number of recent policy statements and actions by the major international agencies providing assistance to nutrition-related activities are reviewed. It is suggested that these statements and actions together comprise a new policy context which will increasingly guide international assistance in health and nutrition. This context is one in which high priority will be given to research and programming related to the extension of integrated prevention-oriented primary health services to underserved majorities, administered by networks of health and nutrition auxiliaries. Educational and communication support of these activities will be stressed. Attention will also be directed toward the role of community participation in this effort. The implications of this policy context for nutrition research and programming are discussed.

Section IV, *Emerging Trends: Related Fields*, surveys developments which have a direct bearing on the practice of nutrition education in a number of related fields. Experience in the field of health education, for example, is cited to suggest that programs aimed at students in formal educational settings in developing countries are unlikely to yield significant payoffs. Other recent research in health education advocates that educational

interventions will benefit from a situation-specific approach, which analyzes indigenous perceptual patterns, educational mechanisms, etc., before attempting to induce changes. Current efforts in international health planning suggest innovative methodologies for training community workers and provide examples of the effective integration of nutrition and other basic services in a single delivery system. Recent research in social learning theory and in programs of weight, stress, and heart-disease risk reduction suggest that principles of behavioral psychology might be fruitfully applied to nutrition education. Relevant developments in the fields of development communication, family planning, applied anthropology, and social marketing are also discussed.

Section V provides recommendations for future research and programming in nutrition education. Research needs identified include:

1. Comprehensive data on current nutrition intervention programs in developing countries.
2. Continued testing of current nutrition education methodologies.
3. Cost-benefit studies of nutrition education vis-a-vis other types of nutrition interventions.
4. Assignment of priorities among target audiences.
5. Attention to the "fit" between audiences and messages.
6. Basic research on behavior change.
7. Situation-specific analysis of intended program settings.
8. Recognition in research and programming of emerging policy trends, especially the integration of primary health services, the training of primary health workers, and the desirability of participatory development.

I. EXPERIENCE TO DATE

Introduction

Nutrition education has received increasing attention in recent years, not only as a complement to various types of nutrition intervention programs, but as an important type of intervention itself. Several factors seem to have contributed to this trend -- the increasing emphasis throughout the international health establishment on all types of preventive programs; the attention received by recent Madison Avenue advertising approaches to nutrition education; the appeal to government officials in poor countries of the seemingly lighter demand on resources made by nutrition education in comparison to other types of interventions. In any case, a recent survey of health programs in some 54 developing countries reported that nutrition education was the most commonly offered service among programs providing some kind of nutrition services (APHA, 1977).

In juxtaposition to this increasing popularity of nutrition education, however, is another recent trend -- the recognition among nutrition professionals that the performance of nutrition education in developing countries to date has nowhere fulfilled its promise. Alan Berg's assessment in The Nutrition Factor is illustrative:

The basic issue remains whether nutrition education can successfully prompt diet change in poor societies, and whether the change will last. There is little evidence to support this notion. Traditional nutritional education activities in low-income countries have been sufficiently disappointing to raise the question whether food habits can be changed by education (Berg, 1973).

Recent statements by other experts in the field support Berg's assessment and further concur with his judgment that the primary reason

for the disappointing performance of nutrition education is the paucity of fruitful research that has been conducted in the field: "Surprisingly little good information is available on nutrition education, despite the vast number of undertakings over the years." A recent WHO monograph on the role of nutrition in preventive medicine, for example, concludes:

At the present time the greatest void in nutrition research programs is in the area of education: in teaching techniques, both formal and informal, and in methods of evaluating educational efforts. A large amount of scientific information on nutrition is available. Better use can be made of this information when research supplies some of the answers about the motivation of people to change their attitudes and improve their food habits (Bosley, 1976).

The primary intention of the report which follows is to address this perceived shortcoming of nutrition education research. After briefly assessing past efforts in both research and action programs, and identifying important current and emerging trends in the field and in others which impinge upon it, this report will suggest those lines of research which seem to hold the most immediate promise for enhancing the contribution of nutrition education to the attack on world malnutrition.

Early Research and Practice

The earliest internationally organized attempts at direct nutrition intervention, other than the mere provision of food, were set in motion in the late 1950s by UNICEF. In 1957, after some years of supporting milk distribution programs in cooperation with WHO and FAO, UNICEF decided to expand its assistance in nutrition in favor of more comprehensive development

schemes, which were first called "expanded aid to nutrition," then aid to "nutrition education and related activities," and finally "applied nutrition programs." While the applied nutrition programs (ANPs) encompassed such food production-oriented projects as school and community gardens and orchards, fish culture, and small livestock raising, as well as supplementary feeding of especially vulnerable groups, they were fundamentally demonstration -- i.e., education -- projects. A joint FAO/WHO report defined ANPs as

...comprehensive...interrelated educational activities aimed at the improvement of local food production, consumption, and distribution in favor of local communities, particularly mothers and children in rural areas, in which the guiding principles are coordination among different agencies and institutions and the active participation of the people themselves (FAO/WHO, 1965).

Research in nutrition education, however, had begun years prior to the applied nutrition programs. The so-called classic works in the field -- the two bulletins on the study and change of food habits prepared for the Committee on Food Habits of the National Research Council under the direction of Margaret Mead -- were published in the early 1940s (National Research Council, 1943; 1945). In the decades that followed, however, little progress in theory or method relevant to applied programs in developing countries was made, as noted by Mead in a 1964 review of research on food habits (Mead, 1964). The reasons for this lack of progress are suggested by several broad generalizations that may be made in the way of characterizing nutrition education research during this period.

In the first place, nutrition education was largely regarded as merely an adjunct to the nutrition sciences -- "the application of the science

of nutrition to the everyday lives of people" (McLaren, 1976). Research on inducing better use of available food resources, the traditional concern of nutrition education, was consistently assigned secondary importance to investigations of nutrition status and the nutritional qualities of diets, which have been the primary concerns of nutrition researchers. A number of significant findings in the field were made during this period -- for example, that, most fundamentally, nutrition education could by itself change food habits; that imparting information alone was rarely a sufficient condition for inducing change; and that certain educational methods were more effective than others (AID, 1970). Subsequent research, however, failed to build significantly on these foundations. Indeed, the review of the nutrition education literature sponsored by AID's Office of Nutrition, for example, concluded that research in the field up until 1970 had by and large been directed more toward the purpose of disseminating nutrition information than toward that of improving dietary habits (AID, 1970). Finally, much of the research of this period was simply irrelevant to the needs of applied programs in developing countries. Few studies were made from a policy or program viewpoint. Most were conducted in formal educational settings in the United States, which were a distinct contrast to the mostly nonformal settings in which nutrition education was implemented in the developing countries.

The concept of the applied nutrition program that originated during this period, emphasizing the demonstration, production, and consumption of protective foods, has remained a popular one. The results these programs have produced, however, are at best mixed. Some dramatic failures have tended, perhaps, to overshadow many modest successes. The Indian-applied

nutrition program, for example, was declared in 1971, after twelve years of practice, to have made no significant difference in general dietary practices," particularly in respect to nutritionally desirable commodities which are promoted under the program" (Desai and Gaiwad, 1971). Similar conclusions have been reached in studies of programs in Indonesia and the Philippines (UNICEF, 1972). The most common case, however, is that program results are simply unknown.

Such is true as for the several other types of nutrition interventions having significant educational components which were begun in the late 1950s and 1960s. Foremost among these are the nutritional rehabilitation, or mothercraft, programs, which provide dietary therapy to children suffering from malnutrition while teaching the children's mothers principles of food selection and preparation. Nutrition education has also been provided to a limited extent in maternal-child health centers, formal school settings, and in conjunction with a variety of supplementary feeding, adult literacy, health education outreach, and agricultural extension programs. Varied claims have been made as to the success of these educational efforts. Nutritional rehabilitation centers in particular have succeeded, not only in rehabilitating malnourished children, but in altering deleterious food habits among mothers participating in the care of their children. (For a recent review of these activities, see Harman, 1977.) In general, however, the educational components of these programs have been so rarely evaluated that generalizations about their success or failure are impossible to make. Evaluation may have been neglected "on the unquestioned assumption that nutrition education is worthwhile, or it may have been scheduled to take place after the end of a nutrition campaign, and many projects never get that far" (Berg, 1973). Evaluation also represents an additional commitment

of resources which government officials responsible for programs, operating with limited budgets and sensitive to unfavorable results, were often understandably reluctant to make. Another explanation is that the contemporary practice of evaluation, referring to the assessment of progress towards concrete goals specified in advance, was simply not in vogue until the late 1960s; the standard reference on evaluation of applied nutrition programs (Latham, 1972), for example, did not appear until 1972.

Recent Developments

In the early 1970s, several developments occurred which significantly affected the theory and practice of nutrition education. At the policy level, these developments included the gaining currency of the new approach to development assistance favoring attention to the basic needs of the rural poor in developing countries; the shift occurring within the international health establishment from an emphasis on curative medicine to one stressing prevention; and the growing recognition of health and nutrition factors in the process of general socioeconomic development. These developments gave a new favored status to all types of health-related activity within the field of development, particularly those with a preventive orientation. The latter -- the recognition of the "the nutrition factor" and the impetus it gave to national nutrition policymaking and planning -- brought about certain very specific changes in the conceptualization of nutrition interventions, including education. The requirements of national nutrition planning brought the concepts and tools of systems analysis into the formulation of nutrition strategies with some immediate salutary results. The delineation of a nutrition system, comprised of component subsystems (e.g., food supply, distribution and processing, and consumption) led to a much clearer

specification of those points at which interventions could be made in the flow of food nutrients from the farm to utilization by the consumer. For nutrition education, the systems approach precipitated an immediate broadening of the scope of the field: as the educational needs of new types of interventions were identified, nutrition education was forced to abandon its traditional narrow focus on changing the dietary practices of at-risk populations and address a number of new objectives and audiences. These will be discussed in detail in the section which follows. Prior mention should be made, however, of the equally important changes in nutrition education brought about during these same years by several dramatic developments in its methodology -- namely, the entry of mass media and campaign approaches into the repertoire of nutrition education techniques.

While various forms of mass media had been utilized in previous nutrition education efforts, the use of mass media to carry the burden of the educational effort and particularly the adoption of commercial marketing techniques of media use were innovations of this period. The potential contribution of these techniques to nutrition education were greeted with high hopes. The major shortcoming of previous educational efforts had been their limited outreach, and thus their limited potential impact, relying as they did largely upon face-to-face communication techniques. The mass media offered a way to overcome this shortcoming. The mass media can reach many more people more quickly and at lower cost than interpersonal channels. Mass media messages, prepared and distributed centrally, can create a campaign psychology -- a common awareness that "something important" is happening -- more readily than possible through conventional face-to-face techniques. Furthermore, the mass media used in combination with some form of face-to-face reinforcement offer an especially potent

force for change, as the experience in the use of radio forums mass mobilization campaigns has demonstrated.

