

- Tucker, L. R. (1951). *A method for synthesis of factor analysis studies* (Personnel Research Section Report No. 984). Washington, DC: Department of the Army.
- Tylor, E. B. (1871). *Primitive culture* (2 vols.). London: Murray.
- Van de Vijver, F. J. R. (1988). Systematizing item content in test design. In R. Langeheine & J. Rost (Eds.), *Latent trait and latent class models* (pp. 291-307). New York: Plenum.
- Van de Vijver, F. J. R. (1994). Item bias: Where psychology and methodology meet. In A. Bouvy, F. J. R. Van de Vijver, P. Boski, & P. Schmitz (Eds.), *Journeys into cross-cultural psychology* (pp. 111-126). Lisse: Swets & Zeitlinger.
- Van de Vijver, F. J. R., Daal, M., & Van Zonneveld, R. (1986). The trainability of abstract reasoning: A cross-cultural comparison. *International Journal of Psychology*, 21, 589-615.
- Van de Vijver, F. J. R., & Harsveld, M. (1994). The incomplete equivalence of the paper-and-pencil and computerized version of the General Aptitude Test Battery. *Journal of Applied Psychology*, 79, 852-859.
- Van de Vijver, F. J. R., & Poortinga, Y. H. (1982). Cross-cultural generalization and universality. *Journal of Cross-Cultural Psychology*, 13, 387-408.
- Van de Vijver, F. J. R., & Poortinga, Y. H. (1991). Testing across cultures. In R. K. Hambleton & J. Zaal (Eds.), *Advances in educational and psychological testing* (pp. 277-308). Dordrecht: Kluwer.
- Van de Vijver, F. J. R. & Poortinga, Y. H. (1992). Testing in culturally heterogeneous populations: When are cultural loadings undesirable? *European Journal of Psychological Assessment*, 8, 17-24.
- Van de Vijver, F. J. R., & Poortinga, Y. H. (1994). Methodological issues in cross-cultural studies on parental rearing behavior and psychopathology. In C. Perris, W. A. Arrindell, M. Eisemann (Eds.), *Parental rearing and psychopathology* (pp. 173-197). Chichester: Wiley.
- Van den Wollenberg, A. L. (1988). Testing a latent trait model. In R. Langeheine & J. Rost (Eds.), *Latent trait and latent class models* (pp. 31-50). New York: Plenum.
- Van Haaften, E. H., & Van de Vijver, F. J. R. (in press). Psychological consequences of environmental degradation. *Journal of Health Psychology*.
- Vandenberg, R. J., & Self, R. M. (1993). Assessing newcomers' changing commitments to the organization during the first 6 months of work. *Journal of Applied Psychology*, 78, 557-568.
- Vernon, P. E. (1969). *Intelligence and cultural environment*. London: Methuen.
- Vernon, P. E. (1979). *Intelligence: Heredity and environment*. San Francisco: Freeman.
- Watkins, D. (1989). The role of confirmatory factor analysis in cross-cultural research. *International Journal of Psychology*, 24, 685-702.
- Werner, O., & Campbell, D. T. (1970). Translating, working through interpreters, and the problem of decentering. In R. Naroll & R. Cohen (Eds.), *A handbook of cultural anthropology* (pp. 398-419). New York: American Museum of Natural History.
- Whiting, B. B. (1976). The problem of the packaged variable. In K. Riegel & J. Meacham (Eds.), *The developing individual in a changing world* (Vol. 1, pp. 303-309). The Hague: Mouton.
- Williams, J. E., & Best, D. L. (1982). *Measuring sex stereotypes: A thirty-nation study*. Beverly Hills, CA: Sage.
- Wilss, W. (1982). *The science of translation: Problems and methods*. Tuebingen: Narr.
- Winer, B. J. (1971). *Statistical principles in experimental design* (2nd ed.). New York: McGraw Hill.
- Yang, K. S., & Bond, M. H. (1990). Exploring implicit personality theories with indigenous or imported constructs: The Chinese case. *Journal of Personality and Social Psychology*, 58, 1087-1095.
- Zegers, F. E., & Ten Berge, J. M. F. (1985). A family of association coefficients for metric scales. *Psychometrika*, 50, 17-24.

## 8

## CULTURE AS PROCESS: EMPIRICAL METHODS FOR CULTURAL PSYCHOLOGY

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## Introduction

This chapter links concepts and methodology for the study of culture as psychological process. Methods must be based on a conceptual framework. In this chapter, the framework is the notion of culture as psychological process (Cole, 1995; Valsiner, 1989). This framework leads to particular kinds of research questions, which, in turn, implicate particular kinds of methods that are capable of addressing the original research questions. Because of the tight link between theory and method, methods are not theoretically neutral, but contain an implicit theory (e.g., Ochs, 1979). Beginning with a contrast between cultural and cross-cultural psychology, we lay claim to a series of methodological principles and practices that can guide research on cultural action and interaction, while revealing the ontogenetic, sociohistorical, and phylogenetic origins of human cultural processes. Where possible, sample studies that serve as models for a particular research method will be presented or cited.

## Conceptual Framework

As a species, humans are biologically primed to create, acquire, and transmit culture. The creation, acquisition, transmission, and use of culture are psychological and interpsychological processes. It is the study of these processes that is the paradigmatic subject of cultural psychology. This chapter asks what methods and what methodology are suitable to the study of culture as psychological and interpsychological process.

The social interaction among beings biologically primed for culture creates culture for the group and for the individuals in it. Culture is therefore viewed as a socially interactive process with two main component processes: the creation of shared activity (cultural practices) and the creation of shared meaning (cultural interpretation). Empirical methodology must be adequate to study both shared meaning and shared activity, the two major embodiments of shared cultural knowledge.

Culture as shared activity is an important focus of methods for the study of everyday life. However, it is the human capacity to create shared meaning that produces the distinctive methodological contribution of cultural psychology. Indeed, the centrality of creating meaning in cultural processes and human life has profound methodological consequences. This is because not only subjects but also researchers are engaged in a meaning-making process.

How to do research that minimizes the researcher's projection of meaning onto the subject and sheds maximum light on the subject's creation of cultural meanings is a major methodological issue in cultural psychology. This issue leads to a number of specific topics in this chapter: the importance of researcher perspective, research as a communication process, and the methodological role of anthropology in cultural psychology.

Both components of cultural process, shared meaning and shared activity, are cumulative in nature. This is because culture is created by processes that occur between, as well as within, generations. Meanings and activities not only

accumulate but also transform over historical time. This cumulative and temporal characteristic of culture creates the necessity for developmental methods for studying the transmission and socialization of culture from the older to the newer generation. It also creates the necessity for historical methods of studying culture as psychological process. Developmental as well as historical methodologies for cultural psychology (as well as their various combinations) will therefore be major topics of this chapter.

Because of the sociohistorical specificity of each group's cultural meanings and shared activities, a case is made for the use of culture-specific procedures. An important (and somewhat unusual) claim is that culture-specific procedures are compatible with the discovery of generalizations about the psychology of culture that transcend particular cultural settings. Such discoveries require the field to transcend methodological behaviorism (Hatano, personal communication, 1996). Methodological behaviorism requires researchers to equate procedures on the level of the smallest unit of experimenter behavior and subject response. In so far as cultural psychology engages in the comparative enterprise, its methodological goal must be to equate procedures at the deeper level of cultural meaning. (See also discussion by Sinha, this volume, of the compatibility of indigenous and universal psychologies.)

In order to provide a context for the methodological perspective that will be developed, the chapter begins by first providing an extended example of cultural process and then discussing the relationship between cultural and cross-cultural psychology. Major sections on metamethodology and methodology for the study of cultural processes follow. In the final section, the substantive consequences of this methodology are discussed.

### **An Example of Cultural Process**

Both shared activities and shared meanings are intrinsic to the human mode of adaptation for survival. They are two facets of shared cultural knowledge. An example will elucidate this theoretical formulation of cultural processes. At the same time the example indicates the subject matter for which we must specify our methods and methodology.

During the Los Angeles earthquake of 1994, many of the ecocultural supports of everyday survival and life, such as water, electricity, and roads, were destroyed. In small groups and through the media, people developed new shared knowledge concerning survival activities, such as where to get water, how to circumvent damaged roads to get from point A to point B, and methods for detecting leaking gas. Expertise was shared with novices, as when a contractor showed his neighbors how to turn off their gas, or a ham radio operator provided news of the location and magnitude of the earthquake in the absence of electricity. The nature of culture as a tool for organizing everyday life (Weisner, 1994) was quite apparent.

Symbolic communication, through both language and visual media, is a critical means by which social sharing takes place; communication processes were quite intense during this period of adapting to the physical conditions created by the earthquake. As a result, new shared activities that enhanced physical survival were created through cultural processes of social interaction.

Simultaneously, though, shared meanings were also created to rationalize and understand the events that had taken place. Like shared activities, shared meanings arose through communication processes. One shared meaning that developed was the custom of asking people how they fared in the earthquake, the normative reply was, "I was fortunate." The search to create shared meaning for a stunning physical event was particularly apparent when, a few days after the earthquake, a local public affairs radio show host convened clergy from many religions to ask them about the larger meaning of the earthquake. His question was, "Did God send the earthquake to punish Los Angeles?" Clearly, adaptation to the aftermath of the earthquake could not be reduced to a process of adapting to physical conditions; the interpretation of these conditions, that is, processes of creating meaning were part and parcel of the shared culture that developed in response to the earthquake.

This example provides a model of processes that are assumed to occur whenever a new member of society is born: the creation of shared knowledge, activities, conventions, and meanings through communication and social interaction. This microdevelopmental example of culture recreation by adults occurs in each generation in the macrodevelopmental processes of children. The example is also a model and metaphor of culture change provoked by new ecological conditions. Finally, this example illustrates the potential for cultural variability as a response to different ecological conditions (Berry, 1976).

If this is the nature of culture as process, the question at hand is what empirical methods will be useful for its empirical study. It is necessary to have an array of techniques that can address the development of shared activities, the development of shared meanings, and the communicative processes through which they are acquired. Cultural psychology has (and continues to develop) empirical methods that can systematically document processes of cultural creation such as these.

### **The Relationship between Cultural and Cross-Cultural Psychology**

The terms cultural psychology and cross-cultural psychology are each fuzzy concepts with partially overlapping sets of exemplars. There are focal (Rosch, 1973) or paradigmatic instances of the two approaches that are sharply distinctive, but there are also many research exemplars that combine attributes of each approach. This is because the methods are more complementary than competing. However, paradigmatic definitions will be used to illustrate the methodological consequences of each.

