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ABSTRACT

Focusing mainly on mother/infant interactions in non-Western cultures, this review of literature in the area of comparative child development covers theoretical perspectives, empirical research, and issues and trends. Infancy is defined as the period from birth to 3 years of age to provide the broadest possible coverage. Theoretical perspectives discussed include ethology, population psychology, culture and personality, cross cultural psychology, and biosocial psychology. The review is organized in terms of geographical location; studies discussed were conducted in Kenya, Uganda, Zambia, Botswana, Japan, the South Pacific, and Latin America. Findings of the research reviewed are summarized under three headings: household structures and composition, feeding practices, and mothers' attitudes and beliefs. Recommendations for further research are offered. (RH)

MOTHER-INFANT INTERACTIONS IN VARIOUS CULTURAL SETTINGS

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INTRODUCTION

Every human infant is dependent on his or her caregiver for survival. This relationship with the caregiver is considered of critical importance in the socialization of the child, a process which in turn affects his or her future adult personality. Since the mother-infant relationship is, of course, a universal one, it is therefore a relevant cross-cultural phenomenon. Issues relating to this particular relationship thus concern not only the child's development, but also relate to international development as well.

In many cultures, the biological mother is the primary caregiver in early infancy. Therefore, the scope of this discussion has been limited to the biological mother-infant interaction. However, some cultures do make use of multiple caregivers; these may include fathers, older sibings, co-wives, members from the kinship group, and so forth. Research on infant care draws most heavily on the Western industrialized nations, where the mother-infant interaction is viewed as being of paramount importance. This paper intends not to condone that bias, but is necessarily limited to the literature on infant care most likely to produce an effective cross-cultural comparison.

As the Third World countries move toward modernization, urbanization, and industrialization, there is often an introduction of goods, commodities, and services that may directly or indirectly influence existing traditional childrearing practices. Some of the questions raised by change in Third World countries include the following: What are the effects of introducing powdered milk formula and early supplementary solids within existing mother-infant interactions, particularly in terms of breast-feeding

and weaning practices? What are the effects of introducing baby carriages and infant seats on existing close and continuous mother-infant body contact and on vestibular stimulation for the infant? What are the long term consequences of introducing infant cribs in societies where mother and infant normally sleep together? Does the introduction of outside-the-home employment support or hinder the prevalent traditional child care system? How can progress, such as the provision of desirable health care services, be brought about without disrupting the existing efficient and traditional childrearing practices?

Systematic studies of mother-infant interactions over a period of time in various cultural settings are essential to address the above-mentioned concerns. Such research would also eventually help in identifying infants in the Third World with developmental risks and in designing family support programs to reduce risks and foster growth and development.

In addition to advantages for the Third World to be gained from research, industrialized and Westernized countries may find alternatives or solutions by studying childrearing practices in other cultures. Further investigation might clarify, for example, how women in other cultures have combined caregiving and work, and how that union has affected their interactions with their infants. In addition, the long term consequences of the use of multiple caregivers in other cultures might be systematically studied so as to identify which specific aspects of this childrearing practice are comparable to the Western practices of family day care, group infant day care, or babysitting. Yet another research question might address the differences among cultures in what is considered "appropriate" infant behavior. Families in industrialized societies could benefit from such research by gaining greater awareness of a wider range of childrear-

ing practices, some of which they may wish to incorporate into their own lifestyles.

Scope of Comparative Child Development

Leiderman, Tulkin, and Rosenfeld (1977-a) make a distinction between cross-cultural studies and comparative child development by stating (1) that cross-cultural studies examine the interrelationship of various systems on a cultural level and (2) that childrearing practices and child development may be included in this investigation but are not the primary focus. The research reported in the present discussion falls under the category of comparative child development. While comparisons are made across cultural groups, they are focused only on those aspects of a given culture that appear to be directly relevant to child development and mother-infant interaction.

Comparative child development is a relatively new field, emerging as it has in the 1960s (Field, Sostek, Vietze, & Leiderman, 1981; Werner, 1979). Until this time, the view of child development was based on a tiny sample of the human race, namely the children of the Western world, and of that sample, principally middle-class Caucasians. Lozoff (1977) reported that children and their caretakers studied in the context of modern industralized societies, such as those in the United States or European countries, are a select group and probably unrepresentative of the human species in most other cultures and during most of human history. The discussion here attempts to balance this earlier bias by focusing mainly on mother-child interactions in non-Western cultures.

Werner (1979) lists six key issues that should be addressed by the field of comparative child development. Two of these six key issues are pertinent to the topic of mother-child interaction. The first of these

issues Werner establishes as "the constraints set by ecology and the economic, social, and political maintenance systems of societies on the behavior of children and their caretakers," while the second he defines as "the adaptive significance of child-rearing goals and practices across a wide range of cultures" (p. 4). These issues directly and indirectly address the topic of mother-child interaction, thereby communicating that the relationship is a topic of significant importance in the field of comparative child development.

Another issue demanding some preliminary attention is the definition of infancy. There is no universal consensus as to the exact span of a human being's existence that can be definitively labeled "infancy." Some developmental psychologists (e.g., Stone & Church, 1973) consider only the first 15 months to be infancy, labeling the period between 15 months and 2½ years the toddler years. Others (e.g., Mussen, Conger, & Kagan, 1979) extend infancy through the first 24 months. Some have a still broader definition of infancy including the first 3 years (White, 1975). This problem is further confounded when one is discussing this issue in cross-cultural terms. Some cultures may not have a term equivalent to infancy in their language. Some may be broad categorizers and thus may label infants as "children," while others may have many specific categories based not necessarily on chronological age but rather on developmental age (for example, "sitters," "stand-uppers," "walkers," "solid food eaters," and so on). For the purpose of this discussion, in order to provide the broadest possible coverage, the period of infancy has been arbitrarily defined as the time from birth to 3 years.

Organized into three major sections, the remainder of this examination will address theoretical perspectives relevant to the topic of mother-infant

interactions in different cultural settings, empirical research on mother-infant interaction in various cultural settings, and issues and trends in the mother-infant relationship within different cultural contexts.

THEORETICAL PERSPECTIVES

The theoretical models and constructs discussed in this section are drawn from various disciplines: ethology, evolution, population psychology, culture and personality theory, cross-cultural psychology, ecology of human development, and biosocial psychology. These perspectives have been chosen because they address the variables that influence childrearing practices in a cross-cultural context; as such, they are particularly relevant to the Third World. The intent of the following discussion is therefore to provide alternative ways of viewing and comparing mother-infant interactions within a larger ecological context and to provide a framework for generating more relevant future empirical research.

Ethology

Ethology is especially concerned with those animal behaviors that have evolved as an adaptation to the environment, thus facilitating the species' survival within the context of a particular environmental niche. This field draws heavily on Darwin's theory of evolution. Patterns of behavior, both infantile and parental, that favor the maintenance of physical proximity, protection, and nurturance are of particular interest to ethologists.

John Bowlby (1958) borrowed these ethological concepts and applied them to mother-infant interaction. For example, Bowlby's conceptualization of attachment is what ethologists would call "bonding." Mother-infant attachment consists of a bonding of infant to mother that endures more or less throughout the extended period of the life span. Mary Ainsworth

(1977-a) discusses this attachment theory in the context of comparative-child development research, asserting the following:

> If different societies have different practices and different patterns of maternal behavior, cross-cultural comparisons will certainly complement within-group comparisons in throwing light upon the development of qualitative differences. Cross-cultural studies, perhaps more clearly than intracultural studies, may clarify how infant-mother relationships of different kinds influence later important interpersonal relations ..... (p. 64).

Ainsworth (1967) applied this ethological approach in her study of infants in Uganda, discussed at greater length in the empirical research section of this discussion.

Evolution

Konner (1977-a) labels his theory the "evolution of human behavior development" and discusses the contribution of Darwin's theory to social evolution. He compares major differences in the evolution of social behavior as the transition takes place from a hunter-gatherer existence to an industrial way of life. Several differences in social behavior discussed by Konner are related to mother-infant interactions. First, he notes that mothers in hunter-gatherer societies hold their infants vertically in a sling, while Western mothers typically position their children horizontally and do not use a sling. As a result, the Western neonate experiences fewer motor challenges, less tactile and vestibular stimulation, and more challenges to temperature maintenance.