These developments thus set the stage for a number of changes evident in current theory and practice of nutrition education, which will be discussed next.

II. EMERGING TRENDS: NUTRITION EDUCATION

Purpose and Scope of the Field

In considering trends emerging in the field of nutrition education, the first changes to be noted are those occurring in the conceptual framework which defines the problems and scope of the field. As noted earlier, the range of subjects seen as proper concerns for nutrition education has expanded considerably in recent years. While the improved nutritional status of the individual or community remains its ultimate purpose, nutrition education today encompasses a number of foci other than the direct improvement of dietary practices. This is indicated in the following sampling of recent attempts to define the purview of the field indicate:

Nutrition education in the widest sense should be designed to improve the diet of the whole family with specific reference to young children. It should also encompass methods of improving village food production, storage, and preservation, as well as the prevention of infections and of customs that have important nutritional significance (Jelliffe, 1968).

The end purpose of nutrition education is to bring about positive changes in food behavior as these changes relate to food consumption. (But) in order to eat, one must have food. To have even the opportunity to be well-nourished, one must have access to certain amounts of a variety of different foods. And, given access to foods, adequate nourishment can be provided only if the nutrients are protected, through appropriate process of food storage and food preparation, and if the foods are consumed according to the individual needs of each family member. Thus, nutrition education must attend to many different objectives to achieve its purpose. One program may teach youth to plant and care for kitchen gardens; another may teach farmers how to build storage bins to protect grain; and others may teach how to prepare foods and which foods to feed infants and children to insure health and proper growth and development (AID, 1975).

Nutrition education should encompass much more than merely counseling people on the basic food groups and how to prepare meals if it is to attack the multiple determinants of malnutrition. The emphasis of nutrition education must be broadened to include:

- Agricultural extension of small farmers about the best techniques for growing, storing, and marketing their crops;
- Proper use of water systems, especially if these are not potable;
- Best nutrient buys, price regulation, and unadulterated food supply;
- Advantages of breast-feeding and regulation of commercial milk formula promotion (Cooke, 1976).

Nutrition education planning need not restrict itself to only selection, preparation, and consumption of food. It can also deal with food storage, preservation, and even production. This means taking nutrition education outside the limits of a strict definition of it as "better utilization of available resources," but this might well be the only sensible approach in certain regions.... Nutrition education can potentially deal with any of the following objectives:

- Production for home use of needed food items;
- Storage and preservation of foods especially at the home and farm level;
- Selection of available foods;
- Preparation of available foods;
- Consumption of available foods;
- Control of conditions and diseases and improvements of hygiene practices related to poor absorption of foods ingested;
- Control of diseases which aggravate nutritional deficiencies (Perrett, 1977).

Nutrition and nutrition-related education...is defined to include:

- Nutrition: information and instruction in how to acquire, store, prepare, and distribute foods for optimum utilization of food resources.
- Health care: information and services for preventive and curative measures which promote proper, or at least improved, health status.
- Population planning: information and services for the control of family size and the spacing of children.
- Sanitation: information and services for the reduction/elimination of unsanitary conditions which foster parasitic and infectious diseases that prohibit or limit food absorption.
- Agriculture: efforts for improvement and expansion of crops, especially those intended for domestic consumption.
- Resource management: assistance and instruction for optimal utilization of resources, including exploitation of available natural or wild food resources (Synectics Corporation, 1976).

As these definitions indicate, nutrition education is becoming a concept inclusive of all aspects of education which attempt to improve nutritional status.

A second important change in the conceptual framework of the field should be noted here. In The Nutrition Factor, Alan Berg argued that the most important change necessary for nutrition education to become a more effective strategy was a reconceptualization of the field acknowledging its proper concerns as education or communication problems rather than exclusively nutrition problems, the province of social and policy scientists as well as nutritionists. Such a reconceptualization is now well underway. It may be seen in the increased attention to communication support of nutrition programs (e.g., PAG, 1976), the use of communication models in the planning of educational strategies

(e.g., Synectics Corporation, 1976), and the appearance of communication-oriented training programs in nutrition; Cornell University's International Nutrition Program, for example, is tentatively planning a master's-level program specifically in Nutrition Communication. A similar kind of re-orientation occurred in the field of family planning in the late 1960s, as will be noted later, which immediately resulted in the identification of certain aids and hindrances to the process of family planning education which the earlier paradigm had ignored. An analagous process may be noted, too, in the adoption of principles of systems analysis in nutrition policy and planning.

These changes in the conceptual framework of nutrition education may be further seen in the changing configuration of professional involvement in the field. Once the province solely of the professional nutritionist and home economist, nutrition education programs today are properly seen as requiring the expertise of an interdisciplinary team including communication scholars and practitioners; sociologists, anthropologists, economists, educational and social psychologists, and other social scientists; agronomists, sanitarians, public health educators, and other specialists in nutrition-related fields; professional change agents; and professional planners.

Specific Themes and Objectives

While the selection of specific themes for nutrition education programs will obviously vary according to local nutrition, health, environmental, and food production patterns, there are certain topics of likely relevance to most developing country settings. These include:

Dietary topics, such as

- Proper diets for pregnant and lactating women;

- The value of breast-feeding;
- Dangers of bottle feeding;
- Types of foods (e.g., "body-building," "energy," and "protective" foods);
- Recognition and prevention of protein-calorie malnutrition;
- The use of weaning foods;
- The avoidance of harmful foods;
- Use of protein supplements;
- Intra-family distribution of food.

Food production topics, such as

- Increased cultivation of legumes, vegetables, fruits, etc.;
- Production of sources of animal protein, such as poultry, fish, rabbits, etc.;
- Improved food preservation and storage, including the use of insecticides;
- Control of soil erosion;
- Increasing soil fertility through composting, etc.

Miscellaneous topics, generally oriented toward health objectives, including

- The purpose and value of available health services;
- Bacterial cause of infectious diseases;
- Immunization against certain infectious diseases;
- Prevention and management of diarrhea;
- Cause and effects of common intestinal parasites;
- Emotional problems of too-sudden cessation of breast-feeding;

- Importance of personal sanitary practices;
- Improvement of village housing, including kitchen, latrine, water supply, and water storage;
- Avoidance of harmful local health customs, such as purgation and starvation treatment of diarrhea;
- Advantages of child spacing, including cheap, simple methods of contraception;
- Budgeting, use of markets, income augmentation, etc. (Jelliffe, 1968).

There is widespread agreement among nutrition professionals that certain among these topics, especially the promotion of breast-feeding and supplemental feeding of infants, should be assigned first priority in nutrition education programs. Reversal of the worldwide trend towards early cessation of breast-feeding is considered of particular importance. A recent statement by the Joint FAO/WHO Expert Committee on Nutrition is indicative of this concern:

Early weaning under the conditions that prevail in the developing countries is one of the main causes of malnutrition in the infant. Breast milk not only provides energy, protein, and other essential nutrients for the infant at a lower cost than any alternative food, but also contains specific antibodies against infection and, very importantly, it is not a vehicle for transmitting infectious disease in an unhygienic environment. Governments should therefore encourage the use of this valuable food resource and include programmes for promotion of breast-feeding in their nutrition planning (FAO/WHO, 1976).

While the scope of the subject matter of nutrition education has thus been redefined in more global terms, there has been a concurrent trend toward specifying the objectives of individual nutrition education programs in a much more concrete manner than previously. While behavioral change has long been acknowledged as the ultimate test of the success of nutrition

education, behavioral objectives are finally being specified in quantifiable terms which allow the measurement of behavior change. The difference this represents in objective setting is illustrated by the following two lists of objectives from nutrition education programs in Latin America:

- Participants must be able to relate nutrients to the four basic food groups.
- Participants must be able to identify illness caused by poor diets and describe ways of curing illnesses through proper feeding.
- Participants must be capable of elaborating an appropriate menu for all the family members -- considering age, physiological characteristics, health, activities, prices, harvest season, etc.
- Participants must be capable of identifying the characteristics of natural and processed foods which are in a good condition of preservation, and the characteristics of those which are not.
- Participants must be able to describe the correct method for preparing the soil, planting and caring for a vegetable garden. (AID, 1975)
- Increase the consumption of iodized salt among low-income Sierra families.
- Increase the frequency of boiling water before drinking, especially for infant food on the Coast and Sierra.
- Increase the consumption of legumes and their recognition by the target group as good sources of protein.
- Increase the frequency of washing hands with soap and water before eating, before preparing food, and after using the latrine.
- Increase the frequency and duration of breast-feeding among rural and urban women on the Coast (Cooke, 1976).

The objectives in the first list are written in behavioral terms, but the behavior required demonstrates only knowledge about nutrition. The second list specifies explicit behaviors that could be expected if the target group put its knowledge of the value of such behaviors into practice. These behaviors would effect a direct and quantifiable change in the nutritional status of the target group.

The specification of such educational objectives is an indispensable component of current efforts to develop effective methodologies for evaluating nutrition education programs, the lack of which has been cited as the main shortcoming of such programs in the past. AID has made the most notable efforts in this regard, having developed and field tested a methodology for determining the "effects of education in changing food habits,...the cost-effectiveness of any individual nutrition education program,...and which of two or more programs, representing different approaches, has the greatest positive effect on food habits at the least cost" (AID, 1975). Much more research is needed in this area, including the development of studies which assess both changes in food habits and resultant changes in nutritional status over the long term. Much effort will also be required to secure the adoption of such techniques. Accurate evaluation is still a rarity among nutrition education programs in developing countries. APHA's recent survey of LDC health programs, for example, reported that among all of the services provided by the programs, "goals are particularly vague in respect to nutrition and family planning." Project responses to the question "what progress have you made toward your goals (in nutrition)?" revealed a "complete absence of consensus regarding how one determines the extent of achievement." Fewer than a dozen projects stated goals or progress in concrete quantifiable behavioral terms (APHA, 1977).

Audiences

Nutrition education programs of the past have been directed primarily towards high-risk populations and the general public. While the nutritional status of vulnerable groups, especially pregnant and nursing women and children under three years of age, appears to be the main concern of nutrition interventions, there is growing consensus that nutrition education should also be directed at men within target populations and at such groups as national and local political leaders, officials of government and foreign assistance agencies, medical and paramedical personnel, mass media personnel, school-teachers, religious leaders, etc. Men are seen as an important audience since they are often the primary decision-makers within families in household matters affecting food practices. The significance of the trend toward directing nutrition education at government officials, health workers, etc. is that changes sought in the food practices of these audiences are regarded as secondary in importance to the changes they in turn may induce in others; they are less the objects than the intermediaries and multipliers of intended change. It thus reflects a better understanding of the process of planned change, acknowledging the wide diffusion of awareness of an intended audience that must precede its adoption, and the role of influential intermediaries -- opinion-leaders -- in extending the outreach of attempts to alter attitudes and behavior on a large scale.

