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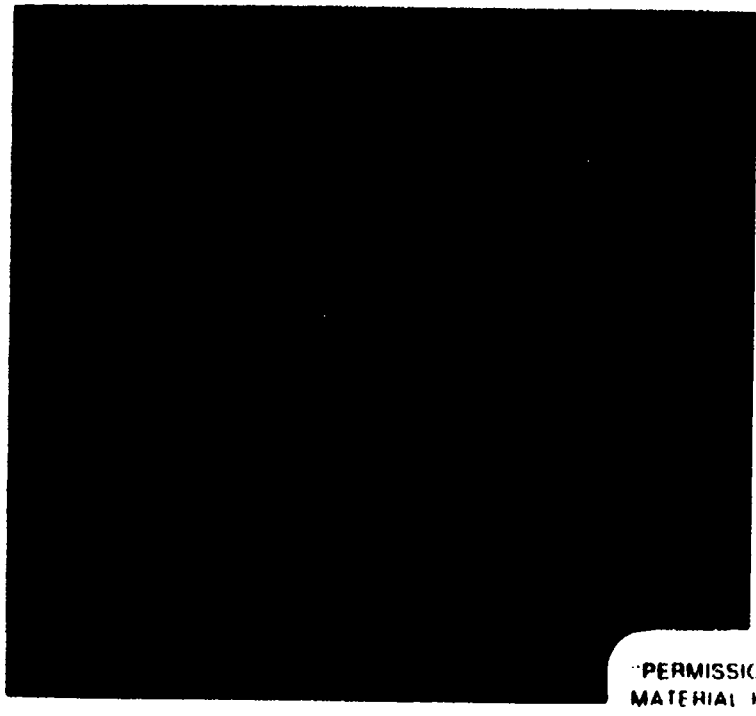
ABSTRACT

This digest issues a call to make good on the rhetoric of "integrated attention to the whole child" and provides some suggestions about how that might be done, beginning with combined interventions aimed at improving the nutritional status and the psychosocial development of the young child. After an introductory chapter that provides a summary of the argument, the problem is discussed in Chapter II in terms of the rhetoric of integrated attention, forms of integration, and under-estimation of the importance of combined, or coordinated, actions among agencies. Chapter III defines child development and offers a multi-dimensional rationale for attending to developmental concerns. Chapter IV discusses the impact of nutrition on development in terms of the relevant research base and implications for programming. Chapter V offers guidelines for intervention. Chapters VI and VII discuss ways of incorporating psychosocial development into, respectively, nutrition plans and programs and nutrition manuals. Chapters VIII and IX illustrate holistic approaches with examples of programs in Northeast Thailand and in India, Indonesia, Brazil, Chile, and Jamaica. An appendix describes Mosley and Chen's analytical framework for the study of child survival in developing countries, indicates why the model is particularly important, and suggests a revised model that incorporates the idea of development. Fifty-five references are included. (RH)

Digest 30

Programming for Early Child Development and Health



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Digest 30

Programming for Early Child Development and Health

The Value of Combining Nutritional and Psycho-social Interventions and Some Ways to do It

By

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Early Childhood Care and Development

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CONTENTS

PREFACE

This Digest challenges some standard notions about programming and reinforces others. It issues a call to make good on the rhetoric of "integrated attention to the 'whole child'" and provides some suggestions about how that might be done, beginning with combined interventions aimed at improved nutritional status and the psycho-social development of the young child.

Perhaps the main challenge to standard ways of thinking comes in the insistance that we should recognize and build on a two-way relationship between nutrition and psycho-social development instead of treating nutrition simply as a cause of delayed development. This is similar to recognizing the relationship between nutrition and disease and treating them simultaneously.

Said simply, the child that is better nourished will be more likely to be alert, active, and demanding of its environment. **But**, and here is the difference, minimizing stress and helping the child to be more alert, active, and demanding of its environment by attending to its psychological and social needs, can also have marked effects on its nutritional status. Thus, caregivers who are sensitive enough to recognize and respond to a child's needs for affection, encouragement, stimulation, consistency of care and varied experiences - will, in making the child more secure, alert, and active, be promoting growth as well as development. Actions favoring psycho-social development should, therefore, be combined with actions promoting growth.

Recognizing the interaction between nutritional status and psycho-social development suggests also that feeding should be viewed as "a social and developmental as well as a nutritional process", with psycho-social as well as nutritional effects. In the process of feeding a child, nutrition and developmental actions can come together but this fact is not reinforced in most programming.

To help overcome barriers and to make the link between nutritional interventions and actions designed to enhance psycho-social development the author focusses on the "convergence" of programme components (on the same group

of children and families) rather than on "integration" which implies often unrealistic unifying of organizational structures set up to do different things. It may be necessary also to begin with one component and phase in others over time. Links are helped when programmes are implemented by organizations that are not created specifically for either nutritional or child care purposes and that have the power to convene and mobilize. Highlighted is the important integrating role that can be played by programmes of parent and community education, adopting a strategy of educational communication. Several instructive examples are provided of programmes linking nutritional and psycho-social developmental components.

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This Digest was prepared for the Unesco-UNICEF Co-operative Programme by the Consultative Group on Early Childhood Care and Development. The Consultative Group is an informal mechanism to gather, synthesize, and disseminate information about programmes of early childhood care and development. Participating in this collective effort to record and extract lessons from research as well as from experience are- Unesco, UNICEF, The Ford Foundation, The United States Agency for International Development, The Carnegie Corporation, The Aga Khan Foundation, The International Development Research Centre, and the World Bank. The Collaborative exercise is intended to assist planning and programming by helping to sort out which programmes seem to work, under what conditions, for whom and at what cost. This essay will form the basis for one chapter in a forthcoming book being written for the Consultative Group setting out a "State of the Practice" for early childhood care and development programmes in Asia, Africa, Latin America and the Middle East.

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Unit for Co-operation
with UNICEF and WFP

Paris, February 1990

I

INTRODUCTION

1. Programming for Development and Growth

"Integrated attention to the child" is a common phrase in the rhetoric of policies and programmes of early childhood growth and development. Achieving that integrated attention in programmes intended to affect simultaneously the physical growth and the social and psychological development of the young child is much less common. Integration is more easily talked about than acted upon. This essay will present several reasons why that is so. More importantly, however, it will attempt to:

- strengthen the rationale for linking nutritional actions intended to enhance physical growth with actions intended to improve the psycho-social development of at risk children, from conception to age 6, in the Third World;

- suggest general programme strategies that will help to make the link between growth- and development-promoting actions; and,

- provide examples of programmes which have successfully combined the two elements.

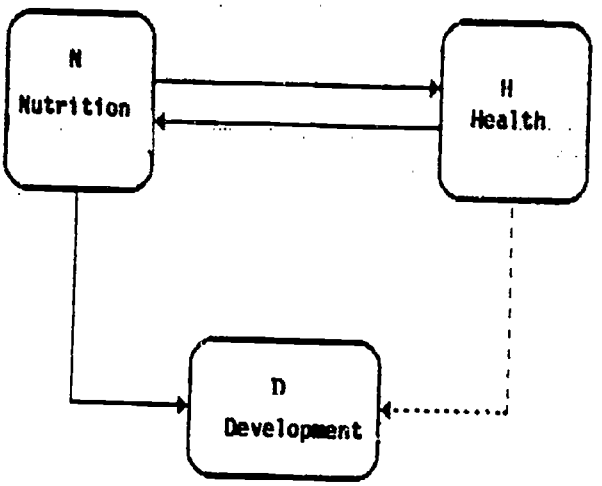
The broader problem of integrated attention to the child will be approached in the following pages at both a general level and by focussing on combining two programme areas: nutrition and psycho-social development. In the discussion of programme strategies and in the examples, emphasis will be placed on ways to incorporate greater attention to mental, social, and emotional development into nutrition programmes - through greater attention to care-giver-child interactions and to the environmental conditions that influence those interactions.

Concentrating on nutrition and psycho-social development is dictated by more than the desire to make the general discussion of integration more manageable and concrete.

The focus reflects a pressing need to call attention to the mutually reinforcing, two-way relationship between these areas.

Figure 1A depicts the way in which most planners continue to think about relationships among nutrition, health, and psycho-social development.

Figure 1A

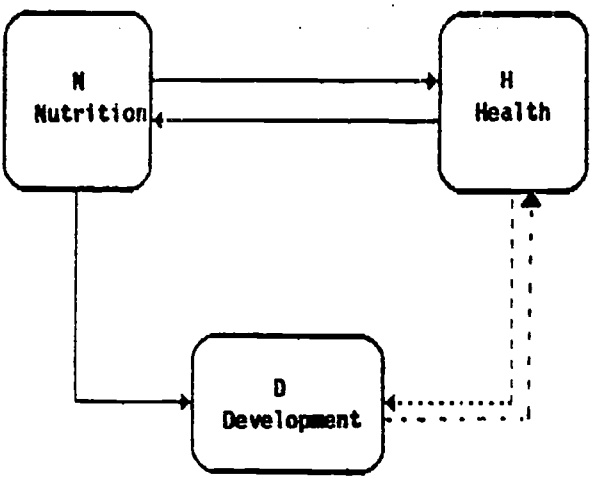


The double arrow between N and H in Figure 1A indicates common acceptance of the idea that malnutrition increases the possibility of disease and vice versa. Therefore, programmes of health and nutrition should be combined. By way of contrast, the relationship between nutrition or health and psycho-social development is ordinarily seen as a one-way relationship, running from N or H to D. The main effect is thought to occur as malnutrition affects growth and development of the brain, or, later on in life, the energy level of an individual. Nutrition (and to a lesser extent

health) interventions are, therefore, thought to aid development, but psycho-social development interventions are not seen as having an affect on nutritional status or on growth. This limited view weakens the argument for integrated attention which incorporates psycho-social as well as nutritional and health interventions.

In this document, we will be guided by, and provide some evidence to support the relationships seen in Figure 1B.

Figure 1B



2. A Summary of the Argument

Roughly, the flow of the argument in this essay is as follows:

2.1 The Issue

There is general agreement at a rhetorical level that integrated attention - including, at a minimum, health, nutrition, sanitation, and psycho-social development actions - should be pursued in order to improve chances

for survival and to promote the overall well-being of young children who are "at risk" of death and/or delayed development. There is, as well, evidence that multifocal interventions are superior to monofocal interventions.

In implementation, however, the potential power of combined actions is not sufficiently understood or appreciated to counter organizational inertia and barriers that often work against realization of the stated desire for integrated attention to children. To strengthen the awareness of benefits from, and the need for, combined actions, programmers and implementors require additional information about what psycho-social development is and about how it interacts with growth and under-nourishment.

2.2 The Evidence

Evidence of the important interplay between various nutritional interventions and developmental interventions (that strengthen and enrich a child's environment and caregiver/child interaction) has accumulated from such diverse sources as basic research with animals, research exploring reasons why some children fail to thrive nutritionally while others from a similar background thrive, studies of malnourished children whose environment is enriched, and operational research and longitudinal studies accompanying planned interventions. This combined body of research suggests that:

a. Physical growth and the process of maturation (including that of the brain and central nervous system can be improved by non-nutritional actions affecting the quality of care-giver/child interactions and the quality of their environment - as well as by nutritional interventions. Caregiver/child interaction is important, therefore, and programming should be directed to the mother-child dyad (caregiver-child dyad), as well as to the mother and the child, treated individually.

b. Young children are amazingly plastic and resilient. Recuperation is possible, in almost all cases of nutritional and environmental deprivation suffered early

in life. The notion that malnutrition during a "critical period" in early life causes irreversible damage to the brain and subsequent delayed development is no longer tenable (Pollitt, 1987, Horowitz, 1987).

c. Providing nourishment will not by itself overcome mental, social, and emotional delays, even though it may result in a high level of recuperation of height and weight.

d. Because environmental conditions can "potentiate" or prevent adverse effects of under-nutrition, programmes must attend to conditions in the surrounding environment as well as to improving nutritional status and caregiver-child interactions.

2.3 What to Do

Feeding, which occurs in a cultural context and involves caregiver/child interaction, should be viewed as a social and developmental, as well as a nutritional process.

To reduce barriers to combined programming for growth and development, it may be necessary to:

a. Mount explicit programmes of advocacy at several levels with policy-makers and programmers, with civil servants, professionals, para-professionals involved in implementation, and parents.

b. Stress convergence of actions on a particular geographical area or population more than insist on organizational integration.

c. Begin with one component (e.g. nutrition), and phase in others over time.

d. Seek implementing and organizing structures that are not created specifically for either nutritional or child care or educational purposes, in order to achieve the desired co-ordination and convergence of programme components.

e. Lean heavily on an integrating strategy of educational communication which strengthens parental and community awareness, demand, and organization for action.

From among the many types of existing nutrition interventions, some lend themselves more than others to combination with a psycho-social development component. These include:

a. Promotion of breast feeding and proper weaning

b. Provision of nutrition education

c. Center-based supplementary feeding and nutritional recuperation programmes.

d. Growth monitoring schemes.

An encouraging range of programme examples exist that provide models for combined attention to growth and psycho-social development of at risk children.

2.4 The Challenge

The challenge is now to create political will and to achieve the organizational flexibility that is needed to make good on the rhetoric of 'integrated attention to the whole child."

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THE PROBLEM

1. The Rhetoric of Integrated Attention

There are many examples of calls for integrated attention to the growth and development of the young child. For instance:

> *The needs of the young child are inter-dependent and therefore any measures for his or her advancement must be based on a holistic approach to child development and be implemented within the framework of an integrated structure." (Government of Sri Lanka. 1986, p.iv)*

> *UNICEF should use its multi-sectoral strengths to encourage multisectoral collaboration in child development in order to incorporate the education-stimulation dimension into health, nutrition and custodial care activities and vice versa; it is a question not only of child survival but of the fullest possible development, according to existing knowledge, of the genetic potential of the human being." (UNICEF, 1984, p.21)*

As one moves from the rhetoric of integrated child development to implementation of specific projects and programmes, "integration" can prove to be elusive. Often, a kind of "territoriality" develops in which primary health care centres are located in one area, nutrition projects in another, water and sanitation programmes in yet another and none of them in the same location as child care centres. Even when there is geographic convergence, there may be more competition than co-ordination among the organizations involved. Lack of co-ordination can lead to duplication of efforts and/or to use of different criteria for participation in programmes so that individual families are not served in an integrated way.