Second, Konner compares the nursing behavior of infants and mothers in terms of frequency of sucking, weaning, and type of sucking. With

respect to frequency of sucking, mammals may be classified into two groups--namely, "continual" and "spaced" feeders. Continual feeders are those whose infants cling to them, such as most primates, bats, and marsupials, and those whose infants follow them. Spaced feeders, such as rabbits, are those who leave their infants in nests. Continual feeders have more dilute milk, with lower fat and protein content, and they suck slowly. Spaced feeders have more concentrated milk and suck quickly. Human milk and infant sucking rate are consistent with Konner's classification of humans as continual feeders. Infants of hunter-gatherers suckle several times an hour, but human infants in Western societies now are typically spaced feeders. Weaning in higher primates, including hunter-gatherers, is precipitated by the birth of a subsequent offspring, but in industrial societies there has been a dramatic drop in the age of weaning. Finally, a distinction may be based on the type of sucking: hunter-gatherers do not expose their infants to non-nutritive sucking, a practice common in industrial societies.

Third, as Konner notes, hunter-gatherers exhibit immediate extensive stimulation of the infant at birth and continuous mother-infant contact during the hours and days after birth. Comparatively, infants in industrial societies experience far less proximity to mothers due to nonrooming hospitalization policies at birth, separate sleeping arrangements in the home, and the distance of the mother's work place from the infant care site. Making and breaking of contact with the infant, once controlled almost exclusively by the infant, is in industrial societies largely controlled by the mother.

Fourth, according to this theorist, the mother-infant bond is mitigated for the mother by the presence of other adults and for the infant by

the presence of a multi-age juvenile play group. Same-age peer relations are nonexistent among human hunter-gatherers. In Western societies, same-age peer groups are prevalent and have replaced multi-age play groups.

Finally, Konner states that infants learn through observational learning, direct teaching, and play. Over the course of technological development from the hunter-gatherer lifeway to an urban-industrial lifeway, the percentage of information transfer accounted for by teaching has greatly increased and that accounted for by observational learning and play has correspondingly decreased. Furthermore, the information transfer in the urban-industrial context is more from adult to child, or adult to same-age peer group, and less from older to younger child.

The consequences of cultural evolution, if any, are still not well understood, but they are nonetheless relevant to an understanding of the effects of technological change on human development and infant-adult relationships in the Third World as well as in industrial societies. Systematic research needs to investigate adaptive patterns of and stress on the mother and the infant as they shift from traditional childrearing practices to a more "modern" approach.

Population Psychology

Another model for the comparative study of psychosocial adaptation, offered by LeVine (1977), is also based on Darwin's evolutionary theory. While Konner's (1977-a) theoretical discussion primarily identifies the significant changes in infant-rearing practices over time, LeVine attempts to explain the reasons for these changes, adapted by entire populations over time. LeVine postulates that cultural evolution within human populations produces standardized strategies of survival for infants and children, strategies that reflect environmental pressures from the past, encoded in

customs and transmitted socially rather than biologically. For example, he explains that the practice of carrying the infant on one's body a great deal of the time (until the child is 18 months of age or older) may severely limit exploratory behavior and may thus affect the emotional and cognitive development of the child. Whatever those intangible effects are, however, they are not visible to the African Gusii or Hausa mothers whom he observed, whereas the very tangible risks of the child's being burned in an open fire, trampled by cattle, or falling from a cliff are. These mothers respond more to tangible risk and have little or no awareness of the possible psychological consequences of continuous physical restraint. Therefore, it seems that prolonged carrying of an infant is a cultural adaptation to protect the infant from a hazardous environment.

Based on his observations, LeVine (1977) cites the two following parental goals:

1. In populations with high infant mortality rates, parents will have the physical survival and health of the child as their overriding concern, particularly in the early years, and childrearing customs will reflect this priority.
2. In populations with relatively scarce or precarious resources for subsistence, parents will have as their overriding conscious concern the child's capacity for future economic self-maintenance (broadly defined), particularly after his survival seems assured, and childrearing customs will reflect this priority. (p. 21)

LeVine's theory thus offers an explanation as to how childrearing practices have evolved and illuminates the underlying parental concerns and aspirations on which these practices are grounded.

Psychocultural Approach

John Whiting's (1977) model of psychocultural research is a heuristic model built from a variety of other theories. It is eclectic in that it is based on psychoanalytic theory, Henry Murray's (1949) theory of person-

Insert Figure 1 about here

ality, and learning theories advanced by Hull (1943) and Miller and Dollard (1941). More recently, Whiting has incorporated concepts from ethological attachment theory and stress theory as well. Whiting's psychocultural model of 1977 offers greater conceptual detail than his earlier model (Whiting, 1963).

The child's learning environment, or what Whiting has called "child-rearing practices" (1963, p. 5) is the component of his conceptual scheme most directly related to mother-infant interaction. The arrows in Figure 1 represent the direction of causation. One can infer that the various aspects of the maintenance system are antecedent to mother-child interaction and that the consequence of mother-child interaction is the kind of adult the child will turn out to be.

Despite the broad theoretical underpinnings on which this model is based, it still has some limitations. The linearity of this model (i.e., the assumption that environment affects the maintenance system, which affects the child's learning environment, which affects the individual, which affects the projective expressive system) and the unidirectionality of causality may be over-simplifications. Real, observable phenomena do not always follow a stable pattern, predictable in a linear fashion, but rather are highly variable and dynamic and exhibit multiple causality. This

variability is particularly true in mother-infant interactions (cf. Osofsky & Connors, 1979). Recent literature emphasizes the bidirectionality of such interactions, showing that the infant affects both the caregiver and the total interaction (e.g., Thomas & Chess, 1977; Wolff, 1971). Frijda and Jahoda (1966) cite similar objections to Whiting's model. In his later writings, Whiting has defended his model by making the following statement:

> In some, if not many, instances, the true direction of causation may be the reverse [of that indicated]: there may be feedback loops and steps in the assumed sequence may be skipped. The arrows do, however, represent a commonly occurring sequence. The primary reason for making such oversimplified assumptions about causation is that they give rise to a readily testable set of hypotheses. (p. 29)

Despite this defense, the psychocultural model as proposed by Whiting may not be the most appropriate one for research on mother-infant interaction. What is needed is a model that focuses on the dynamic process of interaction and on the impact of such interaction on both the caregiver and the infant.

Whiting's (1977) work addressing the contribution of stress theory to psychocultural research is also interesting. He reports animal research indicating that stress experienced during infancy has two very important effects on growth and development: "(1) It increases the rate of growth, and (2) It makes the animal bolder in exploring a strange environment when it reaches maturity" (p. 37). Whiting then explores stress as a variable differentially affecting human infants in various cultures. He finds that in some cultures infants are customarily subjected to physically

stressful events, such as having their earlobes or their nasal septa pierced, having their heads molded for cosmetic purposes, or being vaccinated or circumcised during infancy. In other cultures, infants are carefully protected from such stresses. Yet others promote the psychological stress of infants being separated from their mothers. Since infant stress exists cross-culturally, Whiting includes it as one of the variables in a child's learning environment.

Also following a psychocultural perspective, Minturn and Lambert (1964) compare the mother's warmth, stability, and responsibility for baby care among six cultures within Kenya, India, Okinawa, Mexico, the Philippines, and the United States. The mothers of the Mexican and Indian samples appeared to express less warmth than other samples, perhaps because living in a household with other families, as they did, necessitates a training for emotional control that acts as a damper to spontaneous expression of emotions. The African mothers were more emotionally unstable than the mothers of other societies--that is, they were unpredictable in their expression of hostility and warmth. Regarding responsibility for baby care, the American mothers assumed more responsibility as compared with women in the other five cultures, who could depend on female kin and older children for daily infant care.

Cross-cultural Psychology

Triandis (1979) has developed a model for cross-cultural research based on systems theory, with hierarchical levels of analysis that indicate

Insert Figure 2 about here

interrelationships among systems of variables. For example, mother-infant interaction, a variable in the "interindividual system," is influenced by other ecological, individual, and sociocultural variables. Triandis's model, when compared with Whiting's (1977), appears multidirectional and dynamic in nature, and its theoretical framework is organized such that both the interpersonal and intrapersonal aspects of social interaction are highlighted. While Whiting's model elaborates more the psychocultural aspects of childrearing practices, Triandis's model employs a social-interactionist perspective in which the individual is seen as actively influencing and being influenced by his or her ecology. Therefore, Triandis's model offers a framework more suitable for the study of mother-infant interaction in a cross-cultural context.

Ecology

Urie Bronfenbrenner, in his book The Ecology of Human Development (1979), proposes a theoretical model that views the human being interacting with his or her continuously changing environment throughout the life span. This model is a synthesis of Lewin's (1935) field theory and systems theory. In it, the ecological environment is viewed as a set of nested structures like concentric circles extending outwards, with the individual in the center enveloped by the phenomenological environment.