In cross-cultural psychology, culture is generally operationalized as an antecedent variable (Berry, 1976). This is the perspective offered by Van de Vijver and

Leung in this volume of the *Handbook*. In the paradigmatic instances of such an approach, culture is implicitly viewed as outside of and apart from the individual. Culture and human activity are seen as distinguishable. In cultural psychology (Price-Williams, 1980; Cole, 1990; Shweder, 1990), in contrast, culture is not seen as outside the individual, but as inside in an important way (Jahoda, 1992). Culture is "a way of knowing, of construing the world and others" (Bruner, 1993, p. 516). Thus, culture and behavior, culture and mind, are viewed as indistinguishable (Jahoda, 1992).

Cultural psychology has grown out of dissatisfaction with cross-cultural psychology (Cole, 1995; Eckensberger, 1995), on the one hand. On the other hand, it has also grown out of anthropology's wish to understand the person (Shweder & Bourne, 1982; Shweder & Miller, 1985; Shweder & Sullivan, 1990), not merely the supra individual envelope (Cole, 1995). As such, the methodology of cultural psychology reflects integration of psychology and anthropology, as well as active dialogue between the two fields.

### **Methodological Differences between Cultural and Cross-Cultural Psychology**

The methodological ideal of the paradigmatic cross-cultural psychologist is to carry a procedure established in one culture, with known psychometric properties, to one or more other cultures in order to make a cross-cultural comparison (Berry, Poortinga, Segall & Dasen, 1992). In contrast, the methodological ideal of the paradigmatic cultural psychologist is to derive procedures for each culture from the lifeways and modes of communication of that culture. Any cross-cultural comparison is secondary to such culturally differentiated procedures.

There is a second, closely related difference. Whereas cross-cultural psychology tends to derive its problems and procedures from established psychological methodology, cultural psychology derives its problems and procedures from an analysis of the nature of culture (e.g., Scribner & Cole, 1981; Scribner, 1984, 1985). In other words, the ideal in cultural psychology is for problems and procedures to flow from the nature of culture, both in general and in specific terms. Cross-cultural psychology's reliance on the methodological armory of psychology, rather than on the nature and practice of culture, probably explains why Poortinga and Malpass (1986) can conclude that "culture as a product of human action has not received much attention in cross-cultural psychology" (p. 20).

#### **Variables versus Processes**

Insofar as cross-cultural psychology operationalizes culture as an antecedent or independent variable, it is being studied as an *index* rather than a *process*. B. Whiting (1976) has talked about how each independent variable of a sociocultural nature must be "unpacked" into its component processes. This is clear for ethnic labels; such a label creates a package for distinctive cultural processes such as values and behaviors. The label serves simultaneously as an index for a variety of behaviors and as an independent variable that facilitates cross-cultural compari-

son. Cultural psychologists, in contrast, study cultural processes directly; they rely much less on "packaged" or indexical variables in their research designs.

Just as cross-cultural psychology "packages" culture in independent variables, it also "packages" the individual subject in dependent variables. In the same way that independent variables are stand-ins for complex cultural processes, so too dependent variables generally function as indices of individual cultural processes, rather than constituting the processes themselves. A dependent variable is something that can be measured; it often functions to summarize a process. Again, cultural psychology attempts to study the process itself.

An example of this distinction between dependent variable and individual cultural process is the contrast between *qualitative process* analysis and a *continuous quantitative scale*. This point will be illustrated with a particular study. Greenfield, Raeff, & Quiroz (in press) developed scenarios that are based on real-life value conflicts experienced by Latino families who immigrate to Los Angeles. One scenario is the following:

*Anna and Christina both got ten dollars from their uncle. Christina buys a blouse. A week later Anna wants to wear Christina's blouse, and Christina says, "This is my blouse, and I bought it with my own money." Anna says, "But you're not using it now." Christina tells their mother.*

The subject is then asked: What do you think the mother should do?

Immigrant mothers (who were given the scenarios in Spanish) were frequently collectivistic in their responses (Let Anna borrow the blouse). In contrast, their children were most often struggling to resolve and harmonize the collectivistic orientation of their families with the individualistic orientation of their school in particular and the dominant society in general. For example, one fourth grade girl answered that the mother should tell Anna to pay Christina for the blouse and then Christina can buy another blouse for herself. According to a *qualitative process analysis*, this is a response that integrates the individualistic concept of personal property with the collectivistic concept of sharing with extended family members. If, in a contrasting *quantitative* approach to the data, we were to place this response midway on an *interval scale* going from collectivism to individualism, we would miss the dynamics of the psychological process of cross-cultural value integration that this child has accomplished. Individualism/collectivism as a continuous dependent variable would become a packaged *index* of a cultural process; the package would hide the process itself.

#### **Cultural Process or Cross-Cultural Comparison**

Cross-cultural comparison is the method of choice for cross-cultural psychology (Triandis, 1980, p. 1). Comparisons are at the heart of quantitative methodology in psychology. Through statistical analysis, psychology uses comparison to pinpoint differences. Cross-cultural psychology is based on a comparative methodology in which statistics are used to identify different frequencies in different cultural groups of a phenomenon of interest (cf. Van de Vijver & Leung, this vol-

ume). To do this, it is necessary to assume that what is being measured is the same across groups, that only the frequencies vary. However, this is often not the case. Different adaptations and different systems of meaning, in response to a history of different conditions, imply that phenomena are qualitatively, not merely quantitatively different in different cultural groups. Whereas much discussion in cross-cultural methodology has focused on the best techniques for gaining comparable measurement (Berry, et al., 1992), the notion in indigenous psychology (Kim & Berry, 1993; Sinha, this volume), as in cultural psychology (Stigler & Shweder, 1990), is that the very phenomena are different. An important methodological conclusion flows from this idea: there can not be comparable measurement of incomparable phenomena. The measuring instruments themselves must change.

Cross-cultural comparison is not eschewed in cultural psychology (see, for example, Miller, Bersoff, & Harwood, 1990). For example, Shweder and Sullivan (1993) speak of cultural psychology as "a designation for the comparative study of the way culture and psyche make each other up" (p. 498). However, comparison is not central in the methodology of cultural psychology. Indeed, cross-cultural comparison tends to be done both cautiously and differently: distinctive procedures are often used for each culture being compared (e.g., Morelli, Rogoff, Oppenheim, & Goldsmith, 1992). This is also true of the cross-indigenous approach advocated by Kim and Berry (1993).

The methodology of cultural psychology is therefore distinct from the *psychometric approach* to cross-cultural psychology (see chapter by Van de Vijver & Leung, this volume). There, methods used in each culture should, ideally, be *formally equivalent*. Psychometrics assume that if a questionnaire is used in one culture, the questionnaire format must be used in all others being compared; and that each item must have a corresponding item in all versions/translations. In practice, though, cross-culturalists have frequently accepted variations in questionnaire content, in order to take local cultural meanings into account. In contrast, the position of cultural psychology is that one must communicate with subjects in each culture in a way that is comfortable and appropriate to that culture. This will lead to the use of very different methods to study the same issues in different cultures. Comparison and the testing of universals will come at the more abstract conceptual and theoretical levels, not on the level of concrete methods and specific behaviors generated by formally equivalent procedures. The use of *parallel procedures* across cultures, the hallmark of cross-cultural psychology, works best when cultures are not too different—for example, when all of the samples have had formal education (e.g., Hofstede's 1980 cross-national study of individualism and collectivism). The use of *qualitatively different procedures* across cultures works best when the cultures are very different, and when they have different epistemological and communicative presuppositions, topics discussed later in this chapter. As Triandis (1995) points out, cross-cultural psychology provides a methodology for comparing similar cultures, whereas cultural psychology provides a methodology for comparing dissimilar cultures.

An important facet of both cross-cultural comparison and the study of cultural process is the selection of cultures to be studied. The ideal in cross-cultural psychology is to select the cultures to be compared, based on theoretical analysis

of the independent variables (Berry et al., 1992). In contrast, cultural psychology, like cultural anthropology, puts a premium on deriving procedures and problems from each culture (Wassman, 1995); this requires in-depth knowledge of the culture. Therefore, in cultural psychology, cultures are often chosen because the researcher knows the language or otherwise has a good entree into the culture. Because of this requirement of in-depth cultural knowledge, including language skill, cultural psychologists most often research a single culture. Indeed, they often research their own cultures (e.g., Lave, Murtaugh, & de la Rocha, 1984; Valsiner & Hill, 1989).

When cultural psychologists make cross-cultural comparisons, they often deal with different cultures or social groups within a single country (e.g., Greenfield, 1966; Greenfield, Reich, & Olver, 1966; Wagner, 1984; Wassman & Dasen, 1994; Scribner & Cole, 1981; Serpell, 1993). This type of research design provides better control than a simple comparison between groups in two different countries; it also lies in that overlapping or border area between cross-cultural and cultural psychology.

Because of the labor-intensive methods used within each culture, cultural psychologists are often dependent on other researchers to collect data when they wish to compare cultures across national borders (e.g., Greenfield & Childs, 1978; last chapter of Levine et al., 1994; Saxe, 1981). However, because comparison is on an abstract theoretical level and because the procedures for each distinctive culture are derived from that culture, the need for exact replication does not come into play.

### Removing Unconstructive Stereotypes of Cultural Psychology

To define culture as process and to look for appropriate methods of studying cultural processes removes the present approach from some common misconceptions in the field about cultural psychology and its differences from cross-cultural psychology:

1. This chapter will *not* assume the absence of universal psychological processes. The view of this chapter is that universal psychological processes clearly exist and therefore need to be incorporated into methodology and theory. From the theoretical perspective, this is clearly implicit in the idea, expressed earlier, that humans are biologically primed for culture, as well as for cultures. Indeed, there is a psychic unity of humankind.

Shweder's formulation is the notion of "one mind, many mentalities" (LeVine & Shweder, 1995; cf. Shweder, 1995). In this chapter, one mind is viewed as the human capacity for cultural learning (Tomasello, Kruger, & Ratner, 1993), and many mentalities as the result of cultural variability in the conditions presented by different cultures, each with its own distinctive ecology and economy.<sup>2</sup>

2. This chapter rejects a dichotomous choice between understanding behavior in its cultural context (stereotypical of cultural psychology) and understanding behavior as indices of universally shared psychological processes (stereotypical

of cross-cultural psychology). Cultural does not mean context-bound, as opposed to universal. All behavior is both relative to a context and representative of universal principles or laws. In other words, to act in a cultural context is in itself a major universal principle of behavior. To place a particular conclusion from research in one cultural context into a universal framework is to move to a more general level of conceptualization; it is not to reject the notion of contextualized behavior. Methodology that permits the transfer of contextualized research to general principles of psychology will be one of the foci of this chapter.

## Metamethodology

### *Objectivity versus Perspective*

Modern psychology was born from the methodological ideology of objectivity, the erasure of perspective, generally known as bias. In sharp contrast to this tradition, an important tenet of cultural psychology (also voiced by Miller in her theoretical chapter in this volume) is the logical impossibility of an observer-independent or objective perspective. In cultural anthropology, the notion that results are relative to the position (cultural, class, gender) of the observer has led to self-flagellation and the total rejection of empiricism (Patai, 1994). Cultural psychology, in contrast, is developing methods and concepts suitable to the inclusion of observer perspective in research.