This understanding has some important implications for the goals of nutrition education which were not mentioned above. Even the expanded definitions of nutrition education cited earlier refer primarily to measures intended to have a direct impact on the nutritional status of target groups.

Nutrition education must also be seen as encompassing two other important tasks, however: the creation of an awareness among government decision-makers of the national importance of good nutrition, which some would argue is the most immediate and pressing task for nutrition education since it addresses the issue of political feasibility (Fuglesang, 1974); and the training of manpower to conduct nutrition activities at various levels. There is increasing agreement that this latter task -- the training of nutrition manpower -- is the most important endeavor of nutrition education in a formal educational setting.

As these new audiences for nutrition education are being identified, certain others, such as children in formal school settings, are being de-emphasized. While nutrition education in developing countries has traditionally been conducted mostly in nonformal settings -- e.g., applied nutrition, supplementary feeding, and rehabilitation programs -- much lip service has been paid to its "obvious" role in formal education -- i.e., to its inclusion in the curricula of primary and secondary schools. The school child, seen as yet unfixed in his food beliefs and habits and subject to the influence of his school teachers, is regarded as an important potential subject and channel of nutrition education. Certain research has borne out. The exposure of the child to nutrition education in school in Israel, for example, has been cited as the most important influence in the introduction of certain new foods (Bavley, 1966). By and large, however, such formal educational efforts in nutrition and other areas in health education have, in the words of one recent evaluation, been so "fraught with problems to be anything but marginally important." Typically, such efforts have been "limited to giving information dogmatically, as if this alone would bring about a transformation." Other problems cited include poor attendance patterns and high attrition rates among school children in developing countries; poorly trained teachers; inflexible curricula; lack of reinforcement

mechanisms among the adult members of many communities; and the frequent delegation of such instruction to such "educational auxiliaries" as doctors and nurses, whose busy schedules necessarily limit their contribution to teaching activities (Harman, 1976a). In light of these problems and of the immediacy of the nutrition education task, school-based programs are increasingly being viewed as but one component of a larger overall strategy.

Methodologies

Since the early 1970s, nutrition education activities in developing countries have been categorized for comparative purposes as utilizing either an educational approach or a promotional approach. The former approach refers to the traditional teaching mode -- i.e., face-to-face didactic instruction -- and the latter is characterized by the use of mass media such as radio, newspapers, billboards, posters, etc. (e.g., DeGariné, 1972). The early types of nutrition education programs discussed earlier commonly used the educational approach, and face-to-face instruction still predominates in nutrition education efforts today. APHA's recent survey of health programs in developing countries, for example, reported that 92 percent of the programs conducting some type of health education activity used a person-to-person method of instruction; 59 percent used mass media (APHA, 1977). The absence or weakness of satisfactory evaluation mechanisms among the majority of these programs largely precludes the determination of their success or failure, although there is some evidence that the educational approach, when used in nutrition rehabilitation programs, has produced positive

results (e.g., King, 1971; Chavez, 1972).* This section, concerned with current and emerging trends in the methodology of nutrition education, will focus, however, on the promotional approach and other recent approaches which promise to overcome the main shortcoming of traditional educational efforts -- their limited outreach and impact.

There is no single promotional approach to nutrition education; rather it should be seen as encompassing a number of methods which may employ a single mass medium, a combination of media, or a combination of media and person-to-person communication channels. Each of these methods have demonstrated some promising possibilities in recent years, as the following examples will indicate.

The most common of the media-alone methods has utilized several types of media in combination with one another -- e.g., messages broadcast by radio are reinforced by like messages carried in the press, on posters and billboards, and in such traditional channels as minstrel and puppet shows. Several examples suffice to illustrate the nature of the successes this method has enjoyed. A program conducted by CARE in the Republic of Korea in 1970

* Several months after the termination of a joint feeding and nutrition education program at a mothercraft center in Haiti, King examined the growth records of 30-35 children who had participated with their mothers in the program in an attempt to separate the effects of the mother's education from those of the feeding of the children. 50-60% of the children continued to improve in growth (as a percentage of standard weight after discharge); 25% maintained the weight gains they had made at the center; 15-25% showed a diminution in growth, which King attributed to economic constraints on diet.

Chavez reported the results of three studies conducted in Mexico in which the mothers of malnourished children received training in food selection and preparation either in a physician's office, during the treatment of their children, or in group demonstrations in individual homes. Chavez's evaluation three years later of one of these programs, in which the mothers of severely malnourished children received instruction every two weeks for three months in group demonstrations, showed that all children had survived and none evidenced severe malnutrition.

disseminated nutrition information over a year's time via radio, in the form of songs, jingles, and brief dramas, and through calendars, posters, comic books, and food charts. The messages pertained primarily to the selection of foods from five food groups. A study conducted at the conclusion of the program revealed, among other findings, that approximately 53 percent of those questioned could recall the advice contained in the messages and about 20 percent could state the specific nutrients in each of the food groups (Higgins and Montague, 1972). A mass media campaign in India in 1972, also conducted by CARE, used radio, press advertisements, posters, comic books, wall paintings, mime shows, and other media to carry a combination of positively and negatively oriented messages pertaining to nutritional requirements of pregnant women, weaning practices, and general nutrition over a ten-week period. CARE reported increases in awareness of the content in these three areas of from 58 to 90 percent (pregnancy), 49 to 93 percent (weaning), and 72 to 96 percent (general nutrition) following the campaign (CARE, 1973).

A number of reservations have been stated about the results of such studies, based on their lack of methodological rigor. In the Korean study, for example, the impact of the campaign cannot be truly assessed since no survey of the audience's prevailing knowledge was conducted prior to it. More fundamental objections may be raised, however. First, neither study attempted to examine the length of time that the audience retained the campaign messages. More importantly, both programs measured their impact in terms of changes in knowledge rather than modifications in food-related behavior.

Explicit changes in behavior are sought by the newest and most widely touted of the media-alone methods -- the advertising or vertical marketing approach, which utilizes the broadcast media, usually radio, and the techniques of Western commercial marketing to promulgate nutrition messages. In contrast

to the combined-media method just cited and to conventional modes of educational broadcasting, the advertising approach relies primarily on the motivating power of a single medium carrying short, specific messages frequently repeated over long periods of time. The development and pretesting of messages is thus accorded special importance by this approach, and deserve brief discussion here. Experience has suggested that it is doubtful that changes in food habits can be achieved by teaching nutrition as nutrition, that is by merely presenting the basic facts of the science of nutrition. Such changes have more often resulted from non-nutritional motivation such as the desire to achieve or demonstrate higher economic or social status. Moreover, such studies as the CARE-India project cited have suggested that moderate fear arousal (for instance, "Your child's future is in danger unless from six months you feed him solid foods!") may be more effective in inducing change than more positive persuasive messages. Nutrition educators are thus increasingly being advised to formulate themes and messages which identify economic and other benefits to the potential adopters, and play on universally expressed human needs such as survival and the minimization of suffering. Messages must also take into account culturally specific food imagery and beliefs, which may be causes of resistance to change. The commercial marketing experience upon which the advertising approach to nutrition education is based suggests further guidelines for the development of messages -- they must be few, easily understood, mutually reinforcing, and supported by the market; i.e., products advocated for their nutritional benefits must be available. In sum, messages must be simple, unconstrained by local conditions, memorable, emotionally appealing, culturally relevant, and prompt a concrete response (Cooke, 1976).

The potential of mass media strategies for changing food behavior in developing countries was greeted with high hopes in the early 1970s. The fact that mass media have helped induce changes in other social, political, and commercial activities, including commercially promoted changes in eating habits, indicated their potential for other uses. This early enthusiasm has been tempered, however, with the realization that "selling nutrition" is not exactly like selling soap, and that a number of obstacles stand in the way of mass mediated social strategies in the developing countries. Target groups -- especially the rural poor -- are frequently outside the range of conventional forms of mass media such as newspapers, since the majority of such groups are illiterate. Even within single countries, there may be wide differences in language, religion, ethnicity, etc., which stand as potential barriers to effective mass communications programs. A statement adopted not long ago by the U.N. Protein-Calorie Advisory Group typifies the more conservative view of the role of mass communication in nutrition education which prevails today:

By definition, the role of mass communications in the improvement of nutritional status of a population is to reproduce in quantity a persuasive nutrition message to large numbers of people simultaneously. It should be recognized that mass communications certainly has a great and specific potential for creating nutrition awareness on a national scale, but it should be recognized also that it is one means only among a number of possibilities within the field of nutrition education in general. In other words, it is one of the teaching tools of the nutrition educator.

The research on the diffusion of innovations and the study of mass communications effects yield ample evidence to indicate that mass communications can create awareness and understanding of a nutritional innovation. But this research also shows that when the potential adopter of an innovation approaches the adoption decision, he turns to personal channels.

Thus it becomes imperative that mass communications not be used alone. The effect may in that case be only to create awareness and understanding when the objective is to generate change (PAG, 1974).

This should not be regarded as the final pronouncement on the role of mass media in nutrition education, however. Proponents of the advertising approach currently being tested are claiming that behavior change, explicitly sought in the objectives of these programs, is occurring. The first large-scale test of the advertising approach, conducted in two regions of Ecuador in 1974 resulted, for example, in significant increases in the use of iodized salt among target populations. Modest changes in knowledge and attitudes were also attributed to the program's messages addressing the areas of protein-energy malnutrition, early departure from breast-feeding, unsanitary drinking water, parasites, diarrhea, and other intestinal problems, and iodized salt (Manoff, 1976).*

More recently, changes in attitude and behavior have been reported from an advertising project recently conducted in the Philippines. The percentages of mothers who thought it beneficial to add oil, fish, or vegetables to infant porridge (lugaw) were reported to have increases from 15% to 74% (oil), 48% to 81% (fish), and 49% to 79% (vegetables) from baseline to post-test surveys. The percentages of mothers actually adding these supplements to infant food were reported to have increased from 0 to 24% (oil), 17% to 27% (fish), and 5% to 17% (vegetables) (Manoff, 1977).

* In Imbabura Province, among the mestizos, most of whom already used refined salt, there was a reported increase from 5% at baseline (February 1974) to 98% at final survey (May 1975) in the use of iodized salt. Among the Indians, many more of whom initially used coarse salt, there was a reported increase from 17% to 68% in total use of refined salt and a reported increase from 5% to 54% in use of iodized salt. Knowledge of legumes as a protein source increased an average of 45% among those who were aware of the messages and an average of 25% among those who were not. Changes in attitude towards food for infants were also reported: In Manabi Province, before the broadcasts, 30% of those interviewed thought mother's milk was the best food for infants, while 47% thought fresh cow's milk was best, and 16% thought powdered milk was best. In the final survey, the percentage that thought mother's milk was best had increased to 73% among those aware of the messages, and to 47% among those not aware (Manoff, 1975).