In order to more comprehensively understand the human being's development, Bronfenbrenner has hierarchically organized human ecology into four subsystems: the microsystem, mesosystem, exosystem, and macrosystem. The microsystem includes the interaction between the developing person and the immediate environment. The mother-infant interaction at home exemplifies events occurring in the microsystem. The mesosystem consists of interrelations among two or more settings in which

the developing person actively participates. In the case of the infant, such interrelationships might occur among the home, the infant day care setting, and the homes of other multiple caregivers. The exosystem includes settings that do not themselves contain the developing person but that contain events affecting or affected by the individual. With respect to the infant, the exosystem might include the parents' place of work and worship, older siblings' friends, services of a local health clinic, local stores where parents shop for the baby's needs, and so on. Finally, the macrosystem includes the overarching institutional patterns of the culture. Such patterns include the economic, social, educational, legal, and political systems of which microsystem, mesosystems, and exosystems are the concrete manifestation. At this level, a national policy on children or health could, for example, have an impact on various institutions that in turn would directly or indirectly influence interactions between mother and infant.

Bronfenbrenner's model is recommended as a basis for studying the mother-infant interaction because it is comprehensive in scope and thus applicable to any culture. Despite its comprehensiveness, the model also takes into account the impact on the developing infant of specific ecological variables within a given culture. In addition, it promotes understanding of the mother-infant interaction within a larger ecological context by compelling the researcher to identify variables in the mesosystem, exosystem, and macrosystem that influence the mother-infant interaction (embedded in the microsystem).

Biosocial Psychology

Dawson (as cited by Brislin, Lonner, & Thorndike, 1973) has developed a model focusing on biological and social factors within the environ-

ment that influence the individual. To study these environmental influences, Dawson has developed the Traditional-Modern Scale of Attitude

Insert Figure 3 about here

Change (T-M). He has used the T-M scale in studies of childrearing attitudes and processes among Hong Kong Chinese, Australian Arunta, and West Africans of Sierra Leone (Dawson, 1967, 1969-a, 1969-b; Dawson & Ng, 1972).

Empirical research on mother-infant interaction so far has not been based on Dawson's model. However, research based on other models (e.g., Whiting, 1963; Super et al., 1981) makes reference to the variables listed in Dawson's model as background information.

Lester and Brazelton (1982) have developed a psychobiological model

Insert Figure 4 about here

for cross-culturally studying infant behavior, asserting that this model is a holistic, dynamic conceptualization focusing on the processes of development. In this interactive model, the infant is perceived as being influenced by the environment and in turn influencing the environment. Specifically, Lester and Brazelton state the following: "The neonate is viewed as a competent organism that is skilled, selective, and socially influential, who actively interacts with and makes demands on the caretaking environment" (p. 52).

Since the major thrust of the model is to study the infant's individual behavior and not a dyadic interaction, the analysis could be said to be at-

the level of the individual system, according to Triandis's model (1979). Lester and Brazelton (1982) have used their model in studying African infants from Zambia; Gusii from Kenya; Zinacanteco, Maya, and Chiapas from Mexico; Ladinos from Guatemala; and Latin infants from Puerto Rico. In each of the studies they attempted "first, to view infant behavior in its appropriate cultural context, both as a shaper of and as shaped by cultural expectations; and second, to highlight the complex interaction between genetic and environmental influences on neonatal behavior" (p. 28).

Summary

This review of the theoretical literature demonstrates that the same observable phenomenon of mother-infant interaction is cognized, classified, perceived, and interpreted differently by each theoretician based on the paradigm of his or her own discipline. It becomes apparent that each paradigm, by itself, may limit understanding and create blinders (cf. Kuhn, 1970, p. 77). This limitation suggests the value of more collaborative interdisciplinary efforts in comparative child development research.

All the theoretical perspectives reviewed in this section directly or indirectly refer to childrearing practices in a cross-cultural setting. Although none of the models is designed to study mother-infant interaction exclusively, each does facilitate the understanding of a wide spectrum of variables influencing this interaction. The following section on empirical research focuses on a number of the variables mentioned above; some of the research discussed stems from the theoretical frameworks already described.

EMPIRICAL RESEARCH

The empirical research discussed in this section is limited to non-Western cultures and to recent data. Very early ethnographic records, which make tangential and cursory references to mother-infant interactions, are not reported here. The discussion is organized according to the geographical location of the groups studied and with respect to similarities in the traditional cultures of these groups. A matrix (see Table 1) indicating the relationship of the research to specific theoretical perspectives, where applicable, is also provided.

Insert Table 1 about here.

Kenya

Gusii. The Gusii are a tribe living in the densely populated highlands of Southwestern Kenya. They believe that face-to-face confrontations may call up strong feelings; therefore, such interactions are regulated. A typical adult-adult interaction often occurs with completely averted gaze. Conversations occur with the participants at a 90-degree or greater angle to each other.

Early parent-child relationships among the Gusii are characterized by avoidance of eye contact and restraint in playful interactions. There is continuous physical contact between the mother and her infant, but the infant is rarely held in a face-to-face posture and, therefore, there is little eye contact. Affectionate and social behaviors are rarely directed toward the baby, nor is the infant regarded as capable of communicative intent other than to signal hunger or distress. Whiting and Whiting (1975) found Gusii children to be the least attention-seeking of all children studied.

Whiting (1963) has also reported that the infant's most intense relationship is with the mother, who nurses the child. The mother usually breast-feeds without looking at or fondling the child, and she often continues conversing with others. All day, when the mother is working, the infant is carried and cared for by a child nurse. The primary parental goals are to safeguard the health of the child; enhancing social and cognitive development is not one of the mother's parental goals. These goals are in agreement with LeVine's (1977) observations as to how parents go about prioritizing goals for their children. According to the psychocultural perspective upon which Whiting's (1963) study is based, the findings mentioned above would be categorized as the "child's learning environment" (see Figure 1).

Dixon, Tronick, Keefer, and Brazelton (1981) videotaped 2- to 12-week-old Gusii infants' face-to-face interactions with their mothers. This research reports that the mother-infant interaction would begin with the prescribed stylized greeting; a smile followed by a short pause. The infant would attend brightly and would often smile. Mothers would often initiate a repetitious verbal pattern using single words or phrases. "Baby talk" in its most exaggerated form and dramatic changes in mothers' inflections were not heard. The mother smiled pleasantly and was alert but had little variation in facial expression. Gaze generally was directed toward the infant, but it had a grossly distracted quality. Mothers' movements were generally small head movements rather than large shifts in body position.

The infants responded to their mothers' attention with smiles and cooing-vocalization, accompanied by big kicks and generally positive affect. Dramatic aversions of gaze or posture were very rare. When mothers left

at the end of the taping sessions, few infants showed the dramatic change in affect common in similar American sequences; instead, they competently redirected their attention to objects in their surroundings.

The investigators concluded that, while American and Gusii mothers play with and talk to their infants a similar proportion of time, their styles differ. For example, Gusii mothers' frequency of looking away from the infant is greater than that for American mothers. LeVine (1977) would explain this specific behavior as a cultural adaptation in childrearing practices to reduce mothers' emotional attachment to an infant who has a low probability of surviving. However, several of the investigative procedures employed make it appropriate to classify this study as characteristic of Lester and Brazelton's psychobiological model. Specifically, in addition to videotaping, the investigators gathered medical, social, and psychological information on the mothers during pregnancy. Pediatric assessments and Brazelton's Neonatal Behavioral Assessment were also administered to newborns, followed by naturalistic observation and cognitive assessments over the next 15 months.

Kipsigis. The other highland tribe reported in the research are the Kipsigis of Western Kenya. During their first 3 to 4 months, Kipsigis infants are almost always in physical contact with their mothers; then a child caretaker takes over a large share of the daytime care. Super and Harkness (1982) report that, unlike American families, Kipsigis do not make major modifications in their living quarters or family routines to accommodate the infant's routines, particularly sleep. Also unlike her American counterpart, the Kipsigis mother does not need to rely on the baby's sleeping for a chance to disengage from continuous infant care; sibling caregivers, co-wives, and other relatives are always at hand to

look after the child. Consequently, the Kipsigis 4-month-old infant sleeps just over 12 hours on an average each day, as compared with 15 hours of sleep for an American infant. Kipsigis infants do not develop long periods of sustained sleep: the longest episode of sleep is about 4.5 hours, as compared with 8 hours in American infants. This sleeping pattern affects the infant's other behavior patterns as well. Thus the Kipsigis infant has briefer and less regular cycles of activity and rest, while the American infant has fewer but longer periods of sleeping, feeding, and playful interaction.

