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Development Viewed in its
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INTRODUCTION

Cross-cultural research permits psychologists a broader perspective on human development than is available when considering human behavior in a single cultural group. This expanded view holds important implications for a psychology that has grown out of Western thought and has been tested almost exclusively on Western societies.¹ By allowing psychologists to view variations on human behavior not normally found in mainstream U.S. or Western European society, cross-cultural observation aids in the understanding of human adaptation. Cross-cultural research may allow psychologists to disentangle variables highly associated in one culture but less so in another. In addition, cross-cultural investigations can make use of variations within a single society to examine naturally occurring cause-effect relationships that cannot be manipulated experimentally. Most importantly, cross-cultural research forces psychologists to look closely at the impact

¹In cross-cultural psychology, the term 'Western' is used to refer to technological, industrialized, modern cultures such as the United States, Canada, Western Europe, or Russia. While it is not geographically appropriate, it is more satisfactory than its substitutes which generally carry unwarranted value judgments regarding degree of civilization, development, or cultural advancement.

Please note that our use of the term culture is intentionally broad. While we focus on comparisons of groups differing in their societal membership and examinations of the workings of culture within groups, we believe our arguments are appropriate for groups differing in other background experiences (e.g., age or gender). We also note that Western cultures and non-Western cultures are not homogeneous; societal and subcultural variation of all sorts provide valuable material for comparisons among groups or examination of patterns within groups.

of their own belief systems (folk psychology) on scientific theories. When subjects and researchers are from the same population, interpretations of development may be constrained by implicit cultural assumptions.

Some of the broad questions that have been consistently emphasized in cross-cultural work include whether certain mental abilities are universal or vary across cultures, and how individual personality may relate to cultural characteristics such as subsistence methods or value systems. These lines of research have yielded interesting results, which are reviewed in detail in a number of excellent sources: Bornstein (1980); Dasen (1977); Field, Sostek, Vietze, and Leiderman (1981); Laboratory of Comparative Human Cognition (1979, 1981); Leiderman, Tulkin, and Rosenfeld (1977); Munroe and Munroe (1975); Munroe, Munroe, and Whiting (1981); Serpell (1976); Triandis and Heron (1981); Wagner and Stevenson (1981); and Werner (1979). In this chapter we do not review the extensive research examining cultural universals and variations in human thinking, personality, and behavior. However, we do briefly describe some investigations of universality and variation that refine our understanding of human functioning.

The bulk of this chapter discusses the way in which research involving culture has led psychologists to conceptualize the relationship between culture and thought or behavior. In much cross-cultural research to date, this relationship has been examined using a model in which culture serves as an independent variable (or a set of independent variables) and behavior (or thought) is regarded as the dependent variable, or outcome, of variation in cultural variables. Culture and behavior are conceived as separate variables, rather than mutually embedded aspects of cultural and individual systems. The influence of culture on the individual is frequently studied by correlating an aspect of culture with an aspect of individual functioning. For example, the correlation between the complexity of social structure in the culture and the personality characteristics of its members may be examined. Then investigators may undertake a closer examination of the contexts in which behavior occurs or is taught in varying cultural settings, in the particular aspect of understanding how a particular aspect of culture may influence a particular aspect of individual behavior. For example, how might participation in a technological society encourage children to be more or less nurturant, aggressive, or competitive. This kind of close examination focuses attention on *how* culture can channel development. Whiting (1976) urges that we attempt to "unpackage" independent variables such as culture, social class, schooling, and gender. Because developmental psychologists have similarly become concerned with the process of change rather than simply correlating broad categories of experience and behavioral outcomes (Brown, 1982), this chapter stresses the guidance provided for the field of developmental psychology by cross-cultural emphasis on the contexts in which culture meets individual.

Our primary theme is that human development is guided by the opportunities provided by culture to learn and practice particular skills and behavior. We stress the cultural and contextual basis of development, from the perspective that

culture and context are meshed with development rather than separate from it. We argue that to understand children's actions (or to compare them with those of other children of a different age or culture), it is essential to place these actions in the context of the children's interpretation of the task to be accomplished, the goal in performing the activity, and the broader social context of such activities in the children's experience. Although many of our examples are taken from research on cognitive development, we include studies of the role of context in children's social skills wherever possible. In fact, the incorporation of contextual considerations in the study of development de-emphasizes the distinction between cognitive and social development, because thinking occurs in social settings, and socialization occurs in problem-solving situations.

In this chapter, we first refer to the usefulness of cross-cultural research for testing the universal applicability of existing theories and for examining and refining empirical relationships between sociocultural variables and human development. We then focus on concerns raised in cross-cultural research with how to conceptualize the role of the context of human activity. We review studies that suggest the impossibility of understanding human nature without considering the context in which people develop and use their skills. We contrast concepts of development and indicate recent theoretical directions and empirical studies that attempt to integrate aspects of context with conceptions of human activities and development.

CROSS-CULTURAL TESTING OF WESTERN THEORIES AND FINDINGS

This section briefly describes some ways that cross-cultural research can revise existing theories and refine our understanding of the relation between experience and human functioning.

Testing Existing Theories

Cross-cultural research has been useful in testing psychological theories based on observations in Western cultures for their applicability under other circumstances. Such research may provide crucial counterexamples demonstrating limitations or challenging the basic assumptions of a theory. For example, Malinowski's investigations with Trobriand Islanders (1927) calls into question the foundations of the Oedipal complex in Freud's theory. Freud's theory developed in a society in which the father played both the role of mother's lover and of child's disciplinarian. Among the Trobrianders, however, the roles are separated: The mother's lover is her husband, and the child's disciplinarian is his maternal uncle. Since the Trobriand boys' resentment is directed toward their uncle and not their mother's husband, it appears that the sexual relationship between mother and father may not be related to young boys' resentment toward

their father as postulated in the Oedipal complex. This finding illustrates that cross-cultural research can raise questions not only about the universal applicability of a theory, but also about the postulates of the theory itself.

Another theoretical approach that has received considerable attention in cross-cultural tests of universality is Piaget's (1971) theory of cognitive development (see reviews by Dasen, 1977; Dasen & Heron, 1981; Greenfield, 1976; Price-Williams, 1980). This research has demonstrated great variation in the rate of Piagetian cognitive development and has examined the question of whether Piaget's stages appear in the same order in different cultures. Cross-cultural research demonstrating the rarity of formal operational performance among non-literate adults has led to widespread concern that this stage represents a culturally specific course of development, perhaps best represented by the "Western scientist."² Largely because of the cross-cultural evidence, Piaget revised his stance on the formal operational stage, stating in 1972 that this stage may be one that appears only in specific familiar domains rather than being a structured ensemble. Later research conducted in the U.S., investigating performance on formal operational tasks across domains, supports this reformulation (Kuhn & Brannock, 1977).

These examples illustrate the ways in which cross-cultural research may suggest refinements in a theory or raise questions to be addressed in further theoretical development. Findings such as these reaffirm the complexity of psychological phenomena and highlight the importance of the cultural context in which psychological phenomena occur and in which psychological theories develop.

Cross-cultural research may also discover impressive regularities across cultures in developmental phenomena. For instance, there is marked similarity across cultures in the sequence and timing of sensorimotor development as well as in the age of onset of smiling and separation distress (Gewirtz, 1965; Goldberg, 1972; Konner, 1972; Super, 1981); the order of stages in language acquisition is also constant across a large variety of cultural groups (Bowerman, 1981; Slobin, 1973). Through cross-cultural research, we may become aware of patterns of variation and similarity in human activity, advancing our understanding of human development and of the ways in which experience relates to behavior.

Refining Relationships Between Experience and Behavior

Cross-cultural research can be useful in calling attention to the assumptions regarding human "nature" which go unnoticed by researchers who share the cultural background of the people they study. Doing research in another culture can make one aware of aspects of human behavior which are not noticeable until

²It should be noted, however, that only 30% of U.S. undergraduates perform in a formal operational way (Ashton, 1975).

they are missing or differently arranged, as with the fish who reputedly is unaware of water until removed from it. The fact that human activities are often arranged differently in other cultures allows researchers to examine the pattern of particular variables when they fit differently with other variables in the cultural system.

Cross-cultural research helps to clarify the relationship between experience and behavior by extending the range of variation beyond that available for study in the researcher's own culture and by rearranging variables which may be highly correlated in one culture but not in another. For example, Sears and Wise (1950, reported in Whiting & Child, 1953) conclude that the older a baby is when weaned, the greater the associated emotional disturbance. However, their Kansas City sample was weaned very early: Only 5 out of 70 children had not been weaned by the age of 7 months. Using a worldwide sample of 52 societies, Whiting and Child (1953) found that the age at weaning ranged from 6 months to 5½ years with 2½ years the median. In only one culture were the children weaned as early as those of the Kansas City sample. What is particularly interesting is that with this worldwide variation in the age of weaning, it was possible to modify Sears and Wise's conclusion: Up to age 13–18 months, it appeared to be true that the older the baby was, the more it became disturbed. But after this peak, weaning became easier as children grew older, with older children frequently weaning themselves as their interests diversified. Given the narrow range of variation available in this U.S. sample, the developmental progression would have been predicted inaccurately.