The central weakness of the mass media-alone approach -- the lack of built-in reinforcement of desired change through interpersonal channels of communication -- has been addressed by certain nutrition education programs which combine the educational and promotional techniques. These have taken several forms. In one, where the educational approach predominates, various forms of media are used in support in interpersonal instruction. Project Poshak, carried out in more than 500 villages in the state of Madhya Pradesh, India, typifies this method. Here, nutrition education was performed using three types of communication techniques. Face-to-face instruction was utilized in the form of group demonstrations, including cooking and feeding classes, which used lesson flip charts and child growth charts as instructional aids and take-home food (Poshak) as an attendance incentive. Certain mass media -- films, posters, pamphlets, and slide shows -- were employed largely in support of these demonstrations. And finally, a nutrition rehabilitation approach took the opportunity of rehabilitating severely malnourished children at rural health centers to educate mothers and other community members about the causes and prevention of malnutrition. At the conclusion of the program, certain behaviors as well as attitudes of mothers, children, health center staff, and in some cases the entire community were examined for change resulting from the educational efforts. Among those changes ascribed to the program were increases in awareness among mothers and medical personnel following their participation in the food demonstrations of the need for early introduction of solid foods to infants. Increased attentiveness to the food needs of their children -- i.e., behavioral change -- among mothers who had participated in the nutrition rehabilitation component of the program was also reported. While the

coordinated use of interpersonal and media-assisted instruction confounded the measurement of their relative efficacy, the high level of information redundancy from the coordination was cited as a clear benefit to the educational effort. It appeared to reduce discrepancies between messages, reduce the total number of messages required, and provide a smoother flow of information to the intended audiences (Gopaldas et al., 1975).*

Other programs combining elements of the educational and promotional approaches have built on the experience of a number of countries' use of the radio forum, where programs providing information about agricultural, health, and other innovations are broadcast to organized groups of listeners, which then discuss the new ideas and formulate plans to implement them. Tanzania's recent Food is Life Campaign is perhaps the most notable example. Building on its campaign experience over six previous years, during which, by some estimates, two million of Tanzania's 13 million people were organized into 75,000 study groups for the purpose of receiving basic educational programs via radio, the Tanzanian government undertook the Food is Life Campaign in 1975. Planned as a sequel to a similar campaign on health practices carried out in 1973, its objectives included raising the level of functional literacy about nutritional values of foods and ways to obtain a balanced diet on a limited budget; eliminating food taboos and improper food habits; encouraging the use of good farming methods to increase production of various foods; and encouraging cooperation in solving communal problems (Matiko, 1976).

* Gopaldas et al. attributed most of the attitude changes reported to the face-to-face educational efforts -- the group cooking and feeding demonstrations, supplemented by pretested instructional flip charts and trial food (Poshak) and growth charts given to participating mothers. (Despite some serious misunderstandings about the growth chart -- 60% thought it also authorized the collection of food -- all participating mothers recognized the implications of a downward trend on the chart, and fewer than 15% were unsure of the procedures for potentiating their children's health and weight.) While mothers participating in the nutrition rehabilitation component of the program showed important changes in both attitude and behavior, the community as a whole was not affected significantly, only 15% of non-participants interviewed were aware of a rehabilitated "demonstration child" in their community.

While evaluation of the results of the campaign has not been completed, the following tentative results, based on area samples, have been reported: Increased consciousness of the need for more food production; establishment of vegetable gardens and poultry units; improved dietary habits; creation of day care centers for infants; and the abandonment of certain traditional taboos and harmful food habits (Clearinghouse on Development Communication, 1977).

In addition to the educational, promotional, and combined methodologies, another approach to nutrition education has been emerging in developing countries in recent years which deserves mention here. While it is not yet recognized by any single name or label, individual examples of this "new" approach (similar methods were used in programs in the United States as early as the 1940s) have been variously characterized as community problem solving, community learning, and participatory methodologies. Their common denominator is that a particular process of education -- one which elicits the active participation of the community itself -- is seen as an important end itself and a means of contributing to the overall development of the community, of which improved nutritional status is but a single aspect. The philosophical underpinnings of this methodology are found in the so-called "radical" approach to development identified with Paulo Freire, Denis Goulet, and others, which argues that the participation of people in the improvement of their lives is a higher goal than specific improvements in which they play no direct part. Freire's thought, in fact, provided the specific conceptual framework for one nutrition education project recently carried out in Brazil.

This project sought mainly to help motivate the members of a community in the state of Maranhao in northeast Brazil to initiate action to improve the nutrition of their children. The motivating mechanism was a series

community meetings in which posters depicting community life -- specifically, pictures contrasting healthy and malnourished children -- were used to stimulate discussion to the end that community members themselves would arrive at the realization that a problem existed. Subsequent investigations of the nutritional status of the community were reported, explained, and discussed in follow-up community meetings. The project ended here, however; it did not encompass any subsequent activities to further guide or evaluate the actions of the community. Its efficacy as a nutrition education strategy, therefore, can hardly be assessed. The investigator's statement that the use of such techniques as Freire's "coded situations" (the posters) offers a promising means of eliciting community motivation in nutrition programs has been suggested elsewhere, however (e.g., Harman, 1976b).

Another example of a type of participatory approach is provided by the series of investigations currently being conducted by the Community Systems Foundation in several small communities in the department of Cauca, Colombia. CSF's nutrition education programs are predicated on the following notions:

The implementation of treatments to reduce malnutrition depends upon community acceptance of those treatments and adjustment to the changes they require; even in the case where outside intervenors are present, implementation will require community learning for acceptance and adaptation. We believe participation in the diagnostic procedure will increase the likelihood of community acceptance of its results; but this participation requires learning.... Hence, we aim at two interrelated results: a teachable methodology for diagnosing the causes of malnutrition in rural area communities, and a teachable methodology for improving learning capability (CSF, 1975).

The attempted implementation of these goals is illustrated by CSF's project in the village of Buenos Aires, Colombia. Here, the education in nutrition

of a group of students at a residential secondary school served to teach the more fundamental principles of problem-solving through the scientific method. Using rats as a simulation model for human nutrition, the students learned the relationship between diet and age-weight ratio by discovering it for themselves through experiment. They then experienced the transfer of this learning to the nutritional diagnosis of their own families, after themselves gathering data on the age, weight, and diet of their brothers and sisters, and to experimentation at other points in the community's nutrition system -- for example, controlled testing of certain local cropping practices. Ultimately, this project is intended to test the effectiveness of transferring the students' learning to their own families and then to their communities as a means of enhancing the learning capability of the community as a whole.

These latter two programs, in their respective uses of Freire's "coded situations" (posters) and rat growth experiments, also demonstrate the innovative use of educational technologies adapted to, if not derived from, the cultural setting in which they are used. Other such "small" technologies were cited in earlier examples, including both modern and traditional means of communicating nutrition information (e.g., comic books in Korea, mime shows in India) and supplementing nutrition instruction (e.g., lesson flip charts and child growth charts). Other examples which have appeared in recent literature include the use of Umbanda religion in Brazil as a potential delivery system for nutrition information (PAG, 1976); the use of a bangle bracelet in India as a means of measuring arm circumference to determine malnourishment in children (APHA, 1977); and the use of audio cassettes to provide nutrition information to women in their daily work settings in Guatemala (Colle, 1976).

The development of appropriate technologies for reaching non-literate and tradition-bound audiences in developing countries, however, is a nutrition education task where much research remains to be done.

III. EMERGING TRENDS: DONOR AGENCY POLICY

The traditional international agency donors to nutrition programs have been WHO, FAO, and UNICEF. In their early years, WHO and FAO encouraged the establishment of national nutrition services and group feeding programs. FAO emphasized the relation of nutrition to the production, distribution, and consumption of food, and WHO its relation to the maintenance of health and prevention of disease. UNICEF provided dried milk and other material aid to these earliest programs and was primarily responsible for the instigation of applied nutrition programs in the late 1950s.

In recent years, FAO has established a Food Policy and Nutrition Division and taken on responsibility for nutrition planning within the U.N. system. In general FAO provides support at the level of "training the trainers" rather than operating at the point of contact with the target group. Programs supported by FAO are usually associated with school feeding programs or with school feeding programs or with WFP-assisted supplementary feeding or food aid programs for vulnerable groups. In the 1960s FAO was supporting a number of nutrition education programs through schools by providing expertise to help train teachers to teach nutrition to school children, to develop nutrition curricula for teacher training colleges, and curriculum guidelines for nutrition education in the schools. During the 1970s UNESCO has become more active in this field and FAO has done less (McNaughton, 1977). WHO has generally confined its role in nutrition providing technical expertise to health-oriented activities, but the relative importance of its budget allocations in public health services, environmental health, education and training, family health, and other areas which have a direct impact on nutrition,

has been growing in recent years. UNICEF continues to play the most active role in nutrition programming, supporting a variety of nutrition education and supplementary feeding programs and a broad range of nutrition delivery systems. In addition, these agencies sponsor a number of joint research efforts on matters of mutual interest (e.g., the Joint FAO/WHO Expert Committee on Nutrition), and, with the World Bank, support the Protein-Caloric Advisory Group. PAG was established in 1955 as "an interdisciplinary committee of internationally recognized experts who advise the United Nations and its agencies on technical, economic, educational, social, and other related aspects of global malnutrition problems and the broad programs and new areas of activity needed for combating them" (PAG, 1976).

Other international organizations which have contributed to nutrition programs in a more peripheral fashion include the World Food Program, which has provided foodstuffs, usually in disaster relief efforts; UNDP, which has funded various development programs with nutrition components; ILO, which has provided technical assistance to applied nutrition programs; and, more recently, the World Food Council, established to coordinate implementation of the resolutions approved at the World Food Conference in 1974. Important contributions have also been made, of course, by the foreign assistance agencies of individual national governments and by such private international donors as the Rockefeller Foundation, CARE, Catholic Relief Services, Church World Service, and others.

The intent of the section which follows, however, is to note recent policy changes among the major international agencies and suggest their implications for the direction and support of programs of direct nutrition intervention in the near future. These policy changes are clearly indicated in

a number of reports issued by the major assistance agencies in recent years.

In 1975 the Director-General of WHO presented a report to the World Health Assembly proposing a fundamental change in WHO programming. It advocated a departure from its traditional emphasis on disease eradication to a much broader preventive orientation stressing the needs of the underserved rural poor. This report advocated the promotion of "primary health care," which was defined as

...a health approach which integrates at the community level all the elements necessary to make an impact upon the health status of the people. Such an approach should be an integral part of the national health care system. It is an expression or response to the fundamental human needs of how a person can know of, and be assisted in, the actions required to live a healthy life, and where a person can go if he/she needs relief from pain or suffering. A response to such needs must be a series of simple and effective measures in terms of cost, technique, and organization, which are easily accessible to the people in need, and which assist in improving the living conditions of individuals, families, and communities. These include preventive, promotive, curative, and rehabilitative measures and community development activities (WHO, 1975).