Kipsigis infants are upset when their mothers leave them for short periods, but this response does not last long. However, their stranger anxiety is more sustained and intense than that of American infants. This may be the case because the cast of characters for daily life remains stable and relatively small for the Kipsigis infant, despite the fact that two or three individuals are routinely involved in care. Super and Harkness (1982) conclude that the Kipsigis and American babies are learning the emotional structure of their cultural niches through the above-mentioned practices.

Kikuyu. A third Kenyan tribe whose mother-infant interactions have been observed, the Kikuyu, are located in the temperate highlands near Nairobi. Leiderman and Leiderman (1977) report that Kikuyu infants are cared for by the mother up to 5 months of age and are then looked after by a child caregiver or other adult females. The average age of caretakers other than the mother was found to be 13.9 years for the low socioeconomic level, 10.6 years for the middle socioeconomic level, and 20.2 years for the high socioeconomic level. The reason for this difference in age was that the families of the lowest level could not afford to send their

older daughters to school; therefore, they were available at home to take care of infants. The highest group could afford to hire nonfamilial help to assist the mother in infant care. The families in the middle level tended to send their girls to school, but since they had insufficient extra cash resources to hire nonfamilial older caretakers, they were forced to rely on their younger children as caretakers.

Leiderman and Leiderman (1977) were interested in exploring the effects of these caregiving arrangements on the child's cognitive and social-emotional development. They found a significant positive correlation between the caretaker's age and the infant's mental test performance for the second 6 months of life. Presumably, greater social maturity gained by the caretaker with increasing age does have an influence on the child's cognitive performance.

The infants in this polymatric system also tended to react more negatively to a stranger's approach and more negatively to the mother's departure than did infants in monomatric caretaking arrangements. Thus the investigators concluded that social, demographic, and economic factors relating to the caretaking arrangement affect both cognitive and social-emotional development in the child.

The investigators also found that, when compared with the mother, the child caretaker in all three economic groups was providing more playful language and social interaction. The mother's daytime role--demanding because of household responsibilities, agricultural work, and the utilitarian aspects of life--resulted in relatively little time for social interaction with the infant. Thus, the Kikuyu mother leaves much of this interaction to her older children. The above findings indicate that a village school intended to help children may actually disrupt infant and child care sys-

tems during critical periods of the child's life. This possibility needs to be kept in mind by social policy makers in developing countries.

Uganda

Mary Ainsworth studied childrearing practices among African Ganda tribes, reporting these findings in the volume Infancy in Uganda: Infant Care and the Growth of Love (1967). In a more recent article (Ainsworth 1977-a) she compares mother-infant interaction in Ganda families and in American families from Baltimore, Maryland. With respect to feeding and weaning practices, Ainsworth found that, in 1954 and 1955, 27 out of 28 Ganda babies were breast-fed, while in her American sample only four infants were breast-fed and the remaining 22 were bottle-fed.

Weaning, she found, was a gradual process among Ganda infants, with the daytime feedings dropping out first and the infant still being given the breast on demand during the night. Ganda babies were weaned between 32 and 57 weeks, while the four breast-fed American babies were weaned between 18 and 35 weeks, with the bottle substituting for the breast. Interestingly, the American bottle-fed babies did not show the active initiative in instituting feeding that was so characteristic of breast-fed Ganda infants. Among the American breast-fed babies, only one of the four, who was breast-fed consistently on demand and for comfort, showed this active initiative. The remaining three breast-fed American babies probably did not show this initiative because of their early weaning to the bottle (it is difficult for a bottle-fed baby to take much initiative in securing his or her own bottle).

Ainsworth also found that there were multiple caregivers available for Ganda infants; however, the mother was the main caregiver. Among the American sample, the mother was the only primary caregiver. Despite the

availability of multiple caregivers among the Ganda, infants were left alone for much of the time, even when they were awake. Nearly all Ganda infants were free to move about the floor when not being held. This was not the case for most of the American sample, who were frequently confined to cribs, infant seats, jump chairs, or playpens when they were neither asleep nor being held. Three of the Ganda mothers reported that they were impressed with the convenience of cribs and baby carriages, in which they could leave their babies most of the time without supervision. This interest exemplifies the impact of Western commodities on traditional childrearing practices. (One wonders what effect the introduction of these, as well as other Western commodities, actually has on traditional childrearing practices.)

According to Ainsworth, these differences influence the infant's organization and integration of attachment behavior. Specifically, her hypothesis is as follows:

> Under circumstances in which an infant through his own active attachment behavior, including sucking and rooting and also reaching, grasping and approaching, can gain contact with an actual or potential attachment figure who is also his food source, his feeding behaviors become an integral part of the organization of his attachment relationship. The circumstances under which this integration is possible are: (1) When the baby is fed contingent on his own behavior, including both his signalling behavior, as in thoroughgoing demand feeding; (2) When the baby is breast-fed so that the food providing source and the attachment figure are one and the same; and (3) When weaning is deferred until after an attachment has already been established. (p. 128)

Geber (1958) and Geber and Dean (1957) have done several longitudinal and cross-sectional studies on Ganda children from birth to 3 years, using the André-Thomas neonatal examination and Gesell Developmental Schedules and comparing these children with other ethnic groups. The African newborn is precocious in his or her development, which corresponds to the development of European infants 4 to 6 weeks old. Throughout the first 6 months, Ganda babies are developmentally ahead of Western babies by 2 to 3 months. This precocity is lost gradually, and by age 3 Ganda children's developmental quotient is 95 on adaptive behavior and 90 on language development. Patterns of mother-infant interaction may account for these outcomes. For example, carrying the baby on the mother's back is a practice that stimulates development of head and posture control and encourages visual stimulation during the first year of the infant's life. In the second year, the mother does not provide language and cognitive stimulation for the infant, and thus the developmental quotient drops considerably as compared with Western samples.

Zambia

Lester and Brazelton (1982) report that Zambian neonates have an undernourished uterine environment and require delicate handling. Nonetheless, mothers' expectations are for vigorous neonates who will respond well to vigorous handling. Hence, mothers actually ignore the limp initial behavior of their infants and handle them as if they are more responsive. After hydration and initial feedings, the babies do become rapidly responsive, as the mothers anticipate.

Goldberg (1977) studied mother-infant interaction in urban Zambia and produced findings reflecting childrearing practices similar to those of Kenyan and Ugandan peoples. These included multiple caretakers (includ-

ing siblings but with the mother as the primary caretaker), a great deal of physical contact, and little vocalization to the infant. Although Goldberg used presumably culture-free tests (since they tapped prelinguistic behavior), she later expressed the self-criticism that the instruments were in fact inadequate to deal with the problem of mothers' and infants' lack of familiarity with the testing materials and testing situation.

Goldberg also found that Zambian infants were reluctant to perform on object permanence tests, in which an object is hidden from the child in order to test the infant's ability to understand that the object still exists when it is out of sight (cf. Piaget, 1975). Goldberg speculates that this reluctance stems from the infant's perception that hiding the object represents an adult's restriction on exploratory behavior. Thus, the performance of Zambian infants on Western cognitive tests may be reflecting the manner in which the infants have been socialized. Furthermore, on items requiring an upright position intended to test for head and neck control, Zambian babies may perform better than their European counterparts. The fact that Zambian babies are normally held in an upright posture, while European babies are usually held supine, imposes a bias on test results. Goldberg's delineation of sources of cultural bias in infant testing represents a careful assessment of the value of these research tools in non-Western contexts.

Botswana

Konner (1977-b), utilizing his evolutionary perspective, studied infancy among !Kung San hunter-gathers (previously referred to as Bushmen) in northwestern Botswana. He reports that !Kung San infants have far more physical contact with their mothers and other caretakers than do American or English infants. However, the !Kung San babies receive an

amount of distal communication (looking, smiling, and vocalizing) similar to that received by American infants. In general, Konner notes that the trend is for infants in technological societies to have less proximal communications, such as physical contact, when compared with infants in non-industrialized societies.

Japan

Ainu. Munroe and Munroe (1975) report on the Ainu of Japan. The Ainu neonate is given small doses of an herbal extract for a few days and then is breast-fed. From the age of 1 month, the infant is tied to a cradle suspended from the ceiling of the hut, and no attention is paid to his or her crying. When outdoors, the infant is transported by means of a tumpline, or carrying strap. The period of infancy is called shointek or poishispe, which means a lump of dung or dung-covered. This label reflects a cultural perception of the infant as a passive, unintelligent organism. However, the Ainu pattern of infant care appears to provide close mother-infant contact, with the infant sleeping with the mother.