When studying behavior in one's own culture (as most psychologists do), one has an insider's cultural perspective. Partly because this fact runs counter to the very ideological assumptions of psychological science, the insider's perspective almost always goes unacknowledged (cf. Rogoff & Morelli, 1989). Yet this perspective is crucial. With reference to one's own group, the insider understands the meanings and motives behind in-group behaviors, meanings and motives that may be misinterpreted or devalued by outsiders looking through the lenses of their own cultural values (Berry, 1979).

An example of the unacknowledged insider perspective is the topic of self-esteem in U.S. psychology. Not until the work of Markus and Kitayama (1991) did it become apparent that self-esteem is not a universal quality, but a culture-specific ideal. In sharp cultural contrast, Markus and Kitayama noted the importance of self-effacement, rather than self-esteem, in the development of a Japanese person. Note too that this bicultural team of researchers reflects both an insider and an outsider perspective on both cultures they have studied. This is probably an important reason why they were able to remove the cultural blinders informing self-esteem research in the United States.

In essence, the insider's role is to safeguard the perspective of the subjects, so that it will be represented in the problem definition, methods, and interpretation of results of the research. (See Serpell, 1993, p. 66, for an example of the conscious use of the insider in actual research.) However, in recent years, there have come to be even more direct methods of investigating and therefore safe-

guarding this perspective have been developed. [The reader is referred to the discussion of Tobin, Wu, and Davidson's (1989; Tobin, 1989) work in the section on video technology and to the section on methods for the study of cultural meaning later in this chapter.]

At the same time, however, a knowledgeable outsider has an important perspective as well. An out-group member can see, and therefore study, aspects of the dominant culture that insiders have taken for granted or even repressed. The outsider can also serve as a cultural intermediary in making one culture more understandable to another.

Perhaps even more important to the methodology of cultural psychology is the role of the culturally marginal person, a particular type of outsider. In 1987 a panel of five leading cross-cultural psychologists assembled at the IACCP meeting in Newcastle, Australia to present their intellectual autobiographies. Every one of them had had the experience of being culturally marginal (in the sense of being between two cultures) at some early point in development. Because of their positions *between* cultures, they had ceased to take culture for granted; it was no longer the air they breathed. The contrast between cultures that they had experienced had made them personally aware of culture *per se*. In crossing over cultures in their personal lives, they had arrived at cross-cultural psychology in their professional lives.

There are a number of examples of researchers who have moved permanently into a new culture as adults, who have seen aspects of cultural psychology in their adoptive culture that had been missed by indigenous social scientists. A notable one is John Ogbu, an immigrant from Nigeria to the United States. Upon arriving he became interested in the paradox of explanations for low African-American school achievement. Factors such as poverty and level of parental schooling were being cited as causal explanations for this psychoeducational phenomenon. Yet, having come from Africa where poverty and lack of parental schooling are everyday phenomena, he knew these explanations could not be right, for school achievement was not problematical at all in Africa. At the same time, having lived as a member of the dominant majority in Nigeria, he saw a social phenomenon that Americans had been blind to: caste. This became his explanatory construct for African-American underachievement in *Minority Education and Caste* (Ogbu, 1978). Ogbu used his outsider's perspective to gain an important insight into the cultural psychology of Americans. At the same time, as a permanent resident in the United States and a product of its university system, he was also very knowledgeable about his adoptive culture. Because of firsthand knowledge of two cultures, he could use the perspective of one to raise to consciousness an important aspect of the other, one that insiders had heretofore been unconscious of.

Cross-cultural psychology has accepted the desirability and possibility of objectivity, while acknowledging ethnocentrism as a barrier to it (Berry et al., 1992). Campbell (1970) has proposed a research design whereby each of two cultures, to be compared, is studied by an insider and an outsider. By replicating the same study twice in each culture, one is supposed to be able to separate ethnocentrism from "real" cultural differences. This view provides a good foundation



for cultural psychology, but the proposed methodology does not go nearly far enough. Meanings are considered only at the level of data interpretation; Campbell assumes that the same procedure will be understood in the same way and will be equally meaningful to subjects in both cultures. However, this is not necessarily the case. Therefore, we still have no idea of what the differences mean. In addition, there is no provision in Campbell's design for both insider and outsider to *design* their own study. Comparison of insider and outsider research design can go much further in assessing the effect of cross-cultural differences in the construction of meaning on comparative research itself. In fact, there are many procedures in cross-cultural psychology (see Berry et al., 1992, chapter 9) that seek evidence for such variations in meaning (e.g., item bias indicators), and efforts are made to control them.

### *Research as a Communication Process*

Data collection is a process of communication between subjects and researchers. Although human communication is based on universal capacities, the default assumptions about knowledge and communication are culturally variable. The implication of this cultural variability is that data collection must be based on familiar modes of communication in each culture, rather than formally identical modes and means of communication. This is the cultural psychology approach to dealing with a problem noted in cross-cultural psychology—that particular instrument formats may not be meaningful in all cultures (Berry et al., 1992). However, cross-cultural psychology tries to adjust a single instrument to multiple cultures, whereas cultural psychology paradigmatically adopts the notion of using different procedures in different cultures to study comparable issues. But for the reader to understand how this might work, it is first necessary to be more specific about the nature of cultural variability in presuppositions about the communication process itself.

#### *Cognitive Realism or Cognitive Relativism?:*

##### *Cultural Variability in the Theory of Mind*

A radical departure from the assumption that there is a separation of the knowing subject from the known object can wreak havoc with many psychological procedures. An example follows.

Greenfield (1966; Greenfield & Bruner, 1966 [1969]) brought tests of conservation of quantity to Senegal in order to study the Piagetian stage of concrete operations. After transferring water from a shorter, fatter beaker into a longer, thinner one, unschooled Wolof children were asked (in their native language of Wolof) if the quantity of water was the same, more, or less. After their response, the interview procedure used in Cambridge, Massachusetts (Bruner, Greenfield, Olver, et al., 1966) was continued, and they were asked to justify their quantity judgment: "Why do you think it is the same (or more, or lesser) amount of water?" This question format met with no response. Even when the wording was changed to "Why do you *say* it is the same (or more, or lesser) amount of water?", the question elicited only uncomprehending silence.

Not until the question was changed to "Why is the water the same (or more or less)?" were justifications for the original quantity judgment successfully elicited. At that point, the unschooled children gave reasons for their judgments that were as articulate as those given to Piaget and his colleagues in Geneva.

These children had an epistemology of mental realism. According to their implicit theory of mind, they were not making a distinction between the nature of reality and their knowledge of it. Consequently, the idea of explaining a statement was meaningless; only the external event could be meaningfully explained (Greenfield & Bruner, 1966 [1969]). Implicit in this theory of mind was an assumption that there was only a single way to perceive the event of water transfer and its results.

Had an exact translation of the Cambridge conservation procedure been used, it would have been erroneously concluded that the unschooled Wolof children were not able to explain the reasoning behind their quantity judgments. Their theory of mind would have been confounded with their reasoning about the world. The research publication would have incorrectly concluded that unschooled Wolof children had a major cognitive lack in reasoning skill. Instead, the conclusion from pilot testing was that unschooled Wolof children had a different epistemology and therefore required a different interview procedure. When tested with an epistemologically appropriate procedure, the cognitive deficit in reasoning about the world disappeared.

In contrast to the unschooled children, the Wolof children who attended school responded well to a question form that made no sense to the unschooled children: "Why do you *say* the water is the same (or more, or less)?" They produced articulate reasons indistinguishable from the reasons of children in Switzerland and the United States. Apparently, the process of schooling had changed their epistemological presuppositions to accord with those of the psychological experiment. Our conclusion was that it was the introduction by the school of the written word into an oral culture that had made the difference (Greenfield, 1972): In the medium of writing, thoughts about the world are visibly distinct (on the printed page) from the world itself (Greenfield & Bruner, 1966 [1969]). It seemed likely that the written word had transformed an epistemology of cognitive realism into one of cognitive relativism, an epistemology in which a given person can have a variety of thoughts about the same thing, or different people can have different thoughts about the same thing.

This difference between schooled and unschooled children has important implications for the kinds of populations to whom one can validly transfer procedures: It implicates formal education as a potentially important variable in developing the implicit epistemology required by the communication process common to many psychological procedures and instruments.

#### *Notions of the Nature of Knowledge*

An example is the difference between individualistic and collectivistic notions of the nature of knowledge. Many societies think of knowledge as a group, not an individual, process. Co-construction of knowledge, as it normally occurs in the

course of conversation, is the norm. Interviewing Zinacantecan Maya girls and their mothers about learning, experience, and technique in textile production, the author envisioned each girl and each mother as an individual subject with an individual interview protocol. But that is not how Zinacantecans saw it. The notion that a girl would have an independent viewpoint, piece of knowledge, or perspective was not within the world view of this Maya group from Highland Chiapas. Instead, they expected more knowledgeable mothers to answer for young girls and for members of the family grouping to answer questions cooperatively. Their perspective seemed to be that the overall information would be as accurate as possible, because it was the product of a group effort. The partitioning of this information individual by individual was at odds with their world view. A similar phenomenon has been described for the A-Chewa people in Zambia (Serpell, 1993, p. 230).

The Zinacantecans and A-Chewa illustrate an assumption that is common to many collectivistic societies. However, this is not just a substantive finding about cultural variability in communication processes. It is also a methodological finding that impacts procedures that can be meaningfully used to collect data. The procedure used to collect information in such a society must permit the cooperative construction of knowledge. For example, the author allowed anyone who was knowledgeable to provide information about a subject's weaving experience. Usually this knowledgeable person was the girl's mother.

Although the procedure involves the co-construction of knowledge, the individual subject can still function as the unit of analysis. Thus, in the textile interview example, the author emerged with information about each girl and her mother as distinct individuals. What was different from the nature of research communication in the United States was that the information on each subject was co-constructed by more than one person.

### *Cultural Variability in the Right to Opinions*

Closely related are cultural differences regarding who has the right to have opinions (Lonner & Berry, 1986). In the United States and other industrialized countries, it is assumed that everyone has the right to have an individual opinion on any subject whatsoever. That is why opinion polls work in these countries. However, in many societies, opinions are formed on the group level, not by individuals. In such societies, the group's leaders and elders are given the right to an opinion. Others are not encouraged to express an individual perspective. In such a society, polling ordinary individuals on their opinions or attitudes is not an effective way to communicate with subjects (cf. Lerner, 1958).

