

5 THE USEFULNESS OF A CROSS-CULTURAL APPROACH IN STUDIES OF MALNUTRITION AND PSYCHOLOGICAL DEVELOPMENT

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What knowledge can be derived from a cross-cultural approach to the study of malnutrition and psychological development that has useful applications through intervention programs in developing countries? To answer this question, the emphasis in this chapter lies on the words *cross-cultural* and *applications*: What specifically is gained in taking a cross-cultural approach, that is, a comparative point of view that is sensitive to the cultural context of behavior? How can the knowledge gained through basic research in this area be usefully applied?

Much research in the past has focused on the behavioral effects of malnutrition, and we shall therefore consider this question in detail; as we shall see, it is a most complex affair, and this complexity in itself has implications for application. We will also examine the causes of malnutrition in terms of (a) the risk factors often associated with malnutrition, and (b) the dysfunctional child-care-taker interactions that occur to produce or reinforce malnutrition.

Implications for intervention programs will be considered, but a separate review would be needed to cover the applications of a cross-cultural approach to nutritional education (see Hoorweg & Niemeyer, 1980, 1982; Pollitt, 1980; Ricciuti, 1981a; Schürch, 1983; Schurch & Wilquin, 1982).

THE EFFECTS OF MALNUTRITION ON PSYCHOLOGICAL DEVELOPMENT

Much of the research effort in the early 1970s has been concerned with attempting to establish a direct link between malnutrition *per se*

and different aspects of psychological development, especially intellectual functioning. The main academic interest in this issue is a better understanding of the links between biological and psychological aspects of human development. The implicit (and sometimes explicit) social implications of this approach appear to be the following: If malnutrition impairs intellectual and social functioning, large segments of the populations in developing countries, being malnourished, are prevented from reaching higher levels of productivity or creativity, and thus the potential for national development (usually understood in economic terms) of these countries may be jeopardized. This should, it has been said, convince the respective governments and international agencies to take action against malnutrition. Such reasoning could imply that if malnutrition had no demonstrable effects on intellectual performance and hence, supposedly, economic development, it would be unnecessary to do anything about it. This is to forget that malnutrition may affect the general quality of life—physical, mental, and social well-being. These aspects are not as easily quantifiable as an IQ or GNP (see Delège, 1983, for an attempt within WHO to produce adequate mental and social indicators), but should be understood as the real basis of optimal development, individual and national.

The purpose of research on malnutrition and psychological development, therefore, should be to reveal the causes of malnutrition, and the mechanisms of its effects on psychological development, and this knowledge should help to prevent malnutrition; or if it has already set in, then to minimize its ill effects, and to speed up recovery. As we shall see in this review, malnutrition is seldom only a matter of the absence of food. It occurs in a complex eco-socio-cultural system and therefore the solution is rarely as simple as providing more food, although that may have to be the first and most urgent measure.

Epidemiology of Malnutrition

A great deal of effort has been devoted to the difficult questions of the definition and measurement of nutritional status and protein-energy malnutrition (PEM). Most accurate, perhaps, would be a direct biochemical assessment of cell metabolism, but it has proved difficult to establish reliable methods that are practicable in field situations. The assessment of clinical signs, on the other hand, is notoriously unreliable and applicable only to severe malnutrition. More indirect but more practical are growth measurements (anthropometry), in particular,

Stunting (height-for-age: long-term malnutrition) also showed a peak in the same age group, with a much larger overall prevalence in all developing countries, averaging 45% at one year of age, with figures as high as 73% for Nepal and 77% for Guatemala.

A subsequent analysis (Keller & Fillmore, 1984) compares weight-for-age in the data collected between 1963 and 1973 (52,000 children aged zero to five years from 29 countries) to those collected between 1973 and 1983 (93,000 children from 43 countries). The percentage of severely malnourished children seems to have decreased slightly in Latin America, Africa, and Oceania, but to have increased in Asia (from an average of 50.6% to 54.0%); overall, because of the growth in population, the estimated total number of severely malnourished children is now somewhat larger than 10 years ago (145 million as compared to 126 million children).

In addition to the type and severity of malnutrition, the length of the malnutrition episode should be considered, although this is an unknown factor in many studies. Generally speaking, it would be more appropriate to speak of malnutritious, in the plural, to indicate the diversity and complexity of the issue.

The Impact of Malnutrition on Intellectual Development

What is the impact of these different types of malnutrition on intellectual functioning? Despite extensive research on this subject, there is not a clear-cut agreement on the answer to this question. For example, Lechtig, Irwin, and Klein (1980) conclude:

Although it is very difficult to disentangle early protein-energy malnutrition *per se* from interrelated cultural, familial, and institutional influences, the available evidence suggests that it has a negative effect on intellectual, physical, and social development. A high incidence of the condition may entail a heavy economic burden and be a serious obstacle to development in many countries. (p. 49)

While Gopalan and Rao (1980) state:

It may be said that there is little solidly based evidence to show that malnutrition *per se* causes mental retardation and even less to show that it causes permanent mental retardation. (p. 35)

weight-for-height that indicates *wasting*, or current malnutrition, and height-for-age that indicates *stunting*, or the effects of long-term (chronic) malnutrition. Problems related to the use of anthropometry are the choice of a suitable reference population and the choice of cutoff points that enable nutritionists to classify nutritional status into normal, mild or moderate malnutrition, and severe malnutrition.

These problems have recently been discussed in detail by Rao (1982), Keller and Fillmore (1983), McLaren (1984), Johnston and Lampl (1984), and Waterlow (1984). In practice, the standards used are often British (Tanner, Whitehouse, & Takaishi, 1966) or American, either the so-called Harvard standards (Nelson, Vaughan, & McKay, 1969), or the National Center for Health Statistics (NCHS) data (Hamill, Johnson, Reed, & Roche, 1977). Local reference data are often either unavailable or are inevitably based on populations containing significant proportions of chronically undernourished individuals. The cutoff points for severe malnutrition have typically been 60% of the median reference weight-for-age (Harvard standards), 80% of the median reference weight-for-height and 85% of the median reference height for age, but Waterlow, Buzina, Keller, Lane, and Nichaman (1977) have recommended a cutoff point at 2 standard deviations below the reference weight or height, because such a procedure renders different age groups more comparable.