Other investigations of the relationship between experience and behavior are available in studies of mother–infant contact and relationships on the Israeli kibbutz. In some kibbutzim, children live separately from their parents and are tended in a children's house from early infancy by a children's nurse. Research suggests that infants separated daily from their mothers nevertheless evidence greater interest in staying close to their mothers than to the caretakers with whom they spend great amounts of time (Fox, 1977). It is also interesting that the babies develop strong bonds with their infant roommates (Zaslav, 1980). This suggests that, with extensive contact, infants show a level of social involvement presumed beyond their maturational level in studies (Maudry & Nekula, 1939; Parten, 1933) using U.S. infants who tend to be relatively isolated from other infants (Zaslav & Rogoff, 1978).

Cross-cultural studies also allow investigators to vary factors that cannot be disentangled in one culture but that are less highly associated in other cultures, allowing a form of "natural experiment." For example, studies of mother–child households carried out in the U.S. have, in addition to the absence of the father in the household, a stigma of "broken household," which labels the family structure as aberrant and undesirable. In other cultures (e.g., in polygynous settings), however, mother–child residence patterns are the usual family structure and their effects could be studied without being confounded by a public

attitude of undesirability. For example, low male salience in polygynous households has been related to boys' sex-role development and to societal practices such as masculine-oriented initiation rites and the institutionalization of male participation in pregnancy (the *couvade*, see Munroe & Munroe, 1975).

Another example of covarying factors that are difficult to disentangle in U.S. research is the relation between children's chronological age and the amount of schooling they have received. U.S. researchers commonly use age (Wohlwill, 1970) as a proxy for maturation or for some sort of general experience with the world. But, as the Laboratory of Comparative Human Cognition (1979) notes, "to some people it seems that cognitive development research in the United States has been measuring *years of schooling*, using *age* as its proxy variable" (p. 830). Developmental studies often find a discontinuity in various skills and knowledge structures about age 5-7 (White, 1965), which happens to be the age of the onset of schooling in the U.S. If we are to understand development without confounding maturation with amount of schooling, it is very useful to examine the development of skills in cultures in which schooling is not mandatory or where age and schooling are not so tightly related (see Rogoff, 1981).

A third example of the opportunity that cross-cultural research provides for disentangling intertwined variables is available in observations of children's companionship. It has been noted that Americans emphasize children's peer relations over sibling relations (Ruffly, 1981; Wolfenstein, 1955). Lack of companionship between siblings may not relate to their kinship but to other differences characterizing siblings vs. unrelated peers in Western societies. In Western cultures, sibling interaction implies cross-age relations, since children born of monogamous marriages are unlikely to be very close in age. But in polygynous families there are likely to be same-age siblings living within the same compound. In addition, Western children are separated from siblings through age-graded institutions such as school, while children in non-Western cultures are less subject to the age-grading of schools and are highly involved in caring for younger siblings (Weisner & Gallimore, 1977). However, even in the U.S., sibling interaction may be common if families are isolated from other families, if children are responsible for tending siblings, or if children are not attending school (Ellis, Rogoff, & Cromer, 1981; Fitchen, 1981; Gump, Schoggen, & Redl, 1963; Hicks, 1976; Young, 1970). Cross-cultural observations of prevalence and preference for sibling interaction suggest that age differences between siblings, age grading, and availability of siblings and unrelated companions may be at least as important to consider as the relatedness variable in accounting for a child's choice of companions.

The preceding discussion illustrates how cross-cultural research has modified developmental theories and provided fresh perspectives on the relation between experience and human behavior and development. Through extensive work focusing on cultural variation in human development (reviewed in sources cited on p. 534), the attention of researchers has been drawn to the role of context in

human activity. Next we discuss how cross-cultural research has focused the attention of developmentalists on the role of context in human development. By context we mean any physical or social feature of an activity that channels behavior.

THE ROLE OF CONTEXT IN DEVELOPMENT

Although most approaches in psychology have considered aspects of context to be relevant to the study of the person (e.g., in the need to specify the stimulus or describe the task), understanding the role of context has generally been secondary to examining characteristics of the person. This is true of developmental as well as cross-cultural psychology, in that the basic research strategy is to search for the influence of broad classes of experience (e.g., culture, SES, age, gender) that influence broad classes of individual outcome (e.g., IQ, personality, cognitive level). The focus generally has been on the individual as the basic unit of analysis, with human activity explained in terms of motives, personality, and social and cognitive traits and capacities. Characteristics of the person have been assumed to be relatively stable across situations.

Recently, however, psychologists have become increasingly concerned with the role of context (Bronfenbrenner, 1979; Cole, Hood, & McDermott, 1978; Gelman, 1978; Rogoff, 1982; Siegel, 1977). This concern was sparked to a significant extent by some early cross-cultural observations of the variability of people's performances in differing contexts. Cross-cultural researchers who supplemented their "experimental" measures of performance with ethnographic observations of people's everyday activities have been struck by the fact that people who have difficulty with a particular task in the laboratory may spontaneously use the skill of interest in their everyday activities (see discussion in Cole, Hood, & McDermott, 1978; Laboratory of Comparative Human Cognition, 1979; Rogoff, 1981). Gladwin (1970) reports that Micronesian navigators who show extraordinary skills in memory, inference, and calculation in sailing from island to island perform abominably on standard tests of intellectual functioning. Scribner (1976) points out that subjects who perform poorly on logical syllogisms in a test situation often can be observed using elegant reasoning in other situations, such as giving hypothetical arguments for avoiding answering logical reasoning problems. Cole (1975) and Labov (1970) similarly describe people who seem to lack communicative abilities in a testing situation but who exhibit very skillful and logical persuasive skills in everyday social interaction, such as talking the experimenter into buying a beer.

Contextual variation is increasingly noted in U.S. research indicating that children's behavior in their familiar environments and in the laboratory differs (DeLoache, 1980; Kessel, 1979; Laboratory of Comparative Human Cognition, 1979; Neisser, 1976; Todd & Perlmutter, 1980). For example, young children

routinely have difficulty with egocentrism in referential communication tasks (Erickson, 1981; Glucksberg, Krauss, & Higgins, 1975), yet in everyday situations they adjust their communication to meet the needs of their listeners (Gleason, 1973; Shatz & Gelman, 1977). Similarly, toddlers have difficulty in laboratory memory tests but demonstrate impressive memory for locations of objects hidden in their own homes (DeLoache & Brown, 1979) and impressive recall and strategic capacities in other quasi-naturalistic tasks (Wellman & Somerville, 1980). Infants use an egocentric frame of reference in looking for an object in the laboratory, but use a nonegocentric frame of reference when tested at home (Acredolo, 1979). Babies are more likely to display separation protest when left by their mothers in a laboratory situation than in the home (Ross, Kagan, Zelazo, & Kotelchuck, 1975). Such findings indicate that children's behavior often differs in laboratory tasks compared to more familiar contexts.

A common reaction to the findings that laboratory skills appear different from behavior outside of the lab is to encourage the study of people's actions in their natural environments. It is assumed that valid measures of people's real psychological processes will be found only in natural environments (Charlesworth, 1976). While it is important to examine activities outside of the laboratory, the dichotomy of laboratory vs. "natural" behavior is an oversimplification. Focusing the issue on a field vs. laboratory distinction (McCall, 1977; Parke, 1979; Weisz, 1978; Wohlwill, 1981) overlooks the fact that there is no one situation in which people's *real* capabilities and processes can be uncovered. This view assumes that it is possible, under ideal circumstances, to attribute underlying capacities or processes to internal functioning of people without concern for the context of their activity.

Thinking as well as acting, however, are intricately interwoven with the context of the activity underway. For example, children's communication skills appear to vary depending on whether their listener is a peer or a teacher (Steinberg & Cazden, 1979) or whether they are at home or at school (Shultz, Florio, & Erickson, 1982). One parent's interactions with an infant decrease in the presence of the other parent (Lamb, 1978), and children's peer interactions are more negative when their mothers or teachers are present (Abramovitch, Pepler, & Corter, 1982; Cook-Gumperz & Corsaro, 1977; Field, 1979; Huston-Stein, Friedrich-Cofer, & Susman, 1977). Fifth graders are more likely to evidence altruism when they know they are observed by an experimenter (Zarbatany, Hartmann, Gelfand, & Ramsey, 1982). One must attend to the context in order to understand psychological processes. This is the case for any situation in which development is studied, including the laboratory context, which is not context-free as researchers frequently seem to assume. Context is a complex and structured feature of psychological events, one that is not separate from the activity of the person (Rogoff, 1982).

These concerns are crucial in cross-cultural comparisons (or any comparisons based on group membership, e.g., age or gender comparisons), because such comparisons assume that the factor compared is equivalent for the groups com-

pared, and that other factors do not simultaneously vary. Cross-cultural psychologists distinguish degrees of sensitivity to the broad contexts of human functioning in discussions of *emic*, *imposed etic*, and *derived etic* research strategies (Berry, 1969). In an emic approach, an investigator attempts to maintain the rich interplay of all aspects of the cultural context in the description of a cultural group. Such research may make use of ethnographic observation and participation in the activities of the culture studied.