### *Independent Questions or Connected Discourse?*

Another epistemological surprise that relates to the use of surveys or questionnaires is the assumption of independent questions. Surveys are often constructed so that successive questions do not follow the conventions of connected discourse. Instead, they are conceived as a series of independent items. However, this convention flies in the face of conversational conventions, in which each turn is a

response to the preceding turn as well as a stimulus to the next. A questionnaire or structured interview, with its independent "turns," can therefore seem strange. For example, Zinacantecans seemed very malcontent when a later question seemed to ignore a previous answer. The genre of the structured interview or questionnaire was foreign to their culture. As a result, so was the convention of independent questions specific to this genre.

### *Culture Specificity of Ignorant or Out-of-Context Questions*

The absence of such a convention particularly interferes with a common system of internal validity checks in psychological instruments; such a system is based on redundancy, that is, asking for the same information in two different ways. Far from enhancing validity, redundancy could destroy validity in communities unused to the independent "turns" of the psychological instrument genre. For example, Zinacantecan subjects could barely tolerate redundant questions. The attitude transmitted to the author was "Why are you so stupid as to ask the same question twice?"

Closely related was the Zinacantecans lack of tolerance for ignorant questions. It is likely that the Zinacantecos are similar to many other groups in this. The point is that a rigid questionnaire cannot be used to interview on a topic of great unfamiliarity to the researcher. As a prior step, ethnographic field work or focus groups must be used to figure out what the intelligent questions are. (Such prior steps as these will be discussed later in the chapter.)

Another assumption of the interview or questionnaire is that questions can be successfully asked out of context. Not all groups share this assumption. L. Devereaux (personal communication, 1992) developed a methodology based on her perception that Zinacantecans would not provide meaningful responses to questions asked out of the context of an ongoing activity. She developed a technique of interviewing around ongoing activities. For example, she would interview about weaving when weaving was taking place, about child development when children were present, and so forth. Greenfield adapted this technique to a structured interview. She was having a hard time eliciting information about the activities of play weaving and play embroidery until she started using a play weaving and a play embroidery as stimuli to ask if subjects had ever made such items when they were little. The recognition and comprehension were instantaneous. Meaningfulness was evident in the enthusiasm and spontaneity with which subjects responded. This spontaneity and enthusiasm contrasted strongly with the ennui and lack of comprehension that greeted questions about absent objects and events.

### *Communicating Across Cultures or Age Levels*

This same point, that variability in the epistemology of communication between subject and researcher can undermine research communication and invalidate results, has been made with respect to young children (Schubauer-Leoni, Perret-Clermont, & Grossen, 1993; Siegal 1991a, 1991b, in press) Siegal points out that, in a data collection procedure, the violation of communication conventions—



e.g., failing to minimize redundancy—can cause children to perform at lower levels because of communication failure between researcher and child.

Thus, cross-cultural and cross-age communication hold exactly the same methodological dangers of eliciting invalid information because of systematic but unrealized communication failure. The conclusion is that methods of eliciting data from subjects must be adapted to the presuppositions about communication that are held by each cultural group. This is yet another reason why the most valid cross-cultural comparisons will often be based on radically different procedures used in each culture.

The final point relates to the methodological significance of a researcher's intersubjectivity. Intersubjectivity, the sharing of a perspective, is the foundation of all communication (Trevarthen, 1980). Applying this idea to the notion of research as a communication process with subjects, we must conclude that the validity of data depends on the researcher's achievement of intersubjectivity with his or her subjects. This is because cooperative conversation depends on the sharing of conversational goals (Grice, 1975). If such goals are not shared, the subject may be answering a different question than the researcher had in mind. It follows, then, that the more the researcher can share the perspective of a subject, regardless of the culture of that subject, the more valid the data that will be gathered and the more valid the interpretation of the data. This conclusion is very different from the received wisdom in psychology: The most valid perspective is an objective or detached perspective.

### Validity

The methodology of cultural psychology impels the field to go beyond traditional psychological concepts of validity. A new type of validity—Maxwell's (1992) notion of *interpretive validity*—is most relevant to the metamethodological discussion of perspective and communication just discussed. Interpretive validity involves a concern with what "objects, events, and behaviors mean to the people engaged in and with them" (Wells, Hirshberg, Lipton, & Oakes, 1995, p. 288). If we expand this concept to include what questions and other conversational moves mean to the people engaged in them, then interpretive validity will include (1.) understanding the basic communicational and epistemological presuppositions of our subjects, and (2.) making sure that all data collection procedures conform to these presuppositions. Much work remains to be done to establish methods for ensuring interpretive validity.

A second type of validity that is particularly relevant to the methodology of cultural psychology is *ecological validity*. This, a more well-known type of validity in psychology, involves the extent to which a procedure elicits data that is representative of behavior outside the research context. Many of the methods for studying adaptive behaviors in everyday contexts that we will describe have ecological validity built into them. In studying naturally-occurring rather than laboratory behavior, ecological validity is insured. In deriving research problems and methods from the cultural context, rather than from the science of psychology,

ecological validity is automatically enhanced. In basing experiments on ethnographic observations, a topic to be discussed later, ecological validity is maximized. Thus, ecological validity is implicit in the very foundations of cultural psychology.

When a researcher directly studies a phenomenon of interest, rather than measuring it indirectly through items in an instrument, traditional types of validity checks, such as assessment of content validity, become superfluous. This is because these traditional types of validity concerns are based on using some measurement as an *index* of the phenomenon of interest. However, when a behavioral phenomenon is studied directly, rather than indexed indirectly, the necessity to check representativeness through a content validity check becomes unnecessary; it is ensured *ipso facto*. This point applies to the important cultural psychology method (elaborated later in this chapter) of studying behavior in its natural context.

Another relevant type of validity is *theoretical validity* (Maxwell, 1992). This involves "the presence of a more abstract explanation of described actions and interpreted meanings" (Miles & Huberman, 1994, p. 279). Theoretical validity is particularly important because it gives culture-specific research its generalizability (Miles & Huberman, 1994).

### The Necessity of Methods for Studying Cultural History

A key aspect of human culture is its cumulative quality: culture is both transmitted and transformed between and within generations. If cultural psychology is to be grounded in the nature of culture, then a key aspect of empirical methodology will be the development of methods for studying the role of cultural history in the current psychological functioning of individual members of a cultural group. As part of this effort, it will be necessary to have methods that can relate the interactive processes of intergenerational transmission to the cumulative nature of cultural knowledge. At the same time, the other side of cultural accumulation, cultural transformation and change, must also be a focus of empirical methodology. It is particularly important that the methods of cultural psychology be able to study the ways in which historical roots and cultural change combine to affect the enculturation of individuals in a cultural group at a given point in time (Greenfield & Cocking, 1994a).

### Developmental Methods

A theoretically important process in cultural psychology is the expert-novice relationship in which someone with greater cultural knowledge in a meaningful domain of activity interacts with someone with lesser knowledge in that domain, enhancing shared knowledge in a way that moves the novice toward expertise (Rogoff, 1990). The repetition of this process across generations leads to the cumulative nature of cultural knowledge and the importance of cultural history in cultural psychology (Scribner, 1985). The capacity of the novice to respond to

different kinds of input provided by the expert is influenced partly by chronologically based maturity. In addition, the movement from cultural novice to cultural expert does not occur all at once; it is a step-by-step process. Hence, the importance of *developmental methodology* to cultural psychology (cf. Eckensberger, 1979).

As Valsiner (1989) notes, an important goal of cultural psychology is to understand how the process of development takes place within a culture. (See also chapter by Valsiner and Lawrence, in Volume 2 of this *Handbook*). This "entails development of empirical methodologies that document the process of interaction between the child and his/her environment . . . a research paradigm that is primarily directed towards explaining how culture organizes the conditions for children's development, and how children assimilate these conditions, and simultaneously accommodate to them" (Valsiner, 1989, pp. 4-5). Methods for the study of developmental processes are a methodological keystone for the study of culture as psychological process.

### *The Relevance of Cross-Species and Neuroscience Methodologies*

Bruner (1972) discussed the evolutionary foundations of culture and culture learning. More recently Cole (1992) has spoken of the necessity to integrate universal biological factors into a general theory of cultural psychology. The biological priming of culture includes what have been termed cognitive constraints (Carey & Gelman, 1991; Hirschfeld & Gelman, 1994) or, more accurately, learning biases (Gallistel, Brown, Carey, Gelman, & Keil, 1991). For example, humans are "biased" to learn language (e.g., Pinker, 1994), an important component of cultural processes. The methodological implications of the universal human propensity to culture include investigations of the evolutionary foundation of culture through cross-species comparisons in domains relevant to the learning, use, and transmission of culture such as tools (e.g., Goodall, 1986; Greenfield, 1991; Matsuzawa, 1991; McGrew, 1992), symbolic communication (e.g., Plooi, 1978; Greenfield & Savage-Rumbaugh, 1991), cultural variability (Nishida, 1987) and observational learning (e.g., Tomasello, Davis-Dasilva, Camak, & Bard, 1987). (See also chapter by Keller, this volume.)

Tomasello, Kruger, and Ratner's (1993) formulation of three levels of culture learning—emulation, imitation, and collaboration—relevant to the evolution of culture stems from and suggest cross-species comparison of culture learning mechanisms. This methodology can provide insights (and has already done so) into the evolutionary (and therefore biological) foundations for culture learning. An outstanding example is Boesch's (1991) naturalistic study establishing that chimpanzee mothers in the Tai forest of the Ivory Coast use intentional teaching techniques to transmit the hammer/anvil technique of nut cracking to their young. This technique is cultural not only in the sense of involving social transmission, but also in the sense of being a technique that is distinctive to chimpanzees in a particular geographical region.

The human propensity for culture also implies investigations of the biological, especially the neural foundations of various cultural skills such as language and tools (e.g., Greenfield, 1991; Deacon, in press). Perusse (1993) has done a behavior genetics study establishing the heritability of parental teaching style, an important process in cultural transmission. Segal (1993) has used twin methodology to explore the importance of genetic relatedness in stimulating important cultural behavior such as helpfulness and cooperation. Her studies indicate that methods addressing not just the biology of individuals but the genetic relationships between individuals will be important to understanding cultural behavior.

### *Methodological Role of Anthropology*

It is clear from the inclusion of anthropological approaches in this and other handbooks (Goodenough, 1980; Munroe & Munroe, 1986; see also chapter by Munroe & Munroe, this volume) that anthropology has a role to play in cross-cultural psychology. However, this role is particularly important in cultural psychology where culture is considered a process rather than an independent variable.

First, and probably most important, is the anthropological notion of ethnography as a methodological concept. Weisner proposes a central role for ethnography because "it brings the importance of lived experience in a cultural place to the center of attention, transforming it from ground to figure" (Weisner, in press, ms. p. 3). This method is crucially important as the first stage of any cultural psychological research in a new, unfamiliar setting. Ethnography, according to Goodenough (1980), "describes what people must have learned in order to participate acceptably in most of the activities of that society" (p. 29). This is a broad anthropological notion that assumes that it is possible to master most activities of a society.