The same year WHO and UNICEF jointly issued a report on "alternative approaches to meeting basic health needs of populations in developing countries." This report cited a number of examples of successful health service programs in developing countries, identified their common elements, and incorporated them into its recommendation of a number of primary health care principles:

- Primary health care should be shaped around the life patterns of the population it should serve and should meet the needs of the community.
- Primary health care should be an integral part of the national health system and other echelons of services should be designed in support of the needs of the peripheral level, especially as this pertains to technical supply, supervisory, and referral support.

- Primary health care activities should be fully integrated with the activities of the other sectors involved in community development (agriculture, education, public works, housing, and communications).
- The local population should be actively involved in the formulation and implementation of health care activities so that health care can be brought into line with local needs and priorities. Decisions upon what are the community needs requiring solution should be based upon a continuing dialogue between the people and the services.
- Health care offered should place a maximum reliance on available community resources, especially those which have hitherto remained untapped, and should remain within the stringent cost limitations that are present in each country.
- Primary health care should use an integrated approach of preventive, promotive, curative, and rehabilitative services for the individual, family, and community. The balance between these services should vary according to community needs and may well change over time.
- The majority of health interventions should be undertaken at the most peripheral practicable level of the health services by workers most suitably trained for performing these activities (Djukanovic and Mach, 1975).

These principles were adopted by both the World Health Assembly and the Executive Board of UNICEF in 1975. UNICEF subsequently broadened the concept of primary health services to include other essential "basic services," such as basic education, water supply, family planning, and others. Upon approval by its Executive Board in 1975, "assisting in the rapid extension of basic services for children" has become the main emphasis of UNICEF's programming. And following UNICEF's advocacy, the U.N. General Assembly in 1976 adopted resolutions urging, first, "developing countries to incorporate the basic services concept and approach into their national development plans and strategies," and, second, "the international community to recognize its responsibility for increased cooperative action to promote social and economic development through its support of basic services at the

country programming level" (UNICEF, 1976a).

Several other important health-related policy initiatives were taken during these same years. WHO called for increased efforts in the area of health manpower development, stressing the planning of tiered manpower systems, linking traditional and modern health sectors through front-line workers (WHO, 1976). The World Bank issued its first report ever focused specifically on health issues. In addition to acknowledging the integral role of health in overall rural development and pledging substantial increases to health-related projects, the Bank report stressed the principle of prevention and advocated primary care systems (World Bank, 1975).

The World Food Conference held in Rome in 1974 paid specific attention to the need for programs to combat malnutrition in developing countries. Resolutions passed at the conference acknowledged that development programs must embrace not only efforts to increase food production, but measures to directly affect food consumption. Following the conference, the Joint FAO/WHO Expert Committee on Nutrition met to review objectives of and approaches to national food and nutrition policy and planning. The report of the Committee, issued in 1976, advocated a food and nutrition strategy consisting of three elements: (1) Improvement in overall productivity and output, including the expansion of food production, as well as the pattern of income distribution; (2) improvement of the combination of foods produced, the processing techniques employed, and distribution of these foods, to improve the quality of the diet available to all income groups; and (3) the development of nutrition-related health activities and nutrition intervention programs which have a direct impact on the nutritional status of particular segments of the population. In regard to this third element, the Committee stressed that nutrition intervention strategies

...should be cooperative efforts of all relevant services available in the community, i.e., health services, agricultural extension, community development, schools, etc., since, particularly in regard to nutrition, the skills and responsibilities are complementary. It is also emphasized that the success of such programmes will depend very much on the extent of community involvement in establishing priorities and encouraging participation (FAO/WHO, 1976).

A like-minded approach is apparent in a recent AID review of its nutrition-related activities. The review identifies two primary needs which emerge from AID's nutrition efforts to date:

- We must be able to identify with at least reasonable precision the equity/consumption/nutrition effects of a broad range of development programs undertaken for other purposes, and assure that such efforts are taken into account in the decision-making process.
- We must find better ways of encouraging and assisting the broad-based and, where possible, integrated delivery of health, education, and food distribution services specifically aimed at the poorest segments of the population (AID, 1977).

The commonalities evident in these recent statements and actions, taken together, comprise a new policy context which can be expected to increasingly guide international assistance in health and nutrition. In brief, this context is one in which high priority will be assigned to research and programming activities related to the extension of integrated prevention-oriented primary health services to underserved majorities, administered by networks of health and nutrition auxiliaries. Education and communication support of these activities will be stressed. Attention will also be directed toward the role of community participation in this effort. The emergence of this pattern in nutrition intervention research and programming can be observed in the following key examples of recent

donor agency activities.

-- UNICEF doubled its spending on child nutrition in 1975, increasing that category's share of total expenditures from nine to 16 percent. UNICEF's basic services strategy -- which it claims will "promote more comprehensive nutrition planning at the national and local levels, taking more fully into account the interlocking effects of childhood disease and malnutrition" -- appears to translate into considerably increased funding for the training of auxiliary health personnel and for efforts to elicit community participation in health planning (UNICEF, 1976b). In the latter regard, UNICEF with WHO published a follow-up study to their earlier "Alternative Approaches" study entitled "Community Involvement in Primary Health Care: A Study of the Process of Community Motivation and Community Participation" (WHO/UNICEF, 1976).

-- WHO has recently produced monographs, in addition to the joint study just cited: "Nutrition in Preventive Medicine" (Beaton and Bengoa, 1976) and "A Guideline for Nutrition Activities Through Local Health Services for Joint WHO/UNICEF Strategy (WHO, 1974).

-- The FAO/WHO Expert Committee on Nutrition has assigned priority to the training of staff "needed at peripheral levels, i.e., the personnel concerned with delivery of food and nutrition services to the community. Much more emphasis needs to be given to training multi-purpose workers, to training their trainers, and to intersectoral training. These programmes should cover not only appropriate technical subject matter but, equally importantly, training in communications techniques." The Committee also recommended the development of training materials for community and auxiliary workers (FAO/WHO, 1976).

-- UNESCO has produced several recent monographs in its Educational Studies and Documents series on nutrition education curricula (e.g., Griffin and Light, 1975) and is co-sponsoring an international conference on nutrition education in 1977.

-- The World Bank initiated its first loan directly to nutrition activity in fiscal year 1976, a \$19 million loan to Brazil, and loans to Indonesia and Colombia for nutrition programs are pending.

-- The Protein-Calorie Advisory Group has updated its research on the role of mass media in nutrition work, as evidenced by a recent issue of the PAG Bulletin devoted to "Mass Communications in Nutrition Improvement" (PAG, 1976).

-- AID expenditures devoted explicitly to nutrition have increased from \$6.6 million in 1973 to a projected \$55 million in 1978. The direct nutrition interventions AID has selected for special attention include village-level identification of malnourished children, the reduction of iron deficiency anemia and vitamin A deficiency, the development of intermediate "appropriate" technologies (primarily for food fortification and weaning food production), and interventions -- especially mass media and extension techniques -- designed to change deleterious weaning practices. The AID

Latin America Bureau has reported that the "technical area of highest priority in terms of demand for services and information is interpersonal and mass media communications, otherwise known as nutrition education." AID is also funding, in the health sector, the implementation of low-cost integrated service delivery systems in some 23 countries (AID, 1977).

-- An FAO-sponsored Interagency Meeting of representatives from almost all multilateral and bilateral agencies assisting nutrition activities held in 1975 identified nutrition education as one of eleven priority areas for applied nutrition research: "Research should be undertaken to determine the different needs, types, and levels of education required in specific situations, including training for professional and paraprofessional personnel, families, and homemakers. Studies are needed on alternative methods of consumer education in food and nutrition; cost-effectiveness of alternative educational approaches; nutrition education curriculum content; and development of methodologies for the use of mass communications media, especially radio" (FAO, 1976).

IV. EMERGING TRENDS: RELATED FIELDS

What follows in no way represents an attempt to systematically survey recent developments in the fields discussed. Rather, selected trends in the theory, methodology, or content of these fields are discussed for the direct bearing it is suggested they have on the theory and practice of nutrition education.

Health Education*

The field of health education has itself been undergoing a period of reconceptualization in recent years. Recent definitions suggest the enlarged scope of activity the field is seen as encompassing, which includes nutrition education. For example: "Health education today encompasses not only its traditional components such as personal hygiene, sanitation, use of medical services, etc., but now also extends to nutrition education and family planning and more importantly, to motivation. The modern health educator is no more the teacher of yesterday, but has become the motivator and advisor of the organized action of the people" (McLaren, 1976). Whether or not nutrition education is properly seen as being subsumed by health education, recent experience in the latter field has yielded some results of important consequence for nutrition education.

Health education efforts in developing countries, for example, have suggested the advisability of focusing educational efforts in non-formal rather than formal settings. As noted earlier, the many problems attendant to health

*This section is largely derived from recent work of Dr. David Harman, Assistant Professor of Education at Harvard University, whose views on nutrition education policy for developing countries were also sought for inclusion in this report in a personal interview with one of the report's consultants.

education in formal school settings -- erratic attendance patterns, poorly trained teachers, inflexible curricula, etc. -- have led to general disillusionment with the efficacy of this approach. Non-formal health education activities have been carried out in conjunction with literacy and other adult education campaigns; health clinic-based educational activities, especially those focused on mother and child health; health education outreach programs, such as those connected with mass inoculation programs; the training of various paraprofessional health workers; and community development projects. While the successes of many of these efforts, too, have been marginal, disappointing outcomes have been more often attributable to malpracticed, rather than misconceived, activities. In the words of one recent observer, "despite the uneven record of non-formal educational efforts in the realm of health, in the aggregate the (non-formal) frameworks discussed are more appropriate than the formal school network...Non-formal education is a sine qua non for health education strategies" (Harman, 1976a). Community development programs especially, based on the felt needs or local initiative of the community, continue to be seen as a viable channel for health education. The initiatives of WHO and UNICEF in this regard -- their encouragement of health programming based on the ideology of generating active individual and community participation -- have already been noted.