In an imposed etic approach, an investigator attempts to make general statements about human functioning across cultural groups, but with insufficient attention to the cultural contexts used to support the generalization. Thus, by definition the investigator carrying out an imposed etic study is too quick to impose a culturally inappropriate understanding of the phenomenon of interest, usually uncritically importing theory and measures from research done in Western settings. The ideas and procedures are not sufficiently adapted to the culture being studied, and although the researcher may "get data," the researcher is in jeopardy of misinterpreting the results. The imposed etic approach could involve applying questionnaires, behavioral coding systems, or experimental procedures without modifying them to fit the culture and without seeking evidence that the behavior observed means the same thing to the subjects as to the foreign experimenter.

In contrast, in the derived etic approach the researcher adapts general statements regarding human functioning to fit each cultural group studied. The resulting statements are informed by emic approaches in each culture and are sensitive to the cultural context and the varying meaning of the variables across cultures. Clearly, cross-cultural psychologists aspire to use the derived etic research strategy by coming to understand the cultural contexts studied, adapting procedures to fit the cultures studied, and adapting theories to fit the sensitive tests and observations made in a variety of cultures. Even when the variable of interest requires little inference to observe (e.g., touching, eye contact, carrying practices), some understanding of the cultural milieu is necessary to determine the contexts in which the data are to be gathered (e.g., place in daily routine, cast of characters present) and how the behavior is to be interpreted (e.g., in terms of stimulation or sensitivity).

In the following sections we summarize cross-cultural evidence suggesting that in order to understand behavior it is necessary to attend to the immediate physical and interactional context of the activity, to the person's goal and understanding of the activity, and to the appropriate means of reaching the goal. These goals and means are to a large extent socially defined as well as socially managed. The familiarity of the task materials, purpose of the activity, and features of the social situation are intertwined with culture in ways making it difficult to assume that comparisons of an individual's performance can be made without consideration of the complexity of the context of the performance. Cultural differences may reflect varying exposure to activities differing in their organization, purpose, and social function.

Task Materials and Meaningfulness of the Activity

The relative familiarity of task materials to different populations has obvious relevance to attempts to ensure cultural appropriateness of tasks (Price-Williams, 1962). Irwin and McLaughlin (1970) found that nonliterate Liberian adults were more successful in classifying bowls of rice than classifying geometric stimuli (both differing in color, shape, and number). A sequel to that study (Irwin, Schafer, & Feiden, 1974) reported that U.S. undergraduates responded to requests to sort bowls of rice with the same hesitance and bewilderment as shown by Liberian nonliterate when asked to sort cards decorated with squares and triangles. Both groups, when tested with unfamiliar materials, sorted in a manner considered less advanced than when tested with familiar materials.

But as Cole, Sharp, and Lave (1976), Greenfield (1974), and Lave (1977) have argued, it is not only familiarity of materials that must be considered in comparisons of groups. If the materials are familiar but the task to be performed on the materials is unfamiliar, or if both materials and task are familiar but performing that particular task with those particular materials is unfamiliar, the activity is likely to be perceived as foreign.

The importance of the familiar relation of materials and task is illustrated by several studies in which developmental or cross-cultural differences disappear when the task materials are related in a meaningful, familiar way. Memory research has traditionally tried to minimize the relationships between items (e.g., in free recall, memory span, or paired-associates tasks) in an attempt to equate the circumstances of memory tests given to different people because associations between items are differentially affected by prior experience. However, sophisticated subjects (especially those who have experienced formal schooling) invent connections between items, for example, by clustering by category or elaborating associations. Young children or people from non-Western cultures are usually less familiar with schooling and consequently with associational strategies developed in practice with the lists of decontextualized items associated with literacy (Goody, 1977). Hence, they experience difficulty remembering lists with little or no familiar or meaningful relations among items (Flavell, 1977; Rogoff, 1981).

List-memory tasks may be contrasted with everyday memory problems such as remembering the plot of a story or the location of a store downtown. The information in everyday memory problems is meaningfully interrelated. The familiar organization of the materials or contextual organization can be used by the subject as a structure for recall, rather than requiring organization to be imposed on unrelated items. Research involving contextually organized verbal or spatial information, such as recall of stories or of scenes, has found cross-cultural similarities rather than differences in performance by children and adults (Mandler, Scribner, Cole, & DeForest, 1980; Rogoff & Waddell, 1982). Cultural differences in memory performance may be limited to tasks which exclude

reliance on contextual organization of materials for structuring memory performance.

The use of unfamiliar or meaningless materials and tasks may be an important feature accounting for some findings of developmental and cultural differences in laboratory tasks. Greenfield and Childs (1977) and Kelly (1977) have found impressive performance by non-Western children using an indigenous kinship system to explore relational thinking and an indigenous botanical classification system to test class inclusion concepts.

Familiarity of materials and tasks is intimately related to the activities that are usual for the subjects. Serpell (1979) contrasted Zambian and English children's ability to copy visual displays in four activities differing in familiarity for the two cultures. The Zambian children performed better when asked to copy two-dimensional figures formed of strips of wire (an activity that Serpell observed Zambian children engaging in frequently), whereas the English children surpassed the Zambians in copying two-dimensional figures with paper and pencil (a common activity of English but not Zambian children). No differences were found in activities to which the two groups had similar exposure: copying positions of adults' hands and modeling figures out of clay. The results support the conclusion that cultural differences reflect varying exposure to particular activities, rather than a general cognitive difference between groups.

Problems of representativeness of task do not disappear in research relying on naturalistic observations. Zaslou and Rogoff (1981) argue that the choice of context for observation and the interpretation of behavior observed provides a crucial problem for cross-cultural comparisons of early interaction:

Although studies of early social interaction do not necessarily involve introducing unfamiliar materials, tasks, or contexts, the fact that these studies involve *sampling* behavior makes it necessary to consider comparability of the situation (social and otherwise) sampled, and of the behaviors selected for observation. Identical contexts (e.g., mother-infant interaction without others present) may not sample equally representative proportions of the infant's experience in different cultures. Behaviors chosen for observation on the grounds that they sample the range of social interactions in one culture may sample behaviors incompletely in another, providing a distorted view of interaction. Identical behaviors need not have the same connotations in different cultures (p. 249).

For example, in cultures in which it is rare for a caregiver and infant to be alone together, the imposition of dyadic interaction might yield data confounded by the reactions of both child and caregiver to being isolated from the usual social group (Sostek, Vietze, Zaslou, Kreiss, van der Waals, & Rubinstein, 1981). Bowerman (1981) similarly notes that the traditional technique of taping mother-child interaction to elicit children's speech is unsuited to cultures in which children are seldom conversational partners with adults. In cross-cultural comparisons of

observed behavior it is essential to consider the equivalence of the segment of the behavior sampled and the meaning of the activity and behaviors to the participants in each culture. Price-Williams (1975) notes that:

Among Hausa mothers, the custom is not to show affection for their infants in public. Now those psychologists who are concerned with nurturance and dependency will go astray on their frequency counts if they do not realize this. A casual ethnographer is likely to witness only public interaction; only when much further inquiry is made is the absence of the event put into its proper perspective (p. 17).

Perhaps the most crucial aspect of a task that makes it or its components meaningful is the presence of a meaningful purpose for the activity. Brown (1975), Lave (1980), Leont'ev (1981), and Smirnov and Zinchenko (1969) point out that cognitive research has concentrated on memory or thinking as a goal in itself, rather than as the means to a practical goal, e.g., to remember something of importance or to solve a real problem. The arbitrariness of performance as a goal in itself may account for many developmental and cultural differences. Istomina (1977) found that preschool children's recall of a list of items was much better when the children were asked to remember items to bring back from a play store than in standard free recall tasks.

It is often difficult to ascertain the subject's idea of the purpose of an experimental task. People unfamiliar with experiments may invoke a purpose for the activity that is at odds with the experimenter's intent. The potential mismatch between the experimenter's and the naive subjects' approach to a task is illustrated by an anecdote provided by Glick (1975). He found that in a classification task Kpelle subjects sorted 20 objects into functional groups (e.g., knife with orange, potato with hoe) rather than categorical groups and would often volunteer, on being questioned further, that that was the way a wise man would do things. "When an exasperated experimenter asked finally, 'How would a fool do it', he was given back sorts of the type that were initially expected—four neat piles with food in one, tools in another, and so on" (p. 636). Super, Harkness, and Baldwin (1977) and Skeen, Rogoff, and Ellis (1983) suggest that the classification of real items in everyday life (e.g., in organizing a kitchen or dresser drawers) is not as exhaustive or taxonomic as laboratory researchers expect to find with mature classifiers. Categorization in real life, in contrast to that which occurs in the laboratory, is primarily functional and varies with the purpose of the activity. In the laboratory, the practical goal is typically removed and the subjects are left with their knowledge and inferences regarding what the experimenter is likely to consider an appropriate classification scheme.