For the purposes of studying the psychological processes of culture, a more limited ethnographic goal seems more appropriate. As Packer (1995) puts it, ethnography involves firsthand experience of the settings in which the human activity of research interest occurs. The classical method of experiencing settings is by participant observation. Goodenough (1980) and others have described how to keep systematic records of participant observation. In the course of becoming a participant-observer, the researcher establishes an identity in the setting (Rizzo, Corsaro, & Bates, 1992). An important aspect of ethnography is to be able to communicate with the people of the study community in their own language.

Sometimes, as Packer (1995) notes, firsthand experience can be approximated by open-ended conversations and interviews. Unstructured focus groups can provide another approximation to firsthand experience.

Even when researching in one's own culture, any new setting can be an unknown cultural niche. Packer (1995) relates his experience with the ethnographic phase of a study of a kindergarten class: "I spent two years hanging out with the children in a pre-school kindergarten class, and that experience was invaluable; it helped me interpret and analyze the video-recordings I made. First it gave me a sense of the tone and climate of the school, and the style and manner of the

children. . . . In addition to the affective level, practical engagement with the artifacts of a context is quite different from the detached, objective observation of these artifacts. . . . To understand the common-sense that the participants in a context employ—and, as Clifford Geertz has insisted, this common-sense is a cultural system—we need to encounter it first hand” (pp. 3–4).

This statement stresses ethnography as a way to uncover and discover the subjects’ own perspective. But, as Weisner, a psychological anthropologist, points out, “ethnography is not limited to understanding meaning and the construction of experience by culture members. It is also central in understanding social institutions and social structure, demographic trends, economic exchanges, power and influence, and other, presumably more formal, distal or etic influences on development in a cultural place” (Weisner, in press, ms. p. 8).

Weisner (in press) also stresses the complementarity of ethnography with other methods. Combinations of ethnography with other methods often permit the researcher to integrate data concerning different levels of the sociocultural system. This is a methodological concept that Rogoff has explicated in speaking of the complementary “lenses” through which the researcher can see the developing child on a variety of planes: as individual, as member of a dyad, as part of a community setting (Rogoff, Baker-Sennett, Lacasa, & Goldsmith, 1995).

Wells, Hirshberg, Lipton, & Oakes (1995) point out that sociocultural planes are not themselves static units that can be defined in advance. Instead, the planes are co-constructions between researchers and subjects. Researchers must learn through interacting with subjects and observing their activities which relationships and community institutions are relevant to the focal subjects. This approach is quite different from the notion of random sampling that cross-cultural psychology (Lonner & Berry, 1986; Berry et al., 1992) has adopted from traditional psychology.

Another type of complementarity between anthropology and psychology is that of ethnography and experimentation. A wonderful example of a study in which full-blown ethnographic study was the basis for experimental research is Beach’s study of the role of external memory cues in learning to become a bartender. In the ethnographic phase of his research, Beach (1984, 1992) enrolled in and went through a bartending school’s two-week course. Based on his ethnography, Beach then designed experimental studies to verify and extend the ethnographic findings. His experimental procedure was based directly on an existing school practice, the speed drill for mixing drinks. However, in the experimental phase, he could vary stimuli systematically (e.g., glass shape) in order to pinpoint the cognitive issue of interest, microdevelopmental change in the use of external memory cues with increasing expertise.

Another excellent example of this methodology lies in the work of the Brazilian team of Nunes, Schliemann, Carraher, and colleagues (e.g., 1993; see also chapter by Schliemann, Carraher & Ceci, Volume 2, this *Handbook*). For example, in one study, (Schliemann, 1984), naturalistic observation of carpenters at work and of a carpentry school yielded realistic mathematical problems that carpenters must solve in their everyday work. These problems were then the basis for using experiments to compare professional carpenters and apprentices at differ-

ent levels in order to find out the nature of the development of cognitive strategies for solving the mathematical problems required in this particular ecological context. In other studies, experimental problems are based on interviews with experts in a particular activity context rather than observation (e.g., Grando, 1988). (See also chapter by Schliemann, Carraher & Ceci in Volume 2 of this *Handbook*.)

In cross-cultural psychology, prior ethnographies are recognized as a valuable foundation for research (Berry et al., 1992). However, whereas cross-cultural psychologists generally rely on anthropologists or their local colleagues to learn the language and the culture ethnographically, cultural psychologists more often make learning the language and participating in the culture an important part of their own research. This is because the procedures and methods of cultural psychology arise from the culture itself, not from the methodological cupboard of psychology. As a consequence, the ethnographic stage of research is indispensable. The prior examples make clear the potentially close, and even isomorphic, relationship between ethnography and psychological experimentation.

The integration of anthropological and psychological methods can be facilitated by interdisciplinary teams consisting of a psychologist and an anthropologist. Recently Jurg Wassman (anthropologist) and Pierre Dasen (psychologist) have developed a methodology for integrating the two disciplinary perspectives. They “advocate the following general research strategy in three steps: (1.) interviews with a few key informants and “jpf” [just plain folks]; (2.) behaviour observations in everyday settings to get at the application of knowledge in daily life; and (3.) setting tasks, to induce behaviour that is not observable in everyday situations” (Wassmann & Dasen, 1994, p. 23). The first two steps draw primarily on anthropological methodology, whereas the last step draws on psychological methodology.

The research strategy of Wassman and Dasen was developed partly as a way of addressing the sampling problem that stemmed from the anthropological reliance on “key informants.” Reliance on “key informants” was based on the conception of culture as a homogenous entity, ignoring its internal structural diversity and the individual differences so important to the field of psychology. Interviewing “just plain folks” expands the researchers’ sample beyond “key informants” and allows comparison of various viewpoints within a culture. Others in psychology have also argued for sampling as an important way of modifying classical ethnography:

*Newman and Saxe both develop the argument that careful sampling can be crucial for ethnographic work. Newman samples particular groups for generational identity differences, and Saxe compares Brazilian street sellers who are adepts and others who are novices in folk math tasks (Weisner, in press, ms. pp. 12–13).*

In essence, sampling is a way of dealing with the problem of perspective in ethnography. Miles and Huberman (1984) point out that qualitative field research typically involves purposive rather than random sampling, both within and between subjects: “These may be, for example, samples of actors, settings, events, time periods, and processes” (Miles & Huberman, 1984, p. 25). This is something that has been strongly debated in recent years:

*Critical and feminist theories alike question the historical bases of gender, power, or control from which ethnographies and ethnographers come (di Leonardo, 1991; Marcus & Fischer, 1986; Weisner, in press, ms. p. 5).*

Yet it must be noted that methods for reducing and evaluating bias, as well as methods for enhancing and evaluating validity and reliability in ethnographic data do exist. Validity was discussed earlier, so the examples presented here will concern bias and reliability. Procedures suggested by Miles and Huberman (1994) to avoid the biasing influence of researcher effects include staying as long on-site as possible; spending some time simply hanging around, fitting into the landscape, taking a lower profile; and using unobtrusive measures where possible (Miles & Huberman, 1994, p. 266). In order to evaluate bias, the authors suggest a number of relevant queries, including:

- Can we follow the actual sequence of how data were collected, processed, condensed/transformed, and displayed for specific conclusion drawing?
- Has the researcher been explicit and self-aware as possible about personal assumptions, values and biases, and affective states—and how they may have come into play during the study?
- Were competing hypotheses or rival conclusions really considered? If so, at what point in the study? Do other rival hypotheses seem possible (Miles & Huberman, 1994, p. 278)?

For ethnographic research, reliability involves processes of "quality control" (Miles & Huberman, 1994). Some suggested queries to evaluate reliability include:

- Is the researcher's role and status within the site explicitly described?
- Were data quality checks made (e.g., for bias, deceit, informant knowledgeability?) (Miles & Huberman, 1994, p. 278).

Another way in which anthropological methods can be integrated into cultural psychology is through training in anthropology for psychologists and through training in psychology for anthropologists. Many researchers in cultural psychology have had this type of cross-disciplinary training. Such training enhances interdisciplinary collaboration, as well as the integration of cross-disciplinary methodology by a single researcher.

## Methodology

### *Qualitative Methods are Primary in the Understanding of Process*

The conversational analyst, Schegloff (1993) wrote:

*In examining large amounts of data, we are studying multiples or aggregates of single instances. Quantitative analysis is, in this sense, not an alternative to single case analysis, but rather is built on its back (p. 102).*

Schegloff's point is that it is necessary to understand the phenomenon under study before being able to aggregate multiples of them in a quantitative test of their frequency or typicality. Indeed, it is necessary to *discover* the phenomenon under study before being able to aggregate multiple instances; in such a case the N of 1 functions as an important existence proof (T. Au, personal communication). Qualitative methods (the study of single instances, that is, data are not aggregated) are particularly crucial when it is important to stay in touch with the structural unity of a process (Fisher, 1994). Here is an example from attachment research of the danger of aggregating data without understanding each individual case, with its structurally unified process.

A baby in the United States participated in Ainsworth's Strange Situation Procedure; the baby was classified as "resistant," not "securely" attached to his mother, because he played alone quietly and contentedly (rather than resisting) when left alone with a stranger. As his mother watched this behavior through a one-way mirror, she "proudly commented to the researchers, 'Look how independent he is! See how he can play by himself? This is what I have been working for by having him be with other kids and families while I am working'" (Weisner, in press, ms. p. 11). Weisner (in press) continues:

*This mother was a single parent by choice. She had told us about her cultural goals for independence for herself and her child, her commitment to feminism, her struggles to sustain work and parenting, and many other values. Her construction of her child's behavior came from this framework of beliefs and practices. The knowledge gleaned through such informal conversations with the mother about her ideas about her child, done along with ongoing ethnographic observations of what she is doing in her everyday world to operationalize those ideas, is surely a powerful tool in understanding trust and attachment in cultural context" (ms. p. 11).*

Does it make sense to aggregate this baby with other infants showing the same behavior for completely different cultural reasons? This is the sort of question raised by Schegloff's discussion.