Why is an integrated approach so difficult? What gets in the way of combined programming and action? How can one make good on the rhetoric of "integrated childhood development"? How can child care and health and nutrition be brought together to take advantage of the synergistic effects that can occur?

2. Forms of Integration

There are several complementary ways of thinking about the integration of diverse components affecting survival, growth and development (Myers, 1987). Integration may occur:

- conceptually
- in policy and planning
- in organizing and implementing programmes
- in the content of programmes
- in the actions of families and individual caregivers

2.1 Conceptual Integration

The concept of the "whole" or "total" child provides a framework for integration but is not sufficiently specific to guide programming. Because an integrated notion of growth and development crosses various fields (medicine, nutrition, child development, etc.), definitions differ according to the particular perspective each field brings to the topic. The variables that are important and the relationships among these variables differ as well. Even within fields, there are competing theories of growth and of development. These are, however, often less discrepant than they appear because they take different parts of the same whole or are looking at the topic at different levels of detail. (Thomas, 1985) In the two sections that follow (III and IV) an attempt will be made to pull together evidence derived from various conceptual viewpoints, all of that evidence pointing to the importance of combining nutrition and psycho-social components in programming.

2.2 Policy and Planning

There is a tendency to think in terms of a health policy, a nutrition/feeding/agricultural policy, an educational policy, etc. The same is true for plans which are often made by sectors, with little integration of the components that affect the young child in a synergistic way. As suggested in Figure 1A, the conceptual scheme guiding planners may leave out psycho-social development (See Appendix 1 for discussion of one such scheme). Nevertheless, a number of examples can be found of a combined viewpoint represented in policies and plans. The Indian Integrated Child Development Service (see Section IX) is one such example.

In general, the more detailed the policy or plan, the more difficult it is to maintain an integrated view. Integration at the level of overall policy or general plan is much easier than in the details of programme implementation.

2.3 Organizational and Institutional Integration

The "whole child" is constantly cut into organizational pieces, bureaucratically and academically. A health piece corresponds to ministeries of health and to medical and public health faculties of universities. A nutrition piece is itself chopped up into bits because, as noted by Berg (1987, p.1) "Nutrition is not a sector...rather, it is a condition." Nutrition activities are found in ministries of agriculture, health, and others. Bio-chemists, food technologists, economists, home economists and others study nutrition, but seldom in relation to integrated early childhood development. Psychologists and educators and ministries of education concentrate on mental and social development, rarely, however, in direct collaboration with health, nutrition, or social welfare institutions. Moral and ethical development is set aside for the church.

The problem is complicated further by distinctions in the kinds of organizations involved in the delivery of early childhood programmes. Public sector differ from non-governmental organizations. Among NGOs, the range is also broad, from churches to entrepreneurial organizations. Funding organizations and professional associations also function in different ways from governments and from most NGOs.

Each of the areas and kinds of organizations mentioned above has its own formal and informal networks, publications, budget allocations, reward systems, and training programmes. Moreover, most bureaucratic structures charged with carrying out programmes of health or nutrition or education are organized vertically, each with its own personnel at several levels, each with its own geographic organization, each with its internal rules and regulations. It is extremely difficult, therefore to "integrate" institutional structures and to find a common language and a joint "problematique" providing a solid basis for co-operation and communication.

2.4 Content

Although institutional and organizational integration is difficult to achieve, integration in the content of programmes seems to be more feasible. It is possible for a particular organization to incorporate into its own staff individuals who will have specialized knowledge from another field and who can contribute to integrating content. Health materials can easily include information about psychological and social as well as physical health. Even when this is done, however, the organic relationship among these components is seldom recognized and emphasized.

2.5 Family and Individual Actions

In the last analysis, integration occurs in the minds and in the actions of the people who surround the child as it grows and develops. Aiding such integration poses both an organizational and educational challenge. Often, there is a need to fill in gaps in knowledge in order for that integration to occur. But strengthening integrated action by caregivers it also requires attention to local attitudes and beliefs and to the interpersonal and organizational forms that provide support for growth- and development-promoting actions.

2.6 It would be possible to dwell upon the many organizational and institutional features that make true integrated programming and implementation so difficult. However, these are well known and frequently analyzed. Instead, our approach will be to:

- Take the emphasis off structural integration of

organizations and institutions charged with implementing programmes in different fields such as nutrition and child care or development, placing emphasis instead on achieving conceptual agreement and integration at the level of plans and policies, with convergence of services and of information handled in an integrated way so as to assist those children and families who are most in need.

- Identify general strategies that have helped to overcome, or that get around, organizational barriers, facilitating convergence on particular groups. (See Section V)

- Look at examples of programmes that have managed successfully to combine nutrition and developmental components, often with other components as well. (See Sections VII, VIII, and IX).

3. Under-estimating the Importance of Combined Actions

Recognizing the importance of combined actions requires, first, a recognition that each proposed intervention responds to an important need. Large numbers of dying and of severely malnourished children immediately define a need and dramatize it. Health and nutritional needs are visible. Moreover, infant mortality rates and simple measures of malnutrition are available both to describe the need and to monitor the progress of programmes.

Mental, social and emotional development needs are not always as visible or obvious as health and nutritional needs, and the measures needed to monitor advances are less clear. The rationale for attending to these needs must be strengthened so that non-specialists as well as specialists will understand their importance and be willing to act.

Once the importance of particular interventions is accepted, the question then arises whether or not results can be significantly better if interventions are combined.

When there is a strong belief that combined actions are important, ways can often be found to overcome the organizational barriers to combined programming. That will be evident in the examples to be presented later.

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CHILD DEVELOPMENT : WHY IS IT IMPORTANT?

1. What is Child Development?

Before answering the question posed in the title, it is necessary to indicate clearly what we mean by child development. The following layman's definition serves the purpose:

> *Child development is a process of change in which a child learns to handle ever more complex levels of moving, thinking, speaking, feeling and relating to others.*

Whereas growth is described by a change in size, development is a process characterized by changes in complexity and function. The two processes are different, but inter-related, occurring as the human body continuously reacts and adjusts to genetic and environmental circumstances.

"Maturation" is also defined by a change in complexity and function - "as cells are modified, structured, perfected, and acquire a specific function through which maturity (adulthood) is attained." (d'Agustino and Masse-Raimbault, 1987, p.10). The idea of maturation captures one part of the development process - the physical part.

The above definition emphasizes that development is a multi-faceted process involving a physical or motor dimension (the ability to co-ordinate movements), a mental or cognitive dimension (the ability to think and speak), an emotional dimension (the ability to feel), and a social dimension (the ability to relate to others). Because changes along one dimension both influence and are influenced by changes along the others, these conceptually distinct dimensions are organically inter-related.

In addition, child development is:

- continuous, beginning pre-natally and occurring constantly throughout life;

- patterned but unique (i.e., there is a general sequence or outline to development but the rate and character and quality will vary from child to child and from culture to culture);

- interactive, occurring as the child initiates actions with and responds to people and things in the immediate environment.

Child development must be seen within the broader concept of human development. In this essay, the concern is with the child from conception to age six, but with awareness that development continues throughout life.

When a continuous view of child development is put together with the patterned but unique quality of development, the implication is that the approach taken must be constantly adjusted to the particular condition of the child. For instance, activities that are appropriate for an infant will not be appropriate for a toddler. The environment must become more complex in order to match the increasingly complex skills and competencies.

Because developmental deficits and advances can cumulate, the earlier attention is provided, the better the foundation will be, and the better the progress is likely to be in the future. But foundations can erode. And, a poor start does not mean that a child with problems must remain forever behind others. Children are very resilient, particularly in their earliest years. Changes circumstances can open the way to improvement. If the environment does not change, deficits can cumulate. Conversely, appropriate interventions can have a recuperative effect.

A developing child has basic needs that go beyond protection, food, and health care to include the need for affection, interaction and stimulation, security provided through consistency and predictability, and play allowing exploration and discovery. A supportive environment will respond to all of these needs which will, however, be defined and perceived somewhat differently in different cultures.

The main goal of a child's development is adaptation

to and some mastery over his or her surroundings. Because surroundings. Because surroundings can be extraordinarily limiting, some would include in the goal of child development, the ability to transform one's surroundings. In the short run, adaptation or mastery is always to immediate conditions. Over a lifetime, however, mastery and adaptation can include adjustment to a variety of surroundings with very different requirements for survival and continuing development. Consistent with this goal, we may view development as "...a lasting change in the way in which a person perceives and deals with his environment." (Bronfenbrenner, 1979).

The developmental goal of adaptation to and mastery (and transformation) of ones surroundings differ radically from a goal of simple survival, or of being healthy or of attaining a certain level of co-ordination or a higher intelligence quotient. It takes into account that different cultural and ecological surroundings place different demands on the child.

2. A Rationale for Attending to Child Development

As indicated above, before accepting the importance of combined interventions, the importance of each component and the need for intervention must be recognized. The importance of nutritional and of health-related components promoting growth and development seems to be accepted.

But why invest in programmes to promote mental, social, and emotional areas of early childhood development?

2.1 The Moral Argument

Children have a human right to be able to develop to their full potential, to be happy, to adapt and transform. Allowing disability and arrested development to occur at a high rate in young children when most of it could be prevented violates these basic rights. Moreover, children are dependent on others for their rights and there is, therefore, an obligation to help them.

2.2 The Social equity Argument

Exceptionally stressful conditions inhibiting a person's healthy growth and development in the early years affect

the poor more than the rich, reinforcing social inequities. Moreover, the particular forms of development that are considered "appropriate" for social rewards tend to be those established by an elite. When these two conditions are combined, poor children often fall quickly and progressively behind their more advantaged peers and stay there.

Boys have traditionally out-distanced girls in education, in part because the girls are not equally prepared upon entering school. That discrimination begins with gender-linked disparities in the patterns and practices of early development.

2.3 The Economic Argument

Investments in health, nutrition, and education or stimulation early in life can bring a high return by increasing a person's productivity in later years. Moreover, preventive programmes can produce savings by, for instance, reducing the need for expensive health care or by improving the efficiency of educational systems through reductions in drop-out, repetition, and remedial programmes. Child care programmes also offer the possibility of facilitating and or improving labour force participation by women and they can free older siblings to learn and earn as well.

2.4 The Scientific Argument

Evidence from the fields of physiology, nutrition, and psychology, medicine, and the social sciences suggest with increasing force that the early years are critical in the formation of intelligence, personality, and social behaviour. This evidence begins the work of the brain which points to the importance of sensory stimulation in helping to structure the neural pathways during the formative period. Opportunities for complex perceptual and motor experiences at an early age favourably affect various learning abilities in later life and are able to compensate, at least in part, for deficits associated with early malnutrition. Some of this evidence will be reviewed in the next section as part of the discussion of links between nutrition and psycho-social development.

2.5 The Programatic Argument

The effectiveness and efficiency of health and nutrition programmes can be increased by combining them with early childhood stimulation and education, taking advantage of the interactive effect among them. Establishing this link, for nutrition and psycho-social development, is the subject of Section IV.

2.6 Demographic and Social Changes Require a Response

The infant mortality rate for developing countries dropped from 150 per 1,000 in 1960 to about 80 in 1987 and is projected to be below 50 by the year 2000. Put another way, whereas one in six children died before age one in 1960, one in thirteen dies today. Turning this around, 12 of 13 children now survive to age one, and, by the turn of the century, 19 of 20 children are expected to survive. Unfortunately, because most surviving children live in the same debilitating circumstances that put them "at risk" of death, they are now "at risk" of debilitated or delayed growth and development with attendent long-term consequences.

Increased child survival is occurring at the same time that increased labour force participation of women, migration and urbanization, increased primary school attendance, and changes in traditional family patterns are producing new environments for child-rearing and new demands for programmes of early childhood care and development.

When these reasons are taken together, the case is compelling, but is only slowly being recognized and appreciated, as demographic and social circumstances change, and as new research information and programme experience accumulates.

IV

NUTRITION AND DEVELOPMENT

1. Establishing the Synergistic Relationship

A vast and varied literature exists examining nutritional status and mental development. For more detailed reviews of that literature, the reader can consult inumerable sources (Pollitt, 1987; Dobbing, 1987; McGuire and Austin 1987; Grantham-MacGregor, 1988; Werner, 1979; Zeitlin and Mansour, 1985). Less evidence is available relating nutrition to social and emotional development, but that too is growing. (Barrett and Radke-Yarrow, 1982).

The focus of this section will be on (1) the interactive relationship between physical growth and the physical, mental, and socio-emotional development of the young child, and (2) the synergistic effect of nutrition interventions intended to promote growth and non-nutrition interventions that promote development. Evidence will be presented from:

- animal research on brain development;
- research on effects of touch on Low Birth Weight and premature babies;
- studies of children in nutrition recuperation centres;
- studies of children who thrive in conditions that put them at risk; and
- studies of accompanying planned interventions with children "at risk" or with moderate or mildly malnourished children.

The convergence of results from these extremely varied approaches suggests strongly that a synergistic relationship is at work. Taken together, the evidence makes an impressive case for combining nutrition and non-nutrition interventions

in promoting both growth and psycho-social development.