Such an approach posits that educational and other social interventions in developing countries must take cognizance of the fact that "each and every community of people exists within a cultural and environmental context from which it derives a unique character and dynamic, requiring that the understanding of groups be based on their analysis within the confines of those contexts, and that the planning and development of activities be anchored in

such situation specific analysis" (Harman, 1976b). This kind of analysis must include the consideration of the underlying perceptions of target populations, which, as anthropologists have long insisted, may differ considerably from those of an outside observer. Unless, for example, a population perceives the existence of a condition, such as malnutrition, which can be changed through concerted action, rather than one which is fatalistically determined, attempts to impose change are bound to fail. Such analysis should further include consideration of those indigenous educational mechanisms existing in all societies for the purpose of cultural transmission. Experience has shown that these mechanisms are "by far the most effective educational undertakings for given populations. Rather than create new structures and culturally foreign instructional methodologies, nutrition education planners would be wise to identify indigenous mechanisms and attempt to infiltrate them with new substance" (Harman, 1977).

Other recent research in health education has afforded examples of the effective educational use of mass media. The results of a three-year study on the modification of cardiovascular disease risk factors (which included certain nutritional objectives) conducted by the Stanford Heart Disease Prevention Program in three California communities, indicated that mass media intervention by itself stimulated significant risk reduction, though the utilization of mass media in combination with change agent instruction resulted in a greater magnitude of more immediate and longer lasting risk reduction (Meyer et al., 1977). With regard to the attempt to modify dietary habits

within this campaign, it should be noted that the media achieved particular success.*

International Health Planning

The WHO/UNICEF basic services strategy cited earlier is grounded in the conviction that "the most practicable and effective means of meeting the poor's needs lays in the development of a group of interrelated mutually interacting basic services in the fields of maternal and child health, including family planning, nutrition, water supply, basic education, and supporting services for women" (UNICEF, 1976b). The linkages between these services may be illustrated, at least partially, as follows:

An effective campaign against infectious disease, for example, would include health education related to latrines and safe water, better infant and child feeding practices in order to build resistance to disease, and the practice of family planning, including child spacing, in order to improve the overall health of the mothers and children. Reciprocally, progress in lowering the incidence and severity of diarrhea and other health problems caused by infection or disease will reduce the severe malnutrition that is often precipitated by sickness which causes loss of appetite, the withholding of solid foods, poor absorption of nutrients, or increase in nutrient requirements. Similarly, the key to improve prospects for child survival and, in turn, the perception of the people that this improvement has taken place would appear to lie in the same set of preventive measure... (which thus) can be expected to increase the effectiveness of family planning. Thus the coordination of nutrition, health, and family planning services can be expected to achieve the objectives for each activity more securely than if they were administered separately (Johnston and Meyer, 1977).

*Among the media plus face-to-face cohort (n=67) studied, cholesterol consumption dropped 41% from baseline at the end of year 1, maintained at 42% from baseline at the end of year 3. Among the media-only cohorts (n=37 and n=85) studied, cholesterol consumption dropped 26% and 30%, respectively, from baseline at the end of year 1, maintained at 27% and 39% from baseline at the end of year 3. Reduction in the consumption of saturated fat in the same cohorts followed the same magnitude and pattern.

The effectiveness of coordinating such services has been amply demonstrated in recent research reports. For instance, after five years of research, in Narangwal, India, on the impact of various combinations of family planning services, women's services (including prenatal and postnatal care and supervision of delivery), and child care (including nutrition supplementation and education, immunization, and periodic health checks), the investigators reported that "to get the most efficient and long-term balance of both family planning and health objectives there is no question that the combined family planning, women's services, and child care approach is to be recommended..." (Taylor et al., 1975). A number of other examples are provided in the already-cited report which was the main impetus to WHO/UNICEF's advocacy of the basic services strategy, "Alternative Approaches to Meeting Basic Health Needs in Developing Countries" (Djukanovic and Mach, 1975). This report examined the experiences of a number of countries which have developed successful alternatives to the centralized hospital-and physician-based provision of health services modeled after the industrialized countries. While these experiences encompassed a diversity of structures and services, certain elements were common to most: the delivery systems were typically community-based and provided a variety of medical (preventive and curative) and non-medical services through locally trained and deployed health workers.

These elements have subsequently been incorporated into a prototype of sorts guiding the primary care strategies of the international health agencies. The development of integrated delivery systems and the training of manpower to staff them especially have become main lines of action in the efforts of WHO, UNICEF, AID, etc., to implement primary health or basic services strategies. The DELDS Projects (Development and Evaluation of an Integrated Health Delivery System) currently being implemented in Lampang, Thailand, under the

sponsorship of AID and APHA, exemplifies both these lines of action.

The DEIDS Project is essentially an attempt to implement a low-cost integrated system of health care serving a province of some 600,000 people through a health manpower strategy, and to test the hypothesis that such an integrated system will have a greater impact on community health status with improved cost-effectiveness than a non-integrated system. The project is focusing on providing maternal and child health, family planning, and nutrition services to a primary target group of women of child-bearing age and children under six. The primary innovation serving the extension of these services to previously underserved areas is a new category of health worker -- a parapsychician, known in Thai as "wechakorn," modeled after the Medex role developed in the United States. These workers, selected from existing health personnel, are being trained for a period of one year using a competency-based curriculum and modularized training materials which have been adapted from the experience of Medex programs in the United States and Micronesia over the last seven years. They will be deployed in the provincial hospital out-patient department and peripheral health centers and sub-centers and will provide the bulk of planned services themselves. Complex problems will be referred to physicians at higher levels in the system. They will also train and supervise several other new types of workers -- Communicators and Health Post Volunteers trained to identify common illnesses and treat simple ailments -- whose roles are designed to establish the credibility of the new delivery system, facilitate entry into it, and greatly expand its coverage to all village areas. The entire system is supported by a network of village advisory committees which participate in health planning, personnel selection,

and management decisions, and are expected to give continued support and feedback concerning the performance of the integrated services (Health Manpower Development Staff, 1975).

Development Communication

In the late 1950s and throughout most of the 1960s, the mass media were assumed to play an important role in the modernization of developing countries. A series of communication studies conducted in the Middle East and Latin America, which showed exposure to mass media to be highly correlated with individual modernization variables, assigned the media a prominent place in the then-dominant paradigm of development. This paradigm viewed development as largely a process of economic growth, instigated from above through investment in certain key sectors such as heavy industry, whose effects were then presumed to "trickle down" to other economic and social levels. This conception of the mass media's role in development underwent considerable change in the late 1960s as aggregated research on the diffusion of innovations suggested that while the mass media were instrumental in creating awareness of new products and practices, their actual adoption was more often a function of interpersonal communication with change agents or among peers. Further changes in the view of mass media in the development process have occurred in the 1970s, as the larger development paradigm itself has changed.

Developmental communication was subjected to the same kind of criticism that was directed at the top-down model of development. Both, critics argued, had contributed to a very uneven type of development, favoring certain sectors and minorities to the virtual exclusion of the majority populations in developing countries. The buildup of mass communication capabilities in many of

these countries, it was argued, had resulted in the entrenchment of ruling elites and the perpetuation of social structures which prevented the equitable distribution of development benefits. Diffusion research had largely overlooked the effects of the innovations it studied, which were often to widen rather than narrow the gap between recipient groups of high and low socio-economic status. Moreover, certain countries, such as China, Tanzania, the Republic of Korea, and Taiwan, experienced successes in development efforts utilizing a completely different conception of communication than the one-way top-down approach. In the "self-development" approach of these countries, various small groups at the local level (mother's clubs in Korea, farmers' association in Taiwan, radio listening clubs in Tanzania, communes in China) take primary responsibility for deciding what type of development is most needed, planning how to achieve this goal, obtaining whatever government or non-government resources may be necessary, and carrying out the activity. The main roles of mass communication in such a scheme are to provide technical information about development problems and about appropriate innovations, in answer to local requests, and circulating information about the self-development accomplishments of local groups so that other such groups may profit from their experience (Rogers, 1976).

As a result of these developments, research and practice in developmental communication today are directed towards a number of new areas of concern. Communication researchers have turned their attention to such areas as the communications effects gap, the implications of various national communication policies, the social and cultural impacts of new forms of communication technologies, and the analysis of information flow patterns in community communication networks. Applied communications activity in developing

countries is increasingly characterized by efforts to reach mass audiences through interpersonally mediated channels; to reach opinion leaders who will act as multipliers of development initiatives; to reach selected target groups with technical/instructional messages in specific areas; to develop integrated communication strategies in support of specific campaigns; to elicit community participation and feedback in communication processes; and to apply new and adapt old (i.e., traditional forms) communication technologies to development purposes. The "re-discovery" of radio's potential as a development tool which can address all of the above ends has been an especially important development. In recent years, radio has been effectively used for the instruction of school children and adult education classes (radio schools and instructional radio); the instruction and continuing education of school teachers and health workers (radio networking); the instruction of the population at large in conjunction with organized listening groups (radio forums); direct instruction of the population at large (open broadcasting and social marketing); and the motivation of local communities, with the assistance of trained discussion leaders, to self-directed development efforts (radio animation). (For more about these strategies, see McAnany, 1976.)

Besides the implications these recent developments in developmental communication have for nutrition education strategies, important contributions from the field are to be derived from one of its research traditions of longest standing -- diffusion of innovations research. This body of research has produced some especially relevant findings as to how the characteristics of an innovation -- such as its relative advantage, complexity, compatibility with cultural norms, etc. -- and of the change agent attempting to introduce it -- such as the degree of his homophily or similarity with his clients --

affect the rate of its adoption. The overall utility of bringing the diffusion perspective to bear on nutrition education is perhaps best demonstrated, however, by discussing its contribution to another field whose experience is instructive to nutrition education -- family planning.

Family Planning

In the earliest era of family planning programs in developing countries -- until about the mid-1960s -- most national programs were based on a medical clinic approach adopted from the Planned Parenthood model of the United States and other Western countries. A central assumption of this approach was that once family planning services were made available at clinics staffed by qualified medical professionals, they would be sought out and utilized by the target audience. This assumption, however, proved to be ill-founded: a disappointingly small percentage of the target audience utilized the clinics, which were often too scarce and too costly to be of use to even self-motivated potential clients. Then, in the mid-1960s, as research on the diffusion of innovations was becoming more widely known and better integrated, a diffusion approach was adopted by many family planning programs. The central intellectual contribution that the diffusion approach made to family planning was its view of the innovation as a message that must be actively communicated to its intended audience and which the audience must be persuaded to accept. Clinics remained an important part of family planning programs, but they were supported by vigorous informational-motivational efforts -- mass media campaigns and change agent aides, who went into the clients' homes and work places to promote family planning practices. While it is still very difficult to assess the impact of family planning programs in developing countries, and while none of the national

programs have yet reached their stated goals, some recent studies have cited evidence of declines in fertility attributable to family planning programs. Lapham and Mauldin (1972), for example, reported such a conclusion with respect to family planning programs in Singapore, Taiwan, South Korea, Mauritius, and Hong Kong. And the most important factor differentiating the programs in these five countries from the less successful programs of 15 other countries studied was apparently active home visiting by field staff -- the strategy at least partly inspired by the diffusion approach. There is thus some tentative evidence that this approach, which is now widely accepted as a more effectual theoretical basis for family planning programs, is producing some concrete positive results.