Schegloff goes on to say that "We need to know what the phenomena are, how they are organized, and how they are related to each other as a precondition for cogently bringing methods of quantitative analysis to bear on them" (p. 114) (cf., Hatano, 1995). In other words, qualitative analysis must precede and inform quantitative analysis. This principle is illustrated by the following example involving eye contact as a communication and socialization process for infants:

Based on an analysis of mother-infant eye contact, LeVine and colleagues (LeVine, Dixon, LeVine, Richman, Leiderman, Keefer, & Brazelton, 1994) concluded that infants receive less maternal eye contact in Africa than in the United States. However, unlike the norm for European-derived cultures, siblings are important caregivers in African families (LeVine et al., 1994; Weisner & Gallimore, 1977; Zukow, 1989). Based on this qualitative analysis of the social organization of child care in a particular ecological context, Sigman et al. (1994) measured the

aggregate amount of eye contact Emba babies in Kenya received from *all* of their caregivers, including siblings. The results were very different: the amount of eye contact, rather than being less than Euro-American norms, was, if anything, greater. The earlier conclusion that East African babies were "deprived" of eye contact was changed to the conclusion that they were "enriched" in this regard. A different qualitative analysis of *what* to count, the nature of the phenomenon, led to a different quantitative analysis and, eventually, to different conclusions. The point is that (1.) quantitative results are strongly affected by qualitative analysis of the phenomenon under study; and (2.) the qualitative nature of a given phenomenon (e.g., infant caregiving) varies from culture to culture.

### **Cultural Adaptation, Practice, and Naturalistic Methodology**

If behavioral adaptations to ecological conditions are central psychological processes in cultural psychology, this point has methodological implications: the study of natural behavior *in situ* (in contrast to controlled experimentation) becomes critical to answering questions concerning conventionalized (i.e., cultural) behavioral adaptations under varying ecological conditions. Skills must be studied in practice (Lave, 1988) before they are studied in the laboratory. *In situ* observation is important because it highlights dynamic processes in contrast to static products of cultural adaptation. The freer the behavior, the less the adaptive processes are likely to have been distorted by the research procedure. Insofar as cross-cultural psychology has been wedded to the index (item, stimulus) rather than to the process, it can deal only indirectly with behavioral adaptation to ecological contexts. However, cross-cultural psychology has recognized the importance of ecological adaptation, and the need to employ ethnographic and observational methods to study it prior to the development of psychological instruments (Berry, 1980; Berry et al., 1992).

Everyday activities reflect cultural adaptation to ecological conditions. An excellent example of the study of everyday activity in context is Rogoff's (in press) analysis of developmental transitions in children's participation in sociocultural activities. That analysis is based on *in situ* observations of preschool children in their interaction with one-year olds in two communities, a Mayan town in the Highlands of Guatemala and a city in the United States. But behavioral observations *in situ* are not sufficient, as Rogoff argues. In order to understand the *meaning* of the observed *in situ* behavioral differences in the two cultures, it was necessary to also investigate "the social organization of family roles and cultural expectations of childhood in each community" (ms. p. 18, Rogoff, in press).

### **Methods for the Study of Cultural Meaning**

Although interpretive processes of meaning construction and practical activities of materialistic adaptation are always intertwined in any real-world situation of cultural processes (as in Rogoff's example above), cultural psychology highlights

the interindividual construction of meaning. It follows that this is also the distinctive methodological contribution of cultural psychology. Therefore, this chapter now turns to a discussion of concepts and methods for the psychological study of cultural meaning. As Feldman, Bruner, Kalmar, and Renderer (1993) point out, it has not been easy to see what form empirical research would take within a cultural cognitive psychology focused on meaning-making processes. Nonetheless, considerable steps have been taken, and will be outlined in the following sections.

### **Intersubjectivity and Shared Meaning**

The sharing of meaning transforms individual meaning into cultural meaning. Methods that explore the conventionalization of meaning between two partners are relevant to the growth of shared meaning as the basis of culture (Bruner, 1990). The foundation for shared meaning is the same intersubjectivity that makes communication possible. Trevarthen (1980) sees intersubjectivity as the foundation of human culture. Appreciation of other individual minds creates intersubjectivity and therefore culture. According to him, human beings have from infancy an intrinsic motivation to gain knowledge from others, thereby showing themselves to be intrinsically social and cultural. In this view, social sharing, the basis of culture, is as natural as any other human activity. Hence, methods for exploring the development of shared understandings and information exchange in the communication process (e.g., Ochs & Schieffelin, 1983) are basic methods in cultural psychology.

Cross-cultural psychology has recognized the problem of meaning in designing comparative studies. It is conceptualized as a problem of comparability (Berry, et al., 1992) or equivalence (Poortinga, 1989; Poortinga & Malpass, 1986).<sup>3</sup> However, for cross-cultural psychology, variability in cultural meanings is looked upon as a barrier to cross-cultural equivalence and comparability. Diversity in cultural meaning is seen as something to eliminate in the interest of finding universals; it is not viewed as something to be studied in its own right. Cultural psychology goes deeper in identifying the nature of the problem and develops methods for the direct study of meaning. In cultural psychology, cultural meanings are not a barrier to research; they are the central topic of investigation. A discussion of some methods for studying the construction of cultural meanings follows.

Meaning can be communicated and shared through reciprocal social interaction. This process requires a theory of other minds. Hence, the cross-cultural study of theory of mind is central to the study of shared meaning in cultural psychology.

The developmentally earliest paradigm for social reciprocity and sharing is what Marcel Mauss (1954) called *le don*, the gift. When an infant gives a gift, he/she is applying social reciprocity to the world of objects. Studies of the development of forms of reciprocity in different cultures (e.g., Rabain, 1979) are therefore relevant to investigating the ontogeny of cultural meaning.

Many studies document the transmission of and development of cultural values through everyday processes of interaction and communication (e.g., Blake, 1994; Choi, 1992; Greenfield, Brazelton, & Childs, 1989; Greenfield, Raeff, & Quiroz,



in press; Heath, 1983; Ochs, 1982; Rabain-Jamin, 1994; Schieffelin, 1983; Schneider, Hieshima, Lee, & Plank, 1994; Shweder & Much, 1987). Greenfield, Raeff, and Quiroz (1995) use discourse analysis to document cooperative and conflicting cultural constructions of the child; their study illustrates the use of discourse analysis to study dynamic cultural processes in everyday processes of communication and interaction.

All of these studies use microanalytic methods for analyzing interactive processes. These range from discourse to semantics, grammar, and nonverbal communication. Methodological sources for discourse analysis are found in Sinclair and Coulthard (1975) and Edwards and Lampert (1993). The latter focuses on transcription and coding.

The study of social ethnotheories is another important method for the study of shared cultural meanings and their acquisition (see also chapter by Super and Harkness in volume 2 of this *Handbook*). A social ethnotheory expresses human qualities that are valued by a particular group. Ethnotheories of intelligence (Berry & Bennett, 1992; Dasen, 1984; Serpell, 1993; Wober, 1974) and of parenting (e.g., Harkness & Super, 1995; Zukow, 1984) have been of particular interest. Let us look more closely at the latter. A parental ethnotheory is a culture-specific conception of the goals of child development. Probably the most seminal paper for cultural psychology was the "three developmental stories" paper by Ochs and Schieffelin (1984). This paper was important for two reasons. First, it depicted the theoretical stance of developmental psycholinguistics as a culture-specific ethnotheory, rather than a universal truth. Second, it linked everyday interaction to the cultural value systems beneath it.

Other studies have used interview methodology to study parental ethnotheories (e.g., Goodnow, 1985). Another technique is the use of scenarios in which different child development goals lead to different resolutions of the scenario (e.g., Greenfield, Raeff, & Quiroz, in press). By analyzing open-ended responses and letting the categories emerge from the data themselves, this technique enables researchers to study the social construction of the child both intraculturally and cross-culturally. An important extension of methods for studying ethnotheories of child development and cultural socialization is the "multivocal ethnography" pioneered by Tobin, Wu, and Davidson (1989). It is discussed in detail as a use for video technology in a later section. A social psychological version of multivocal ethnography has been pioneered by Kitayama, Markus, Matsumoto and Norasakkunkit (in press).

Note that methods for studying the construction of meaning all have as their goal to reveal the nature of the research subject's perspective or subjectivity. Jones and Thorne (1987) point out that the perspective of the subject can also be a methodological tool to evaluate the meanings of assessment procedures, particularly useful in exploring intercultural clinical assessment.

### *Narrative Methods*

Bruner (1986, 1990) proposes narrative as an intrinsically cultural mode of thinking (Lucariello, 1995). Narrative thought involves structuring the world in terms

of characters with intentions who perform actions in settings, using particular means. Narrative therefore highlights the human interpretive understanding of other human beings and their activity as central to culture. At the same time, narrative as a cultural category emphasizes the making of meaning rather than the performing of behavior. Narrative is a dynamic process because it involves interpreting sequences of ongoing events. As a cultural mode, it is also dynamic and process-oriented in that it permits the study of human generative creativity: there are infinite combinations of characters, intentions, actions, settings, and means that may produced in a narrative construction.

Labov and Waletzky (1967) provide a basic source on the methodology of narrative analysis. *Narratives from the crib* (Nelson, 1989) presents further examples of narrative analysis; at the same time it illustrates how cultural psychology centers on the developmental acquisition of cultural modes of activity, in this case, the production of narrative. Another example of narrative analysis as a technique is provided by Ochs and Taylor (1992) their analysis of dinner table narratives.

### *Combining the Study of Materialistic and Symbolic Culture: Constraints and Preferences*

The fact that cultural processes are both shared activities adapted to ecological conditions and shared meanings for these activities implicates methods that assess both constraints (based on material conditions) and preferences (based on values or cultural meanings) (Shweder, Jensen, & Goldstein, 1995). Shweder and colleagues' study of sleeping arrangements in India and the United States was innovative in distinguishing constraints based on material ecological conditions (e.g., size of family, gender composition of family, number of beds available) from preferences that were based on culturally meaningful values (e.g., caring for the young, incest avoidance, chastity anxiety). The authors distinguished constraints from preferences by asking subjects (in India) about sleeping arrangements of a hypothetical seven-person family under varying resource conditions. Such a method allows one to specify both the shared cultural meanings that generate preferences (e.g., care of the young in India, autonomy in the United States) and the shared cultural responses to limited resource conditions (the number of beds). The methodology of this study points out the limitations of simple behavioral observation: Observing who sleeps with whom would not permit the analytical distinction between constraints and preferences to be made (Shweder, Jensen, & Goldstein, 1995). Simple behavioral observation, no matter how thorough, would confound cultural preferences (symbolic or idealist meaning) with cultural responses to ecological constraint (materialist adaptation).

### *Methods for the Study of Cultural History*

All of the empirical methods discussed so far assume that the study of the psychology of culture takes place at one point in time. However, an important tenet of cultural psychology is that the present psychology of culture reflects residues



of past cultural history (Scribner, 1985). What methods are appropriate for examining this past residue? One method suggested by Vygotsky was to study the influence of cultural tools and artifacts, because each artifact is itself the product of cultural history (Cole, 1995). Cole writes, "human beings live in an environment transformed by the artifacts of prior generations, extending back to the beginning of the species (Geertz, 1973; Ilyenkov, 1977; Sahlin, 1976; Wartofsky, 1979). The basic function of these artifacts is to coordinate human beings with the physical world and each other" (Cole, 1992, p. 9). Thus, when Scribner and Cole (1981) studied the cognitive effects of three different literacies used by the Vai in Liberia, they were in essence studying the effects of a complex cultural history that had produced the three writing systems and the practices with which each is associated. Saxe (1982a, 1982b) has studied number systems and their use as the product of cultural history.