The appropriate solutions, goals, tasks, and materials represented in traditional laboratory studies of cognition bear a marked resemblance to activities familiar in the school situation. Several authors have suggested that the difficulty met by young children and relatively traditional peoples in laboratory tests is due

to their limited experience with formal schooling (Rogoff, 1981; Sharp, Cole, & Lave, 1979). People who have more schooling, such as older children and Western peoples, may do better on cognitive tests because tests are usually a sample of the activities specifically taught in school. As Cole, Sharp, and Lave (1976) and Charlesworth (1976) point out, versions of most traditional cognitive tasks can be found in Binet's early measures predicting school performance. In addition, familiarity with performing a task merely for the purpose of being evaluated may relate to experience with Western schooling, a particular social setting.

Social Situation

The social context of an activity organizes materials and tasks in meaningful ways. As emphasized by Vygotsky (1978), the social context affects development at both the institutional and material level, as well as at the interpersonal level. At the institutional level, cultural history provides organizations and tools useful to cognitive activity (through institutions such as school and inventions such as the calculator or literacy) and practices facilitating socially appropriate solutions to problems (e.g., norms for the arrangement of grocery shelves to aid shoppers in locating or remembering what they need; common mnemonic devices). The society provides organization for human activity in institutions such as schools and political systems, in which particular forms of behavior are encouraged.

Social Institutions. An example of the role of societal institutions in psychological functioning comes from research on moral development, which may relate to the political system of an individual's society. Kohlberg (1969) takes the position that moral development stages are comparable across cultures, with "higher" performance on moral development interviews indicating "more adequate" morality. The first two stages in Kohlberg's hierarchy of moral development (see Hoffman, this volume) focus on avoiding punishment and getting reward, and the third emphasizes achieving the approval of others. The fourth stage is defined in terms of obedience to the laws set down by those in power, i.e., to be a good citizen and keep social order. The fifth and sixth stages emphasize moral principles established through mutual agreement or on the basis of universal ethical principles; if social rules conflict with moral principles, individuals may morally decide not to follow the rules of society.

Edwards (1981) contests this view, arguing that the bureaucratic systems' perspective of Stage Four is appropriate for people whose political frame of reference is a large industrialized society, but inappropriate for people in small traditional tribal societies: "The two types of social systems are very different (though of course both are valid working types of systems), and thus everyday social life in them calls forth different modes of moral problem solving whose

adequacy must be judged relative to their particular contexts (p. 274).'' Stages Five and Six are rare in cross-cultural studies and Edwards proposes that these ''metaethical reflections on morality'' should be eliminated from the system, leaving a sequence of moral development with three universal stages and a fourth present for some adults in large industrialized societies with formal institutions. The political institutions of a society may channel individual moral reasoning by providing standards for the resolution of moral problems.

An important cultural institution is Western schooling, which similarly structures behavior by providing norms and strategies for performance that are considered advanced in cognitive tests. Schooling may provide students with a common view of what is ''clever'' (e.g., classification of objects by taxonomic category rather than by their function). An emphasis on fast performance, as in a timed test, may be unusual in many cultures. Goodnow (1976) suggests that differences between cultural groups may be ascribed largely to the interpretation of what problem is being solved in the task, and to different values regarding ''proper'' methods of solution (e.g., speed, reaching a solution with a minimum of moves or redundancy, physically handling materials versus ''mental shuffling'').

The cultural tools and techniques used in school involve certain conventions and genres, such as Western conventions for representing depth in two-dimensional pictures; the common format of test items (e.g., multiple choice); and the genre of the story problem (similar to the logical syllogism), in which one must rely only on information given in the problem to reach the answer. Luria (1976) found that Central Asian subjects did not treat verbal logical problems (syllogisms) as if the premises constituted a logical relation, but as if they were unrelated judgments requiring verification from direct experience. While Luria (and others) take the peasants' responses as indicative of logical shortcomings, it is clear from transcripts that the subjects did not conceive the problem in the same manner as the experimenter. The syllogism was handled by the subjects as a request for an opinion. Many nonliterate subjects refused to answer, not accepting the problem as a self-contained puzzle with the truth determinable from the stated premises. They protested that they ''could only judge what they had seen'' or ''didn't want to lie.'' Here is an example of the interaction between a peasant and the experimenter (Luria, 1976):

[Syllogism:] In the Far North, where there is snow, all bears are white. Novaya Zemlya is in the Far North and there is always snow there. What color are the bears there?

... ''We always speak only of what we see; we don't talk about what we haven't seen.''

[E:] But what do my words imply? [The syllogism is repeated.]

''Well, it's like this: our tsar isn't like yours, and yours isn't like ours. Your words can be answered only by someone who was there, and if a person wasn't there he can't say anything on the basis of your words.''

[E:] . . . But on the basis of my words—in the North, where there is always snow,

the bears are white, can you gather what kind of bears there are in Novaya Zemlya? ''If a man was sixty or eighty and had seen a white bear and had told about it, he could be believed, but I've never seen one and hence I can't say. That's my last word. Those who saw can tell, and those who didn't see can't say anything.''' (At this point a young Uzbek volunteered, ''From your words it means that bears there are white.'')

[E:] Well, which of you is right?

''What the cock knows how to do, he does. What I know, I say, and nothing beyond that!'' (pp. 108–109)

The subject and the experimenter seem to disagree about what kind of evidence one should accept as truth. The subject insists that truth should be based on first-hand knowledge, or perhaps on the word of a reliable, experienced person. (He obviously does not include the experimenter in the latter category.) Given differing criteria for determining truth, the peasant's treatment of the syllogism cannot be taken as evidence of his logical functioning. Luria notes that the nonliterate subjects' reasoning and deduction were excellent when dealing with immediate practical experience. However, in a system of ''theoretical thinking,'' they showed several differences from literate subjects. They refused to accept the premise as a point of departure for subsequent reasoning; they treated the premise as a message about some particular phenomenon rather than as ''a priori''; and they treated the syllogism as a collection of independent statements rather than as a unified logical problem.

Cole, Gay, Glick, and Sharp (1971) found that when the problem format was changed to evaluating someone else's conclusion from the premises, rather than personally answering a question on the basis of the premises, nonschooled subjects had much less difficulty. This supports the argument that nonschooled subjects were uncomfortable having to answer a question for which they could not verify the premises. When the subjects did not need to assert that a conclusion was true, they were willing to consider whether that answer was a logical conclusion and examined the hypothetical premises and conclusion to see if they fit logically.

Scribner (1977) suggests that verbal syllogisms represent a specialized language genre that is recognizably different from other genres. Through practice with the genre, individuals become able to handle more complex versions of it and understand the form of the problem. In Western schooling, people may become familiar with the genre through experience with story problems and other verbal problems in which the answer must be derived from the relationships presented in the problem. Hence, it appears that logical reasoning practices cannot be separated from the formats developed for such thinking in cultural institutions such as schools. Other institutions such as courts, markets, and families may share these formats or have their own conventions in different cultures.

Social Interaction. In addition to considering the influence of social institutions on development, Vygotsky (1978) also emphasizes the immediate social interactional context of activity. Social interaction structures individual activity, especially as information regarding tools and practices is transmitted through interaction with more experienced members of society during development. Particular patterns of interpersonal relations are organized by institutional conventions and the availability of cultural tools. Social aspects of experimental and observational situations are unfamiliar to some groups. For example, the relationship between Experimenter and Subject in an experiment may be rapidly grasped by Western children familiar with testing in school, but may be highly discrepant from familiar adult-child interactions for non-Western children and adults. In addition, schooling provides familiarity with having to answer questions on content material before it has been fully mastered. The practice of testing school children at an arbitrary point in the learning process may be unusual in cultures where learners begin to participate in an activity only when they feel competent at the skill being learned (Cazden & John, 1971).

Schooled children are likely to have had more practice figuring out what an adult is really asking when the adult does not reveal all aspects of performance that will be evaluated. Sharp, Cole, and Lave (1979) found that schooled subjects were more sensitive to the nuances of their experimental instructions. Pinard, Morin, and Lefebvre (1973) found that with minimal training in a conservation task, nonschooled children showed far more spontaneous switches to conserving responses than did nonconserving schooled children, supporting the idea that the nonschooled children were simply learning what it was that they were being asked, whereas the schooled children may have already understood the question even if they could not answer it correctly. Nonschooled children, having less experience with a testing situation, may be more concerned with showing respectful behavior to the tester and trying to figure out the tester, than with trying to figure out the problem. Kiminyo (1977) points out that the nonschooled child will be more likely to change an answer when asked "why?" by an adult, as this traditionally means the adult considers the child's answer incorrect rather than indicating that the child should explain his or her reasoning. Kiminyo argues that Western education in African settings teaches skills and rules for such performance in examinations, making schooled African children better prepared to justify their answers in Piagetian tests.