Keller and Fillmore (1983), using the latter cutoff point with NCHS reference curves, have reanalyzed the data of a large number of studies from about 50 different countries. The prevalence of *wasting* (weight-for-height: acute, current malnutrition) in the second year of life is below 10% for most countries in Latin America and in the Eastern Mediterranean region, while in Africa and South Eastern Asia, the prevalence ranges from 5% to 55%, with most countries having a prevalence of more than 10% (average about 15% at one year of age). Among the developing countries, almost all populations have a peak percentage of wasted children in the second year of life. The authors conclude:

The fact that the 12 to 14 month-old age group can be isolated as being at high risk for wasting suggests a nutritional or health problem which is not a result of general lack of food availability, a problem upon which the health sector probably has little influence, but rather a problem in which nutrition education and general health measures might have an impact. (p. 137)

Part of the contradiction comes from the following two issues: (a) the expected level of effects—Gopalan and Rao speak of the absence of mental retardation, but there may be various levels of suboptimal development; and (b) the attempt to establish the influence of malnutritions independently of all other factors, as if it were possible to isolate it.

It has now been widely recognized that malnutrition is always part and parcel of an eco-socio-cultural system that includes other adverse environmental conditions, such as poverty, poor housing and sanitation, repeated exposure to infectious and parasitic diseases, inadequate health care, and poor feeding and child care practices.

There has been a tendency to move away from the assumption of a direct causal relationship between early malnutrition, altered brain development, and impaired intellectual functioning toward a focusing of greater attention on the following issues:

- (a) more systematic analysis of the ways in which the child's nutritional status and aspects of his or her social environment and early experience may interact in jointly influencing the course of psychological development, with more precise assessments of nutritional status as well as behavioral outcomes;
- (b) a fuller understanding of the mechanisms through which altered nutritional status may affect behavior and psychological development; and
- (c) evaluation of the effectiveness of systematic efforts to prevent or ameliorate the potentially adverse behavioral consequences of early malnutrition.

We shall examine the complex ecology of this malnutrition syndrome and some of the models proposed for the mechanisms of influence in a later section of this chapter. For other reviews, see Brozek (1978), Pollitt and Thomson (1977), Ricciuti (1977, 1979, 1981a, 1981b, 1982), and Ricciuti and Dorman (1983). For entire volumes devoted to this topic in the last few years, see Lloyd-Still (1976); Greene (1977); Brozek (1979); Levitsky (1979); Griesel (1980); Balderston, Wilson, Freire, and Simonen (1981); Rajalaksmi (1982); Celedon (1983); Galler (1984); Brozek and Schürch (1984); Brozek (1985); and Barrett (1985).

The Impact on Emotional and Motivational Aspects of Behavior

Another interesting recent trend is a shift away from an almost exclusive attention to intellectual development, to the study of devel-

opment in the *emotional* and *motivational* spheres. Barrett (1984) reviews eight studies, all published after 1975, that show the malnutrition syndrome to produce attentional impairments, reduced social responsiveness, poor state control, difficulties in tolerating frustration, low activity levels, and lack of initiative and independence, even in the absence of any measurable cognitive impairment. In his own study on the effects of energy supplementation on the behavior of 138 school-age children in Guatemala, Barrett observed their social interactions over two days, through time-sampling behavior observations and global ratings in either naturalistic or contrived situations. The children's nutritional history was significantly related to a number of important dimensions of social and emotional functioning, in particular, to interest and involvement in the peer group's activity, activity level, and affective characteristics. Children who had received a higher level of supplementation were less often anxious, and showed more positive affect, more exploration of a novel environment, more persistence on a frustrating task, and more involvement in a competitive game and greater alertness and better motor control in an impulse control game. Barrett concludes that the effect of supplementation is "to increase the child's ability to seek out stimulation and respond to environmental stimuli" (p. 299). But the effect depends on the social and cultural milieu, and on behavior norms and expectations, for example in relation to the differential socialization of boys and girls.

In a study of the effects of moderate malnutrition on the development of sensorimotor intelligence (in infancy), Dasen, Lavallée, Retschitzki, and Reinhardt (1977) found that the substage that was most affected was characterized by the "tertiary circular reactions"—the discovery of new means to reach a goal through active experimentation. The infant at this stage no longer applies known action schemes to new situations, but actively searches for new schemes through trial and error. It is this "active experimentation" that seemed to be affected by adverse nutritional status. As Piaget has often stated, optimal cognitive development depends on an active interaction with the environment. Thus cognitive, attentional, and motivational aspects can be closely linked and interact with each other (Cicchetti & Hesse, 1983).

The findings of an impairment in social responsiveness, activity level, affect, attention, and interest in the environment are extremely important, because, in addition to their direct consequences for reduced psychic activity, they mean that the malnourished child becomes a *different type of stimulus* both to peers and to caregivers. Research to be reviewed below shows that the latter tend to respond to the malnourished child less often and with less enthusiasm. The child in turn withdraws

In a follow-up study of severely malnourished infants and their "controls" (Stoch & Smythe, 1980), differences were found in scholastic and extracurricular learning experiences, dropout rates, occupational and social roles, and social integration and identity. Another observational study in Mexico by Chavez and Martinez, reported by Brozck (1983), has found differences in classroom behavior and school results that are not only highly statistically significant but also of practical importance.

These studies suffer from the same limitations as the large majority of projects dealing with malnutrition and intellectual performance, in particular, insofar as they are unable to demonstrate the impact of malnutrition *per se*; but they do show that malnutrition is indeed of functional social significance. It should also be noted that many studies report the difference in average scores between a control and a supplemented group. This may in fact distract attention from the most important effect, that is, of pulling up the lower tail of the distribution: Rather than simply improving everyone a few IQ points, or a few hundred grams in weight, the intervention may substantially reduce the occurrence of severe intellectual deficit or physical wasting in, say, the lowest 15% of cases.