There are certain specific similarities in the nature of the obstacles faced by family planning and nutrition programs which recommend the value of nutrition education programs taking heed of the family planning experience. Traditional food beliefs and practices, like those about birth and contraception, are usually strongly held and not easily changed. Changing such beliefs and practices often means overcoming social taboos, which are especially resistant to alteration. The family planning experience has demonstrated in this regard that extra effort must be expended to motivate acceptance of the intended innovation, including, perhaps, some kind of incentive system, and special attention paid to the person of the change agent. Change agent aides, for example, who are more homophilous with their clients than professional change agents, were an innovation of the family planning experience, designed to provide the safety credibility required by the taboo nature of family planning communication. Such measures may well be required of nutrition education programs in particularly tradition-bound societies as well.

Family planning communication research has also drawn attention to the need to understand the sociolinguistic aspects of particular programs of planned change. In order to effectively communicate with their usually less-educated clients, especially on subjects which may involve taboos, change agents must be careful to couch their messages in words and symbols of a non-offensive nature drawn from the clients' own lexicon. And where the introduction of new concepts is required, it has been suggested that communication planning begin with the indigenous terminology for analagous concepts in a given language and appropriate word symbols selected on the basis of an investigation of their meanings to the client audience (Rogers, 1973). A particularly innovative example of this type of communication planning is provided by the agricultural approach to family planning developed by the International Institute of Rural Reconstruction in the Philippines. This approach, developed with the active participation of the farm population which is its primary intended audience, uses agricultural examples to explain family planning concepts. An illustrative example is:

When a farmer plants corn, he does not place one seed right next to the other; he leaves a certain amount of space between the seeds to ensure the growth of strong and healthy corn plants. Similarly, a couple should not have babies one right after another; spacing the children will help protect the mothers's and children's health (Maglalang, 1976).

Applied Anthropology

Anthropologists have long been interested in food-related research topics. Ethnographers have for many years studied patterns of food production and consumption in primitive and traditional societies as they relate to investigations of cognitive processes, subsistence patterns, ecological adjustment, etc. Medical anthropologists, enlisted in efforts to introduce modern health practices in a variety of settings, have studied traditional and

popular health beliefs and practices, including those related to diet, and features of social structure which inhibit or assist such attempts at innovation. One of the earliest examples of such research has already been cited - the classic works on the study of food habits conducted under Margaret Mead by the National Research Council in the early 1940s. Only recently, however, has anthropological interest in food habits been rekindled and research supported after the years of neglect that followed Mead's pioneering work. In 1968, for example, the International Congress of Anthropological and Ethnological Sciences formed a permanent working group, the International Committee for the Anthropology of Food and Food Habits, to encourage and communicate interdisciplinary research dealing with food habits and nutrition. Increasingly, too, have contributions from anthropologists been included in the planning and implementation of health, nutrition, and other development programs sponsored by international agencies. AID, for example, has conducted anthropological investigations of food and other beliefs derived from the Unani medical system prevalent in India and Pakistan prefatory to its implementation of health and nutrition programs there.

This is a trend which deserves encouragement, for the experience and methodologies of anthropological inquiry are uniquely suited to certain needed kinds of research in the area of food habits. It is obvious discipline, for example, for the study of cultural food imagery, such as the "hot" and "cold" classification of foods that is widespread in poor countries, and for distinguishing between food beliefs, which include food taboos and are highly resistant to change, and food habits, which are forms of ordinary behavior more amenable to change. Moreover, anthropology affords a normative perspective on development from which all manner of development efforts might profit. Applied anthropology -- "the study of man acting on reality in order

to change it" (Bastide, 1971) -- grew out of the experience of anthropology's enlistment by European colonial administrations during the 19th and early 20th centuries in the service of acculturating colonized peoples in Africa and Asia. This discipline more than any other thus has a long tradition of dealing with the particular kind of asymmetrical social dynamics -- whose powerful groups are acting upon powerless groups -- which still characterize the development process today. More importantly, anthropologists have had ample opportunity to observe the dysfunctional consequences of such asymmetry. Attempts at imposed change which have failed to take note of the core values -- what Clifford Geertz has called the "logico-meaningful" aspects of culture -- of those for whom change is intended have often produced only social disturbance and no particularly constructive outcomes. There is, too, the example of the "dependency syndrome," the emasculation of the colonized personality, which anthropologists have indentified in the cases of British-India and French-Malagasy colonial experiences among others, and attributed to the asymmetry which characterized them. As a result of this experience, applied anthropology today is less concerned with seeking to accommodate the forces of social change and simply mitigating their disruptive effects than with fitting them to the requirements of individual cultural values and choices; the applied anthropologist today, working at the level of micro institutions and social settings, increasingly embodies the normative stance that a respect for the integrity of those upon whom change is intended requires their participation in deciding the form it takes.

It is this sense of identification with the powerless, along with anthropology's longstanding concern with deciphering the meaning to a culture of both its traditional beliefs and practices and new ones which impinge upon it, which recommend the inclusion of the anthropological perspective in planning

development programs today, especially as it is very much in keeping with the new philosophy of development articulated in recent years.

Social Learning*

In contrast with other learning theories, which assume that learning can occur only by performing responses and experiencing their effects, social learning theory assumes that virtually all results from observing the behavior of others and the effects of their behavior; learning is thus seen as taking place through modeling and observation of response consequences (Bandura, 1977). The environment is the primary locus of cues for predicting response consequences. The cues include those originating from other individuals (the social environment), from mediated forms of communication (the information environment), and from the setting itself (the physical environment). Through the use of their cognitive skills, individuals analyze the cues in the environment and the effect of their behavior on the environment. It is this pattern of integrated feedback, rather than the effect of immediate consequences, that serves to regulate behavior (Baum, 1973).

Observational learning or modeling is an essential factor in nutrition education. Given a food supply, acquisition and consumption patterns are learned. And past the infant and toddler stage, learned preferences for food are increasingly influenced by social factors. These include socialization into culturally-based beliefs, values, and attitudes, as well as influence from currently available information present in the environment and mediated through interpersonal

* This section is excerpted from the consultant report submitted to this study by Joyce D. Nash, Ph.D., Stanford Heart Disease Prevention Program, Stanford University, School of Medicine.

communication (Giffit et al., 1972). Modeling is the process by which this information is transmitted. The information may be conveyed by actual physical demonstration, by pictorial representation such as TV, or by verbal description.

In order for observational learning to take place, four component processes are involved: 1) attentional, 2) retentional, 3) motor reproduction, and 4) motivational (Bandura, 1977).

Attention is affected by the nature of the modeling stimuli and observer characteristics. Aspects of modeling stimuli include their distinctiveness, affective valence, complexity, prevalence, and functional value. If the food-related behavior being modeled is distinctive, does not transgress social norms, is relatively simple, and suggests some value resulting from its performance, it is more likely to gain the attention of at least the less educated. Likewise, if the person doing the modeling is perceived as being highly credible or having some level of expertise, the observer is more likely to pay attention. Thus, athletes and other celebrities can pass as experts in nutrition because their success in other areas is seen to generalize to this unrelated areas.

The level and duration of attention devoted by the observer will in turn depend on this sensory and cognitive capacities, arousal level, perceptual set, and past experience with the behavior or behaviors similar to that being modeled. For effective nutrition education, steps must be taken to insure that attention is maximized. This means taking into account who the receivers of the educational effort are intended to be and tailoring the information transmission to their characteristics. If the receivers are well educated and reasonably intelligent, symbolic modeling using print or lecture formats should be both effective and efficient. With individuals less educated or less sophisticated in the use of symbols, modeling involving guided practice would

be more effective. Such individuals and children would probably benefit as well from the use of visual media such as television and film.

Of course even if attention is held, little is gained unless the observers remember what they have learned. Two representational systems, imaginal and verbal, are involved in remembering. Any means by which use of either or both of these two systems is facilitated will contribute to greater learning. Thus, in verbal modeling using a lecture format, the use of slides to key with words important concepts from the lecture will facilitate memory. Concise labels, headlines, and other devices in print help recall of the material. Guided practice and role playing facilitate the effects of physical modeling. Mental rehearsal of responses patterns is useful as well. Observational learning is maximized by symbolic organization and rehearsal of the modeled behavior followed by overt enactment (Jeffery, 1974).

To maximize the effectiveness of nutrition education, people need to be given more than just information; they must be taught how to implement and use this information. Conversion of symbolic representations of behavior into actual enactment involves motor reproduction processes. Reproduction of the modeled behavior is approximated through self-corrective adjustments on the basis of feedback from the environment unless the observer does not possess the necessary skills with which to perform it. In this case, steps must be taken to correct deficits that may exist in order for learning to progress and appropriate behavior to be produced. The remedy of skills deficits in the area of food-related behavior has been the subject of considerable investigation by researchers interested in the technology of behavioral self-management (e.g., Mahoney and Thoresen, 1974; Watson and Tharp, 1972). Individuals suffering from obesity, for example, have been taught to monitor their eating behavior systematically, to perceive and process informative feedback more appropriately, and to manipulate their

physical and social environment so that appropriate food-related behavior is more likely. Likewise, for qualitative dietary change individuals may require guidance in making the right interpretation of the information and then instruction in methods for achieving change. Not only must they be taught what a balanced diet is but how to go about consuming one.

Though modeling is a powerful means for facilitating the acquisition, maintenance, and alteration of food-related behavior, does not guarantee behavior performance. Through observational learning it is quite possible for an individual to learn how to perform a particular behavior but not to do so. While the likelihood of this is increased, if the behavior is not socially sanctioned, even socially sanctioned behavior will not be performed if the perceived outcome is not sufficiently valued. The value that is placed on a particular behavioral outcome is the result of information gained from modeling. If the observer fails to notice or to interpret correctly the outcome of a response pattern, he is unlikely to generate an appropriate value for it. Thus, people who do not understand the concept of "germ" or who do not perceive that boiling water will kill germs may indeed learn the process and skills for boiling water but are unlikely to perform the behavior because they do not value it sufficiently.

Moreover, in societies where little or no departure from tradition is modeled, the introduction of innovative ideas is unlikely to occur easily. As Bandura notes, "in homogeneous cultures, where all models display similar styles of behavior, behavior may undergo little or no change throughout a series of successive models. It is diversity in modeling that fosters behavioral innovation" (Bandura, 1977). In simple, homogeneous cultures, exposure to divergently thinking models or to models who are unusually productive may be perceived as threatening to observers, and especially so if the modeled behavior is at

odds with familiar routines that are perceived as adequate. For nutrition education, this suggests that in such a culture small changes from traditional routines and notions should be introduced gradually. New behavior must be "shaped" or molded slowly.