Schooled people are more familiar with an interview or testing situation in which a high-status adult, who already knows the answer to the question, requests information of a lower-status person, such as a child. It is not uncommon in traditional societies for the interaction between adults and children to be characterized in terms of commands by the adult and compliance by the child (Harkness & Super, 1977). Traditional adults seldom ask children's opinions (Blount, 1972). In a traditional society, a year of school dramatically increases a child's ability to finish an experiment—regardless of the correctness of the answers—and increases the number of words used in responding (Super, 1977).

An example of how conventions of social interaction influence cognitive test performance is provided by Rogoff and Mistry (in press), who note that it is culturally inappropriate for Mayan children to speak freely to an adult. When carrying messages to adults, they must politely add the word "cha" ("so I have been told"). In a recall task, when asked to tell a story to an adult, the Mayan children's excessively bashful utterances were frequently punctuated with the word "cha." Their performance also indicated that they were responding as if being grilled rather than narrating a story. Although the Mayan children usually mentioned a fact from each of the main episodes of the story, they did so in a disjointed fashion as if they were listing the answers to questions regarding the facts of the story. The experimenter found it continually necessary to ask "What happened next?" In contrast, the U.S. children's more fluent recalls were marked by much more narrative connections between pieces of information and less need for prompting questions, suggesting that they were more familiar with the social situation of the task.

Irvine (1978) notes that findings of Piagetian nonconservation by nonschooled Wolof adolescents and adults (Greenfield, 1966) might be due to the test-like social features of the experimental setting:

Outside the schoolroom, it is rare for a Wolof adult to ask another adult, or even a child more than six or seven years old, a question to which he or she already knows the answer. Where this kind of questioning does occur it suggests an aggressive challenge, or a riddle with a trick answer. . . . [S]ubjects unaccustomed to school room interrogation would be in a poor position to understand the researcher's motives or to guess what sort of response was wanted of them (Irvine, 1978, p. 304).

The nonschooled children may simply be responding to a strange situation involving a powerful adult by trying to give an answer that the adult might be presumed to expect, since she had crossed the ocean to ask what, to her, must be an important question. This idea is supported by the fact that Greenfield's nonschooled Wolof subjects gave conservation responses essentially equal to those of the schooled subjects when they themselves poured the water in the conservation test.

Irvine (1978) informally investigated adults' conservation responses by modifying the setting of examination. Her subjects were informants who dropped in to visit her in the familiar setting of a village household. She presented the task in the context of questions about language (explaining to the ignorant language-learner words like "more" and "the same" using water and beakers for illustration), rather than as a test. Irvine paused and waited for elaborations of initial responses or indicated that she did not understand. Several of the informants' initial responses suggested nonconservation, with responses strikingly similar to the ones recorded by Greenfield. However each informant subsequently elaborated with a response clearly reflecting conservation (e.g., "The glasses are not

the same, but the waters are the same." p. 306). Although discrepancies between Irvine's and Greenfield's observations are not resolved (see Greenfield, 1979), the work clearly illustrates that the cultural institutions which organize social interaction must be considered in order to interpret the skills displayed.

Even in naturalistic observations, the behavior of those observed is influenced by their interpretation of the social situation. Like the experimenter, the observer plays a social role which must be taken into account when considering the constraints on the interaction observed. The observer may be regarded as an intruder, a visitor, or a strange alien, but it is not likely that the observer's presence is ignored: "It seems likely that one influence of the observer on parents is to produce a heightened frequency of behavior that the participants judge to be more socially desirable and inhibit behavior considered socially undesirable" (Pedersen, 1980, p. 181). Field and Widmayer (1981) note that mothers' objectives for interaction vary across cultures, with Cuban American mothers interested in "educating" their children and Black American mothers concerned about not spoiling their children by giving them too much attention. Such agendas might be differentially exhibited in the presence of an observer from another culture, depending on the presumed similarity between the mothers' and the observer's cultures.

The reports of researchers observing early interaction in other cultures indicate that the presence of an observer leads to changes in behavior and that subjects interpret the observational context differently in diverse cultures. Among the Zinacantecos, a group of Mayan Indians living in Mexico, Brazelton (1977) describes fear of the observer in both adults and infants:

We were automatically endowed with 'the evil eye' until I assured mothers that I was a 'curer' and could counteract it if I had it. However the effects of stranger anxiety in the baby were powerfully reinforced by his parents' constant anxiety about our presence. We were unable to relate to babies after nine months of age because the effect was so powerful (p. 174).

Brazelton expresses concern about the impact on the data of such an intense reaction to the observer.

On the other hand, the appearance of an observer may produce great interest rather than fear, which nevertheless disrupts the observation. Munroe and Munroe (1971) report that in Logoli (East African) households, as soon as the observer arrived, the infant was readied for display. It was picked up and brought to the observer for inspection. This cooperation on the part of the Logoli mothers made for difficulty observing the usual caretaking of the infants. Hence, the Munroes changed their observational procedure to data taken from a first glance (a "snapshot") of the infant and its surroundings, before the observer's presence was noticed and disrupted the ongoing activity.

A study by Graves and Glick (1978) suggests how American middle-class mothers interpret what is expected of them when being observed. Graves and

Glick contrasted behaviors of mothers with their 18- to 25-month-old children when the mothers thought they were being observed (video equipment was conspicuously running) and when they thought they were simply waiting in an observation room (repairs were "being made" on the video equipment; in fact, observations were made from behind a one-way mirror). The mothers' behavior when they thought they were being observed seemed to reflect their concept of "good mothering." Speech to the children doubled when the mothers thought they were being observed; mothers used more indirect directives, produced more test questions, engaged in more naming and action routines, made more evaluative comments, asked more questions, and spent more time in joint interactive focus with their children, than when they thought they were not being observed.

Clearly, there is a problem of comparability in studies contrasting the observed behavior of two groups whose responses to, or even tolerance for, the presence of an observer differ substantially. Researchers must be alert to the fact that being observed or interacting with an experimenter is not a context-free situation. It is a social context with meaning varying for different populations.

Familiarity of the activity and its goals, as well as the social context of behavior, influence the behavior of individuals. To compare the characteristics of individuals across cultures (or ages or gender), it is necessary to consider their behavior as embedded in a complex system of activities and social situations usual in their experience. To interpret differences, the context of the behavior observed must receive considerable attention. In the next section, we compare concepts of development that differ in how they handle the relation between an individual's previous experience and current behavior.

CONCEPTS OF DEVELOPMENT

The relation between cultural variables and individual functioning has often been cast in terms of the effects of broad aspects of culture on broad aspects of individual characteristics. Attempts to understand *how* the culture meets the individual (or how the individual develops in culture) suggest that the relation of culture and behavior resides in the particular learning experiences of individuals. While there should be nothing surprising in the idea that people learn what they know or develop skills through practice, there are differences in how general the learning experiences and the resulting performances are expected to be, and therefore in how cultural differences are explained.

The Laboratory of Comparative Human Cognition (1980) has drawn a distinction between two models of learning, the "Central Processor Model," which suggest characterizes the assumptions of existing developmental theory and research, and the "Specific Learning Model," which they offer as a substitute. The two models are diagrammed in Fig. 13.1.

In the Central Processor Model, the person experiences a variety of events, each of which contributes some strength or power to a central processor, which is

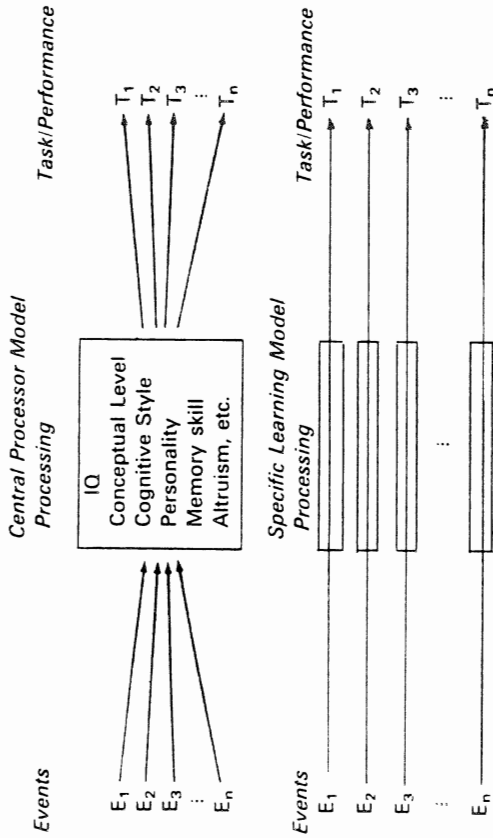


FIG. 13.1 Diagrams of Central Processor Model and Specific Learning Model of learning and performance. (Adapted from the Laboratory of Comparative Human Cognition, 1980.)

conceived as consisting of somewhat general abilities or skills. When a subject is faced with a particular task, he or she makes use of the general ability contained in the central processor to perform the task. The central processor is assumed to function similarly on a large variety of tasks. As an example we may take the construct "intelligence." The individual's "intelligence" is developed through a variety of experiences which strengthen it, and the person deploys intelligence in a similar way when solving a number of tasks that are presumed to require intelligence for successful performance. It is worth noting that the background experience that builds intelligence does not necessarily bear an obvious relation to the task the subject is asked to perform. Thus, researchers may ask whether maternal employment or number of siblings influence "intelligence," as evidenced on a task requiring people to remember a string of numbers backwards. A correlation may be found, and the researchers would then try to identify a mechanism by which the independent variable could conceivably influence task performance. For example, research based on Berry's (1976) ecocultural theory focuses on determining which ecological and childrearing variables (e.g., hunting and gathering for subsistence, nomadic vs. sedentary settlement pattern, level of sociopolitical stratification, restrictiveness in socialization) promote "psychological differentiation," which is assumed to be characteristic of an individual across a variety of social, perceptual, and cognitive tasks. The Central Processor Model represents views of development that assume that context plays little role in thinking or behavior and that personality, behavioral propensities, and skills are general.