Urban Japanese. Caudill and his associates (Caudill & Frost, 1972; Caudill & Plath, 1966; Caudill & Schooler, 1973; Caudill & Weinstein, 1969) were among the first to conduct systematic observational studies of mother-infant interaction from a cross-cultural perspective. Caudill started his work in the early 1960s by comparing childrearing in Japan and America, and a number of his studies are summarized here. Regrettably, he passed away before he could fully complete his longitudinal study.

Studies by Caudill and Weinstein (1969) and Caudill (1972) showed that American mothers engaged in more lively chatting with their babies than did Japanese mothers; as a result, the American infants had a generally higher level of vocalization and particularly responded with greater

amounts of happy vocalization and gross motor activity. The Japanese mothers, on the other hand, did more vocal lulling, carrying, and rocking of their babies; as a result, the Japanese babies were more physically passive. In addition, Japanese babies had a greater amount of unhappy vocalization because their mothers took longer to respond to such signals for attention.

Caudill (1972) has termed these vocalizations between mother and infant "tiny dramas," which he has further explored with sequential analysis. Basically, Caudill has found that the pace of the American mother is livelier: First, she is in and out of the room more and thus provides more naturally occurring opportunities to speak to her baby and for the baby to respond vocally as she comes to provide care. Second, the American mother generally responds more quickly to her baby's vocalizations, regardless of whether they are happy or unhappy. Third, she responds more quickly to unhappy vocalizations than to happy ones, thus teaching the infant to make a more discriminating use of his or her voice. Finally, the American mother has more vocal interactions with her baby, especially by chatting at the same time the infant is happily vocal. Caudill suggests that this added vocal stimulation and encouragement by the mother carries over to the times when she is silent but the baby is happily vocalizing, probably in anticipation of a response from the mother.

In contrast, the Japanese mother's pace is more leisurely, and her caretaking periods are fewer and longer in duration. She holds her baby until he or she falls asleep and then puts the child down, to which the infant responds with unhappy vocalization. (This situation accounts, in part, for the greater amount of unhappy vocalization among Japanese infants.) Also, the Japanese mother physically checks her sleeping baby

by, for example, wiping sweat from his or her forehead or adjusting the covers. These practices sometimes awaken the sleeping baby and increase the unhappy vocalizations. The American mother, on the other hand, visually checks her sleeping baby.

According to Caudill (1972) childrearing practices in these two cultural settings vary because of differing perceptions of the child. The American mother views her baby as a separate and autonomous person. By responding to the infant's vocal communications, she therefore teaches the baby to express needs and wants. The Japanese mother, on the other hand, views her baby as an extension of herself and places great emphasis on attachment.

South Pacific Islands

Fias. Sostek et al. (1981) coded ethnographic films of mother-infant interactions among a population in the United States and among the people of Fias Island, a small isolated island in the Pacific Ocean and bordering the Philippine Sea. In this Micronesian culture, the investigators were exploring the social contexts in which mother-infant interactions occur. The most common dyadic interaction among Fias occurred with the infant's head facing outward (i.e., the child would be on the mother's lap, not facing the mother but rather with his back to her, with both looking in the same direction). Face-to-face interaction was the most commonly found style in the films on American babies.

In addition, the social context varied between these two cultures. The American mother tended to be alone and indoors with her baby, while the Fias mother tended to be in social groups and outdoors when interacting with her baby. The presence of others changed the mother-infant interactions in both cultures; however, interactions were affected differ-

ently in each. For example, among Fias, when the mother and infant were alone, face-to-face interaction occurred more often than did other forms of interaction (such as that taking place in a facing-outward posture). In the presence of one to three other people, however, the infant walked or ran and the caregiver made more play faces and grimaces and held the infant less. When more than three persons were present, the caregiver reverted to holding the infant but did not engage in face-to-face positions. In America, when the dyad was alone, the infant's walking or running increased, but when there were one to three others present, the American mother's face-to-face interaction decreased. American mother-infant interactions in groups larger than three was so infrequent that it was omitted from the coding.

Marquesans. Martini and Kirkpatrick (1981) also studied Micronesian culture through parent interviews, ethnographic observations, and film study. They studied mother-infant interaction on UaPou, one of the high volcanic islands of the Marquesas in French Polynesia. These investigators found results similar to those of Sostek et al. (1981): "[Infants] were rarely held in a face-to-face position (25% of the time); they were faced outward 43% of the time and in a half-outward position 32% of the time" (p. 199).

The Marquesan caregivers spent much of their time calling their babies' names, directing them to look and wave at others, prompting them to perform motor skills, and directing 3- to 6-year-old siblings to play with them. The mother's function was to set up complex interactions involving three or more people, with the baby as focus. According to Martini and Kirkpatrick (1981), unlike American mothers, who have dyadic interactions with reciprocal turn-taking dialogues,

the Marquesans did not engage in pseudo-dialogues in which caregivers act as if infants controlled the detailed turn-taking rules of conversation. Instead they had infants "recognize" others, even before they seemed capable of distinguishing the many people mentioned.(p. 208)

The Marquesan infants are remarkably quiet and particularly attentive to the surrounding social and object worlds from the first month onward. The infant is treated on the assumption that he or she has individual will and motivation, which often run counter to those of the adults. Unlike Japanese childrearing, Marquesan practices accentuate infant separateness. Japanese mothers perceive infants to be willful, but extensions of themselves, and rear them to be obedient and dependent on adults. Marquesan mothers perceive their babies to be willful and demanding but consider them to be separate individuals.

These two research reports again illustrate that the way infants are reared is based on how they are perceived by the adults around them. They further illustrate that face-to-face interaction, adult turn-taking dialogue, baby talk, and reciprocal social games, which are considered normal mother-infant interactions in Western cultures, are not universal patterns existing in all cultures. These studies demonstrate as well the impact of ecological variables (such as social density and childrearing taking place primarily out-of-doors) on the quantity and quality of all interactions.

Latin America

Columbians. Super et al. (1981) studied infant-caregiver interaction in Bogata, Colombia, using interventional strategies that affected mother-

infant interactions in this culture. The intent of this project was to evaluate the effects of two different kinds of interventions (namely, nutritional supplementation and maternal education) on the development of infants known to be at risk for early malnutrition. It was found that nutritional supplementation increased infants' levels of positive social and nonsocial activity. Maternal education influenced maternal beliefs about infant development, which in turn altered mother-infant interaction.

Guatemalans. Klein, Lasky, Yarbrough, Habicht, and Sellers (1977) undertook an exploratory study in Guatemala to investigate mother-infant interaction and its relationship to malnutrition and cognitive development. They found that mothers spent a large part of their time at some distance from their infants and that the level of caretaker vocalization was low. High levels of physical contact were present, but relatively little of this contact involved active social play. The strongest relations between infant-caretaker interaction and variables and indices of nutritional status were in infant verbal behavior. In a different study, Lester and Brazelton (1982) reported that Guatemalan neonates had a stressful perinatal environment resulting in underdemanding infants who were poor elicitors of maternal responses.

Mexicans. Brazelton (1977) also describes the Zinacanteco infants of southeastern Mexico. The Zinacanteco infants, unlike the Guatemalan infants, were considered very mature because they could control their temperature while quietly lying naked for as much as 30 minutes after birth. No jerky startle movements were found in Zinacanteco infants. (Brazelton reports that an American baby, when born, has such jerky startle movements and would have cried and shivered to regulate his or her temperature.)

Following a psychobiological model in this research, Brazelton noted that Zinacanteco mothers do not play with or talk to infants and that infants are fed 30 to 40 times a day, in each case before they cry from hunger. The Zinacanteco value quiet conformity with low-grade peaks of excitement; their socialization from infancy may result in a personality that is in conformity with these cultural goals.

Summary and Conclusions

The empirical research reviewed here generally indicates that three cross-cultural characteristics have an impact on mother-infant interaction: household structures and composition, feeding practices, and mothers' attitudes and beliefs.

Household structures and composition. There is wide variation in household arrangements in different cultures. Whiting and Whiting (1960) examined 565 societies representing a sample of world cultures. Only slightly more than a quarter of these societies were found to have monogamous nuclear family households. Most of the cultures reported on had extended family households. This high social density in turn affected mother-infant interactions.