In sum, modeling is the means by which a society socializes its members and evolves its culture. Response consequences are learned through observation of models and serve to regulate behavior. Modeling functions chiefly to transmit information about response consequences as well as to teach new behavior patterns. Behavior patterns are in turn regulated by perceived response consequences. In order to influence behavior related to nutrition, information is a necessary prerequisite for change but not sufficient. Skills training in self-observation and self-monitoring of the behavior, the cues, and the response consequences that are involved may also be required. Finally, maintenance of behavioral changes can be fostered through encouraging the appropriate social reactions on the part of others and through teaching individuals to use more appropriate cognitive processing of events in their environment. Any program involving nutrition education, therefore, should involve or take into account the aspects of modeling and response consequences in order to ensure: 1) information transmission, 2) skills training, and 3) maintenance via social support and cognitive restructuring.

Social Marketing*

The concept of social marketing emerged with the appearance of Phillip Kotler and William Levy's article, "Broadening the Concept of Marketing" in the Journal of Marketing in 1969. Kotler and Levy suggested that rather than

*This section is excerpted from the consultant report submitted to this study by Jan Alexander, Institute for Communication Research, Stanford University.

limiting marketing solely to business, marketers should be aware of the opportunity to apply marketing theory and techniques to a larger realm of social activity -- to non-business organizations, ideas, and ventures (Kotler and Levy, 1969). Kotler and Gerald Zaltman more specifically defined the concept of social marketing in the same journal in 1971: "It is explicit use of marketing skills to help translate present social action efforts into more effectively designed and communicated programs that elicit desired audience response" (Kotler and Zaltman, 1971).

Somewhat different notions of social marketing have appeared in the marketing literature following Kotler's. William Lazar and Eugene Kelley, for example, who published the first textbook solely devoted to social marketing in 1973, seem to imply by social marketing a sort of social consciousness for traditional managers and marketers who need to obtain a broader perspective that can encompass the process and effects of marketing within the total social system: "Social marketing is that branch of marketing concerned both with the uses of marketing knowledge, concepts, and techniques to enhance social ends, as well as with the social consequences of marketing policies, decisions, and action" (Lazar and Kelley, 1973). Kotler's ideas, however, will be cited here as representative ones.

In his 1975 book Marketing for Nonprofit Organizations, Kotler further refined his definition of social marketing:

Social marketing is the design, implementation, and control of programs seeking to increase the acceptability of a social idea or practice in a target group. It utilizes concepts of market segmentation, consumer research, idea configuration, communication, facilitation, incentives, and exchange theory to maximize target group response.

This is compared with the conventional understanding of marketing, which comprises:

.....the analysis, planning, implementation, and control of carefully formulated programs designed to bring about voluntary exchanges of values with target markets for the purpose of achieving organizational objectives. It relies heavily on designing the organization's offering in terms of the target markets' needs and desires, and on using effective pricing, communication, and distribution to inform, motivate, and service the market (Kotler, 1975).

Kotler notes four key variables of marketing management: "... the right product backed by the right promotion and put in the right place at the right price." The "product" variable is concerned with designing appropriate products in packages which target audiences find desirable and are willing to purchase. The "promotion" variable is concerned with how to make the product familiar, acceptable, and even desirable, usually through advertising, personal selling, publicity, and sales promotion. "Place" has to do with the provision of adequate and compatible distribution and response channels: "Motivated persons should know where the product can be obtained;" provision must be made for "accessible outlets which permit the translation of motivations into actions." And "price" represents the "costs that the buyer must accept in order to obtain the product." Kotler redefines price to include "money costs, opportunity costs, energy costs, and psychic costs," and so includes the notion of transaction in his formulation of social marketing. He notes that "the marketer's approach to selling a social product is to consider how the rewards for buying the product can be increased relative to the costs, or the costs reduced relative to the rewards..." (Kotler and Zaltam, 1973).

As noted earlier in this report, the social marketing school of thought has already made an impact on nutrition education programs being designed for developing countries. Programs utilizing advertising strategies have been undertaken in Ecuador, Nicaragua, the Philippines, and elsewhere, which appear, from preliminary reports of results, to be having some favorable impact; the attention of these strategies to such previously overlooked variables as market support of project goals (the "place" variable in Kotler's formulation above) itself represents a gain over earlier efforts. Serious questions must be raised, however, about the extent, beyond these limited efforts, to which social marketing strategies can be undertaken successfully in developing countries.

Social marketing is fundamentally a Western concept whose transferability from the market economy culture in which it has originated to other societies must be questioned. (One should note, in the first place, that even in the West marketing approaches have as yet been little applied to the solution of social problems and consider whether or not there are structural constraints on ours or any social system which preclude the use of marketing techniques to solve "quality of life" problems.) Social marketing implies a macro-system viewpoint and the ability to manipulate the total system. It approaches social problems in the same way as it does products, that is, in terms of the "development of a well-conceived product and appeals moving through mass and specialized communication media and through paid agents and voluntary groups to reach targeted audiences" (Kotler and Zaltman, 1973). It thus assumes an economy in which many products are available, selections can be made among them, and their shape and packaging organized to fit consumer needs; it assumes that there are choices to be made among channels or avenues to the target

audience; it assumes that transaction with regard to the product is possible within the life context of the people addressed. It thus assumes, at least implicitly, a consumer economy and consumer behavior, which is a normative bias which cannot be ignored; the unhappy results of the export of other Western biases to developing countries, in educational systems, for example, has already been noted. This approach taken as a whole thus seems incongruent, not with the content or purposes of nutrition education per se, but with the scale and the context in which nutrition education programs are currently being conducted in developing countries.

V. DIRECTIONS FOR FUTURE RESEARCH AND PROGRAMMING

The recommendations for future research and programming in nutrition education which follow derive from three sources: needs cited in current nutrition education literature reviewed for this study; inferences made from the indicated trends emerging in nutrition education, related fields, and donor agency policy; and a number of interviews with academic and professional experts in the fields of nutrition, public health, and education conducted by consultants to this study. These recommendations are not listed in any particular order of priority, nor are they intended to suggest a specific program of research for any single donor agency. Rather, they are intended to summarize the range of research needed in nutrition education and to provide general guidelines for individual agencies to follow given their constraints of opportunities and resources. These research needs could be most profitably addressed through a coordinated program among the major international donors, which several recent international meetings have called for (e.g., FAO, 1976). In keeping with the mandate of the World Food Conference of 1974, the World Food Council has been working toward the formulation of a course of action to guide the nutrition activities of multinational aid agencies, bilateral donors, and aid recipients in developing countries. Such attempts to coordinate nutrition research and action should be encouraged.

Those needs identified to be met by future research include:

1. Comprehensive data on current nutrition intervention programs in developing countries. Such a data base would allow the determination of quantitative correlations between program characteristics and outcomes and help

prevent the replication of unworkable approaches from the past. A survey of nutrition programs similar to APHA's recent "State-of-the-Art Study" of LDC health programs might be undertaken; (in the meantime, the data generated by this study on the nutrition components of health programs should be analyzed and reported.) The nutrition manual project currently being conducted by Harvard's Institute for International Development under AID sponsorship may go a long way towards satisfying this need.

2. Continued testing of current nutrition education methodologies.

The poor quality of program evaluation to date necessitates extensive further comparison of alternative approaches. This requires the continued development of appropriate evaluation techniques which utilize scientifically sound experimental designs to provide quantitative measures of both short- and long-term changes in food-related behavior and nutritional status. Certain of the current methodologies should be assigned first priority; the non-formal promotional (single media and integrated media) and combined promotional and educational approaches whose potential for extending the outreach of educational efforts was noted earlier should especially be further encouraged.

3. Cost-benefit studies of nutrition education. A number of experts have argued that changes in food habits have usually occurred in response to economic factors such as changes in price structure, and that nutrition education is a "non-starter" because so little is known about inducing behavior change. Until this latter assertion is either confirmed or disproved, the continued testing of nutrition education methodologies should proceed with an eye to the costs and benefits of nutrition education in comparison to other types of interventions, and to how they may be most efficiently

combined. Research is needed to develop methodologies for better making such cost assessments.

4. Assignment of priorities among target audiences. There is general consensus that the most important target populations for nutrition interventions are pregnant and nursing women and infants among landless classes in rural areas and urban slum dwellers. Additional research is needed, however, to determine which audiences for nutrition education are most appropriate for achieving maximum impact on the targets. It has been suggested that nutrition messages be directed at men as well as women, and that other important audiences are various groups of influentials -- government officials, media personnel, health workers, etc. -- who can be expected to relay nutrition messages to others.

5. Attention to the "fit" between audiences and messages. While there is agreement that certain messages -- especially the encouragement of breast-feeding and the early introduction of nutritious locally-available weaning foods -- should everywhere be assigned high priority, research in individual program settings should be conducted to determine which messages are likeliest to have greatest impact on the target behaviors of the intended audience. The assignment of priorities among both audiences and messages should thus follow an assessment of need in each setting. The impact of selected messages will be enhanced through the use of integrated communication strategies -- i.e., the reinforcement of specific message content in each medium used.

6. Basic research on behavior change. A consistent theme throughout the literature and interviews was the need for more basic research on the

educational motivation of change. Recent applications of behavioral psychology to preventive medicine, as in programs of weight, stress, and heart disease risk reduction, should be carefully noted in this regard. One practice from the experience of these programs which could be immediately and fruitfully applied to nutrition education is the greater specification of behavioral objectives in project designs.

7. Situation-specific analysis of intended program settings. This principle, derived from current research in health education (Harman, 1976b), refers to the needed investigation of indigenous perceptual patterns, education and communication mechanisms, etc., whose understanding can be expected to greatly facilitate change efforts. Other culture-specific research needs include studies of food habits and food beliefs and the design of relevant change messages. The experience of family planning communication and applied anthropology can be especially instructive here.

8. Recognition in research and programming support of emerging policy trends noted in this report, especially:

-- The integration of primary health services. Nutrition programming should increasingly proceed with an eye to its complementarity with other health and social services. The initiatives taken by WHO and UNICEF (e.g., WHO, 1974) in studying how nutrition services may be most effectively integrated into systems of basic services delivery should be followed.

-- The training of primary health workers. As the linchpin of basic services strategies, the front-line primary health worker is both an important audience for and practitioner of nutrition education. Innovative training

methodologies and materials such as those noted in the example of the DEIDS Project (i.e., competency-based, modularized instruction) must be developed which address the central problem of teaching a multiplicity of skills to a worker who is unlikely to have had extensive prior education. Research on the use of media networking to provide in-service support for deployed workers, whose need for such additional training increases as formal training time is reduced, should be encouraged.

-- Participatory development. Recent development policy and experience both dictate the desirability of maximizing community participation in the planning and implementation of basic services programs. Participatory strategies of nutrition education, such as the Community Systems Foundation approach and the Freire method noted earlier, should thus be further investigated.

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