Methodological Contributions of the Cross-Cultural Approach

It is not necessary for the study to include a comparison between two distinct cultural groups in order to be of a cross-cultural nature; in fact, the comparison is usually made between two subgroups of the same macro-culture, the so-called index and control groups. The cross-cultural dimension comes from the use of the instruments, measures, research designs, and underlying theories that typically originate in a Western scientific paradigm and are then carried across cultures.

It is well known that the cross-cultural use of tests and other psychological instruments exacerbates the methodological problems inherent in psychometrics, yet until recently very few authors took these into account. A review of psychometrics applied to malnutrition studies as recent as that of Hurwitz (1984) pays only lip service to the cautions raised by cross-cultural psychologists, and goes happily on recommending the use of general developmental schedules and IQ tests, if not supposedly "culture-free" tests.

Dasen and Colomb (1984) have dealt with these problems previously, and extensive treatments of methodologies applicable to cross-cultural

further from social interaction, and a sort of *behavioral vicious circle* is generated (see below).

Functional Impairments

It is not always clear whether the statistically significant differences in behavior that can be attributed to the malnutrition syndrome are also functional impairments. In Dasen et al.'s (1977) study, for example, the effects observed were on the order of one or two months (occasionally three or four) in the age of attainment of some substages, but all infants eventually reached the last substage, and no structural differences in cognitive processes were found. It is not clear what *functional importance* such lags in development may have.

In studies using psychometric tests, typical differences between the means of the index and control groups are on the order of five to ten IQ points, but there is a large overlap between the distributions. Even if IQ tests are predictors of school performance, such a result means little in terms of a functional handicap such as the inability to take advantage of educational or vocational opportunities, being less productive, or enjoying life less. Rather than the performance on some strange test, it is quite obviously these functional aspects of optimal development that are important, yet very few studies have so far attempted to measure them.

Teacher ratings, classroom behavior, or school failure have been included in a number of studies, for example, by Richardson, Birch, Brabie, and Yoder (1972) in Jamaica; Stoch and Smythe (1980), and Stoch, Smythe, Moodie, and Bradshaw (1982) in South Africa; and Galler, Ramsey, Solimano, and Lowell (1983), and Galler, Ramsey, and Solimano (1984) in Barbados. In this last study, children aged five to eleven years with a history of severe malnutrition in early childhood, but who had completely recovered, were found to have lower performance on eight out of nine academic subjects, an outcome shown to be mediated to a large extent by deficits in classroom behavior, and to a lesser extent by a reduction in IQ. Schuftan (1984), reporting on an older study in Chile, finds that low school performance is not directly correlated with malnutrition and socioeconomic and cultural deprivation, but is linked to these through IQ. The problem with these models is that the theoretical status of IQ is weak and controversial; at least it can hardly be used as an entity independent of the poverty syndrome itself, insofar as it is derived from socioculturally biased instruments.

situations are available (e.g., Brislin, Lonner, & Thorndike, 1973; Irvine & Carroll, 1980). Some of the major recent research projects, particularly the large-scale longitudinal ones in Latin America, have been careful in having local or cross-culturally sophisticated psychologists adapt tests (for example, reordering item difficulties) and produce local norms, or even to design new and more appropriate tests, or measures based on behavior observations in more or less naturalistic situations. Examples of these new trends are the "natural indicators of cognitive development" devised by Nerlove, Roberts, Klein, Yarbrough, and Habicht (1974) on the basis of so-called spot-observations, and used in the INCAP longitudinal study in Guatemala (e.g., Irwin, Klein, Engle, Yarbrough, & Nerlove, 1977), which also used ratings by adults in the communities of the children's *listura*, a ladino term for intelligence or cleverness. While these measures are still not entirely "emic" (i.e., derived from local norms and values), they are more likely to be culturally valid than imported standard tests.

It is sometimes argued that malnutrition studies, because they compare two subgroups of the same culture, do not have the methodological problems that comparisons across cultures must face; it would be sufficient to show that the measures are reliable (i.e., that they produce consistent results over time and investigators) and discriminating (i.e., that there is sufficient variation between subjects). If the testing conditions are unfamiliar to the subjects (e.g., an adult asking for a child's opinion, or asking questions to which the adult already knows the answer), involve nonexplicit assumptions and expectations (e.g., working quickly, attempting to do best), or unfamiliar materials (e.g., paper and pencil, geometric forms), all subjects are expected to be similarly disadvantaged, and, as long as the scores are not compared to norms, a comparison of subgroups is deemed possible. This is partly correct, but the major problem remains one of *construct validity* and *cultural validity*. Construct validity refers to the psychological dimensions the test is supposed to measure; the same test applied in two different cultures may in fact measure different dimensions (MacArthur, 1973, 1974). Furthermore, a test may be psychometrically perfect, but measure a skill that is of no relevance in a particular culture; in other words, it lacks cultural validity.

The problem may be even more complex. There is a growing appreciation in the cross-cultural literature that the "demands" of the environment play a major role in shaping the development of skills. The kinds of physical materials encountered, the uses to which they are put, the activities that prepare for adult work in providing income, food and shelter, the beliefs and values of parents and teachers—all these features

of the "developmental niche" (Harkness & Super, 1983) influence which skills a child will invest more psychic resources in, which will develop more rapidly, and, perhaps, more robustly (see Dasen, 1975). In this vein, it has been proposed that the psychological and behavioral effects of malnutrition may themselves be a variable, that is, that the *expression* of malnutrition may reflect the child's environment (Super, 1984).

The cross-cultural approach has contributed a great deal to our understanding of such methodological problems, and should be taken into account to a larger extent in the planning of future research. Under the influence of anthropology, sophisticated cross-cultural research now pays much more attention to behavior occurring in natural situations, and to the context of behavior (Ciborowski, 1980; Jahoda, 1982; LCHC, 1979). The cross-cultural approach is also giving psychologists from developing countries the self-assurance and courage to question the ethnocentric aspects of Western theories and methods and to develop culturally more adequate alternatives (e.g., Scerpell, Berry, personal communications; D. Sinha & Holtzman, 1984; J. Sinha, 1983).

THE ECOLOGY OF THE MALNUTRITION SYNDROME

A sound knowledge of the *mechanisms* of the influence of the malnutrition syndrome on behavior, and, even more important, the influence of the *causes* of malnutrition, is needed to plan efficient prevention and intervention programs, and it is to these issues that we now turn our attention.