Another important methodological approach to the study of cultural history is the comparison of psychological processes of the same ethnic group in different societal contexts. Sometimes this is done directly by a single researcher (e.g., Ho, 1989). Other times, it is done indirectly by comparing the findings of different researchers (e.g., Greenfield & Cocking, 1994a). The commonalities in psychological phenomena of the same ethnic group in different societal contexts point to the effect of ancestral cultural influences that predate the divergence of the ethnic group into different societal contexts. On the other hand, differences between ethnic group members residing in different cultural contexts reflect a different sort of history, the history of intergroup contact under varying societal conditions. The development of methodology for studying the impact of different patterns of intergroup contact on the same ethnic group has been pioneered by Ogbu (e.g., 1978, 1994).

Such differences reflect the dynamic, changing quality of cultural history. There have been a number of attempts to capture the psychological nature of cultural change indirectly by synchronic or cross-sectional methods. Perhaps the first was Vygotsky's and Luria's attempt to assess the cognitive impact of the post-revolutionary process of farm collectivization in the Soviet Union by comparing cognitive processes in peasants living on traditional farms with those who had been collectivized on a number of cognitive tasks (Luria, 1976). Recent examples of this research strategy include Saxe's (1982a, b) studies in New Guinea comparing the mathematical cognition of Oksamin people who have been more touched by the recent introduction of commerce and money with those who have been less touched. Draper and Cashden (1988) have explored the impact of sedentarization on sex role socialization among the Efe by comparing Efe still living as hunter/gatherers with those living as agriculturalists. (See also chapter by Berry & Sam, in Volume 3 of this *Handbook*, on the psychological consequences of culture contact and change.)

Perhaps the most direct of all of the synchronic approaches to diachronic change is the study of families who have immigrated from the same country in different generations. An example of this strategy is Delgado-Gaitan's (1993, 1994) comparison of immigrant and first-generation Mexican-American families'

intrafamilial interaction patterns and values. What differs at one point in time between the immigrant and first-generation families is used to model the cultural assimilation process over time in a single family. In all of these research designs, the logic of the method is to take advantage of current variability in the diffusion of a cultural change to reconstruct the impact of that cultural change over historical time.

This indirect methodological strategy has the potential problem of making assumptions about unidirectional cultural evolution (cf. Eckensberger, Krewer, & Kasper, 1984). Consequently, the simulation of cultural change by comparative research must be based on specific knowledge of actual cultural change, not general theories of cultural evolution. In addition, there is the methodological problem of assuring group comparability in factors other than those connected with social change.

A more direct way of assessing the impact of cultural change is through diachronic methods, termed *longitudinal* in psychology. Longitudinal studies of historical change are a recent addition to cultural psychology. Three examples of this new method can be cited:

1. Through the comparison of two generations of children from the same families, Greenfield (1993) has studied the impact of economic development on interactional processes of informal education and individual processes of cognitive representation in a Mayan community in Chiapas, Mexico.<sup>4</sup>
2. Through longitudinal study in both Puerto Rico and the United States of Puerto Rican families before and after immigrating to the New York area, Laosa (in progress) has been able to trace the impact of cultural change on psychological and family interaction processes.
3. Through the longitudinal observation of dairy workers adapting to computerization of their jobs, Scribner, Sachs, Di Bello, and Kindred (1991), studied the cognitive adaptation to a major change in the technological side of culture.

Because longitudinal or diachronic methods are intrinsically historical, they are more direct than cross-sectional or synchronic ones. Therefore, they should take on increasing importance in the study of the psychological impact of cultural history. However, the two types of method are mutually complementary. Sometimes, for example, massive historical change may make it impossible to delineate exactly what factors caused what psychological changes. Synchronic variability in a range of factors can then be used to model the historical change process with more precision. This strategy is currently being used by Greenfield, Childs, and Maynard to delineate precisely what aspects of the Zinacantecos' historical economic movement from agriculture to commerce are the proximal and distal causes of the associated changes in learning, teaching, and cognition.

The analysis of cultural change, whether the change be historical or evolutionary, requires particular attention to an aspect of data that is often ignored in psychology: its variability. The nature of evolutionary change is that, in response to environmental change, natural selection takes adaptive characteristics that are

less frequent and makes them more frequent over long periods of time. In cultural change as well, minority trends at one time may expand into dominant trends under new conditions. Therefore, infrequent behavioral phenomena may often furnish more clues as to historical or evolutionary cultural change than do normative trends. The methodological implication holds that it is necessary to recognize the theoretical significance of infrequent as well as frequent behavioral phenomena in understanding the psychological dimensions of cultural change. Central tendency may often lead one astray in the study of social change.

### *The Unique Methodological Role of Video Technology*

Video is uniquely suited for the study of processes of *in situ* cultural adaptation and for the study of the construction of cultural meaning. Examples of research that have drawn upon video for the former purpose are Childs and Greenfield's (1980) study of weaving apprenticeship and Stigler's study of U.S., Chinese, and Japanese classrooms (Stigler & Perry, 1990). Video also solves certain problems of reliability and validity, posed but not solved by classical psychology. It provides a permanent record by which other researchers can check the basis for interpretations and conclusions. Whereas the classic criterion of replicability of findings has been called into question (Valsiner, 1989) because of the possibility of change over time (either developmental or cultural), video freezes data in time, thus allowing the analysis to be replicated without repeating the observation.

Whereas video furnishes the *data* for the study of *in situ* processes of cultural adaptation, video can also furnish *stimuli* for studying the construction of cultural meaning (Jacobs et al., 1996; Tobin, Wu, & Davidson, 1989; Tobin, 1989). In this latter method, members of different cultures are given the task of evaluating everyday practices on video from the same range of cultures. In the study of Tobin et al. and of Jacobs, they focus on the evaluation of classroom practices in China, Japan, and the United States. The design is cross-cultural at two levels, the level of the stimuli and the level of the subjects. For example, in Jacobs' (in press) study, Japanese and American teachers are given an opportunity to evaluate videos of Japanese and American classroom lessons. The notion of multiple perspectives is built right into the design of the study itself.

An important point is the difference between this empirical approach to multiple perspectives and the post-structuralist approach which simply decries the researchers' ethnocentric perspective without trying to do anything about it (cf. Patai, 1994). Tobin (1989) describes the thought behind the Tobin et al. (1989) study in this way: "We have sought to develop a method for doing research and a narrative stance for our writing that would *decenter* as well as *deprivilege* the author-anthropologist. Rather than replacing the persona of the omniscient, positivistic, confident, gentleman-scholar with the persona of the apologetic, soul-searching, self-centered, reflexive anthropologist, we strive to shift narrative attention and the authority to define meaning away from the author. We strive to give voice—the power to name, interpret, and analyze—to the teachers, students, parents, and children who have traditionally been objects rather than partners in investigation" (Tobin, 1989, p. 174).

Tobin et al. accomplished exactly that in their innovative study. They first videotaped a preschool in each of three cultures, China, Japan, and the United States. They then showed the tapes to preschool staff, parents, and child development experts in each country, asking them to evaluate their own and each other's schools. This method led to "a multicultural discussion of such issues as freedom, conformity, creativity, and discipline" (Tobin et al., 1989, dust jacket). This method leads the authors beyond cultural differences in educational practices to the values and child development goals that lie beneath the practices.

Some of the most interesting discussion took place when the video sequences from one country violated norms of another. Nothing is as effective in revealing cultural norms and values as the reactions people have when the norms are broken. In many cases, the norms of one culture, shown on video, violated the norms of the "outsider" observing the video. The cross-cultural showing of videos provides a systematic opportunity to comment on norm violation, thus revealing the very existence of normative values.

Video technology involves a host of other methodological fine points, including transcription, coding, and interobserver reliability. The focus here will be on a new method developed by J. Stigler. In the course of a cross-cultural study of classroom practices, he and his colleagues have developed software that allows coding to be done on or next to the video frames, for instant retrieval and statistical access. After a tape has been digitized onto CD-ROM, the software allows instant access to any of the codes or video frames. This system has the potential to speed up video coding tremendously. For one reason, it will no longer be necessary to transcribe simply to keep a record of what was going on at the time a code was made; the original video clip is stored with the code. At the same time, the advances in video and computer technology enable frames to be captured on computer and, ultimately, paper, to illustrate results and to constitute a visual part of discourse transcription (e.g., Goodwin, in press).

### *Quantitative Methods for the Study of Behavior as Part of a Cultural System*

Once qualitative understanding has been achieved, quantitative methods involving issues of frequency are useful and appropriate (Gaskins, 1994). However, not all statistical techniques are equally suitable for answering cultural questions. Insofar as cultural psychologists are interested in the varying levels and layers of culture from the most macro to the most micro, particular kinds of statistical techniques are often more appropriate. One major problem with traditional techniques such as analysis of variance and regression, is the division into independent and dependent variables. Although cross-cultural psychology generally interprets culture as an independent variable or even a set of independent variables (Jahoda, 1990), this approach has major problems.

First, culture is a system with interrelated, not independent parts (Berry, 1983). An excellent statistical technique to capture these interrelations is structural equation modeling (e.g., Bentler, 1989). This technique permits a model with multiple interacting variables. Any variable can have links with any or all of the other

variables. Analyses of covariance structures are another example of a statistical technique that has these characteristics. These methods are discussed by Van de Vijver and Leung, this volume.

Second, variables cannot be neatly divided into cause and effect. Most variables function both as causes of some things and effects of others. For example, Greenfield and Childs (Greenfield, 1993) have proposed a causal model in which it is hypothesized that historical factors influence economic activity, which in turn, influences how weaving is transmitted intergenerationally. In this model, economic activity is treated as the effect of historical era and the cause of style of informal education. Given data on each of these levels, such a model can then be tested by structural equation modeling.

Third, in cultural systems, variables often function as both cause and effect. An example is the influence of symbolic cultural tools such as video games on individual development, and the effect of individual differences on the use of these tools. Such reciprocal two-way relationships can also be tested by structural equation modeling (e.g., Greenfield, Brannon, & Lohr, 1994). In general, structural equation modeling is consistent with the concept of culture as a system that is not apart from the individual. It allows the testing of models involving a whole web of social, cultural, and personal factors over time in a single model. However, the very same flexibility that is an asset of these models can also be a disadvantage. If a researcher is using them in an exploratory fashion, as a rule, some structure will emerge. However, the post hoc interpretation of such an outcome is open to question. In such a case, the validity of a given model depends on testing and ruling out theoretically plausible alternatives.