1.1 Animal Research on Brain Development

Working with animals allows control over environmental complexities in a way not possible with humans and permits study of the brain at death. A considerable body of animal research suggests that early stimulation and an enriched environment can have beneficial effects on survival, maturation, growth, responsiveness to stress, and behaviour (Newton and Levine, 1988; Crnic, 1983)

A. Environmental Enrichment and Brain Maturation.

Current research shows that an enriched environment - of objects and companions - can affect brain development of experimental animals and can partially compensate for effects of under-nutrition on development and behaviour (Smart, 1987). When previously under-nourished rats have been subsequently provided with adequate nutrition and placed in different environments (enriched and impoverished), results show:

- Compensatory effects of enriched environments on brain weight, forebrain length and width, and on the depth, area, synapses, synaptic disc diameter, and dentritic branching within the occipital cortex.

- that previous under-nourishment did not impair the possibility of the rats to respond to environmental enrichment.

- that brain maturation of the environmentally enriched but previously under-nourished rats always remained below that of the environmentally enriched but previously well-nourished rats.

Clearly, both nourishment and enrichment have effects. Enriched environment produced compensatory effects, an under-nourished state did not allow the experimental animals to live up to their potential.

B. Maternal Care and Other Mechanisms

Several mechanisms, in addition to brain maturation, have been suggested that might help to account for the effects of early stimulation and environmental enrichment on development. Of most interest for our purposes is altered maternal care of the young. Mothers were found to behave in a different way toward treated and non-treated young. "Just how much and in what manner these differences in parental care contribute to subsequent developmental differences has never been satisfactorily demonstrated, but the evidence is highly suggestive of some relationship." (Smart, p. 62) Other mechanisms through which the results might be occurring are neurological arousal by stimulative action, hypothermia, and stress reduction related to hormonal changes, and "learning" that occurs through social interaction.

Animal studies have not been able to show with certainty that an effect on brain development will have a lasting effect on mental functioning. The idea that effects are associated with "learning" through social interaction is still somewhat controversial. Not enough is yet known about the physical basis of higher mental functioning to draw the unequivocal conclusions one would like to find. And, there are many intervening variables. What is clear, however, is that there is more to both under-achievement and growth promotion than increasing food intake, that a varied environment helps, and that maternal (caretaker) behaviour matters.

1.2 The Effects of Touch on Low Birth Weight and Premature Babies

One non-nutritional aspect of the interaction between caretaker and infant that seems to have an effect on physical growth operates through the sense of touch. To a large extent, research examining the effect of touch on growth and behaviour of infants stems from research with animals showing that "handling", or touch, affects the level of growth hormone (Schanberg, Evoniuk, and Kuhn, 1984). It is hypothesized that the touch system is part

of a primitive survival mechanism found in all mammals which depend on maternal care for survival in their earliest weeks or months. Absence produces stress and seems to trigger slowing of metabolism (until the mother can return); hence its need for nourishment is reduced. This is functional in the short run but leads to stunted growth if prolonged.

Stimulating touch seems to promote growth and brain maturation and has an effect on activity and behaviour. In a recent intervention experiment, a group of premature babies in a United States hospital were lightly massaged and their limbs moved passively during three, 15-minute periods per day for 10 days. As a result, the babies averaged a 47 per cent greater weight gain per day than other infants who were kept in incubators and were not massaged, even though the massaged infants did not eat more than the others. The massaged infants were also more active and alert during sleep/wake behaviour sessions, and showed more mature signs on a variety of behavioural tests. Eight months later, they did better than the others on tests of mental and motor ability and continued their advantage in weight. (Field, Bauer and Nystrom, 1986)

A study in South India (Landers, 1982) showed that low birth-weight babies who were massaged showed a remarkable catch-up in their weight and on a battery of developmental tests over a period of six months. This research showed a clear effect of mother-child interaction on both physical and developmental outcomes.

Massage is a common, but declining child care practice found in many cultures throughout the world. Why the practice is so widespread is not known, but a reasonable hypothesis is that it emerged from experience and became a socially institutionalized practice providing an effective and natural way to assist underweight babies to survive, grow and develop in adverse conditions.

These research findings leave us with questions, but, independently of the work on "attachment" (Harlow and Harlow, 1969) give support on such common Third World practices as carrying babies to the back and sleeping with babies, both of which are ways of maintaining physical contact

and communicating through touch. What comes through clearly is that caregiver-child interaction is very important for growth as well as development.

1.3 Children Who Thrive in "At Risk" Conditions

Most nutrition research has been directed toward discovering causes of malnutrition and identifying the effects of attention to malnourished children. More recently, another line has focussed on children who grow up in conditions of poverty that often lead to under-nourishment but who manage to be well nourished. Why do some children thrive while others do not? What are the mechanisms of social and behavioural adaptability to nutritional stress that allow these "positive deviant" children to grow and develop well?

Zeitlin and Mansour (1985) review 16 studies which compare children who thrive with those who do not. They also examine a large body of related research. The authors consider three kinds of correlates, noting the importance of 1) socio-demographic and 2) physiological correlates of malnutrition and then focussing on another cluster of variables - and 3) "psycho -social and behavioural aspects of mother-child interaction, their individual temperaments and the social network supporting the dyad." Their purpose was to learn from adaptive child care and feeding behaviours and the social networks that support them.

The review examines energy metabolisms, growth-related hormonal adjustments, immune responses of the body, and psychological stress as related to positive deviance. A link is made between psycho-social well being, nutritional thriving, and a healthy condition. The importance of examining psychological as well as genetic or physiological factors is explained as follows:

> In fact, we have no evidence that the purely physiological components of positive deviance are strong enough to predominate over or to completely control the interpretation of the psychosocial components. The fact that some children are genetically more resistant than others to the unexplained variance in the effects of psychosocial deprivation, that is

uncontrolled psychological factors add to the "noise" in physiological research findings." (p. 53)

Zeitlin and Mansour go on to say:

> *Stressful caretaker-child interaction can be expected to increase protein requirements while tending to decrease the amount of food that the child consumes. Pleasantly stimulating interactions, on the other hand, enhance the child's tendency to exercise its developing organ systems and hence to utilise nutrients for growth and development. (p. 53)*

> *There is increasing evidence that psycho-active pepides, produced by the brain in association with psychological mood, attract immune cells to parts of the body where they are needed to fight infection or repair damaged tissue." (p.53)*

In short, psychological stress has a negative effect on use of nutrients and on resistance to infection whereas psychological wellbeing activates the immune system and may stimulate the secretion of growth hormone. "These mechanisms help to explain how psycho-social factors, such as smiling happy affect between mother and child, are associated with adequate growth and development." (p. 54)

Three major conclusions emerge from the overall review:

1 Psychological and Social Well Being

> *"... most of the psycho-social factors now known to be associated with adequate growth amidst poverty are not specific to nutrition alone. The same characteristics that predict a good nutritional outcome also predict good cognitive development, health, and long-term development of the individual into a stable, productive member of society." (p. 2)*

2. Attitudes and Aspirations

Parents of positive deviants are more likely than others in their communities to be upwardly mobile, to discard fatalistic attitudes and to take initiative, adopting modern practices for themselves and their children. They make more and more effective use of health services, family planning, and educational facilities. They tend to bear fewer children, have higher aspirations for these children, and invest more resources in each child." (p.3)

3. Behaviours, Technologies, and Social Structures

There are positive deviant behaviour patterns, technologies and social networks that are specifically adaptive in protecting the nutritional status and health of infants and young children. These need to be identified and incorporated into child survival strategies. (p.4)

Positive caregiver-child interactions.

In line with later discussions in this essay, it is worth noting characteristics of caregiver-child interactions that Zeitlin and Mansour identified from their review of the literature as associated with adequate growth and development.

- Frequent physical interaction (holding, hugging)
- Rapid, consistent, and appropriate response to perception of child's needs
- Speaking and responding to a child's vocalizations, both when holding the child and over distance
- Showing affection by smiling and friendly behaviour rather than hostile or dominant behaviour
- Looking directly into the child's eyes
- Permitting the child to initiate and guide interaction

- Avoiding interaction that is too slow or too rapid and overstimulating

- Giving clear instructions

- Rewarding achievements

- Reprimanding without being brusque, harsh, or severe

- Avoiding forms of control with the only object of demonstrating authority over the child

- Creating a stimulating physical environment for the child

A nutrition-related interaction related to positive deviance was found to be actively feeding toddlers instead of expecting them to feed themselves.

Social Support.

Figuring prominantly in the identification of children that thrive in conditions of risk was the efficiency and quality of the network of social support available to caregivers. A supportive system (family or community) helped to moderate effects of overwork as well as of stress and depression.

The importance of social support noted in the Zeitlin and Mansour review is also a central finding in one of the most detailed positive deviance studies that has been carried out, following a group of multiracial children from different social backgrounds in the same Hawaiian community from the pre-natal period to the threshold of adulthood. In their book, Vulnerable but Invincible, Werner and Smith (1982) identify protective factors within the child and the caregiving environment that differentiate high-risk children who are resilient from those who develop serious learning and behaviour problems. The major sources of support within the caregiving environment were (p. 134):

- Four or fewer children spaced more than two years apart;

- Much attention to the infant during the first year;

- Positive parent-child relationship in early childhood;

- Additional caretakers besides the mother and care by siblings and grandparents;

- Steady employment for mother outside the household;

- Availability of kin/neighbours for emotional support;

- Structure and rules in the household and shared values - a sense of coherence;

- Close peer friends and availability of counsel; and

- Access to special services.

These studies of "positive deviant" children help to identify conditions and behaviours that permit some families to bring up well nourished children in spite of the conditions of poverty in which they live. They draw upon and reinforce other lines of research demonstrating the interaction between nutritional and non-nutritional behaviours and between a child's characteristics and the environment in which the child grows and develops. Crucial features of that environment are the relationship of the child with its caregiver and the psychological and social support available to the caregiver.

1.4 Studies of Children in Nutrition Recuperation Centres

Whereas the studies of positive deviance compare children of different nutritional levels experiencing different environmental conditions, studies of children in recuperation centres examine what happens to children who are all seriously undernourished when they are exposed to a different type of environment. Two telling examples come from Chile and Jamaica where experimental studies were set up in nutrition recuperation centres. The studies compared a) the progress of children who received a treatment of stimulation and play as well as food with b) the progress of those who received only food (Chile) or who were well-

nourished (Jamaica).

Chile.

In the Chilean experiment (Monckeberg, 1986), infants were fed, provided with psycho-sensorial stimulation (for 30 minutes twice a day) with physical exercise (also 30 minutes twice a day), and opportunities to play with attendants throughout the day. These children were compared with children with similar characteristics who received the same diet but no psycho-motor or affective stimulation. For the stimulated children:

"Not only was the weight gain different, but the physical growth was better and there was a significant difference after 60 days of treatment. The psycho-motor quotient also exhibited the same pattern. While for the control group the average quotient was 65 (plus or minus 12) at the 150th day of treatment, for the experimental group it was 85 (plus or minus 7)."

(Monckeberg, p.38)

These differences, for weight, psycho-motor and mental development, were more pronounced for children who were less than six months of age at admission to the recuperation centre than for those between 6 and 12 months of age.

To explain the differences in recovery, Monckeberg hypothesized that stimulation and affect trigger and help reinitiation of growth. He then makes reference to the links mentioned above relating resumed growth to biochemical processes and to the functioning of growth hormones.

Jamaica.

The Jamaican study (Grantham-McGregor, 1984) compared three groups of children. Two of the groups had been admitted to the hospital for nutrition recuperation and one group was well nourished but was admitted for other reasons. In the recuperation programme, one group of malnourished children was also provided with psycho-social stimulation, the other was not. The stimulation consisted of instructing attending nurses to play with the children for one hour each day.

When children entered the hospital, both malnourished groups had similar developmental quotients and were significantly behind the control group. By the time they left, all three groups had improved, but the intervened group had improved the most and was no longer significantly behind the control group.

One of the most interesting features of these two studies is that they both followed up the children after leaving the recuperation centre. In the Jamaican case, that follow-up included an active programme of home visiting, using Community Health Workers (CHW). The CHWs visited homes of the previously malnourished, recuperated children once per week over 24 months. During this time the weight recuperation was maintained. The gains registered in psychological development were maintained as well, so that the children who had been played with in the hospital continued on a par with the comparison group of well-nourished children when followed over a period of 36 months.

In the Chilean case, no additional action was taken following departure from the recuperation centre. As contrasted with the Jamaican study, the Chilean follow-up led to the conclusion that the programme of stimulation succeeded in raising mental performance only for the period of the programme. A decline was observed when the children went back to their former environments. By way of comparison, in a small group of 35 children, who had also suffered severe early malnutrition and who were recuperated, were adopted after discharge by families of higher socio-economic status, mental ability scores were normal, well above the scores quoted above.

1.5 Long-term Effects of Nutritional and Psycho-social Interventions with Mild to Moderately Malnourished Children

Yet another form of evidence supporting the importance of attending to both nutrition and environmental conditions affecting growth and development comes from studies of intervention programmes carried out in conditions of every day life where many children suffer from mild to moderate malnutrition. In several instances, interventions have been designed to try and sort out effects from nutritional supplementation and effects from non-nutritional interventions intended to improve psycho-social development.

In an extraordinary study carried out with families in poor neighbourhoods of Bogota, Colombia, 280 Colombian infants at risk of malnutrition were randomly assigned to one of four experimental groups formed by the presence or absence of two interventions: 1) nutritional supplementation for all members of the family, from the last trimester of pregnancy until the target child was three years old and 2) a twice-weekly home-visiting program designed to promote early cognitive development, from birth of the target child until age three years. All families received free medical care and were studied prospectively.

The following quote summarizes some results:

"At three years of age, children who had received nutritional supplementation averaged 2 centimeters and 810 grams more than controls; the incidence of children with severe growth retardation was reduced by half. Home visiting had no overall effect on size but did reduce the number of severely under-weight children.