Model of Mechanisms

In considering the impact of the malnutrition syndrome on behavior, two mechanisms or routes have been proposed; these are illustrated in Figure 5.1. The first route is a direct influence of undernutrition on the development of the central nervous system (number of cells or number of connections) or on its functioning. A great deal of experimental research on animals is available to prove such a direct organic mechanism, and interesting hypotheses are related to specific periods of greater vulnerability (for example, during the growth spurt of the brain), or to localized areas of the CNS that are more sensitive to nutritional injury and yield specific deficits (for example, in spatial skills). The

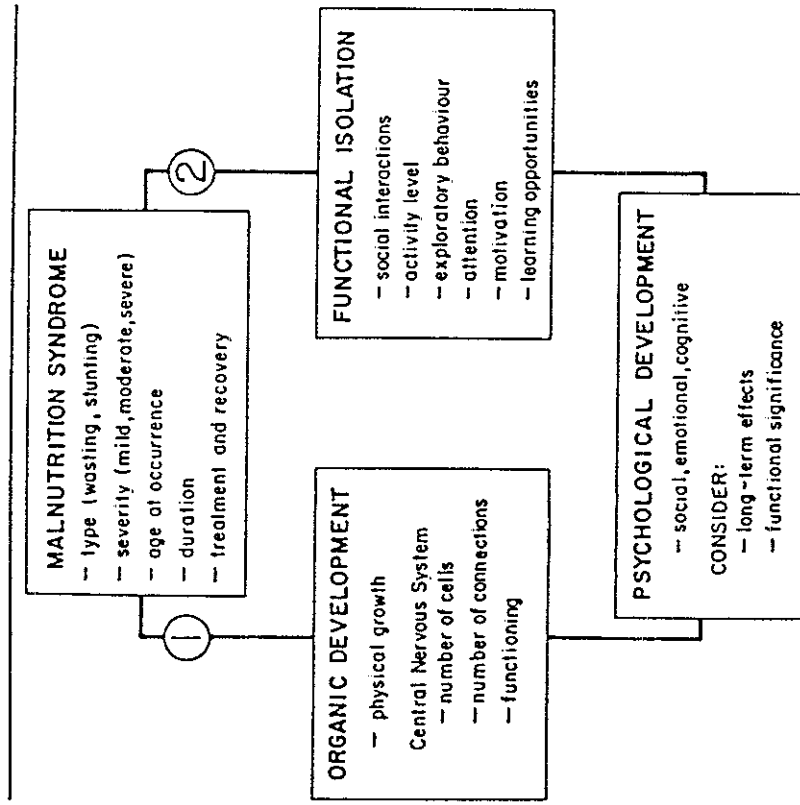


Figure 5.1 The Impact of Malnutrition on Psychological Development: A Model Distinguishing Two Mechanisms

volumes edited by Levitsky (1979), Brozck (1979), and Rajalaksmi (1982) each contain several papers on this field of inquiry, and a recent summary of the advantages and limitations of animal models has been provided by Smart (1984).

Until the early 1970s, this first mechanism was thought to be the sole or major one, in both animal and man; the implications for intervention were that food supplementation, during pregnancy and the early periods of life, would be sufficient to ensure optimal development.

This soon proved to be a simplistic or at least insufficient model, in part because of evidence that brain function is remarkably well buffered from nutritional insult, except under the most extreme conditions, which do not characterize the situation of the majority of malnourished children. The complexity of the issues forced researchers to consider a

second, more indirect, route: malnutrition produces a so-called *functional isolation* of the malnourished organisms (Levitsky & Strupp, 1984), reducing social interactions, activity level, exploratory behavior, attention, and motivation. It is this functional isolation that reduces learning opportunities and thus hinders psychological development.

These two mechanisms are not mutually exclusive, of course, and they may interact, but it is currently thought that the second route is the most important one. For intervention programs, it implies that greater attention be paid to social and behavioral aspects, and, in particular, to child-caretaker relationships. Indeed the model presented in Figure 5.1 is in fact embedded in a much larger web of elements and relationships that may be called the *ecology* of the malnutrition syndrome.

Model of Causes

A general model of the ecology of the malnutrition syndrome is illustrated in Figure 5.2. The basic elements are the characteristics of the macro-environment: the family or home environment, the caretaker (usually the mother), and the child. Later in this chapter, we shall deal with the caretaker-child interactions as our particular focus in this model.

The characteristics that define the basic elements of the model are listed in Table 5.1; research mainly based on anthropological, sociological, and epidemiological methods designates these characteristics as *risk factors*, a combination of which is likely to cause malnutrition. More detailed reviews that also provide detailed references to the research on which this model is based may be found in Ricciuti (1981b, 1982), Ricciuti and Dorman (1983), Grantham-McGregor (1984), and in Galler, Ricciuti, Crawford, and Kucharski (1984).

"Malnutrition never occurs alone, it occurs in conjunction with low income, poor housing, family disorganization, a climate of apathy, ignorance and despair" (Birch, 1972, p. 78), in other words, in the context of poverty. But poverty is produced by the social and political systems, and the world's unbalanced economy, otherwise malnutrition would not be restricted mainly to the southern part of the hemisphere! This is what we may call the *macro-environment*, the factors that are to a large extent outside of the control of individuals.