The prevalence of multiple caregivers in a society and their impact on infant development are apparent, particularly as regards attachment behavior and stranger anxiety. Siblings often assume a caregiving role, and their role as playmates and models may facilitate infants' social and cognitive development. Having these siblings learn parenting skills at an early age is of additional value.

The pattern of mother and infant sleeping together is a very common practice in many societies. Whiting, Kluckhohn, and Anthony (1958) have supported this perception. These investigators reported that only five out

of their sample of 56 world societies had sleeping arrangements similar to those of Americans, where mother and father share a bed and the baby sleeps alone. Thus infants sleeping in a crib or cradle of their own is a rare practice, prevalent in less than 10% of the world's societies whose ethnographies they surveyed. Even when infants have a cradle or cot of their own, it is generally placed near the mother's bed within easy reach. Only in Western societies, notably in the middle class of the United States, do infants have bedrooms of their own.

Feeding practices. Breast-feeding on demand and continuously seems to be the traditional pattern in non-Westernized and non-industrialized countries. Ainsworth (1977-b) has described the easier integration of attachment behavior with consistent breast-feeding on demand for long periods of time, thus challenging Western feeding practices. Konner's (1977-a) description of human milk as being more appropriate for continuous feeding is also provocative in this respect.

Many cultures offer breast-feeding as a soothing method for comforting a distressed child. Harlow and Harlow's (1966) experiments on the value of physical contact in neutralizing stress suggest the benefits in offering the breast as a comforter. In addition, many traditional cultures prolong breast-feeding and delay weaning until the birth of the next infant. Tremendous variation exists in methods and severity of weaning.

Finally, feeding practices are related to health practices, which in turn are related to superstitions. One such superstition, prevalent in many cultures, is the mother's belief in the "evil eye," or the ability of someone to cause harm to the vulnerable infant by looking at the child. Therefore, the mother may restrict strangers from interacting and complimenting the infant (Lester & Brazelton, 1982; Whiting, 1963).

Mothers' attitudes and beliefs. Mother-infant interaction is dependent on the mother's culturally prescribed perception of the infant and her expectations for the child's performance and development. Many cultures view infants as passive and incapable of communicating their needs or having mastery over their environment. Such cultures act upon a child instead of interacting with the child. In such settings, mothers see their role as that of caregiver rather than facilitator of the infant's total development, with the result that they pay more attention to the child's physiological needs than they do to the child's cognitive and language development. Therefore, in many of the cultures reported in the research, the mother has been found to do little or no talking to her infant.

In spite of the perceptions of caregivers who view infants as passive, infants do modify their caregivers' interaction. For example, the infant's health, responsiveness, and overall temperament shape adult expectations, perception, and affect (Brazelton, 1977; Klein et al., 1977).

RECOMMENDATIONS

Comparative child development research is itself in the stage of infancy. It is highly advisable that Western and Third World scientists undertake collaborative efforts to open up new frontiers in this field. The field of comparative child development also needs to attract professionals from various allied disciplines to actively participate in international research. This commitment to multinational and multidisciplinary ventures would provide a great impetus for the growth of knowledge in child development. It is hoped that the recent establishment of child development research units in universities in the Third World will provide the milieu for the exchange of scholars and for this type of research effort.

The bulk of Western research on child development presently does not generally address issues of importance to Third World nations, nor does it offer relevant solutions to problems confronted in these countries. Research done in universities in the Third World and studies undertaken by various international development agencies need to confront aspects of infant care such as health, nutrition, and caregiver-child interaction. In addition, such efforts should attempt to assess the interrelationships between these aspects and to gauge their effect on the infant's total development. Specifically, research might be designed to investigate the following five areas of concern:

1. The existing infant-rearing practices within given cultural contexts and their impact on caregiver-infant interaction.

Initial exploratory or pilot studies need to gather more data on the typical patterns of mother-infant interaction in the larger ecological and social-cultural context. Since Triandis's model (see Figure 2) indicates that ecology affects both individual and social-cultural factors, which in turn affect social interaction, it could be helpful in delineating specific variables for study.

Research described earlier in this discussion has indicated that social density, an ecological variable, modifies mother-infant interaction (Sostek et al., 1981; Martini & Kirkpatrick, 1981). Climate is another ecological variable that influences mother-infant interactions. In the tropical Micronesian culture, for example, most mother-infant interactions take place outdoors (Sostek et al., 1981; Martini & Kirkpatrick, 1981). Zinacanteco neonates have mild hypoxia due to high altitude, a condition that makes the infants alert but quiet. This behavior in turn shapes the infants' nurturing environment in the direction of passive caretaking

practices (Lester & Brazelton, 1982). Hazardous ecological environments have also been found to influence mother-infant interactions (LeVine, 1977).

Norms, beliefs, and values are sociocultural variables influencing mother-infant interaction (see Figure 2). The review of empirical research presented earlier has indicated that the Japanese value restraint in infant-rearing while Americans value independence (Caudill, 1972). The Zinacantecos (Lester & Brazelton, 1982) and Ainu (Munroe & Munroe, 1975) value passivity and conformity. Micronesians value social interaction between siblings and infants (Martini & Kirkpatrick, 1981). Each of these differing value systems shapes the mother's interaction with her infant.

Research needs to unravel many more such specific ecological and sociocultural factors shaping mother-infant interactions. Dawson's model (see Figure 3) could also be helpful in identifying the interactions between specific biological and sociocultural variables having an impact on mothers and infants in the Third World. Specifically, Dawson's "biological variables" include such factors as malnutrition, disease, and parasitic infection. These influences, along with Dawson's "sociocultural variables" (factors such as socialization practices, ecology, and overcrowding), influence the individual's "psychological processes" and development. (Triandis's and Dawson's theoretical models are particularly recommended here because as yet they have not been used to design empirical research on mother-infant interactions.)

2. The interactions and relationships of all potential caregivers within the child-care system.

Since multiple caregiving seems to be a common phenomenon in most Third World cultures, future research needs to be broadened in scope to

include all potential auxiliary caregivers in addition to the primary caregiver (i.e., the mother). More systematic studies need to be undertaken to compare the similarities and differences between primary caregiver-infant interactions and auxiliary caregiver-infant interactions. It is also vital to compare the interactions between adult caregiver and infant with those occurring between child caregiver and infant. (In this review of research, only Leiderman et al., 1977, have addressed this issue directly.) Even among child caregivers, age and experience vary. Research needs to investigate how these variables affect the child caregiver's interactions with the infant. Finally, studies need to explore the consequences of multiple caregiving on infant development.

3. The relationship between economic resources and mother-infant interactions.

The availability of economic resources or the lack of them does have an impact on mother-infant interaction (Leiderman et al., 1977). Many urban Third World women of the lower middle class may choose to work outside the home due to financial necessity. This in turn may affect their interactions with their infants, perhaps resulting in a reduction of continuous physical contact or a shift from breast- to bottle-feeding. Future research needs to explore the impact of work outside the home on mothers' interactions with their infants. The choice of substitute infant care to replace the mother will also be partly affected by the availability of economic resources.

Research could also compare mother-infant interactions in various socioeconomic groups within the same culture. Third World women of the upper socioeconomic class often hire women of the lower socioeconomic class to raise their children. Very often, a completely different set of value

systems and childrearing practices exist in the upper and lower socio-economic classes. Research needs to investigate the impact these differing childrearing practices have on the infant. The mother's direct influence on the infant, as well as her indirect influence as mediated through hired help, also need to be explicitly delineated and stated.

In addition, research should help in identifying the different needs and options women have regarding infant care arrangements, as based on their economic resources. Suitable services could then be provided. For example, in India, poor women work on urban construction sites, and they bring their infants with them since they have no other caregiving arrangements. Mobile creches on some construction sites in India have now been provided so that these infants can be cared for in close proximity while their mothers are at work.

4. The relationship between women's work loads and mother-infant interactions.

Western women have access to commercial baby-food, disposable diapers, and ready-made infant-garments, all of which make infant care less of a chore. These conveniences are largely unavailable to Third World women. Besides caring for infants, women in nonindustrial societies also have many labor-intensive household and agricultural tasks. Cumulatively, such women's roles and responsibilities are many and are bound to have an effect on the quality and quantity of interactions with their infants. Comparative child development research on mother-infant interactions has sorely neglected to study the effect of work load on the mother's interactions with her infant. Future research designs need to incorporate the variable of the mother's varying work load, keeping in mind its ecological setting. Research reviewed earlier has indicated that mothers in Third

World countries seem to spend more time in caregiving activities and less time in social, playful, and language interactions with their infants. Lack of these interactions may be a result of heavy workload.