"At age six (three years after intervention) the supplementation effects remained at about the same magnitude. Children in the home visit condition had become larger than controls, by 1.4 centimeters and 486 grams. Both interventions reduced the incidence of stunting and wasting. Dietary recall data suggest that changes in family

functioning as well as biological mechanisms account for the observed pattern of results." (Super, Herrera, and Mora, 1987)

Several other results of the Bogota study are worth noting:

- Effects were greater for lower levels of father's education.
- Supplementation had a small but significant effect on school readiness test scores, and there were no independent effects of home visiting.
- Home visiting led to earlier enrolment in primary school.
- There were significant positive effects of supplementation and home visiting, alone and combined, to reduce 1st grade repetition.

A host of other studies could be cited (see reviews by Pollitt, 1987 and Grantham-McGregor) to support the contention that nutrition interventions can have short and long-term effects on some aspect of behaviour such as impaired attention, reduced social responsiveness, heightened irritability and inability to tolerate frustration, low activity levels, reduced independence, and diminished affect. These behaviours are related to both cognitive and social behaviour in the long run.

What causes the effects listed above? How should these findings be interpreted? Pollitt (1987) suggests that in much of the literature, interpretation has been built around a model depending on the biomedical tradition of disease causation that did not take into account the social context in which development occurred or the previous and subsequent history of an individual - or the interactions. This static, linear model and interpretation contrasts with another starting from the assumption that "through its interactions with illness and adverse family and socio-economic conditions, undernutrition increases the probability of diverting the trajectory of mental development..." (Pollitt, 1987, p.19). It differs from

a view that "effects may occur within a synergistic system where the malnourished infant is less successful at engaging caretakers in interaction and, in turn, is responded to less often and with less sensitivity, resulting in a failure to develop normal patterns of social interaction." (Lester, 1979, as reported in Barrett)

Increasingly, however, an interactive view is accepted and is being used as a basis for designing as well as reinterpreting research results. For instance, in a recent study of "food intake and human function" carried out in Mexico (as part of a three-country study including also Egypt and Kenya), the interactive model serving as the basis for analysis of cognitive performance and social conditions was as follows:

> *... one pathway by which low intake may affect development is through subtle effects on the young child's manner of interacting with his or her environment, including reduced activity, attentiveness and social responsiveness. These behaviours, which lead to reduced stimulation and hence reduced opportunity for more complex responses, may also affect the child's intake, perpetuating continued low intake because he or she does not "demand" food. Similarly, development may be compromised by an interaction between child passivity and maternal time allocation in households where child care time is limited because the caretakers are pushed by economic necessity to long hours of work. In such a situation, low intake in the child interacts with the behavioural consequences of poor economic resources, with each component contributing to and reinforcing a less than optimal outcome.*
>
> *(Chavez, et. al, 1987)*

Following this model, a measure of cognitive development for children at age 30 months was related to measures of 1) growth (length), 2) caretaking (using as a proxy for maternal caretaking and observed appearance of the child), 3) current diet, and 4) socio-economic status. In a series

of regression analyses allowing a look at different combinations of the variables, cumulative growth was the dominant significant variable, but caretaking and SES were also significant. When all four variables were entered, length and child care continued to be significant.

The analysis lends strong support to the interpretation of development that looks at the interaction between the characteristics of the child and its environment, including interaction with the caregiver and with the conditions surrounding both the caregiver and child. The researchers concluded that:

> *Social-environmental conditions of the household (as measured by socio-economic status indicators and maternal care-giving) clearly affect development. The biological and behavioural experiences of the child, as reflected in growth, also affect development. The mechanism of these effects is probably synergistic. That is, child nutrition, health, and activity (reflected in growth) have a synergistic relationship with social and social-relational conditions, with respect to risk of poor or delayed cognitive development. The model is analagous to the dynamic interaction of infection and malnutrition, which have a synergistic relationship with respect to mortality.*
>
> (p. 503)

Focussing on weight instead of cognitive development, and on infants, aged 0 to 6 months, a similar kind of interaction seemed to be present.

> *Infants increased faster in weight from birth onwards if the exterior and interior sanitary conditions of their homes were better, and if the pre-schoolers and mothers of the household appeared cleaner,... (p. 507)*

The implication is that nutrition interacted both with an environmental condition related to better health

and to better maternal care, as represented in the attention given to cleanliness of the house.

2. Implications for Programming

The review presented above provides evidence that satisfying psycho-social needs can have an effect on nutritional status through its affect on metabolism linked to stress reduction, and by helping to produce changes in the care demanded and provided. Conversely, nutrition is seen to have an effect on psycho-social development, operating primarily through its impact on attention, responsiveness, independence, irritability, and affect. Nutrition is one of a complex of factors operating to influence that development and associated behaviour.

It should not be surprising, then, that a major programme implication to be drawn from the evidence is that nutritional interventions intended to improve growth should be combined with non-nutritional interventions directed toward a child's psycho-social development. To do so will take advantage of the interactive, or synergistic, relationship that exists between the two.

Several implications also emerge from the analysis regarding how one might go about taking advantage of the relationship.

2.1 Support the Caregiver-Child Dyad

Researchers have emphasized that satisfying a child's psycho-social needs requires mutually satisfying caregiver-child interactions within a supportive and stimulating environment. Thus, programming should be directed toward the caregiver-child dyad (using the word dyad captures the reciprocal nature of the interaction between caregiver and child) as well as to the caregiver (usually the mother) and to the child, viewed individually. Improving the nutritional condition of both is obviously important but, again, is not enough.

What can be done to improve the interaction? Caregivers can be helped to interact better with their infants, toddlers and pre-schoolers by at least two kinds of actions - strengthening the supporting environment and providing information to caregivers within a supportive structure.

2.2 Improve the Supporting Environment

The first, and probably the most important type of action is one that will help to remove limiting conditions that prevent natural interaction to occur. Most caregivers will be loving and attentive and responsive and stimulating if they are given the chance. But there are many pressures on resources, time, and psyche that produce stress in caregivers, affecting their interaction - other than stress induced by under-nutrition. As suggested by Zeitlin and Mansour, there is an important need to look at the social support systems caregivers can count on - at whether there are additional hands and hearts available. Are there ways in which time taken for other tasks can be reduced? These concerns are in addition to efforts to improve the larger environment through changes in water systems, sanitation, and other features of the physical environment.

2.3 Provide Parental Education

A second set of actions would focus more directly on the caregiver. Without under-estimating the natural parenting abilities of most caregivers or disregarding the many traditional practices that help foster a positive interaction between caregivers and their children, it is possible to see important ways in which working with caregivers could improve interaction and foster development. Many mothers, for instance, are not aware of the ability of their newborns to see and hear at birth, do not value play, see no harm in "bottle propping" (leaving the child alone with the bottle instead of interacting during the feeding), or are unaware of the importance of stimulating the child through touch, talking, and eye contact. In urban conditions, a teenage girls may not have had the

socialization to child care she would have had in a rural area and so be in need of help with her parenting skills. In short, programmes of parental support and education may be appropriate that include both nutritional and child-rearing information.

2.4 Treat Feeding as a Social and Developmental Process

From the review of evidence emerges a natural link between nutrition and psycho-social development related to the fact that feeding is a social and developmental as well as nutritional process.

In nutrition programmes, how a child is fed should be attended to - along with attention to screening and to what and how much a child is fed. Feeding is at once a social activity with psycho-social development purposes as well as a nutritional activity with nutritional and growth purposes. The quality of the social and psychological interaction during feeding affects nutritional status both through a physiological effect on the child and through its influence on the amount of food the child demands and ingests.

Interactions during breast- or bottle-feeding, during the weaning process, and at meal times can encourage or discourage proper feeding while helping to satisfy important developmental needs.

2.4.1. Breastfeeding

Breastfeeding provides natural and frequent opportunities not only for touching and holding, but also for cuddling, exchanging glances, and talking and responding to the baby. All of these can contribute to its psychological and social health and development and have an influence on nutritional status.

In spite of the obvious and direct relationship, the promotion of breastfeeding gives little, and sometimes no, place to this dimension. Pictures are published and distributed in which the breastfeeding mother is not in eye contact with the child. In the

advantages mentioned, the social and psychological advantages tend to be omitted. This occurs in part because the promotion falls to nutritionists. A joint effort would produce a better result.

2.4.2 Bottle feeding

In discussions of the problems that can be associated with bottle feeding, emphasis is correctly placed on over-diluting, on the frequent use of unclean water to dilute the milk, and on the unsanitary conditions surrounding the process of drinking the milk (unsanitary nipples, dropped bottles, etc.). Seldom mentioned are the convenient (for the caregiver) but negative (for the child) social consequences of "bottle propping". A child that is left alone with the bottle does not receive the warmth or interaction that holding the child to give the bottle can give. To the extent that a bottle is substituted for the breast at an earlier and earlier time, this withdrawal of a support for psychological development becomes more important

2.4.3 Weaning

Most of the literature dealing with the weaning process (defined as the period from the first introduction of supplementary foods to the period of halting breastfeeding and/or bottle feeding of milk) is directed exclusively to when the process should begin, to what kinds of locally available foods provide the best supplement to milk, and to the amount of supplementary food needed. These are the most important nutritional concerns. Little or no attention is given to social dimensions of weaning such as separation and self-feeding.

- Separation

Occasionally, in anthropological literature, references will be made to a process in which a child is abruptly sent away from the mother in order

to terminate the weaning process. The psychological effects of this practice are not well understood and some controversy exists over whether or not (or under what conditions) the practice results in unnecessary trauma (Erny, 1987; Timyan, 1988) Sometimes, maternal separation is automatically equated with deprivation, i.e., with removal of stimulation through touch, sound, and movement, with a break in consistency, and with discontinuity in meaningful relationships. That view is a gross over-simplification.

In a detailed review of separation during early childhood, based for the most part on research in the United States and Europe, Yarrow (1980) concludes that psycho-social effects will depend on:

- Age at time of separation;
- The quality of the relationship with the mother prior to separation;
- The character of maternal care subsequent to the separation;
- The character of the relationship with family during the separation;
- The duration of the separation;
- Subsequent reinforcing experiences;
- The role of constitutional factors in the child (differences in basic sensitivities to changes in kind and intensity of stimulation); and
- The constancy (or similarity) of the old and new environments.

The most sensitive time of separation may be the period from about six months to two years, when the infant is establishing stable affectional relationships, both with the mother

and others in the immediate surroundings." (Yarrow, 1980, p.122) This is the period when most weaning takes place.

- Self-feeding

In the weaning process and when weaning has occurred, emphasis is sometimes placed on the child's learning to feed itself. This may be an adequate and good practice in the sense that it helps a child to develop co-ordination. It may help develop independence as well. Sometimes, however, self-feeding is begun too soon and a child does not get the amount of food that it needs. And, again, the question of interaction should be taken into consideration. The equivalent of bottle propping in which a child is left alone to feed should be avoided. Indeed, the positive deviance findings reported by Zeitlin and Mansour suggest that active feeding was a positive behaviour.

2.4.4. Feeding of Pre-schoolers

The social circumstances of feeding can be an important part of the early socialization process of children. Consider, for instance, the following quote from a study of families in rural Nigeria which illustrates sensitivity to the social as well as nutritional value of feeding:

The children are presently being fed in a well-regulated but need-centered and caring environment. Removing them from the home environment to a day care setting would involve serious responsibilities in terms of their feeding. (Wilson-Gelman and Ladipo, p.47)

We turn now to questions of how the nutrition and developmental link may be made within nutrition programming - so as to make good on the implications sketched above.

V

MAKING THE LINK

Having argued for the importance of interventions intended to enhance psycho-social development in the early years and for combining such interventions with nutrition, in order to capitalize on their synergistic relationship, we turn now to ways in which the two might be combined programatically. In this section, several general strategies and positions will be sketched. In the following section, a typology of nutrition programmes will be drawn and possibilities for incorporating developmental components into each will be discussed.

1. Barriers Revisited

Reference was made earlier to a set of organizational and institutional barriers to integrated programming associated with academic and bureaucratic specialization. These included differences among disciplines and ministries in their conceptual frameworks or problematique, the language of discourse, information sources, informal networks, budget allocations, reward systems, and training programmes. Further, the vertical and parallel structures characterizing the governmental institutions most often charged with carrying out programmes was noted. Each institution boasts its own personnel at several levels, its geographic organisation, and its internal rules and regulations. It would appear extremely difficult, therefore, to "integrate" institutional structures and to find a solid basis for co-operation and communication among the fields.

There are however, a number of strategies that might help to overcome, or bypass, these barriers to integration.

2. Some Strategic Suggestions

2.1 Stress Convergence

Institutional integration may, in practice, be too much to expect in the implementation of programmes. The goal of integrated programming is to respond to the needs of the child in an integrated way, not to achieve integration of delivery systems. Convergence can be accomplished if various programmes attend to the same children and families. Even if the administration of the programmes is not, programme results may be.

Convergence is helped if there is a physical and/or social focal point. A building that is at once a nutrition centre and a child care or pre-school centre and a place that the doctor can visit and a location for parental education, provides natural convergence of programmes. A social or economic grouping - such as a co-operative or local women's organization or labour union can provide another focal point for convergence of services and self-help programmes.

2.2 Begin With One Component

Although the clear intention of a plan or programme may be to provide combined attention, it may be advisable and necessary to begin with one component and to phase in others along the way. The desired convergence would be achieved over time. This compromise to an initially integrated effort may be necessary for financial as well as structural reasons. The component (nutrition, child care, etc.) which provides the starting point need not be the same in all places. If starting points are different, they will result in temporary dispersion rather than convergence of efforts. It is, therefore, crucial that they be part of an overall plan that seeks convergence and associated with a community-based strategy of educational communication (see below).

2.3 Seek Agreement on Those Most in Need

To achieve convergence requires agreement at a high level about the population groups most in need of attention, and a mechanism for defining the areas in which they will be found. That may be as simple as designating one area of a country - Northeast Thailand, for instance. Or it may involve a relatively sophisticated situation analysis in which pockets of rural and urban poverty are identified to which all programmes should be directed. Once such a definition has been made, special budget incentives might be made to be sure that the various organizations involved put their effort into those regions.