A combination of the macro-environmental factors listed in Table 5.1 is usually found to indicate *high risk* of malnutrition. Even in the same unfavorable macro-environmental conditions, however, malnutrition does not occur in all individuals; there must, therefore, be other factors

TABLE 5.1
List of Risk Factors

<p>Macro-Environment:</p> <ul style="list-style-type: none"> -World and local political, economic, and social systems -Unequal distribution of wealth -Demography (high population density and growth) -Agricultural problems: <ul style="list-style-type: none"> -Small land size and lack of ownership -Deterioration of soil fertility (erosion, chemicals) -Agribusiness favoring single crops and cash crops instead of diversified local food supply -insufficient quantity and quality of food availability -Poor sanitary conditions -Poor health care, poor access to health care, or failure to use access to health care -Disadvantaged socioeconomic conditions: <ul style="list-style-type: none"> -Low income -Lack of education and access to education -Poor quality of housing
<p>Family Characteristics:</p> <ul style="list-style-type: none"> -Large number of children (3 to 5, depending on context) -Absence, or lack of involvement of father -Stress in marital relationships -Alcoholism -Little contact with public media (especially radio) -Inequitable distribution of food in the family -Cultural food restrictions (e.g., taboos and superstitions, particularly for pregnant women and children) -Concepts of food and illness (e.g., malnutrition symptoms are not recognized as illness, and are not related to feeding) -Absence or failure to use formal or nonformal support systems -Sociocultural isolation
<p>Caretaker Characteristics (usually mother):</p> <ul style="list-style-type: none"> -Age below 19 or above 35 years -Mother's poor nutritional history -Mother's problematic childhood history -Unwanted pregnancy -Birth spacing below two years -Poor prenatal health care -Early weaning and bottle feeding in unfavorable circumstances -Disposition toward physical or mental illness -Anxiety, stress, depression, apathy -Immature personality
<p>Child Characteristics:</p> <ul style="list-style-type: none"> -Premature birth -Low birth weight -Pre-, peri-, or postnatal medical complications -Separation from the mother at birth, or in the first six months -Less desired sex -infectious and parasitic disease, disabilities -"Sickly state" -Physically unattractive

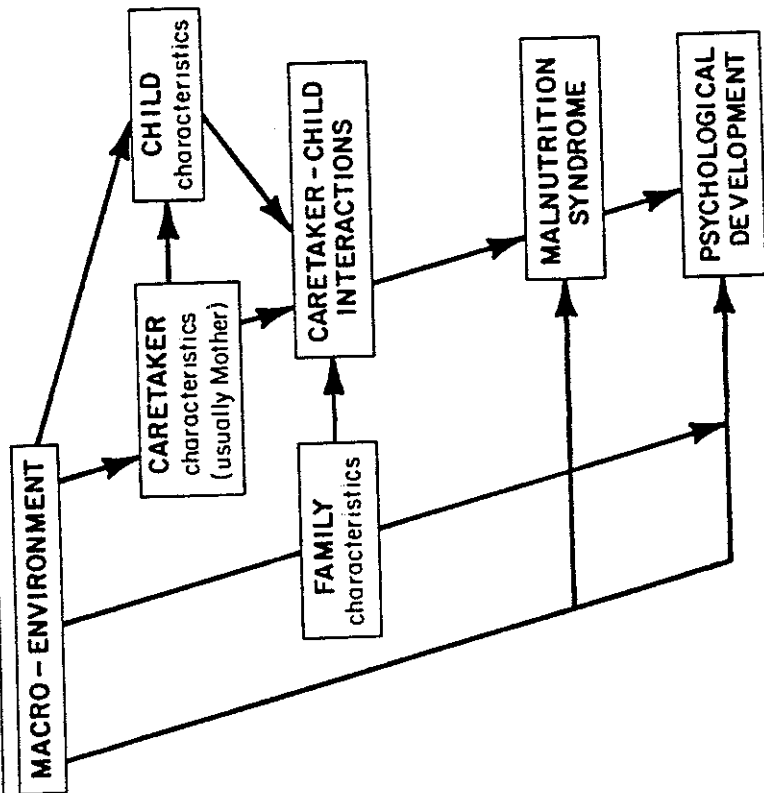


Figure 5.2 The Ecology of the Malnutrition Syndrome: A General Model

acting within these general conditions to produce malnutrition. These are the risk factors related to the *family/home environment*, and the *mother/caretaker characteristics*, some of which are listed in Table 5.1. Some children are more prone to suffer from malnutrition than others because of constitutional factors or their own medical history; there are therefore also risk factors that result from the *child's characteristics*. The risk factors outlined in Table 5.1 have been identified in a large number of studies, and usually show a statistically significant relationship with nutritional status. Occasionally one or the other variable does not show such a correlation, but the different studies are not really comparable, varying in the geographical, social, and cultural background of the population and the type, severity, and duration of malnutrition. Any profile or set of indicators predicting risk of malnutrition (Goodall, 1979) will have to be tailored to each specific situation. Developing a checklist of risk factors for primary health care workers would be a

useful practical application, as long as instructions are also provided on how to adapt it to local conditions.

Even more important than individual risk factors, however, is the combination among risk factors. A risk factor never occurs alone, but in interaction with other risk factors, in an additive or even multiplicative interaction. For example, in the conditions of poverty on the periphery of a large city in a developing country, a young woman of 17 may bear a premature or SGA (small for gestational age) baby after an unwanted pregnancy that she was trying to hide, therefore getting inadequate prenatal care; she may be anxious about the future and get depressed, having no support from the father of the child. On the other hand, the negative factors may also be compensated for by positive ones, interacting to prevent the occurrence of malnutrition or alleviate its ill effects. In the example just mentioned, the mother may have the support of her own mother, her extended family, or a cooperative women's association, providing her with help, advice, and social comfort.

Any list of risk indicators should, therefore, attempt to capture the complexity of interactions among factors. It is this complexity that may explain why, in the same high-risk macro-environment, malnutrition occurs in some families and not in others, or hits only one child in the family. But there are indications that even if all the risk factors just outlined were held constant, the incidence of malnutrition would still vary because of behavioral aspects, particularly in the child-caretaker relationships. It is to this topic that we shall now turn our attention for a detailed analysis.

In the studies reviewed in this section and the next, it is difficult to separate the specific contributions of a cross-cultural approach. Research in this area is typically multidisciplinary, crossing the traditional boundaries of the social, behavioral, and medical sciences, and paying much more attention than previously to the social and cultural contexts.