The Specific Learning Model has grown out of cross-cultural attempts to understand developmental processes. Recognizing that behavior and skills are closely tied to the context of practice, researchers in cross-cultural human development are currently developing the Specific Learning Model as an alternative to the Central Processing Model. (See especially Laboratory of Comparative Human Cognition, 1980; Rogoff & Lave, 1984.) The Specific Learning Model has a much closer tie between the events experienced by individuals and the tasks on which their performance is observed.³ In this model, the individual develops skills in particular tasks through experience in related activities. Skills are customized to the particular task. There is no assumption that experience in Event E_1 builds skills that generalize broadly to performance in Task T_3 . Research focuses on specific relations between performance on tasks and previous experience in similar events. For example, an investigation may relate performance on a test requiring people to remember a string of words with experience memorizing strings of foreign words in Koranic schooling (Scribner & Cole, 1981; Wagner, 1978). The problem with this alternate model is that we are left with the question of how far and by what means generalization occurs.

Experience in a variety of similar events builds skills that, although specifically groomed in practiced activities, may be applied to related but novel tasks. Each task we perform is both somewhat novel and somewhat similar to previously experienced events, either in the form presented or in the way we reorganize it for solution. It would be a gross oversimplification to assume that because there is contextual variation in performance, the specificity of skill is infinitely narrow. The problem here is to determine to what extent there is transfer from one experience to performance on a somewhat novel task and how such transfer occurs. What prediction can be made from successful performance on, say, a logical syllogism? That the individual (a) will do well on the next syllogism? (b) will do well on other kinds of logic problems? (c) will be logical in many situations? or (d) is smart? The question of generality is an empirical one that has received little attention due to the predominance of the Central Processor Model in developmental psychology. This problem is not solved but instead posed by the alternate Specific Learning Model. We return to this question after a more complete discussion of the two models.

The Central Processor Model and Questions of Context

Psychologists have long debated the amount of transfer expected from specific activities to other activities (Vygotsky, 1962). Thorndike's (1914) discussion of "mental discipline" described the common view that:

The words accuracy, quickness, discrimination, memory, observation, attention, concentration, judgment, reasoning, etc., stand for some real and elemental abili-

³The LCHC also refers to this model as the "Functional Practice" or "Cultural Practice" Model.

ties which are the same no matter what material they work upon; that . . . in a more or less mysterious way learning to do one thing well will make one do better things that in concrete appearance have absolutely no community with it (p. 272).

Most depictions of stages (e.g., Piaget's concrete operational stage), capacities (e.g., spatial skill, metamemory), or personality traits (e.g., competitiveness, altruism) assume that the stage, capacity, or trait characterizes the child's thinking and behavior across a large number of task situations (Ekehammer, 1974; Feldman, 1980; Fischer, 1978; Lewis, 1978; Mischel, 1979; Piaget, 1971). Usually the existence of the stage, capacity, or trait is evaluated through the use of a single task or a small sample of tasks assumed to be representative of the domain of problems that children meet. However, when multiple tasks are given, the assumption of widespread generality of stage, capacity, or trait is usually not upheld (Brainerd, 1978; Fischer, 1980; Fowler, 1980; Siegler, 1981). Skills that are logically similar appear at different ages or do not cluster together on similar tasks performed by the same individuals (Feldman, 1980; Rees, 1977).

Piaget's theory contends that task performances relate to each other in an interrelated structure (structure d'ensemble), but it requires the concept of décalage to account for time lags in tasks that are formally similar. Piaget (1971) considered it impossible to develop a general theory of time lags in, for example, class inclusion problems involving two different sets of objects. He claimed the time lags were due to variation in the "resistances" of the different types of object.

Cross-cultural research has borrowed tests, interpretations of performance, and the concept of developmental stages from Piaget. The research uses the tests Piaget developed to probe the thinking of Western European children. For example, the test for liquid conservation involves pouring equal amounts of liquid into identical containers, having the child verify that they contain the same amount, then pouring the contents of one of the containers into another of a different shape. A child who answers that they are still the same amount is considered a conserver, and one who maintains that there is more water in one container is considered a nonconserver. Piaget was most interested in understanding how the child reasoned, rather than in whether the child knew the right answer. He used a "clinical method" in which children's answers were probed and questions reworded in an individual fashion in order to understand *how* the children reached their answers. Cross-cultural research using Piaget's tests has generally not followed the clinical method, but has standardized the questions and sometimes not even asked the children to explain their answers. This facilitates comparison of populations, but uses Piaget's tasks as intelligence test items in which reasoning is not probed but explanations are simply assessed for correctness.

Researchers have also borrowed Piaget's interpretation of what Piagetian tests indicate: underlying development in logical thinking. There is reason to doubt that comparing quantities of water necessarily taps the same process in all cul-

tures. Since the child's reasoning is seldom explored, all one can safely conclude from most studies is that the child has compared two glasses of water and answered "the same" or "not the same." Whether this tests the child's understanding of the world is another matter.

In addition to borrowing the specific tests and the interpretation of performance, cross-cultural researchers have made use of the theoretical concept of developmental progression. If nonschooled 9-year-olds do not conserve and nonschooled 13-year-olds do conserve, the researcher concludes that it is not until the age of 13 that nonschooled children enter the stage of concrete operations, which implies more than simply whether a child can conserve or not. It implies, in addition, a generalized structure of thought that is assumed to permeate much, if not all, of the child's intelligence. This is a far bigger inferential leap than simply concluding that it is not until the age of 13 that nonschooled children learn a particular skill or concept (e.g., to impose organization spontaneously on material to be remembered, to explain the dimensions used in classifying geometric stimuli). Borrowing the concept of generalized cognitive development along a time line, the researcher may claim that one population is retarded relative to another, or even that one population is stunted in cognitive development (if adults do not pass the test either). Such analyses result in unwarranted conclusions about the logical stage of people, on the basis of their performance on a few tests in which their opinions about the quantity of deformed materials is obtained.

Psychologists apparently assume that it is possible to examine psychological processes without concern for the content or context of what is being processed; that is, to neutralize the task so that performance reflects 'pure process' (see Cole & Scribner, 1975; Price-Williams, 1980; Rogoff, 1982). The research reviewed in previous sections of this chapter suggests that behavior does not involve abstract, context-free competences that may be used generally across widely diverse problem domains; rather, it involves skills tied to somewhat specific types of activity in particular contexts. Behavior in one situation may not generalize to another, even though we may be able to name some process (e.g., role-taking, sharing, competing, remembering, problem-solving) that both activities have in common. People with experience in one type of problem will be able to apply the skill to that kind of problem, but not necessarily to another problem with which they are less familiar.

The Specific Learning Model and Questions of Transfer

In order to make use of previously learned skills or information, people must be able to generalize some aspects of knowledge and skills to new situations which differ in at least some details from the problems they have previously experienced. People would be very limited if they could only apply what they learn to identical problems met repeatedly. Thus, while performance is somewhat specif-

ic to the context of practice, the notion of strict specificity of skills will not account for the flexibility of application of skills from one problem to another. Accounting for transfer in terms of a mechanical process of generalization from one problem to another on the basis of formal or physical similarities of the problems themselves does not take into account the systems nature of contexts, involving not only the form of the problem but also the purpose of solving it and the social context in which the activity is embedded.

People transform novel problems, making them resemble familiar situations by actively—but not necessarily consciously—seeking analogies across problems. A person's interpretation of a problem in any particular activity may be important in applying skills already developed in another context. The person uses the context of the problem to apply familiar information and skills to the novel problem, metaphorically transferring aspects of the familiar context to the new problem (Burstein, 1981; Petrie, 1979). Bartlett (1958) asserts that generalization "is not in the least likely to occur . . . unless there is active exploration of the situation that offers it an opportunity" (p. 95). Gick and Holyoak (1980) demonstrate that with story problems that differ but have the same structure and logically isomorphic solutions, subjects do not transfer relevant information from one problem to another unless they first notice the underlying similarity, even though the transfer is relatively simple once the similarity is suggested. And Duncker's (1945) experiments on functional fixedness demonstrate that the ease with which subjects employ materials in unconventional uses in problem solving depends on the relation of the problem to the familiar context of use of the materials.

Even more important than the active role of the individual in bridging contexts is the part played by other individuals and cultural scripts for problem solution in guiding the individual's application of information and skills to a new situation. We discuss this process in some detail in the next section, in which we summarize some theoretical frameworks that provide an appealing solution to the problem of context's role in development and in the application of knowledge and skills to new situations.