Brown (1973) reports that all tribal and peasant women work in nonindustrialized societies. These women are able to contribute substantially to their households' incomes because their major subsistence activities are such that the dictates of childrearing can be easily accommodated. She further explains that full-time motherhood is a rarity in the nonindustrialized societies--but that equally as rare is full-time work requiring as many hours, as inflexible a schedule, and as great a spatial separation from the child as is required by maternal employment in Western technological societies. Brown therefore recommends that research be conducted on how women in nonindustrialized societies juggle both work and childrearing. Such research may suggest ingenious solutions to maternal employment and childrearing problems in the United States.

5. The relationship between mother-infant interactions and modernity, change, and acculturation.

Introduction of Western goods, commodities, services, media, and ideas is bound to have an impact on existing traditional mother-infant interactions. Some of these variables may adversely affect infant-rearing practices. For example, Leiderman et al. (1977) reported that the fact that more female children in East Africa enrolled in school disrupted the existing infant-care system.

In addition, Western women are reverting to breast-feeding, while Third World women are discovering the convenience of bottle-feeding. Ainsworth (1977-b) clearly advocates the advantages of breast-feeding, noting that it facilitates the infant's organization and integration of attach-

ment behavior. Harlow and Harlow (1966) stress the value of physical contact between mother and infant. Slings are being sold in Western markets, and many Western mothers are reverting to their use. On the other hand, Ainsworth (1977-b) has reported that acculturated Ganda women have abandoned the traditional use of slings and have been sold on cribs and carriages, for they provide the convenience of leaving the baby unsupervised. Konner (1977-a) has also expressed concern about the long term consequences of the shift from traditional to modern infant-rearing practices.

Also to be considered is the fact that many rural men in the Third World countries are emigrating to the cities looking for jobs, leaving the family in rural areas. This in turn is bound to affect women's roles and responsibilities, which in turn would affect their interactions with their infants. In addition, the trend in Africa, Asia, Latin America, and the Middle East is for more women to be educated formally. The amount of education women are now receiving has also increased. LeVine (1982) has reviewed four studies reporting the impact of women's education on the maternal behavior of different groups of women: Yoruba (Nigeria), Gusii (Kenya), Philippino, and Mexican-American. From the research reviewed, LeVine has generalized that

> women's schooling is often associated with low fertility, lower infant and child mortality, and a style of maternal behavior toward young children that is more pedagogical and conversational than the styles indigenous to many Third World cultures. (p. 307)

Although LeVine has also noted that "none of these generalizations can be

claimed as universal or uniform across regions, levels of schooling, or age cohorts" (p. 307); the need is clear for more research on the acculturation of Western ideas and on the attitudinal shifts women undergo in various cultures as a result of education. Such investigations might also focus on the impact of such schooling on infant-rearing practices.

In conclusion, the types of research recommended here have large ramifications, for they may provide direction to social policy makers. Researchers might recommend the development of appropriate support systems for women and their families undergoing rapid change in the Third World. Such recommendations might involve the development of infant crèches, the provision of family life education in the context of women's literacy programs, or the staffing of maternal health clinics with child development specialists. It is hoped that suitable social intervention programs will be developed--and that these programs be designed to respect the cultural fabric and integrity of the societies in which they are implemented.

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Table 1

A matrix integrating theoretical perspectives with major empirical research

Region or Country	Group	Investigator	Theoretical Perspectives
Kenya	Gusii	Whiting and Whiting (1975)	Psychocultural
	Gusii	Whiting (1963)	Psychocultural
	Gusii	Dixon, Tronick, Keefer, and Brazelton (1981)	Psychobiological
	Kipsigis	Super and Harkness (1982)	*
	Kikuyu	Leiderman and Leiderman (1977)	*
Uganda	Ganda	Ainsworth (1967, 1977-a)	Ethological
	Ganda	Geber (1958); Geber and Dean (1957)	*
Zambia	Urban Zambian	Lester and Brazelton (1982)	Psychobiological
	Zambian	Goldberg (1977)	*
Botswana	!Kung San	Konner (1977-b)	Evolutionary
Japan	Ainu	Munroe and Munroe (1975)	*
	Urban Japanese	Caudill (1972); Caudill and Frost (1972); Caudill and Plath (1966); Caudill and Schooler (1973); Caudill and Weinstein (1969)	*
South Pacific	Fias	Sostek, Vietze, Zaslow, Kreiss, Waals, and Rubenstein (1981)	*
	Marquesans	Martini and Kirkpatrick (1981)	*
Latin America	Colombians	Super, Clement, Vauri, Christiansen, Mora, and Herrerra (1981)	
	Guatemalans	Klein, Lasky, Yarbrough, Habicht, and Sellers (1977)	*
	Guatemalans	Lester and Brazelton (1982)	Psychobiological
	Mexicans	Brazelton (1977)	Psychobiological

Note. Theoretical perspectives are named only for research explicitly stating such an orientation. Other research, unlabelled, could be viewed as eclectic in approach.

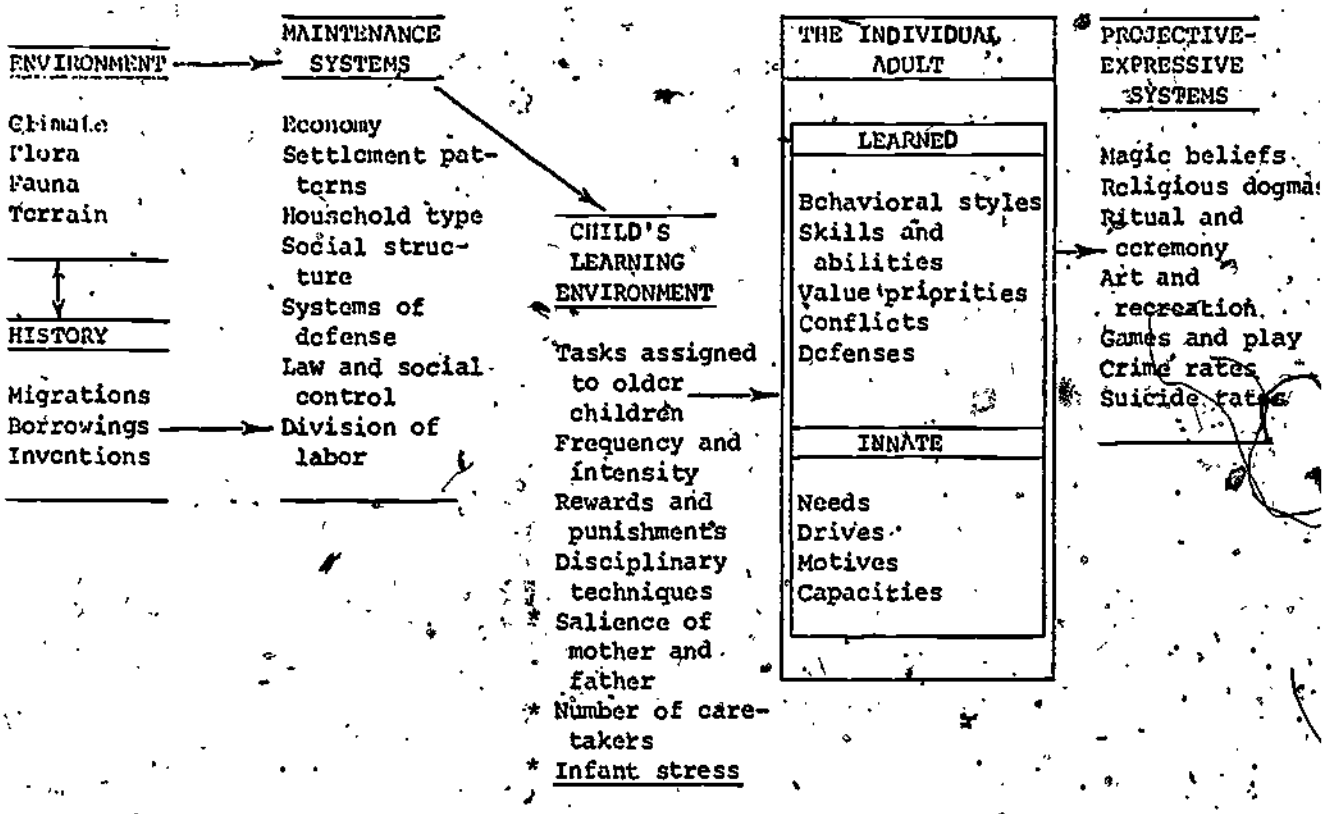
FIGURE CAPTIONS

Figure 1. A model for psychocultural research. Note. From "A model of psychocultural research" (p. 30), by J. W. M. Whiting, 1977, in P. Leiderman, S. Tulkin, and A. Rosenfeld (Eds.), Culture and infancy. New York: Academic Press. Copyright 1977 by Academic Press. Reprinted by permission.