CHILD-CARETAKER INTERACTIONS

There is convincing evidence that malnutrition produces changes in the child-caretaker relationships that eventually aggravate the condition and diminish the child's social and intellectual stimulation. It is extremely important to recognize the mechanism of this *behavioral vicious circle* and to study means to break it. This evidence is best illustrated with the following two studies:

Chavez, Martinez, and Yaschine (1975)

In this six-year longitudinal study of moderate malnutrition in rural Mexico, two groups of 17 mother-infant pairs were matched on socioeconomic status, age, height, and parity; the neonates were of good health and normal birth weight. In one of the groups, the mothers received a food supplement during pregnancy, and the infants were given a supplemented diet after the third month of life. The nonsupplemented children presumably suffered from moderate malnutrition, as is common in this population; no severe symptoms were observed that would have required hospitalization. Behavior observations were carried out every two months initially, then every four months; these lasted three continuous days, using only the second and third days for data analysis in order to minimize the bias created by the observer's presence. Records were made of the observations during two times 150 minutes, plus 10 minutes in every hour.

The nonsupplemented children were consistently found to sleep more, to be less active (up to six times less than supplemented children), to be closer to the mother, with more clinging, and to present more dependency behavior after six to nine months; they spent less time outside of the home, played less, talked less but cried more. The mothers in the nonsupplemented group took less care in cleanliness, attended to the child less quickly, were less concerned to avoid accidents, and showed less affectionate attention (giving praise, presents, space, listening to the child). They also provided less emotional contact, fewer types of stimulation, and only half the verbal stimulation than did the mothers of the other group. (Related findings have been reported by Super et al., 1981.)

The supplemented children also received much more attention from their fathers, who publicly showed pride in their offspring. After 36 weeks, the children presented twice as much complex behavior than the nonsupplemented children, including behavior judged negative. In other words, they made themselves a nuisance, thus attracting attention, especially from the father. It was also found that children who did not ask for food or toys did not get them because the parents took little initiative, while those who requested more food got more. (A similar observation among Australian Aborigines is reported by Hamilton, 1981.)

In this study, as in others of similar design, the striking results cannot be attributed to food supplements alone. Attending the study center to collect the food supplements would also provide social stimulation, and probably prestige and salience in the community; for this reason, other

studies either provided supplements (with different protein/calorie contents) to both groups (Klein, Irwin, Engle, & Yarbrough, 1977), or willingly provided social and educational stimulation as a part of supplementation (Sinisterra, McKay, Gomez, & Korgi, 1979). The value of the study by Chavez et al., however, lies in the detailed behavior observations in naturalistic settings, and the demonstration that an intervention can produce massive effects on the behavior of both the children and their caretakers.

Graves (1979)

The second study that we have decided to single out is also based on behavior observations, albeit of only 20 minutes and in the more restricted setting of a room in a clinic. The samples consisted of 35 infant-mother pairs in Bengal, India, and 74 pairs in Katmandu, Nepal; about half of the infants, aged seven to eighteen months, suffered from moderate malnutrition, but all children were judged to be free from other disease.

The malnourished children in both groups tended to have a reduced activity level, and reduced exploratory behavior (particularly for distance interactions), to show reduced "secure attachment" behaviors and more dependent behaviors, for example, they would stay in the mother's lap more and suck the breast more. Increased suckling may be a response to the poor nutritional status in an attempt to bring it back to normal; if this behavior lasts too long without being effective, however, it produces a functional isolation from the environment.

Bengali mothers tended to interact with undernourished children less vigorously than with well-nourished children. In the Nepali sample, there were no statistically significant differences in mothers' behavior, except that in the well-nourished group there was an increase of mother-initiated behavior with age, while in the malnourished group, there was a decrease of such behavior. This illustrates the feedback loop or vicious circle between the altered state of the infant who presents a less attractive stimulus to the mother, who in turn initiates less stimulation. The difference in the results between the two samples warns of the existence of cultural differences, even in populations that are relatively close to each other.

The Vicious Circle: A Model

The behavioral vicious circle just described is illustrated in Figure 5.3, a model derived from Galler, Ricciuti, Crawford, and Kucharski (1984).

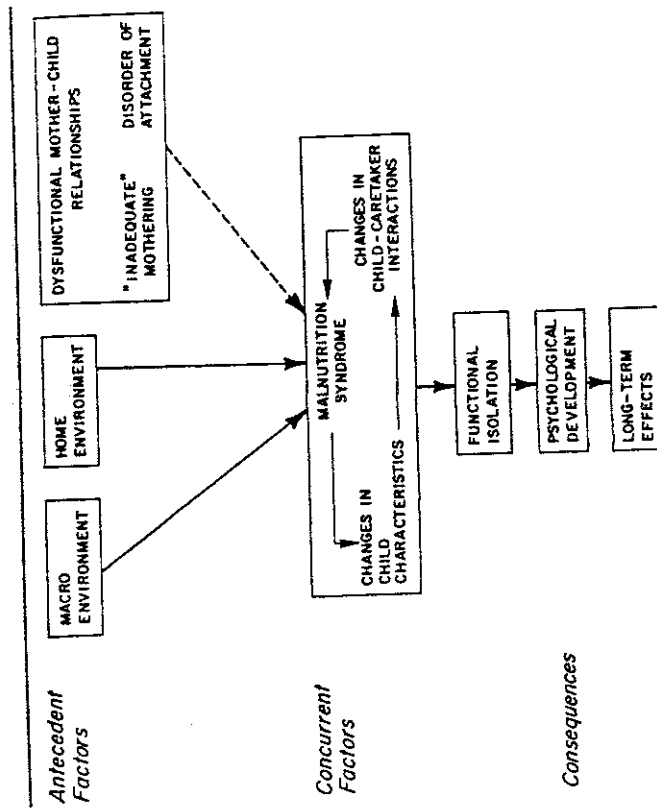


Figure 5.3 Malnutrition and Child-Caretaker Interactions: A Model

It should be clear that Figure 5.3 is a more detailed elaboration of one part of Figure 5.2; the ecology of the malnutrition syndrome, that is, the general socioeconomic and political circumstances in which this vicious circle occurs, should always be kept in mind.

A distinction is made between *concurrent* factors and *antecedent* factors. The studies reviewed illustrate changes in the child-caretaker interactions that have been observed *during* the episode of malnutrition, and the initial cause of the attempted adaptation is the malnutrition syndrome.