FUNCTIONAL APPROACHES TO DEVELOPMENT

Theoretical Formulations

In this section we review some theories that emphasize that ways of thinking and behaving are not characteristics of the person separate from the context in which the person functions. We focus on Soviet work influenced by Vygotsky (1962, 1978; Wertsch, 1979a,b) and work by the Laboratory of Comparative Human Cognition (1979, 1980). Some similar ideas are contained in Gibson's (1979) ecological theory but without the focus on culture contained in the Vygotsky and LCHC frameworks. While several other theories (Feldman, 1980; Fischer, 1980)

have attempted to involve context in explanations of cognitive development, their consideration of context has been limited to the structure or features of the task or to the domain of knowledge. They have not incorporated the purpose of the activity or the interpersonal and cultural context in which an activity is embedded. The functional approaches we discuss in this section emphasize that behavior is directed toward accomplishing goals and that these goals are socially defined and mediated by other members of the culture.

Vygotsky's theory stresses the adaptation of behavior to fit the context and the structuring of context to support behavior. This perspective focuses on the social adaptation of humans to their environments through cultural history. As such, the study of development and the cultural context are both central to the examination of the processes of human functioning. To understand how culture relates to individual psychological functioning, the process of development or adaptation is examined rather than simply studying outcomes or static states. Development is not assumed to take a fixed, unidimensional course toward a unique or ideal end point; rather, the individual is expected to differentiate to fit the niche or cultural setting.

Rather than focusing on individual responses to environmental stimuli as the unit of analysis, the Vygotskian approach focuses on the concept of *activity*. Leont'ev (1981) has elaborated the Vygotskian concept of activity, a molar unit of analysis involving goals, means, and conditions that mediates between the individual and the context. The cultural practice theory of the LCHC (1980) also focuses on activity by identifying "socially assembled situations" as the unit of analysis rather than working from characteristics of individual persons or cultures. "Socially assembled situations" are cultural contexts for action and problem solving that are constructed by people as they interact with one another. Cultural practices employed in socially assembled situations are learned systems of activity in which knowledge consists of standing rules for thought and action appropriate to a particular situation, embodied in the cooperation of individual members of a culture. The Laboratory of Comparative Human Cognition argues that descriptions of what people "know-to-do" are distorted if they do not consider the social circumstances in which that knowledge is displayed and interpreted. In such an approach, the distinction between social and cognitive functioning fades.

Both the Laboratory of Comparative Human Cognition and Vygotskian approaches emphasize the *practice* of socially constructed modes of thinking, where cognition involves *doing* goal-directed action. In related work, Scribner and Cole (1981) define practice as "a recurrent, goal-directed sequence of activities using a particular technology and particular systems of knowledge" (p. 236).

In a functional approach, thought and action are integrated. Both mental and physical processes are means by which an organism achieves practical results that are relevant in particular contexts. The purpose of cognition is not to produce thoughts but to guide intelligent action. Leont'ev (1981)-objects strongly to the

dualism of mental and physical processes, on the basis that mental activity develops from processes that put the agent in "practical contact with objective reality." Similarly, ecological psychologists (see Gibson, 1979; Michaels & Carello, 1981) emphasize the confluence of perception and action, integrating perceptual learning and the acquisition of motor skills. Perception tailors the animal's actions to its environment. The point of perception is appropriate action: to act adaptively, the person needs to perceive the environment accurately; to perceive effectively requires putting oneself in a position to obtain information (Gibson, 1982).

In the Vygotskian approach, thought develops from experience in socially structured activity through the internalization of the processes and practices provided by society and its members. As discussed earlier, the social context influences the individual's patterns of behavior through cultural institutional tools of action and thought (and norms for the use of those tools), such as arithmetic systems and electronic calculators, and mnemonic strategies, writing systems, and paper. Such tools—indeed all objects—are socially developed and defined. Social and nonsocial objects are not distinguished, because even with "natural" objects, their significance for people is socially determined.

The Vygotskian view of cognition emphasizes that the social unit in which the child is embedded channels development, and suggests that, rather than deriving explanations of activity from the individual plus secondary social influences, we should focus on the social unit of activity and regard individual functioning as its product. This stance makes it of foremost importance to consider the role of the formal institutions of society and the informal interactions of its members as central to the process of development. In order to understand development, we must attend to the role played by such influences as formal schooling, television, the characteristics of children's toys, and the formal and informal instructional roles played by adults and other individuals expert in the activity and by peers as they coordinate joint activities.

The cultural institutional context reaches the individual largely through interaction with other members of the society. The social interaction of children with people who are proficient with the skills and tools of society is essential to development. Indeed, the child's individual social and cognitive activity derives from his or her interactions with other people. Vygotsky (1962, 1978) emphasizes that development occurs in situations where the child's problem solving is guided by an adult who structures and models the appropriate solution to the problem (in the "zone of proximal development"—the region of sensitivity to instruction where the child is not yet able to manage the problem independently and can benefit most from guidance). Cole (1981) argues that the zone of proximal development is "where culture and cognition create each other." Through experience in the zone of proximal development, the child's individual mental functioning develops. Adults are instrumental in arranging the occurrence of cognitive tasks for children, and they facilitate learning by regulating the difficulty of the task and providing a model of mature performance. Formal instruc-

tion and informal social interaction embed the child in the application of appropriate background information for a new problem, thereby providing experience in generalizing knowledge to new problems.

The process of interaction requires the creation of a common framework for the coordination of action and the exchange of information. Communication relies on the establishment of an intelligible context of interaction; this coordination facilitates generalization, in that new information has to be made compatible with the newcomer's (novice's, child's) existing knowledge. In the process, the child is led toward an understanding of this new information or situation. For example, in observations of mothers teaching their children how to perform classification tasks, Rogoff, Gauvain, and Gardner (in preparation) observe that 84% of the mothers guided the child in transferring relevant concepts from more familiar settings to a relatively novel laboratory task with statements such as "we're going to organize things by categories. You know, just like we don't put the spoons in the pan drawer and all that stuff." The language used in communication removes some of the complex alternative interpretations of an event by coding it in a particular way. In this way, cultural expectations are transmitted by linguistic labels in which events regarded as similar are coded similarly by a cultural group. The structuring provided in communication serves as a "scaffold" (Wood, 1980) for the novice, providing bridges between the old knowledge and the new. In making new information compatible with the child's current knowledge and skills, an adult guides the child in generalization to the new problem.

The answer offered, then, by a functional approach to the problem of how generalization from specific contexts occurs, is that individuals actively seek bridges from one situation to another and are greatly assisted by others who have more or different experience and make the analogy intelligible to the newcomer. Development and learning are not spontaneous but guided and channeled by other people experienced in the culturally developed modes of handling situations.

In the next section, we review some cross-cultural research that is consistent with the functional approaches we have described. Although some of these investigations of the relation between cultural experience and individual functioning have been influenced by Vygotsky's theories, others have not. Nevertheless, they have in common an emphasis on examination of the process of adaptation of people in their wider social/cultural milieu.

Research on the Functional Fit of Cultural Experience and Individual Development

Several recent lines of investigation illustrate the functional relation between learning experiences and the cognitive skills developed. In the following sections, we review some examples of the development of particular skills in domains of practice encouraged or structured by the cultural milieu. Along with the

many studies previously reviewed in this chapter, they form the empirical basis of the sociocultural, functional theories of development we have described.

Cognitive Skills. Lave (1977) examined arithmetic skills used by Liberian tailors varying in amount of schooling and in amount of tailoring experience. She designed the problems to involve identical arithmetic skills, but to vary in resemblance to arithmetic problems met in school and in tailoring. The results showed a specific relation between the type of math experience obtained and skill in the different types of math problems. Neither arithmetic skills learned in school nor those learned in the practical problems of tailors generalized to arithmetic problems different from either type.

Scribner (1984) investigated arithmetic calculation by U.S. dairy workers whose day-to-day experiences provide them with practice in calculations involving numbers of single cartons and cases (full of cartons) of milk products. The workers' responsibilities varied, either manipulating numbers of cartons and cases to fill orders, accounting for deliveries using numbers on computer forms, or billing for the product using entirely symbolic numerical representations. Scribner gave calculation problems in these different formats, and found that calculation skill and strategies corresponded to the daily use to which the individual habitually applied such calculation. Scribner argues that skilled practical thinking is goal-directed and adapted to the changing properties of problems and task conditions.

Rogoff and Gauvain (1983) tested Navajo women with varying amounts of experience in weaving and in formal school. They gave tests of pattern continuation that varied in resemblance to weaving processes (continuing yarn patterns on small looms) and school procedures (continuing paper-and-pencil patterns in workbooks). The results showed a specific relationship between experience and pattern continuation skill: Experience as a weaver related to performance on patterns resembling the process of weaving, and experience in school related only slightly to performance on any patterns.