Although seeking such agreement might seem to be an easy thing to do, it too can encounter barriers. Almost inevitably, political interests and pressures come into play, not only in the form of favorite areas, but, in cases where governments are accountable, in the desire not to show favoritism that might weaken a political position. There is need, then, for a relatively high level of political will.

2.4 Build Political Will: Advocacy

To help build the necessary political will where that is not present, it may be necessary to invest in a strategy leaning heavily on advocacy in the early stages of building a programme. Convincing key people of the importance of integrated (or convergent) attention usually involves more than telling; it involves showing, either by travelling to see experiences elsewhere or by setting up a demonstration programme at home. Analyses in which differential figures for mortality, malnutrition, and other indices of children "at risk" are provided can also be part of an advocacy effort, helping to identify populations most in need. Such analyses can be carried out jointly and serve as one basis for combined effort that could lead to joint planning. Thus, situation analyses should be looked at as more than a source of information; they can be part of a mobilizing process.

2.5 Place Co-ordination Outside Specialized Agencies

If a specialized organization such as the Ministry of Health or Education controls the co-ordination of an "integrated" programme, it will often be difficult to achieve the converging, multi-faceted attention that is desired. Efforts will be biased toward the component for which the particular agency in charge is specifically responsible. For all the reasons noted above, achieving the co-operation of other specialized organizations may be difficult.

There are however, mobilizing and co-ordinating structures that are not as specialized and that can help to bring together the specialized organizations. Among the strategies that have been used in different places are:

- Placing co-ordination under a national women's organization with mobilizing power at several levels (China).
- Creating a Ministry for Rural or Community Development that takes responsibility (Zimbabwe).
- Establishing a Ministry of Programme Implementation with an independent life (Sri Lanka).
- Attaching efforts directly to the office of a national, or state-level leader (Santa Catarina, Brazil), where a social development committee involving representatives from all pertinent ministries as well as labour unions and other groups was directly responsible to the governor and was charged with the co-ordination).
- Assigning responsibility to non-governmental organizations with recognized mobilizing ability.

2.6 Create Inter-Organizational Activities

Although delivery structures and decision making may continue to be vertical and parallel, several mechanisms may facilitate communication and combined efforts. Without threat to the normal way of functioning, for instance, it is possible to:

- involve several organizations together in the diagnosis, planning and implementation of an experimental project.

- create inter-agency groups to work on a particular problem, with each asked to indicate what they can contribute to the solution of the problem.

- form an inter-agency group to create materials that would then be used by the several agencies.

- organize joint training programmes involving personnel from several specialized organizations.

- create a joint commission charged with overseeing a combined programme.

2.7 Strengthen Community Organization/Responsibility

Another integrating force that is not linked to a particular specialized organization or bureaucratic structure is the local community. If organization of the local community is strong, the chance that various programme components will not only reach the community (because demand and execution will be strong), but the chances of real co-ordination at the local level will be greater. Although many programmes speak of community participation and make some overtures in that direction, vertical structures and centralized decision making continue to predominate in most cases. (Rifkin, 1985)

2.8 Parental and Family Education : An Educational Communication Strategy.

In the last analysis, the responsibility for integrating different components in responding to the multiple and interacting needs of the young child falls to parents and family members charged with the immediate care of the child. The most basic integrating strategy, therefore, is one that is directed toward supporting and educating parents in ways that will improve their ability

to respond to the complete gamut of needs of their children. That education involves more than passing on information; it requires opportunity for inter-personal communication, reinforcing and activating needed behaviours. An educational communication strategy, therefore, requires more than social marketing of information through the mass madia; it must have an organizational component as well as providing for inter-personal communication. (Rivera, 1987; Haffey, 1986)

The reader will undoubtedly think of other ways of assisting communication and co-ordination among organizations and institutions involved in providing integrated attention to the multiple needs of the 'whole child'.

If several of the above strategies for assisting combined programming can be successfully carried out, it may be possible to overcome some of the barriers to combined programming and implementation. It may even be possible to avoid some duplication of effort in attempting to achieve a convergence of programme efforts directed to children most in need.

VI

INCORPORATING PSYCHO-SOCIAL DEVELOPMENT INTO NUTRITION PLANS AND PROGRAMMES

As indicated in section II, integrated attention to the young child can be approached in various ways - at a conceptual level, in the formulation of policies and programmes, as an organizational and institutional problem, in the content of programmes, and/or at the level of beliefs and actions of families and individuals. In previous pages, attention has been given to bringing together conceptually the various components of child development, and to the interaction between growth and development. We have been especially concerned with establishing the synergistic relationship between psycho-social and nutritional states and conditions. Various organizational strategies have also been suggested to aid integration and/or convergence of programmes.

In this section, our emphasis is on incorporation of psycho-social development into planning and programming by setting out a range of nutrition programmes. We will discuss also incorporation into the content of programmes, focussing on the content of manuals provided to guide nutrition programme actions.

Types of Nutrition Programmes

Perhaps the most visible form of nutrition intervention is food supplementation. Huge programmes of food supplementation have been mounted throughout the world. Often these are given a great deal of publicity for political reasons. Large "give away" programmes have been criticized on a number of grounds with the criticisms also providing visibility. Indeed, there has been an unfortunate tendency on occasion to talk about nutrition interventions as if food supplementation is the only kind of action taken.

There are, however, many kinds of nutrition

interventions in addition to food supplementation, some of which lend themselves better than others to combined programming and to incorporation of a psycho-social development component.

The following sets out and discusses briefly a broad range of programme possibilities:

1. Increase Food Production

On a large scale, this strategy does not lend itself very well to combined action, focussing usually on the introduction of new and better seed varieties, on irrigation systems, or on other technological solutions that can be applied broadly. The strategy can be conceived as part of a broader and integrative programme, but in implementation is unlikely to include other components.

On a small scale, promoting community gardens in conjunction with operation of child care centres could help to combine developmental and nutritional actions, but such actions are unlikely to make a major impact on food production.

2. Improve Marketing Mechanisms; Adjusting Food Prices; Subsidize Purchases, including Coupons

These actions, intended to improve the nutritional situation of a population, are also broad and sweeping actions. At first glance, it is difficult to see how other dimensions of attention to the child might be integrated into them. If, however, marketing occurs through a system of centers in which prices are subsidized, these centers could also be considered as locations in which, for instance, oral rehydration packets could be distributed. They could also be locations where health consultations could be given or where child care centers might be located or where information could be provided about other services and programmes.

3. Provide Mineral and Vitamin Supplements

This action will benefit psycho-social development and behaviour to the extent that the supplements help to prevent disabilities such as cretinism (related to iodine deficiency) or xerothemia (vitamin A deficiency) and/or are linked in other ways to learning and behaviour (Berg and Brehm, 1986). Evidence is mounting, for instance, concerning the effect of iron deficiency anemia on children's ability to concentrate and perform normally in school because they are weak and fatigued. (Soemantri, Pollitt, and Kim, 1985)

Because of their nature, these extremely important interventions are likely to be attached to other programmes or to be handled centrally through such devices as fortifying bread or salt. They do not, therefore, normally provide the structure or opportunity for integration of other components into the action.

4. Provide Food Supplementation

Programmes of food supplementation are widespread. They may be directed to particular areas or communities or families or to pregnant or lactating women, or to infants or pre-schoolers, or to some combination of these. Some programmes involve provision of food in centres. In other cases, food is distributed for comsumption at home. The amount and kind of food provided varies considerably. Sources of food may be imported or local. In short, food supplementation takes many forms.

Food supplementation programmes, particularly those involving imported food that is given away, are controversial. Critics contend that the programmes undercut incentive to cultivate and consume perfectly good local alternatives; that the amounts given are often too small, that the supplements are usually not supplements but are substitutes so that total food intake remains the same; that the programmes are hard to manage logistically so lend themselves to misdirection and corruption; that

programmes lack continuity, under-cutting the potential effect when discontinuity involves substantial periods during a given year when food is not provided, and creating a problem at the time of early programme termination for those who have come to depend on the source of food and have adjusted their bodies accordingly.

Supporters of food supplementation, while recognizing problems, point to real benefits that well-conceived and administered programmes can bring, both direct benefits in terms of better nutritional status, and indirect benefits in terms of the convening power of food which brings people together in groups so that other actions can be taken as well. And, novel programmes are being developed that do not create dependency on outside sources, that promote local cultivation, and that help overcome both logistic and social problems by supporting community efforts (the promotion of school and community gardens in Zimbabwe and Tanzania are good examples).

Examples can easily be found of both successful and unsuccessful food supplementation programmes. It is not the purpose of this essay to enter into the controversy, but it is clear that there are better and worse ways of setting about providing food supplements.

Most important for our purposes is the fact that many supplementation programmes do not incorporate complementary programme elements that would help to improve the health and psycho-social development of children at the same time that they improve nutritional status. Too frequently, children who are gathered for feeding sit listlessly, propped against walls of the nutrition centre, waiting for their food when they could be participating in activities that would stimulate them and help to make good on the nutritional assistance. Too frequently, caregivers bring young children and, either leave them for a period or stand idly by while the children are fed when they could be participating and learning about proper care and feeding. Or, food is distributed, without, for instance, taking the opportunity to talk with parents about nutrition and health problems or about what might be done to overcome the frequent diarrhea contributing to malnutrition.

In brief, food supplementation can provide the opportunity for related and complementary actions helping to improve early childhood development.

5. Nutrition Recuperation

Nutrition recuperation centres are a special case of the food supplementation action discussed above. These centres treat children with severe malnutrition. The children are usually below the age of three and usually live in the centres while they are being treated. Evidence quoted earlier from Chile and Jamaica shows clearly that the addition of a stimulation component to the recuperation programme speeds the process of regaining weight while providing psycho-social benefits as well. Still, many recuperation programmes fail to incorporate activities responding to children's psycho-social needs. To make the combination may involve some additional training for personnel responsible for recuperation or the addition of caregivers to hold and cuddle and play with the children. These might be volunteers as in the Chilean example described by Monckenberg. This nutritional action lends itself to a combination of nutritional and psycho-social activities. Given the demonstrated benefits, the relatively low cost involved, and the fact that intervention does not even require cooperation across bureaucratic lines, failing to make the combination seems unforgivable. If, however, follow-up actions cannot be organized, the extra efforts in the centre may have no lasting impact.

6. Growth Monitoring

The practice of periodic weighing in order to identify children in need of special attention and to detect growth faltering has spread over a wide front during the 1980s. Growth charts are now relatively commonplace. The person responsible for weighing, recording, and interpreting the weight data is sometimes a professionally trained individual, sometimes a para-professional, and, less often, a parent or caregiver. The occasion for weighing also varies, occurring during home visits, health check-ups, as part of a centre-based child care routine, in conjunction with

food supplementation programmes, in nutrition centres, etc.

Depending on the circumstances of the weighing, growth monitoring can provide an excellent opportunity to combine nutritional and psycho-social programming. Examples from India and Indonesia, below, will suggest how this might be done.

7. Nutrition Education

Experience with various forms of nutrition education is accumulating and along with it a considerable evaluation and implementation literature (Van der Vynckt, 1987). Some education is directed to parents, other to school children, and other to the public at large. Nutrition education may be made part of a regular school curriculum, incorporated into home visits, made the subject of a special adult education course, or carried out through the mass media. If nutrition education is provided using a strategy of educational communication directed toward families and communities, involving interpersonal exchanges and strengthening organization, its potential for integration is enhanced.

For the most part, nutrition education focusses on diet, i.e., on what children should be fed. As indicated in Section IV, and as will be evident from the analysis of manuals that follow, little attention is given to how children are fed.

Nutrition education, to be integrative, does not require the integration of bureaucratic structures; rather, integration occurs in combining content from the other areas with that from nutrition. Moreover, the same audiences that nutrition education programmes are intended to reach are often the very audiences that health and education and others will take as their focus. This convergence of interests could become the basis for cooperative production of materials incorporating information about health and psycho-social practices into nutrition education and vice versa in an attempt to respond in an integrated way to the combined needs of the child.

8. Promotion of Breastfeeding and Proper Weaning

In breastfeeding, a natural combination of a nutritional and psycho-social action occurs. Both of these features can be promoted but, as will be discussed at greater length below, the failure to consider feeding as a social and developmental as well as a nutritional process has led to neglect of the psycho-social side. The same is true of the treatment of weaning where, however, the combination is not as direct as in breastfeeding.

From the above, it is evident that some nutritional actions lend themselves better than others to incorporating a developmental component. Nutritional recuperation, food supplementation, promotion of breastfeeding and proper weaning, and nutrition education, and, growth monitoring are logical candidates for incorporating psycho-social development activities.

VII

INCORPORATING PSYCHO-SOCIAL DEVELOPMENT INTO NUTRITION MANUALS

If psycho-social elements are to be integrated into nutrition programmes, an integrated perspective should be incorporated into manuals. Unfortunately, the propensity to divorce the treatment of social, psychological, and nutritional themes related to child development carries over into the production of manuals and other materials used in training and programme implementation.

Instances of both isolated and combined treatments will be described briefly below in discussion of three manuals. The first two examples illustrate a cursory treatment of the social dimension of feeding and of early childhood development as it is related to nutrition. The third example demonstrates a more integrated view.

1. A Missing Psycho-social Dimension: Two Examples

1.1. One widely distributed nutrition field manual, now in its third edition, is the Manual on Feeding Infants and Young Children by Margaret Cameron and Yngve Hofvander (1983). This manual was prepared under the auspices of the FAO/WHO/UNICEF Protein Advisory Group.

The manual is intended primarily for professional groups who have some basic knowledge of nutrition, child health, home economics, etc. Early childhood development, as first mentioned in a paragraph on page 5, is treated exclusively in terms of the development of skills related to the functioning of the brain. An initial chapter dealing with risks and screening includes brief mention of developmental "milestones", treated as a screening device, much as a growth chart.