An interesting alternative hypothesis is that the onset of the malnutrition episode is itself caused, at least in part, by the caretaker's behavior. Unfavorable macro- and home-environmental conditions combine with a low level of mother's competence or *inadequate mothering*, to produce a *dysfunctional mother-child relationship* or *disorder of attachment*; these maladaptive features of early infant care represent the antecedent factors in the model of Figure 5.3. A quote from Dixon, LeVine, and Brazelton (1982) will illustrate this hypothesis:

The authors conclude that contrary to macro-environmental factors, radio-listening by the mother, amount and type of stimulation available in the home, and mother's behavior toward her child helped substantially to identify families with and without potentially severely malnourished children long before the appearance of the syndrome. . . . The occurrence of severe malnutrition among children in the families at high risk is associated with a distinctly inadequate microenvironment. (p. 34)

Other studies do not completely confirm such a conclusion; first of all, they usually do find differences in macro-environmental conditions; second, they do not always find significant differences in home stimulation scores (e.g., Sheffer, Grantham-McGregor, & Ismail, 1981), even when the same instrument is used. Richardson (1974), using a questionnaire in Jamaica, found no difference in the extent and diversity of the children's social relations, but a significant difference in their intellectual stimulation; he also reports several home-environment differences, and, in particular, in the "caretaker's level of capability." Galler et al. (1984), in a similar study in Barbados, report that the previously malnourished children had fewer toys and books, were read to and told stories less often, and had fewer visits and trips providing social contacts. Kerr, Bogues, and Kerr (1978), through an interview study in Jamaica, paint a gloomy picture of the mothers of malnourished children: these mothers suffer disruption and isolation, were deprived in their own childhoods, and are apathetic, dependent, manipulative, and narcissistic.

Unfortunately, none of these studies (except Cravioto & DeLicardie's) was *prospective*, nor did they include direct *behavior observations* of the child-caretaker interactions. There is a distinct need for further research in this area, even if it is extremely difficult, long, and expensive.

How Ethnocentric Is the Deficit Model?

The studies and models just reviewed all show that malnutrition occurs in so-called *disadvantaged* homes where mothers have a *lower level of competence*, and present quasi-psychiatric symptoms. If we look at the types of questions used in the questionnaires, or the observations that are made, however, it is strikingly obvious that the researchers went to the field with the norms and values of a Western or westernized middle class. Richardson (1974), for example, to judge the caretaker's

At some time societal, familial, individual and economic events combined to produce this "bonding failure," with nutritional failure as a secondary event. The malnutrition of these children should then be labelled as a symptom of a "disorder of attachment" . . . in the same way that failure-to-thrive, child abuse and neglect have been described in Western countries. It is the tropical presentation of a basic disorder familiar to child-health workers around the world. (p. 680)

Evidence for this second part of the model is only indirect, not very consistent, and based to a large degree on the failure to thrive (FTT) literature in developed countries (e.g., Pollitt, 1975; Pollitt & Wirtz, 1981; Thoman, 1975; for a review, see Galler et al., 1984). The hypothesis is worth further study, however, for in the parallels may lie some clues to interventions.

The major directly related research and the only prospective study is a longitudinal project by Cravioto and DeLicardie (1976) in Mexico; among 334 children followed up from birth, 22 developed clinically severe PCM by the age of five years despite biweekly medical examination and nutritional advice. This sample was matched with 22 controls on sex, gestational age, season of birth, weight and length at birth, and psychomotor development. There were no differences between the two groups in the following macro-environmental factors: age, height and weight of either parent, number of pregnancies, number of live children, family size, family type (nuclear or extended), personal cleanliness, literacy, educational level, newspaper reading, per capita family income and source of income, percentage of income spent on food, and sanitary facilities in the household; the only small difference was that more mothers in the control group (eleven versus five) listened to the radio regularly.

The control mothers' behavior during monthly testing sessions, observed *before* the onset of malnutrition, was judged to be significantly more cooperative with the examiner and interested in the interview (versus reserved and defensive), more proud and admiring of the child's performance (versus passive), more interacting with the child (versus no or minimal verbal communication), more sensitive and more responsive to the child's needs, expressing more affection and emotional involvement. There were no differences in the amount of physical contact, tolerance of the child's behavior, and reactions when the child had difficulties on a test item. Furthermore, the total home stimulation scores, using the Caldwell and Bradley (1978) HOME stimulation inventory, were significantly higher in the control group as early as at six months of age, when only one child in the sample was actually severely malnourished.

caretakers is exactly the opposite, concurrently and developmentally, of the American case (Super, 1984). In divergent settings, behaviors that look destructive to the outsider may carry adaptive properties for coping with high-risk circumstances.

A *culture of poverty* model may possibly be true to life in some depressed urban centers, where acculturative pressures have degraded more traditional adaptive patterns (see Berry & Kim, in this volume). It certainly does not apply to many situations in Africa and Asia, however. The cross-cultural approach has clearly shown the limitations and fallacies of a deficit model when applied to minorities in Western industrial countries (e.g., Cole & Bruner, 1974; Howard & Scott, 1981) as well as to the diversity of world cultures. A *difference* model, on the other hand, leads the researchers to look for traditional adaptive patterns—for example, in child-rearing practices, feeding patterns, and support systems—that contribute to avoid malnutrition if they are maintained or reestablished. Breast-feeding as opposed to bottle-feeding is an obvious example that has made the headlines in recent years.

The reciprocal influences schematized in Figure 5.3 as the “vicious circle” can, in theory, be used by interventions to create the reverse phenomenon, a “vital circle.” Altering caretaker-child interaction, the model says, should alleviate the malnutrition syndrome. Evidence to this effect is currently being developed in the Bogotá study of malnutrition and mental development (Super & Herrera, in press). Preliminary results indicate that in this high-risk sample, psychosocial intervention with the mother and child may have long-term effects on physical growth nearly equal to nutritional intervention.