Figure 2. Relationships among systems of variables in cross-cultural studies. Note. From "Cross-cultural psychology" (p. 559), by H. C. Triandis, 1979, in M. E. Meyer (Ed.), Foundations of psychology. New York: Oxford Press. Copyright 1979 by Oxford Press. Reprinted by permission.

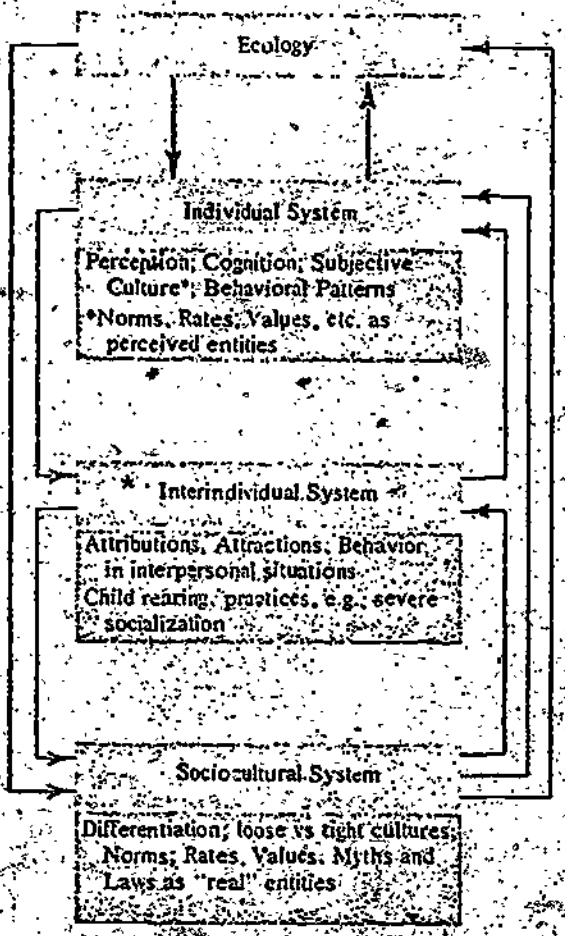
Figure 3. Dawson's biosocial psychological system. Note. From Cross cultural research methods (p. 183), by R. W. Brislin, W. J. Lonner, and R. M. Thorndike (Eds.), 1973. New York: John Wiley & Sons. Copyright 1973 by John Wiley & Sons. Reprinted by permission.

Figure 4. A psychobiological model for the cross-cultural study of the organization of infant behavior. Note. From "Cross-cultural assessment of neonatal behavior" (p. 51), in D. A. Wagner and H. W. Stevenson (Eds.), 1982, Cultural perspectives on child development. New York: W. H. Freeman & Sons. Copyright 1982 by W. H. Freeman & Sons. Reprinted by permission.



*These variables are directly related to mother-infant interaction.

Figure 1. A model for psychocultural research



*Mother-infant interaction is a variable related to the interindividual system.

Figure 2. Relationships among systems of variables in cross-cultural studies.

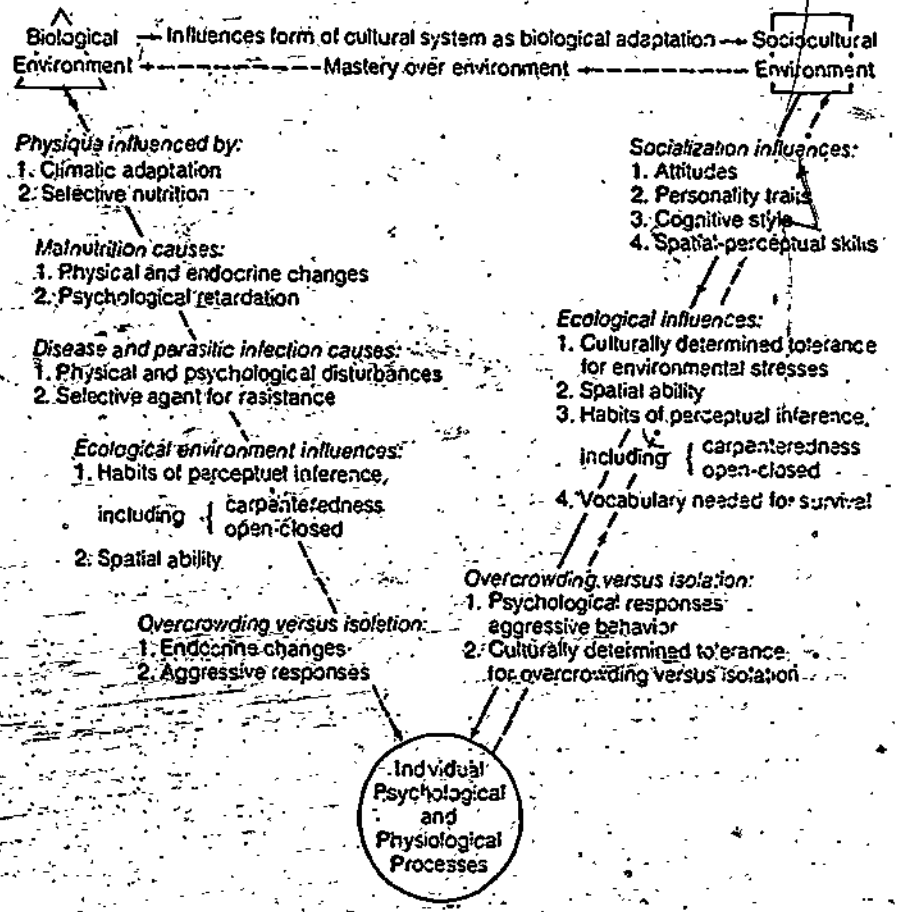
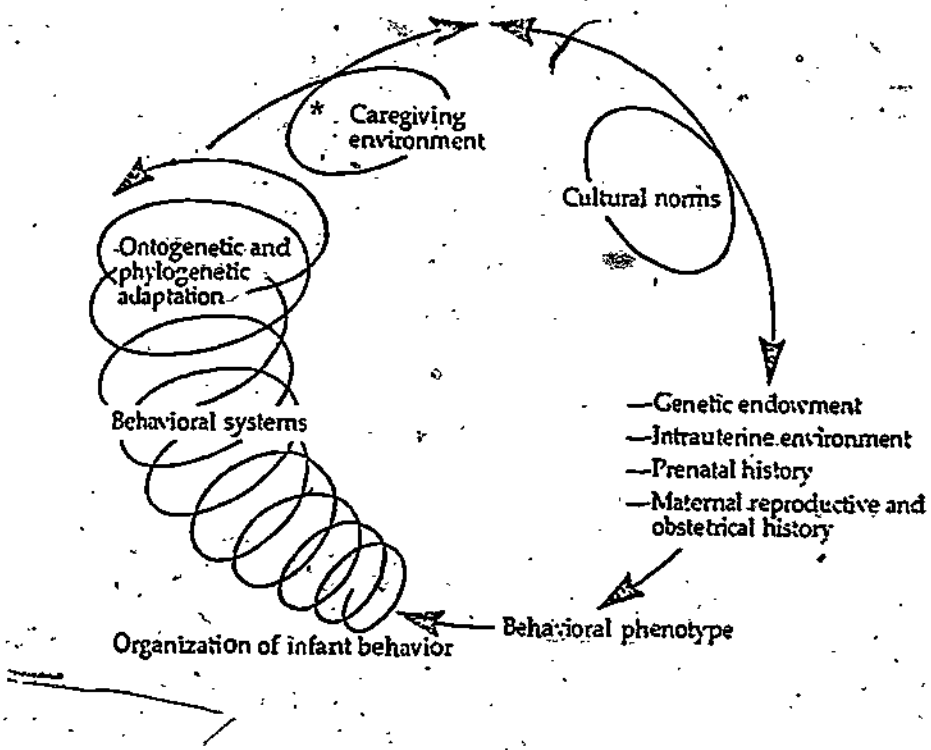


Figure 3. Dawson's biosocial psychological system



*This variable is directly related to mother-infant interaction.

Figure 4. A psychobiological model for the cross-cultural study of the organization of infant behavior.