Serpell (1979) found that Zambian and English children's skills in copying patterns were tied to the activities they had practiced. Each group was most skilled in copying patterns using media and processes with which they were familiar. Zambian children excelled in copying figures formed of wire strips, and English children excelled in copying figures drawn on paper. There were no cultural differences in skill at copying patterns in activities of equal familiarity to both groups.

Literacy Effects. Scribner and Cole (1981) expected a specific functional relation between the practice of literacy and consequent cognitive skills. To test this, they studied "general" and "specific" cognitive skills used by the Vai people of Liberia, who varied in use of several types of literacy. The Vai people independently developed a phonetic writing system, widely available throughout

the society, consisting of a syllabary of 200 characters with a common core of 20-40. Vai individuals may also be literate in Arabic or in English or not literate in any script. English is the official national language and is learned in Western-style schools; Arabic is the religious script and is learned in traditional Qur'anic schools emphasizing the rote memorization of religious passages usually without understanding; Vai script is used for the majority of personal and public needs and is transmitted outside of any institutional setting, with a nonprofessional literate teaching a friend or relative over a period of two weeks to two months.

Scribner and Cole predicted that literacy in the Vai script would not have the general intellectual consequences that have been suggested to be the result of high levels of school-based literacy, as Vai literacy does not involve new knowledge or the examination of ideas. To test for general cognitive consequences of literacy, Scribner and Cole studied performance on logic and classification tasks and found little difference between nonschooled Vai literates and Vai people not literate in any script.

To test for specific effects of learning and using the various scripts, they examined the component skills involved in Vai people's literacy in Vai script, Arabic, and English, compared with nonliteracy. (Note that English literacy is confounded with Western-style schooling.) In describing a board game in its absence, Vai literates (who frequently write letters requiring communication carried in the text and not supported by context) were more successful than Arabic literates and people not literate in any script. The English literates (high school students) were highly successful in this task as well.

Since Vai script is written without word division, the authors suspected that Vai literates might be skilled in the integration of syllables into meaningful linguistic units. Vai literates were better at comprehending and repeating sentences broken into slowed syllables than were Arabic literates and nonliterates. When the sentences were presented word by word instead of syllable by syllable, the Vai literates had no advantage over the other literates.

The authors demonstrated specific consequences of Qur'anic schooling with a memory task resembling learning of the Qur'an (learning a string of words in order, adding one word to the list on each trial). On this task, English students ranked first, but here the Arabic literates showed better performance than either the Vai literates or the nonliterates. On other memory tests (Scribner & Cole, 1981; Wagner, 1978), Arabic literates showed no superiority in performance over the Vai literates and the nonliterates, suggesting a very specific transfer of learning rather than general transfer.

Also consistent with the conclusion that literacy promotes specific skills is Olson's (1976, 1977) statement that human intellect cannot be separated from the technologies (e.g., writing, speech, numerical systems) invented to extend cognitive processes. He argues that the conception of a general quality of mind (underlying ability) is useless, as it is only in the interaction with the technology (writing, navigational system, and so on) that cognitive processes operate:

All tasks or performances that we require from children in intelligence tests reflect competence with our technologies. They assess the level of competence of a child or an adult in using some artifact that we find important in our culture. . . . If it is agreed that our measures of intelligence reflect different kinds of symbolic competencies, it is perfectly legitimate to measure this level of competence to determine, for example, if a child requires more practice, but it is illegitimate to draw any inferences about so-called underlying abilities (Olson, 1976, p. 195).

Infant Development. Super (1981) and Kilbride (1980) argue that the controversy over "precocious" sensorimotor development in African infants is best resolved by considering the practices of the cultural system in which the babies develop. They present evidence that the items on tests of infant development do not function uniformly, and that the variation from item to item is meaningful. African infants routinely surpass U.S. infants in their rate of learning to sit and to walk, but not in learning to crawl or to climb stairs. They report that African parents provide experiences for their babies that are intended to teach sitting and walking. Sitting skills are encouraged by propping very young infants in a sitting position supported by rolled blankets in a hole in the ground. Walking skills are encouraged by exercising the newborn's walking reflex and by bouncing babies on their feet. But crawling is discouraged, and stair-climbing skills may be limited by the absence of access to stairs. Infant sensorimotor tests assess an aggregate of skills varying in rate of development according to opportunity or encouragement to practice them, rather than involving a general skill or a uniform set of skills.

Super (1981) also suggests that infant sleep patterns vary as a function of culturally determined sleeping arrangements. In the U.S., the common developmental milestone of sleeping for eight uninterrupted hours by four to five months of age is regarded as a sign of neurological maturity. In other cultures, however, the infant often sleeps with the mother and is allowed to nurse on demand with minimal disturbance of adult sleep. In this arrangement, there is less parental motivation to enforce "sleeping through the night," and Super reports that in this arrangement, the developmental milestone of sleeping is at variance with that observed in the U.S. Babies continue to wake up every four hours during the night to feed, which is about the frequency of waking during the day. Thus, it appears that this developmental milestone, in addition to its biological basis, is culturally mediated; that is, it is adapted to the context in which it develops.

Personality and Sex Role Development. Whiting and Whiting (1975) observe that the social behaviors displayed by children in six cultures varied according to the age and gender of the people with whom they were interacting. Children displayed nurturance in the company of infants, aggression with peers, and dependence with adults. Analyses of sex differences in these behaviors revealed worldwide trends in which older girls (age seven to eleven years) were

more nurturant than boys of their age; younger girls (age three to seven years) were more responsible than their male counterparts; and boys were more aggressive than girls (Whiting & Edwards, 1973). Whiting and Edwards discuss these sex differences in terms of the tasks usually assigned girls and boys in the six cultures. The nurturant behavior of the older girls was probably related to the fact that they were far more likely to be assigned infant care than were boys. Girls of all ages were assigned chores near or inside the home, requiring compliance to mother, while boys were allowed to play or work (e.g., herd animals) farther from home and in the company of peers. In addition, girls were assigned chores at a younger age than were boys.

The impact of task assignment on social behavior is examined by Ember (1973) in a study of sex differences among children in a Luo community in Kenya. While Luo mothers attempted to assign girls and boys chores that were culturally defined as feminine and masculine, respectively, the absence of an elder sister in some homes required boys to undertake some of the feminine chores. Ember found that Luo boys who were assigned feminine work in the home, especially infant care, were less aggressive and more prosocial than boys who did not have these task assignments. The importance of Ember's finding is that the nurturance exhibited by Luo boys with experience in tending infants generalized to their interactions with other individuals. Hollos (1980) similarly reports that Hungarian 6- to 8-year-olds who began school later and spent more time after school at home tending siblings were less competitive than children who spent their time with same-age peers in a collective educational setting beginning at about age two.

Whiting's (1980) model for the development of patterns of social behavior stresses the importance of setting variables, especially the characteristics of individuals and activities that occupy a setting. Children are assigned to different settings on the basis of their sex, age, kinship, and relative status. In turn, different settings are marked by varying activities and amounts of time spent with infants, peers, adults, siblings, teachers, etc. Whiting hypothesizes that the patterns of social behavior learned and practiced in the most frequented settings may transfer to new settings or to individuals of different status. Certainly one task of childhood is to learn which patterns of social behavior are appropriate to transfer to novel settings.

Summary of Functional Approaches to Development

In this section we discussed theoretical approaches and empirical studies that focus on the functional relation of cultural experience and individual development. To understand the process of children's development in their cultural context, functional approaches emphasize examining the adaptations to particular contexts made by children and those around them. It is assumed that since development is adapted to the cultural context, the course of development is

multidirectional; there is no unique end point or developmental trajectory for children in general. Children's skills in thinking and acting are regarded as developing for the purpose of solving practical problems, which vary according to the cultural context. This development involves children's adapting and adopting the tools and skills of their culture, aided by other people.

CONCLUSION

We have argued that research and theory focusing on how culture channels development provides important perspectives on variation and universal patterns of human development. One of the most important lessons of the cross-cultural perspective is that the development of personality, cognitive skills, and behavioral patterns is intimately related to the immediate social and physical contexts and the broader cultural contexts in which children are embedded.

We have suggested that the particular contexts forming culture be examined in order to understand the process of child development. This contrasts with the treatment of culture simply as an unexamined independent variable, or child development as the general progression of the child's skills without regard for the contexts in which these skills are developed and employed. It is necessary to "unpackage" culture and the skills children practice in order to place their actions in the context of their interpretation of the tasks to be accomplished, the goals in performing the activities, and the broader sociocultural contexts of children's activities.

We discussed functional approaches to development which are presently being developed, influenced by cross-cultural perspectives and by Vygotsky's theory. These approaches emphasize that in development, children adapt their cognitive and social skills to the particular demands of their culture through practice in particular activities. Children learn to use physical and conceptual tools provided by the culture to handle the problems of importance in routine activities, and they rely on more experienced members of their culture to guide their development.

A major contribution that cross-cultural research and theorizing have made to developmental psychology is the notion that the meaningfulness of the materials, demands, goals, and social situation of an activity channels an individual's performance on a task. Sociocultural experience and individual functioning are fundamentally tied to one another and are, thus, companions in human behavior and development.

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