The only mention of the social dimension of feeding is in relation to breastfeeding where two pictures make the points that (1) quiet confidence assures successful

lactation and (2) breastfeeding establishes a close and happy contact between the mother and child. The effect of this quiet confidence and contact on the nutritional status of the child is implied but not explicit. In one of the pictures the mother is looking at her child; in the other she is not. A paragraph labelled "social aspects of breastfeeding" does not include anything about interaction between mother and child. A summary of advantages of breastfeeding has nothing about interaction or about psych-social development. A chapter dealing with the management of breastfeeding has nothing about holding, gazing, interacting or talking. The same holds for a chapter on "replacement feeding". Guidelines for weaning do not include anything about mother-child interaction (or its absence).

1.2 Another prominent manual is titled Improving the Nutritional Status of Children During the Weaning Period, A Manual for Policymakers, Program Planners and Fieldworkers. This manual was produced for the Office of Nutrition of the United States Agency for International Development by Karen Mitzner, Nevin Scrimshaw, and Robert Morgan in 1985.

The cover of the manual shows a woman feeding a child, but with the child turned towards the camera and away from the mother. In a chapter dealing with collecting information about feeding practices, attention is given to what is fed and to whether food is properly prepared, but none is given to the actual feeding practice or to mother-child interaction. A section on "Feeding Techniques" does not deal with interaction, except to say that by the time the child is two years old it should be given its own portion of the family food and be allowed to eat by itself. There is no treatment in the book of the interaction between mother and child in feeding.

2. Toward Incorporation of a Psycho-social Dimension

In a more positive vein is Nutrition and Families (Ritchie, 1983), originally distributed as a Manual on Child Development, Family Life and Nutrition. The integrated tone is set in the introduction as follows:

Successful progress from childhood to adulthood depends to a large extent on whether families and communities can provide children with good nutrition and a healthy environment, and with the necessary care, encouragement and education to allow full and normal growth of body, mind, and emotions. The close relationship which mothers form with their babies and young children is of great value in early life, when important steps in children's growth occur. In Africa during the early years when children are on the breast, they rarely leave their mothers and close ties exist. After babies are weaned, however, they are usually quickly replaced by younger brothers or sisters and it is difficult for mothers to devote the time, energy and resources needed for the best development of the weaned children.

(p.1)

The first substantive chapter of the manual is devoted to "Child Development and Growth", creating mental and social-emotional development and physical growth in an integrated way. The discussion of breastfeeding includes the following:

African mothers are accustomed to having infants in the same bed with them and no African mother harms her child by overlying him. Separate beds for normal children with normal mothers should not be encouraged. In addition to the nutritional advantage to the child of suckling at night, the sharing of a bed with mother and child provides the child with warmth and security..." (pp.85-86)

The discussion of weaning states:

A mother should not send her newly weaned child away from her or put him in the care of people who do not know how to feed him properly. (p.92)

Practical learning experiences include examination of childrearing practices and conditions contributing to good physical, mental, emotional and social growth of children, the preparation of play materials, as well as practice with measuring growth, food preparation and other explicitly nutritional exercises.

In brief, although a stronger position might have been taken with respect to the synergistic nature of developmental components and actions, this manual does relatively a good job of bringing together in one place the various dimensions of development.

VIII

A PROGRAMME EXAMPLE : Northeast Thailand

Integrating Psycho-Social Components of Early Childhood Development into A Nutrition Education Programme

The following example of a combined nutrition and development programme is drawn from a case study prepared by Dr. Nittaya Kotchabhakdi (1987). The programme she describes is particularly instructive for several reasons:

- It focusses on young mothers and other caregivers attending to children from birth to age 2.
- It incorporates both nutrition and psycho-social education components into primary health care and a national programme of growth monitoring and targeted supplementary feeding.
- The education programme is based on previous study of nutritional status, and of caregiver knowledge, attitudes, and practices.
- The addition of the developmental component was based explicitly on the idea that nutrition and development are synergistically related. It focusses on the mother-child dyad and interactions with the assumption that "...improved mother-child interaction would have a positive effect on child nutritional status, acting through improvements in maternal understanding of the child's need and better feeding of supplementary food." (p.2)
- An evaluation accompanied the combined education programme and showed significant results.

1. Context

According to an analysis by the Ministry of health in Thailand, the three major constraints to significant reduction in the level of protein energy malnutrition (PEM) in infants and preschool children during the late 1970s were: (1) the inadequate coverage of the health system, (2) the lack of community awareness of the problem, and (3) the inadequate multi-sectorial input to the nutrition programme. Studies had shown also that, by themselves, income-generating projects did not necessarily have an impact on the problem.

Taking a broad approach to the problem, the government, in 1979, introduced growth monitoring, within a national plan for poverty alleviation and a programme of community-based primary health care. Growth monitoring was accompanied by a supplementary food program and nutrition education.

Growth monitoring provides the opportunity to advise parents about how to maintain their child's growth. It also leads to identification of cases of "poor growth" and of malnourished children. In the Thai programme, these cases were examined closely to discover the cause, and additional measures were taken to remedy the situation, including supplementary feeding, nutrition education, and referral to health workers.

The importance of nutrition education in this mix of programmes directed toward the most vulnerable infants and preschool children was demonstrated by the Institute of Nutrition of Mahidol University working in the poorer Northeast section of the country. Moreover, an important part of that nutrition education was a psycho-social component focussing on caregiver-child interactions and on the physical and social environment in which children are brought up.

In Northeast Thailand there are usually more than two generations living together in the same house or in

the vicinity. The women, including the mother, aunt, grandmother, and sisters are responsible for childcare. However, these women must also do the housework in addition to participating in agricultural and other income-earning jobs. The physical and mental condition of the mothers may, therefore, account in part for the lack of interaction between mothers and infants.

The culture values subtleness more than expressiveness. Newborn infants are usually wrapped and placed in a basket lined with a blanket, close to the mother for a few days. Parents, relatives and neighbors usually do not openly express their enjoyment or admiration of the baby for fear that the spirits might take the baby away. Relatives usually say aloud, "What an ugly baby he is," in order to deceive the spirit. Holy thread may be tied around the baby's wrist to protect the baby. This traditional practice may be another example of cultural adaptation to previously high peri-natal mortality rates. Infants are often given banana and sticky rice in addition to breastfeeding to make them "full" and "well-behaved." Children are often seen laying in a closed cloth cradle.

In addition to the above observations, a study of child-rearing attitudes and practices revealed several attitudes and beliefs affecting interaction of the caregiver and child:

2. Beliefs and Practices

2.1 Psycho-social beliefs and practices

- Few mothers recognized the visual perceptual or auditory abilities of infants. For instance, only 1.7 percent thought the baby could see at one week and only 14.7 percent at one month.

- Mothers displayed little awareness of their own capacity to make a difference in their children's development by making use of existing resources to create a more nurturing environment. Only one-third of the mothers would encourage

or play with their children using household items. There were no toys or recognizable play materials in more than 70 percent of the homes observed during the first home visits and almost half of the mothers reported never having given their children any toy or play materials. Mutually interactive games between the child and family members were reported in few families although these activities did not require commercial plan materials which may be limited by their economic status.

2.2 Nutritional beliefs and practices

- When introducing semi-solid foods as supplementary to breastfeeding, many mothers would discontinue feeding when the child turned away or thrust out its tongue.

- A misbelief about colostrum and early suckling was associated with failure to begin breastfeeding immediately following birth.

- Although most mothers breastfed, they did so with little understanding of its benefits and were ready to change to bottle feeding.

Identifying these beliefs and practices helped to provide a basis for the combined nutrition and development education programme.

3. Method

A series of interactive video nutrition education programmes was created. One of the five modules was specifically oriented toward child development, aimed at creating maternal awareness of her child as an individual with early perceptual ability, and at recognizing the importance of play and of mother-child interaction in that

play and in supplementary feeding. A second video comparing two 15 month old boys, one malnourished, the other normal, included behavioral as well as nutritional differences. The remaining three videos dealt with cooking of the supplementary food, the value of breastfeeding, and the nutritional value of five food groups. The video tapes are 25 to 30 minutes long with 8-10 interactions which, together, take up another 15 minutes.

Health communicators in each village, who also served as distributors of supplementary food, were trained in the use of the videos which were presented several times in each village.

The interactive learning and motivation strategies used with the video-based education included:

- Discovery/logical conclusion.

  The audience is exposed to certain information and then asked to make a decision logically following that information. Example: a newborn baby can see and hear and imitate facial expression.

- Analogy/logical conclusion

  The audience is reminded of something familiar that works on the same principle as the idea being taught. Then the audience is asked to draw conclusions from the new information based on the analogy. Example: the analogy of being greeted on the arrival at a house, with the mother-newborn interaction.

- Observation

  1. Description. The audience observes an event and reports what was seen. Example: Observe the reciprocal 'face-to-face' interaction between the doctor and a 3-month old baby.

2. Comparison. The audience observes two or more conditions and reports differences and/or similarities. Example: Contrast is shown between malnourished and normal boys in their physical and behavioural responses.

3. Modeling of Desirable Behaviour. The audience sees desirable behaviour and is asked to describe the positive behaviour or some of the elements. Example: mother prepares the supplementary food and feeds her baby who displays tongue-thrusting behaviour and disinterest. The desired behaviour is gently trying to feed again and distract the child.

- Specification

The audience is given a general principle and asked to apply it by giving specific examples. Example: play materials can be made from locally available plants. The audience is asked to name the plant and the play materials.

- Generalization

The audience is given specific examples and asked to conclude the general rule. Example: the baby can hardly see anything while she is laying awake in a closed cloth cradle.

- Personal Opinion or Feeling

The audience is asked to give their opinions about non-threatening subjects related to the matter. Example: the audience is asked to see things through the eyes of the infant in the closed cradle.

- Reinforcement

After every interaction an immediate feedback and reinforcement of the correct answer is given.

Field implementation involved sending a video-van equipped with a video tape player and color monitor to visit villages on a repeated basis. Accompanying the video van was a person who assisted the village health communicator in motivating participation from the audience and to answer questions raised in the video programme.

4. Evaluation and Results

An evaluation of the nutrition education programme was carried out to determine whether there were changes in caregiver beliefs and practices following showings and discussions of the video. Mothers of under-two children were interviewed during home visits. The interviewers observed mother-child interaction, type of cradle used, and existing play materials.

The evaluation showed that:

- Maternal knowledge about, and attitudes toward infants' ability to see were significantly more positive after seeing the videos. The increase was less dramatic in the number of mothers who thought their child could hear at the age of one week, but the increase was two-fold in mothers who thought a child could hear by the age of one month.

- More open cradles were found during home visits.

- Compared with mothers in villages where the video was not presented, a significant increase was found in the percentage of mothers reported giving colostrum to their newborns. More mothers gave correct reasons for giving colostrum and more mothers were committed to early suckling right after delivery.

- After the video, significantly more mothers responded to tongue thrusting or disinterest by repeated tries and playing with the child until the child took more food rather than just discontinuing feeding.

- In the post-test, fewer mothers reported they had never given their children any type of toys or play materials. In addition, more of them "played with" or taught their child when the child played with household items - rather than punishing or taking the things away.

- A modest but significantly higher proportion of mothers in treatment villages reported making play materials from local plants, as compared with mothers in villages where the video was not presented.

These results suggest that visual messages provided in a way that permits discussion, can bring about significant changes in beliefs and practices surrounding feeding, seen as a social as well as nutritional practice. In addition, educational communication can produce changes in the ways in which a caregiver establishes the environment for child development and interacts with infants. The method and the associated behavioural changes do not depend on literacy.

IX

OTHER PROGRAMME EXAMPLES

The several examples that follow illustrate different forms in which psycho-social components of development can be integrated into nutrition programmes. The examples chosen represent variations in 1) the type of nutrition and of psycho-social interventions used, 2) the beneficiaries, 3) the location of the interventions, 4) the sequencing of the combination, 5) the size of the programmes, 6) organizational responsibilities and funding, 7) the degree of community participation, and 8) geographical location. These differences are set out in Table 1.

Represented among the nutritional interventions are food supplementation, growth monitoring, nutrition education, social marketing, and breastfeeding, sometimes in combination. Developmental interventions include various center-based forms of early education, early stimulation, home visiting, and education of caregivers and of primary school students.

In several instances, the interventions were conceived in an integrated, converging way from the outset. In others, the psycho-social component was added on, as was the case with the Thai example described in the previous section.

Some programmes focus on children at birth and in the early months of life, others on children in the immediate preschool years, and others on parents or prospective parents.

Table 1. Examples of Combined Psycho-

Programme/ Country Dates	Scale	Nutrition Inter-vention(s)	Psycho-Soc Intervan-tion(s)	Other Compo-nents	Bene. ficieries
PHC Prog Thailand/ 1981 •	W/in Natl Expmt in 12 towns	Growth Mon Nutr. Educ Supplement	Parent ed (video)	Inc. Gen. Health	Childrn 0-2 w. "poor growth"
ICDS/ India/ 1975 •	National	Supplement	Non-forml Pre-school	Health Educ.	Childrn 0-6 Preg/Lac Mthrs Tribal/Marginal
TNIP/ India 1980 •	State-8 Districts (T. Nadu)	Growth Mon Nutr. Educ Supplement	None	Health Educ	Children 0-2 w. no wt. gain Mothers at risk
Famly Nut Impr Prog/ Indonesia 1986/87	W/in Natl Expmt in select towns	Growth Mon Social Mktg	Care-giver Educ.	Health Family Plan	Children 0-5 Mothers
PROAPE/ Brazil/ 1982/3	Regional (North-east)	Supplement	Pre-school	Health	Children 4-6 Urban Marginal
Nutr Cntr/ Chile 19	National	Supplement	Stimu-lation Play	None	Children 0-7 Severely Malnourished
Child-to-child/ Jamaica 1985	Country	Nutrition Education	Develop-ment Educ.	Health	Primary school students, grades 3, 4, 5.