Because it is demonstrated that malnutrition is not distributed uniformly among families living in the same high-risk conditions, it may be a wise strategy to concentrate the research on those that somehow manage to cope, instead of (or in addition to) those that do not. In other words, future research should concentrate on *coping mechanisms* (Coelho & Irving, 1981; Marsella & Dash-Scheuer, this volume) as the positive opposite to inadequate mothering. In terms of applications to prevention and intervention programs, it may be hypothesized that a scheme based on the transfer of culturally familiar and acceptable coping mechanisms from one sector of a population to another within the same cultural group should be more efficient and more cost-efficient than programs based on foreign models. Any intervention program should take into account the population's own strengths. The success of any scheme destined to foster optimal human development will depend, in Mahler's (1984) words,

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level of capability, asked the following question: “If you have or ever had any free time, what sort of things do you like to do most?” The following items receive a favorable rating: religious or educational activities, games, sports, dancing, exercise, TV, movies, visiting, go on trips, read. Receiving an unfavorable rating are the following behaviors: sit, rest, sleep, smoke, or never has free time, must work all the time.

The favorably rated activities are clearly middle-class oriented, as are other questions related to the ability to read and write, doing church work, being legally married, and so on. In other studies, the observation on the number of toys and books available has a similar flavor, and in the much used Caldwell and Bradley (1978) HOME stimulation scale, several items are distinctly drawn from middle-class American culture, for example:

- inventory of toys to learn colors and sizes and shapes;
- three or more puzzles present;
- child is encouraged to learn the alphabet, numbers, spatial relationships, and so on;
- child's artwork is displayed some place in the house;
- mother uses correct grammar and pronunciation, complex sentence structure, and some long words;
- child is permitted some choice in lunch or breakfast menu; and
- neighborhood has trees, grass, birds—is esthetically pleasing.

A Positive Alternative: Coping Mechanisms

Such a value orientation leads to descriptions of the families at risk, and the mothers' behaviors and child-rearing practices, that are systematically couched in negative terms, as indicated by the phrase “inadequate mothering.” As long as the research follows such a *deficit* model, intervention will be patterned after the “compensatory” type of programs, trying to instill middle-class language, values, and habits and continuing to depreciate the community's own values and skills.

To some degree, the theories that lie behind many interventions are based not only on “Western middle-class” outcomes, but also on “Western middle-class” theories. At least some of the theoretical expectations born of Western experience and reflected in Western data are artificial at their base. A concern to have *few* caretakers for an infant is one example: in some settings, the functional meaning of plural

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on the genuine cooperation we offer in order to leave behind the capacity for self-sustaining growth, and on our refraining from diverting people's attention from their own development efforts by enticing them with short-sighted and short-lived assistance but that leaves nothing behind it when it is withdrawn. (p. 4)

With such a new orientation, the field is wide open to further cross-cultural action research and applications.

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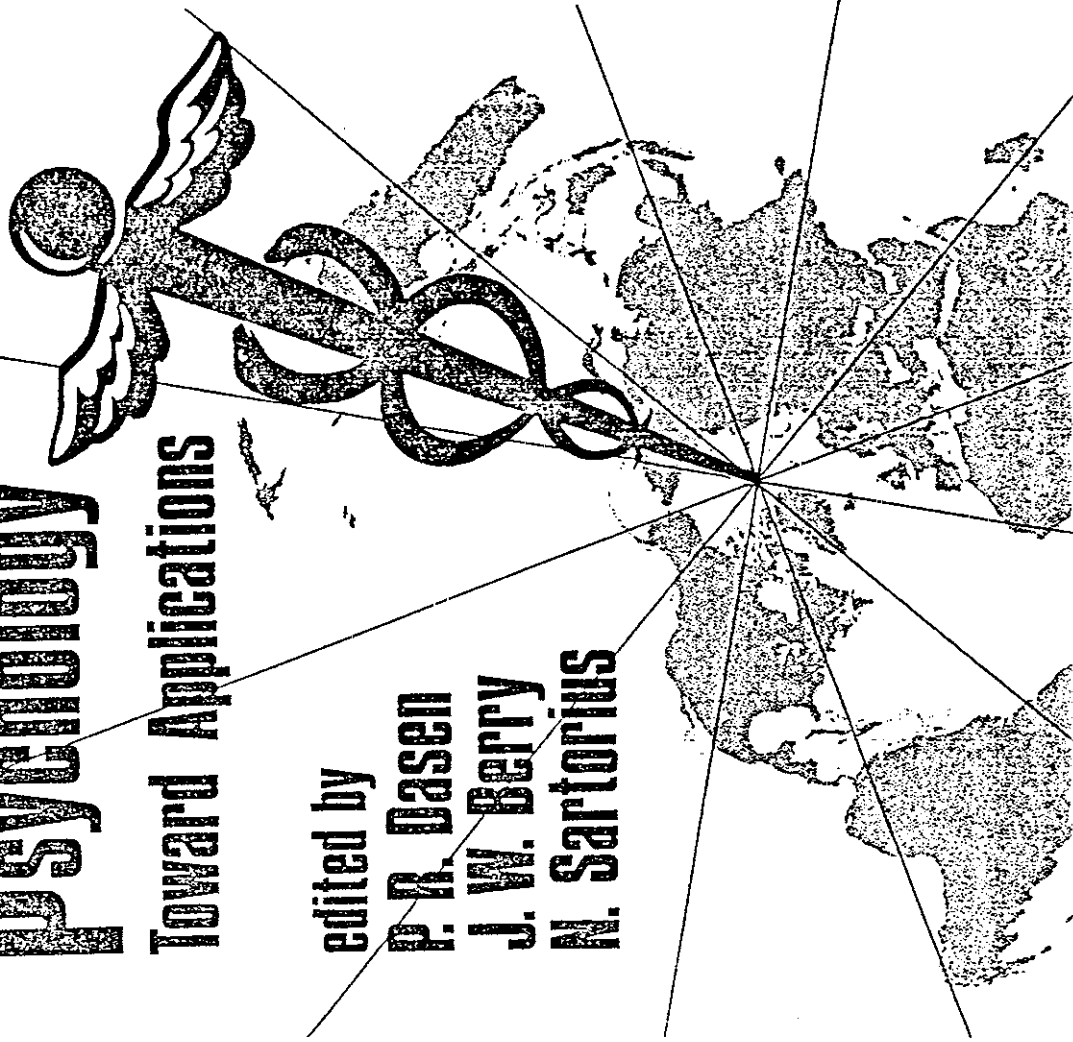
Health and Cross-Cultural Psychology Toward Applications

edited by

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