Social and Nutritional Interventions

Sequence	Responsible Organization(s)	Community Participation	Location	Funding
"Add on" to Health & Nutr.	Min. Health, Interior. Mahidol U.	Part of larger comm-based Local para-prof	Food distr location Home visits	Govern. of Thailand
Integrated from outset	Min of HR, Dept. W + Ch Min Health	Local Para-prof Provide locale	Pre-school centre (Anganwadi)	Govern. of India UNICEF
No psycho-social component	State gov. Inter-dept Comm	Local Para-prof	Growth Mon Centre Home visits	Gov. India-State & Natl World Bank
"Add on" to Fam Plan'g, Hlth & nut	Min Health Nutr Direct Women in Dev Fmly Welfare	Local Para-prof	a. Nutr ctr discussion b: Home visit of centre	Gov Indonesia World Bank UNICEF
Integrated from outset	Natl. Food & Nutr Inst Min Health	Rotating Assr. from mothers	Pre-school Centre	Gov. Brazil World Bank
"Add on" to Nutr Recuperation Ctrs	?	None	Nutrition Recuperation Centre	Gov. Chile
Integrated Contnt/Add to school curriculum	Min Educ U. W. Indies (TMRU)	None	Primary school	Gov. Jamaica U.W. Indies

The two Indian programme examples that follow are complementary approaches to nutrition and development. The first, the Integrated Child Development Service (ICDS), was conceived in an integrated way, as the name implies. It is selective by large administrative area, but not in terms of the relative needs of children within those areas. Food is provided to all children participating in a pre-school or who come to the centre to receive a ration; therefore, the main beneficiaries tend to be children 3 to 6 years of age. The developmental intervention is conceived principally as a non-formal pre-school service. By way of contrast, the Tamil Nadu programme focusses on children 0 to 2, in a selective manner related to their identified nutritional needs. No developmental intervention is specifically built into the project, but a maternal education component is included. The example is included primarily to illustrate the potential for doing so and as a comparison with the ICDS programme.

1. India - ICDS: Food Supplementation

The Integrated Child Development Service (ICDS) of India may be the most massive programme in the world bringing together nutrition, health, and psycho-social components of development. This was conceived as an integrated programme from the start. It was preceded by an initiative located in the Ministry of Planning which constituted eight inter-ministerial study committees to work out a scheme for the implementation of integrated child care services. The committees could draw on considerable past experience in India with programmes of family welfare.

An experimental progrmme launched in 1975 in 33 administrative areas called "blocks," each containing approximately 100,000 people. A positive evaluation of the initial experience helped lead to its inclusion as a priority programme of the government and its continued

expansion to cover more than 2000 blocks (by 1986) representing almost one-fourth of the administrative areas. (Tandon, 1986)

The integrated purposes of ICDS are reflected in the multiple goals of reducing mortality, morbidity, and malnutrition in children under the age of 6 years while also providing them with proper psycho-social development so as to reduce school dropout and prepare the children for their later years. Focussed on tribal, rural, and urban marginal areas, the programme was designed to render supplementary nutrition, immunization, health check-ups, referral services, nutrition and health education, and non-formal pre-school education.

The intended beneficiaries of the programme are children in the age-group 0 to 6 years, expectant and nursing mothers, and other women in the age-group 15 to 45. The programme design calls for children up to 3 to receive supplementary nutrition, health check-ups, immunization, and referrals. Children 3 to 5 receive the same services, plus non-formal pre-school education. Expectant and nursing mothers are given health check-ups, supplementary nutrition, nutrition and health education, and (for pregnant women) tetanus immunization, with health and nutrition education also provided to women 15 to 45. Not all of these elements are actually delivered in all areas, but the design calls for them all.

the focal point for convergence of services is a centre called an Anganwadi (literally, courtyard), run by an Anganwadi Worker (AWW). AWWs are para-professionals selected according to uniform experiential and educational criteria set by the Central Government. They are provided with pre-service training which includes information about nutrition, health, and early education techniques. They are charged with providing early education to groups of children ages 3 to 6 and with helping to monitor growth, distributing supplementary food and vitamin A, maintaining immunisation records, making home visits and, sometimes, providing mothers with health and nutrition education. In these activities the AWW is assisted by a helper.

In each administrative areas, a Child Development Programme Officer is charged with implementation of the

programme. The CDPO is assisted by five supervisors and works directly with the Block Development Officer and with the Medical Officer. The programme is administratively under the Ministry of Human Resources, with support from Health, Social Welfare, and Community Development.

Discussion

Although the ICDS programme was conceived and organized as an integrated programme, organizational integration has been difficult to achieve in fact. Convergence of nutritional supplementation and education for pre-schoolers has been possible by making the Anganwadi the focal point for delivery of services. In operation, the AWW spends most of her time carrying out her pre-school functions. The assistant prepares food. Other functions in the long list of what the AWW is supposed to do often get neglected. In particular, feeding of the younger children, referral of pregnant and lactating mothers, and nutrition and health education are often weak components. (Bhalla, 1985). Because the AWW is not directly responsible for the health component, coordination with health workers is required. That coordination is sometimes difficult to work out. The degree of cooperation between the health personnel and ICDS-contracted personnel often depends as much on personal relationships and individual character as it does on the organizational arrangements at various levels within the block.

The fact that ICDS is centrally directed rather than based in the community means there is little reinforcing integration at the community.

The ICDS example shows a high degree of integration at a conceptual level and in policy and planning; the utility of the Anganwadi centre in facilitating convergence; the breakdown when one person is expected to serve as the integrating force for various actions without adequate support from the community; and the fragility of organisational devices attempting to secure collaboration among different parts of a bureaucracy.

At the same time, the example is encouraging because convergence of services is often achieved and the programme has had a significant effect on child health and nutrition (Tandon, 1986) as well as on the development of children (see, for instance, evaluations of the effect of ICDS on the progress and performance of children in primary school, as summarized in Myers, 1988). A structure is in place that can be improved with time. The example illustrates also the importance of continued strong political will.

2. India - TNIP : Growth Monitoring, Supplementation, and Education

The Tamil Nadu Integrated Project (TNIP) offers both a complement to and a contrast with the Integrated Child Development Service (ICDS). (The description of TNIP that follows draws heavily on writing by Alan Berg, 1987, in Malnutrition, What Can be Done?) The state level TNIP began in 1980 and concentrated on children from 6 to 36 months of age and on expectant and nursing women. Within Tamil Nadu state, six rural districts were selected where the most inadequate caloric consumption was found.

Growth monitoring was used to identify children who were at risk. Weighing occurred at community nutrition centres and in households (for those who did not get to the centres). The identified children were provided with short-term supplementary feeding to help them reach an acceptable pattern of weight gain. Those who did not respond were referred to health services. In addition, food supplements were provided to mothers who had a malnourished child or who had lost a child. Mothers were involved in the process through a comprehensive communications programme that included both personal instruction and mass media. Groups of women were formed who took on the task of preparing the food supplement from locally available and inexpensive ingredients.

An evaluation at the end of the project shows impressive

results in reducing malnutrition (Berg, 1987). Moreover, the proportion of children in the project area who required feeding dropped after the first two years, reducing costs. The targeted and temporary approach, combined with nutrition education was cost effective.

The project was administered by a group of professional administrators, responsible to a project coordinator. The coordinator also acted as the secretary to an interdepartmental committee, chaired by the state's chief secretary and bringing together the secretaries of finance, health, social welfare and other concerned departments.

Rather than overburden local health workers, a cadre of village nutrition workers and of nutrition supervisors was selected and trained. The project nurtured convergence of services and interdepartmental cooperation, rather than the integration, of parallel and mutually reinforcing systems.

Discussion

What seems to have been missing from the TNIP project is attention to the mental and social development of young children. This was not a goal of the project. And, the philosophy of the project was to keep activities as simple and focussed as possible. What could have been anticipated, however, was the addition of a developmental component, through simple messages and activities introduced into the nutrition education programme. And, recalling the findings that nutritional improvements do not automatically bring improvements in psycho-social development, adding on a developmental dimension would seem increasingly appropriate, as community workers master their strictly nutritional activities, as the level of malnutrition decreased, and as groups of women formed in which the topic could be treated.

3. Indonesia: Growth Monitoring and Caregiver Education

Over the past 10 years, Indonesia has developed a far-reaching community-based nutrition programme. The Family Nutrition Improvement Programme (UPGK) is integrated into a system of family planning and health which covers (as of 1987) approximately 90 percent of all villages.

The UPKG is primarily a growth monitoring and communications programme, organized and managed by village mothers. Weighing of all children under five years of age is done monthly in groups organized by women volunteers (kaders) and takes place in health posts, village halls or the homes of community leaders. This grouping provides an opportunity for education and discussion related to a variety of themes affecting child survival and development.

The programme takes as a basic assumption that most families possess sufficient resources to maintain good nutrition and health; that the major problems are awareness, information, motivation, and time.

Also involved in the national nutrition programme is the Ministry for the Role of Women through its Bina Kelluarga Balita (BKB) programme. The BKB is an action programme for the enhancement of the role of women in comprehensive child development. The primary idea is to add a new dimension to programmes providing basic services for mothers and children. Hence, the efforts of BKB are integrative and build upon existing structures and resources. The BKB programme offers a complement to center-based child care programmes through education of caregivers.

The monthly gathering of mothers for weighing of their children has provided an opportunity for the BKB to introduce a psycho-social development component into the nutrition programme. Discussion groups have been formed in some locations to deal with child-rearing issues and problems. From within the group come suggestions for activities and for possible solutions to particular problems. At each meeting, an activity is proposed for emphasis between meetings. For example, women might decide that they will

observe how they talk to their children. This may lead to suggestions for improvement such as trying to increase the amount of praise and trying to decrease the amount of negative talk, or, trying to respond more often to child-initiated conversation.

Play is encouraged by making toys available to the discussion groups from a toy bank. Ways of using the borrowed toys and of making toys from locally available materials are discussed.

The BKB initiative has been evaluated and monitored periodically. A 1985 report (Stein) indicated that results had been impressive as judged by demand in nearby villages, the involvement of volunteers, the reaction of mothers who were

> *both enjoying and profiting from their new found learning about stages of child development,*

and the results with children who

> *seem clearly to value the toys and use them both by themselves and, in play with mother and others in the family.*

The report concludes also that

> *"the preliminary evaluation research, giving evidence of positive impact from the pilot project, appears to be confirmed by current observation and experience.*

Finally, it is suggested that a side effect of the project seems to be

> *"the increasing ease and self-confidence of mothers not only with respect to their children, but also to one another."*

These observational conclusions needed to be backed up by more systematic evaluation.

Another Indonesian project intended to integrate psychosocial components into the nutrition programme is recently under way in the form of an experiment. This is a home-based intervention project designed to be carried out with mothers or primary caregivers and preschool children.

The experiment builds on the results of a recent study examining the relationship between nutritional status and a range of home environment and interpersonal variables. The results are being used to identify positive practices in the environment. Apparently, the best predictors of the 24 month old child's physical, mental, and emotional development (after controlling for family social and economic differences) are the primary caregiver's verbal responsivity, warmth, provision of play materials, and involvement with the child. (Satoto and Colletta, 1987),

Information about these practices has been converted into simple educational messages presented in cartoon form. In addition, wordless storybooks and directions for making toys from local materials have been developed. The cartoon messages and other materials can be used as a basis for discussions, either in groups at the time of weighing or in home visits by kaders. Use of the materials in home visiting programmes and in group discussion sessions is currently being tested.

Discussion

The two Indonesian examples represent ways to add on a developmental component to a programme that already has strong governmental support, has already been functioning for some time, has grown to large scale, and has become progressively more integrated. The community-based nature of the programme is noteworthy

as is the attempt to draw content for the growth and developmental programme from existing knowledge and experience of village women and from information about the correlates of positive development in an Indonesian setting.

4. Brazil - PROAPE: Nutrition Supplementation

With loan funds from the World Bank, the National Food and Nutrition Institute and the Ministry of Health in Brazil have collaborated in a combined nutrition, health, and non-formal pre-school programme, called PROAPE (Programme of Pre-school Nutrition). Children ages 4 to 6 living in marginal urban areas are brought together in centres during weekday mornings in groups of about 100 children for supervised psycho-motor activities and a snack. A health component is included in the programme. The children are attended by a trained pre-school teacher, assisted by 6 mothers or other family members who participate on a rotating basis.

Evaluations of PROAPE suggest that a very modest impact on physical growth resulted from the intervention (Berg, p.20), but that the effect on school readiness and performance and repetition in the first two grades of primary school was impressive. (Berg, 1987; Ciavatta Franco, 1983)

Discussion

In the Brazilian case, a package was developed that included several components from the start. The combined effort was facilitated by several conditions. A National Nutrition Institute existed that could take the lead in developing the programme. (This meant that the nutritional component was not itself farmed out to another part of the bureaucracy.) The creation of centres as a vehicle for delivery of food facilitated convergence of services. The link to

an international funding source helped to promote combination. In addition, the PROAPE model had been tried out and evaluated with good results, prior to launching the larger programme. The evaluated trial provided a firmer basis for acceptance by the participating organizations.

5. Chile: Nutrition Recuperation

This programme was described briefly when presenting evidence that children in recuperation centres improve faster when they are provided with stimulation and played with as well as given food (see p. 27). The example is included because it represents an "add on" within an existing structure. It is also included to remind the reader that without follow-up in such circumstances, the value of the integrated programme may be lost.

6. Jamaica: Education of Primary School Students

The Jamaican Child-to-Child programme illustrates an entirely different way of integrating nutrition and developmental components, focussing on integration of educational content. In this case, the caregivers to whom education is directed are primary school students, some of whom are responsible for care of younger siblings outside of school hours, most of whom will soon be parents themselves, and all of whom can be responsible for improving the conditions of their own homes and community (Knight and Grantham-McGregor, 1985).

In order to introduce primary school children to health, nutrition, and psycho-social development practices, materials and activities were created, building on local customs. Activities and materials dealt with foods, immunization, dental care, and development. The child development

curriculum included ideas about the different areas of development, important developmental achievements, and appropriate child care techniques. The children made toys from waste household materials and were taught how to use them with younger children to encourage development.

These activities were tried out in one rural school, with children in grades 3, 5, and 7. Teachers were trained to carry out the activities which were scheduled for one hour each week over the course of a school year. An evaluation showed an affect on the behaviour as well as on the knowledge of the primary school children. Based on the success of the intervention, a decision was made to incorporate the content into the curriculum on a nationwide basis.

Discussion

Child-to-Child programmes are now found in many countries. Primary school children are seen as caregivers, future parents, communicators of information, and actors in their communities. In most programmes, the content of the child-to-child interventions has focussed on health and nutrition issues, with little or no attention to caregiver child interaction that can enhance psycho-social development (Somerset, 1987). The Jamaican case provides an exception to that practice because developmental activities were included; it serves as an excellent example of how integration of programme content and actions can occur.

X

A CONCLUDING NOTE

It is our hope that the reader of this essay will take away several messages. Perhaps the most important general messages are:

1. There is a two-way relationship between psycho-social development and physical growth that is evident in an increasingly broad spectrum of scientific studies. Accordingly, the two processes should be approached together, whether the principal goal of a programme is said to be growth or to be development.

2. Although there are many barriers to combining attention to nutrition and to psycho-social development, there are also a variety of ways to get around these barriers conceptually, in policy and planning, in forms of organization, and in setting programme content.

3. Several kinds of nutritional programmes lend themselves to incorporating a psycho-social development dimension. These include programmes to promote breastfeeding and proper weaning, food supplementation, growth monitoring, and nutrition education.

4. Because the ultimate and most desirable combination is in the beliefs and actions of family members and other caregivers, programmes of educational communication which propitiate integration in action should receive high priority.

5. There are a sufficient number of good examples of combined programmes to both demonstrate that

it can be done and to provide useful models of how to do it - in a variety of ways, under varying conditions.

Against this background, there is no good reason why programme elements cannot be combined, given the will to do so. Excuses for not making good on the rhetoric of integrated attention to nutrition, development (and health) of the young child are weak. The rationale is strong.

It is now time to move beyond rhetoric to action. To do so requires a strengthened belief that combined actions are really appropriate and needed and, above all, the political will to pursue that belief.

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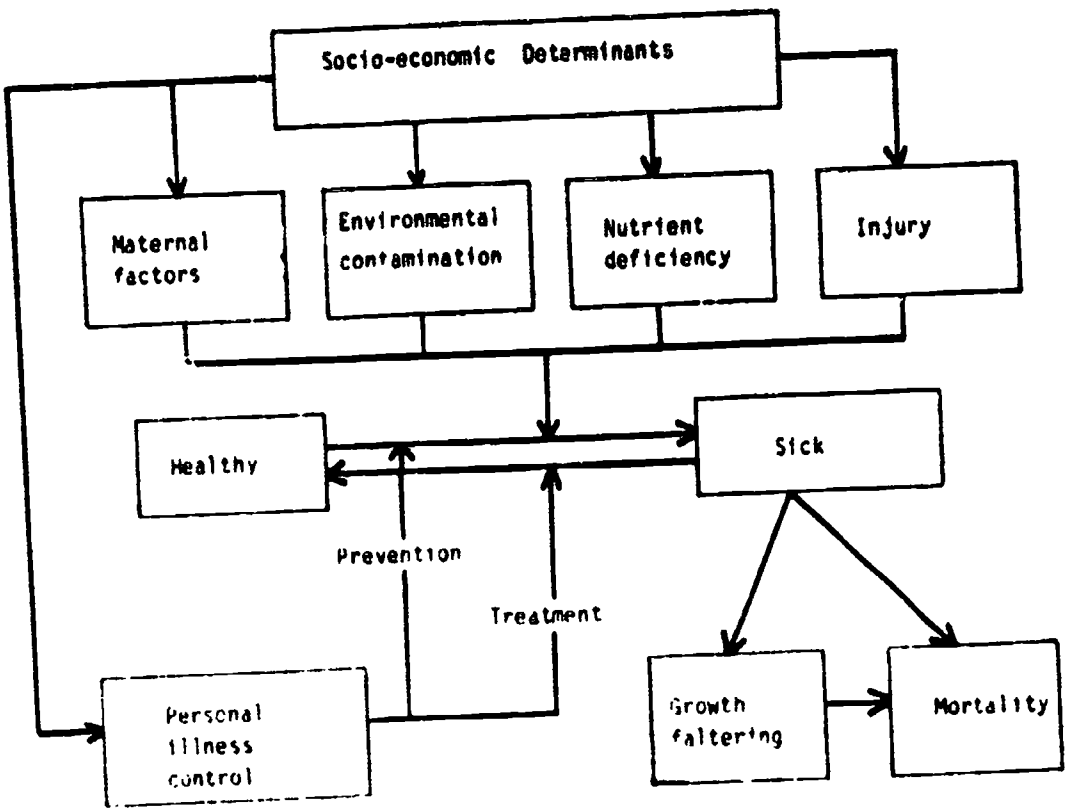
Appendix 1

THE MOSLEY-CHEN FRAMEWORK

The purpose of the model presented by Mosley and Chen (see Figure below) is to aid the study of social, economic, biological, and environmental factors affecting the probability of survival. This epidemiological model is the work of two medical doctors with field experience in developing countries and with a strong public health bias.

An Analytical Framework for the Study of Child Survival



This diagram is taken from: W. Henry Mosley and Lincoln Chen, "An Analytical Framework for the Study of Child Survival in Developing Countries," Population and Development Review, A Supplement to Vol. 10 (1984), pp. 27.

The variables presented in the model are specified roughly as follows:

Socio-Economic determinants

- Individual Level Variables
  - . Skill, health, time
  - . Traditions, norms, attitudes
- Household Level Variables
- Community Level Variables
  - . Ecological setting
  - . Political economy
  - . Health system

Proximate Variables

1. Maternal Factors
   - . Age
   - . Parity
   - . Birth Interval

2. Environmental Contamination
   - . Air; Food/water fingers;
   - . Skin/soil/objects;
   - . Insect Vectors

3. Nutrient Deficiency

   . Calories; Proteins

   . Vitamins and Minerals

4. Injury

   . Accidental

   . Intentional

5. Personal Illness Record

   . Preventive

   . Medical treatment

The Mosley-Chen model is particularly important for several reasons:

1. It represents a conscious, prudent, and influential effort to overcome communication barriers between medical and social science communities by seeking common ground, combining variables derived from the social sciences with medical variables in one operational model.

2. The model looks at survival (and death) as processes occurring in time and defined in terms of a health/sickness continuum. In so doing, the model redefines "cause of death" as the cumulative consequences of multiple disease processes (including their bio-social interactions). Growth faltering is taken as an indicator of a child's general condition, with death incorporated as the end point of growth faltering.

3. Within the medical community, this is a revisionist model. By giving an important place to socio-

economic determinants of survival, it shifts analysis and action from extending and improving the supply of health technologies and services to working on the demand for technologies and services while strengthening the "home production" of health.

4. By grouping 14 variables into a set of 5 "proximate" (intermediate) variables, Mosley and Chen arrive at a relatively parsimonious model in which socio-economic determinants are seen to act through the biological mechanisms to insert an influence on mortality.

In brief, this is an integrative and broad, yet relatively tidy analytical scheme marking an advance in thinking about child health and survival.

Featured in the Mosley/Chen model are five "proximate variables," labelled by Mosley and Chen as: Maternal Factors, Environmental Contamination, Nutrient Deficiency, Injury, and Personal Illness Control (see the Figure for more detail).

The question of the model is described in the following terms:

> *The socio-economic determinants must operate through more 'proximate variables' (intermediate variables) that in turn influence the risk of disease and the outcome of disease processes. The specific diseases and nutrient deficiencies observed in a surviving population may be viewed as biological indicators of the operations of the proximate determinants.*
>
> *(Mosley and Chen, 1984, p. 23)*
>
> *All proximate determinants in the first four groups influence the rate of shift of healthy*

individuals toward sickness. The personal illness control, factors influence both the rate of illness (through prevention) and the rate of recovery (through treatment). Specific states of sickness (infection or nutrient deficiency) are basically transitory: ultimately there is either complete recovery or irreversible consequences manifested by increasing degree of permanent growth faltering (or other disability among the survivors) and/or death. A novel aspect of this conceptual model is its definition of a specific disease state in an individual as an indicator of the operation of the proximate determinants rather than as a 'cause' of illness and death."

Adapting the model

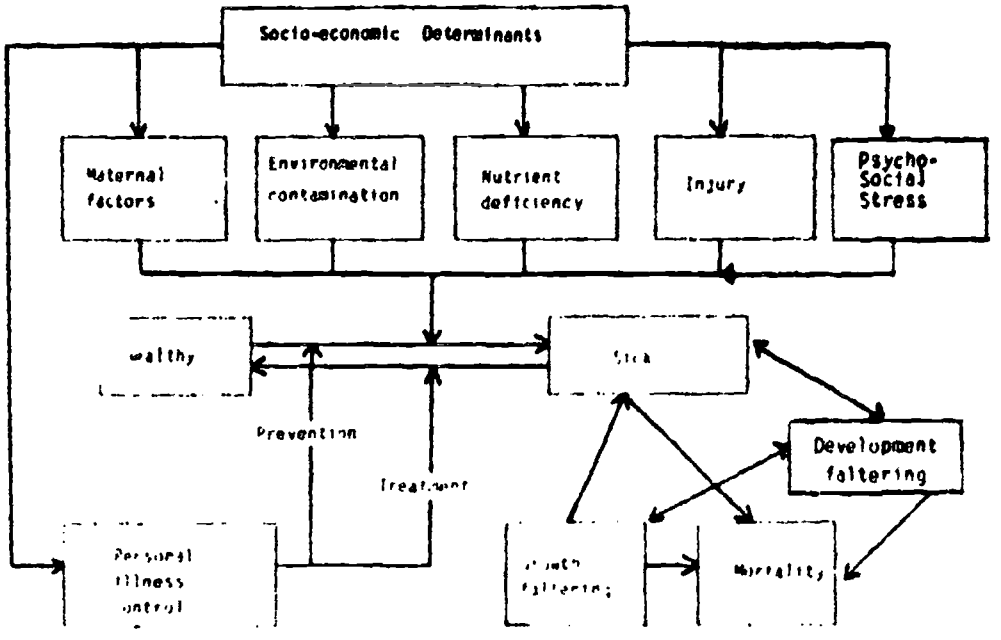
How can these ideas of child health and survival be applied to shed light on our concern with child development and care for children who are surviving? How might the model be used, adopted, modified, built upon? The following observations seem relevant:

1. Incorporating "Development" into the Survival Model

The child survival model of Mosley and Chen makes no specific reference to child development. However, making a developmental component explicit in the model is a relatively easy task and can be done from a health standpoint, by including psychological health and social adjustment as components of "a healthy state." Indeed, it is common for the medical community to include these in the definition of a healthy state (WHO, 1981). Moreover, Mosley and Chen open the door to a broader view with their reference to "other disabilities among survivors."

It seems both feasible and advisable to include a sixth "proximate determinant" in the Mosley/Chen model that might be called "psycho-social stress," affecting where an individual is on the health-sickness continuum. And, "development faltering" can be introduced as an outcome parallel to "growth faltering," making explicit the psycho-social dimension of being healthy or being sick. Growth faltering and developmental faltering are inter-related, and both are inter-related with health. The Mosley/Chen model is presented again below, with these additions made.

Revised Mosley-Chen Model



2. Attending to the mother-child dyad

Missing from the Mosley/Chen model and from their discussion of the operation of the model is reference to the mother-child dyad. Individual characteristics of the mother and father are included among the socio-economic determinants. But healthiness and development are very much a product of how a mother (or other caregivers) interacts with a child. More than time and education are required. In the list of traditions, norms, and attitudes presented by Mosley and Chen should be included child rearing practices and beliefs influencing the mother-child interaction. (This was not done in their explanation of the model.) What are beliefs about the ability of the child to see and hear? What are the feeding practices (not just food preferences)?

3. Community organization and support systems

Mosley and Chen describe socio-economic variables at three levels: individual, household, and "community". In their treatment of "community-level" variables the authors move directly to discussion of larger system variables operating at a national level. Missing is reference to community participation and organization in which "community" refers to an immediate social grouping, larger than the household, of which children and families are a part. Usually, "community" is associated with a particular town or, perhaps, a tribal grouping. Although an immense literature has been devoted to ways in which social organization and participation might be strengthened at the grass roots in support of survival and development, this dimension is missing from the model. It could be incorporated into the socio-economic determinants with relative ease.

Also appearing as important in the literature dealing with growth and development are "personal support networks". How a mother can use her time depends in part on her social system. Her self esteem and confidence, also important in improving care for a young child, can be influenced heavily by her social support system. Although the family is the first level of social support, it is not the only, or always the best support mechanism. The Mosley/Chen model does not incorporate this social dimension which is, however, picked up in other models to be discussed below.

4. A linear view

The social science model that Mosley and Chen build upon is essentially a demographic model seeking "main effects", describing the presumed effect of a set of independent variables on intermediate variables which, in turn, affect dependent variables. This linear flow does not allow for possible interactions among variables. The model differs fundamentally from a "transactional" or an "ecological" or anthropological treatment of the same topic.

5. A western view

In their discussion of the model, Mosley and Chen emphasize understanding interventions that have their origin in concepts and practices of Western medicine. The question is whether or not the western methods and technologies used are effective and have an impact. Another way of approaching the problem might be to ask, "What methods and technologies work?" By phrasing the question in that way, one opens to the possibility that local methods can be identified and supported that are different from, but as effective as the Western methods.

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