### *Cultural Adaptation of Procedures and Measures*

A cogent example of the conceptual and theoretical problems that arise when measuring instruments are transported across cultures without adaptation comes from the study of attachment (LeVine & Miller, 1990; Takahashi, 1990). Attachment is a topic particularly suitable for cultural and cross-cultural investigation because adult-infant attachment is a key foundation for cultural transmission and for the social relations upon which human culture is based. (See also chapter by Keller, this volume.)

LeVine and Miller (1990) recount how a procedure, the Strange Situation, that had been devised by Ainsworth as a culture-specific adaptation to measure attachment in the United States came to be used universally in the interest of cross-cultural comparison. In moving her study of attachment from Uganda (Ainsworth, 1967) to the United States, Ainsworth had changed her attachment measuring instrument to accord with the greater autonomy and independence encouraged in U. S. infants. Nonetheless, the deceptive standardization of the Strange Situation subsequently sent it all over the world, with no thought as to its cross-cultural validity and dubious comparative results (see Takahashi's critique, 1990). LeVine and Miller (1990) point out that in 1978 Ainsworth and colleagues wrote, "It seems entirely likely that Ainsworth's (1967) Ganda infants and Konner's (1972) Bushmen babies could not have tolerated the strange situation" (Ainsworth,

Blehar, Waters, & Wall, 1978, p. iv). Recently, Takahashi (1986, 1990) announced that the Japanese mothers of her sample would not consent to leaving their babies alone in an unfamiliar situation.

Clearly, the same situation had totally different meanings for babies and mothers in these different cultures. Mindful of this critique, Harwood (1992) did a cross-cultural study of the interpretive meaning of the Strange Situation and the behaviors that occur in it for Puerto Rican and Euro-American mothers. Indeed, she found that the meaning of responses to this situation was different in the two cultural groups: In keeping with their more individualistic orientation, Euro-American mothers "describe an active yet related infant as most desirable and a clingy, distressed infant as most undesirable" (Harwood, 1992, p. 831). Puerto Rican mothers, in keeping with their more sociocentric or collectivistic orientation, "describe as most desirable a quiet, responsive infant whose behavior is tipped more toward proximity maintenance than toward active exploration" (Harwood, 1992, p. 831). If the culturally desired response to the Strange Situation is culturally variable, then it is not possible to standardize behavioral categories and the interpretations of these categories across different cultures. In line with the earlier discussion of single case analysis as applied to the Strange Situation, cross-cultural quantitative comparisons also become problematic.

Going one step further, note that the Strange Situation measures attachment through response to separation. Given that the ability to cope with separation is normative in only a minority of cultures (often termed individualistic), one might also want to measure attachment as proximity maintenance behavior, in line with the Puerto Rican (and other collectivistic societies') ideal of attachment behavior. In other words, this analysis of attachment reveals how culture-specific a measuring instrument can be. To use the Strange Situation in both an individualistic and collectivistic culture is to have a biased comparison. The infants in one society will be tested by the same measure that their upbringing has utilized; the infants in the other society will be tested on how well they can do in a culturally-foreign situation. If only one single testing situation is to be used in cross-cultural comparison, it should be one that provides room for a range of ideals to be actualized. A procedure for measuring attachment that allowed *both* proximity maintenance and tolerance for separation to be manifest as normative attachment would provide this range. Such a situation would be culturally fairer than the classical Strange Situation that forces mother-child separation on all babies, whether or not they have ever experienced it in their everyday lives (Takahashi, 1990).

### **Substantive Consequences of Empirical Methodology for Cultural Psychology**

#### *Cultural Adaptation of Procedures Leads to Generalizable Processes of Cognition and Culture Acquisition*

Generalizations concerning universal processes must be a part of cultural psychology, insofar as the culture-making capacities of the human species are being

considered. However, cross-cultural generalizations must arise from a more abstract level than the level of similar or identical measuring tools. An example illustrating this point is taken from a study of the development of kinship terminology carried out by Greenfield and Childs (1978) in Zinacantan, a Mayan community in Chiapas, Mexico. Children of different ages were asked about various sibling relations in their own households, using the complex sibling terminology of their Tzotzil language in which there are separate terms for older and younger siblings, as well as for the sibling of a boy and the sibling of a girl. Samples of the type of question asked are, "What is the name of your older sister?" and "as for older sister, Shunka, what is the name of her younger brother?" From anthropology, linguistics, and developmental psychology, Greenfield and Childs extracted theories that might have explained the results. The theories from anthropology and linguistics were *relativistic*, emphasizing the role of culture-specific values (the importance of the older-younger relationship) and language-specific structure (the complexity and organization of the sib terminology system). The theories from psychology, Piagetian and information processing, were *universalistic*, emphasizing common responses as a function of chronological age (Piaget) and memory load (information processing).

Piaget (1928) had done a study in the same domain with Swiss children. Greenfield and Childs' procedure, however, was quite different from his. Whereas he asked quantitative questions ("How many brothers do you have?"), Greenfield and Childs asked qualitative ones ("What is the name of your older brother?"). (To have been required to answer quantitative questions would have demanded an unfamiliar skill for Zinacanteco children.) Whereas Piaget asked simply about the two terms, brother and sister, Greenfield and Childs asked about the six different Tzotzil sibling terms. (Note that comparability would have dictated aggregating sets of sibling terms, such as older sister, girl's younger sister, and boy's younger sister. Yet, to do this would have violated the organization of Tzotzil sibling organization.)

A maxim of the use of "comparable" instruments for cross-cultural comparison is that comparable instruments are necessary in order to elucidate universal processes. A corollary would be that the lack of comparable instruments will lead only to culture-specific conclusions. This maxim, with its corollary, was belied by Greenfield and Childs' results. Whereas their culture-specific procedure should, according to this way of thinking, have led to the verification of culture-specific processes (triggered, in this case, by cultural values or linguistic terminology), the results showed no evidence of any such culture-specific processes. Instead, all of the results led to the validation of putatively universal developmental and cognitive processes. For example, Piaget had posited the development of a stage of concrete operations in middle childhood, a stage where children can symbolically represent the transformations of concrete objects. In Greenfield and Childs' data, there was evidence of concrete operational development, from egocentrism to understanding of reciprocity to understanding of reversible relations (e.g., I am my older brother's younger brother), occurring in the same age range described by Piaget for Swiss children. Greenfield and Childs also found evidence of memory development and the influence of category size on memory retrieval, theorized to be universal processes.

The methodological point of this example is that maximum adaptation of methods to each particular culture in which a phenomenon is studied maximizes the possibility of uncovering nomothetic, even universal, processes at the same time as it obviates the possibility of direct, quantitative cross-cultural comparison (cf., Enriquez, 1977). Ironically, the comparable methods required for direct comparison in this example would probably have reduced, if not eliminated, the manifestation of universal processes. For example, unfamiliar quantitative questions would not have been answered so well by Zinacantecos, and cognitive competencies in kinship terminology would have been masked. Similarly, the use of unfamiliar aggregates of siblings to conform to the French sibling terms used by Piaget would have been confusing and would have hidden the Zinacanteco child's mastery of a more complex sibling system. The paradox is that universal processes are revealed more by *noncomparable methods* and *theoretical comparison* than by *comparable methods* and *quantitative comparison* across cultures.

However, this study was not explicitly comparative. Is it possible to use noncomparable methods in an explicitly comparative study? Morelli, Rogoff, Oppenheim, and Goldsmith (1992) did exactly that in a comparative study of sleeping arrangements in Utah and in a Maya community in Guatemala. In each place, "the interview was tailored in ways appropriate to each community" (p. 606). The tailoring did not preclude basic quantitative comparisons, although the emphasis was on qualitative results. Of great pragmatic interest to those advocating noncomparable methods as a way of drawing conclusions both about cultural variability and possible universals is the fact that this article was published by a mainstream journal.

### *Cultural Generation of Procedures Leads to Generalizable Processes of Cognition and Culture Acquisition*

This important point will be illustrated with the example of the cognitive appropriation of cultural tools. Processes of transforming cultural tools into mental tools (Bruner, 1964; Vygotsky, 1978; Saxe, 1991) are part of universal cognitive equipment and operations. The exploration of these processes demands the identification of particular cultural tools, an understanding of how they function in cultural practices, and experimental methods by which the transformation and use of the tools can be studied. The important point is that, although a particular tool is rarely universal, its learning and use will draw upon and reveal universal processes in the cognitive appropriation of cultural tools (Saxe, 1991).

An outstanding example is the exploration of the "mental abacus" begun by Hatano, Miyake, and Binks (1977) and continued by Stigler and colleagues (Stigler, 1984; Stigler, Chalip, & Miller, 1986). The research begins with an analysis of the abacus as a calculation tool. Clearly, an understanding of the cultural tool in question is an important part of the methodology. This understanding must be gained either by being a cultural insider who has been exposed to and trained in the use of the tool, by ethnographic exploration, or by collaboration with a cultural insider.

A number of different methodological strategies have been used to explore the transformation of the physical abacus into a mental tool and the operation of the "mental abacus." One strategy (Stigler, 1984) is based on identifying steps in the arithmetic problem-solving process that were specific to abacus use (i.e., would not be used in standard numerically-based calculations). When shown photographs of an abacus with its beads in various positions, experts were extremely accurate at distinguishing abacus states that were intermediate steps to the solution of particular problems from states that were not part of the problem's solution. In addition, response time was slower if the depicted abacus state occurred later in the problem-solving sequence.

A second methodological strategy was to do an error analysis to see if the nature of abacus user errors reflected a mental representation specific to abacus use (Stigler, 1984). Because the abacus has upper beads that represent the quantity five, errors that deviate by exactly five would reveal the use of an internal abacus representation in mental calculation. Abacus operators made significantly more mistakes that were off by exactly five, both in using the abacus and in mental calculation, than did American students.

Consequently, it could be concluded that (1.) abacus experts had internalized a representation of an abacus that they could operate upon mentally, (2.) they carried out operations on the mental abacus in the same sequence as would be done on the physical abacus, and (3.) their errors bore the trace of the mental abacus. The point is that the conclusions from this research are not specific to the abacus, a cultural tool particular to certain cultures. The point is not whether subjects could generalize their skills to other tools. In essence, the conclusions are about potentially universal processes of transforming cultural tools into mental tools (Gauvain, 1995).

By studying the effects on representation and problem-solving of activities using other culture-specific tools, further conclusions about the scope and nature of these cognitive processes of cultural appropriation (Saxe, 1991) can be drawn. For example, in the domain of math, the influence of money denominations on the representation of math problems was demonstrated by Saxe (1982a, 1982b) in New Guinea. Note that these findings about the representational impact of money generalize the conclusions of Stigler and colleagues about the representational impact of the abacus, even though Saxe used different procedures to study the effects of a different tool in a different society. Indeed, the cognitive consequences of using a range of cultural tools in a variety of activities have been studied (Greenfield & Lave, 1982; Guberman & Greenfield, 1991): tailoring (Lave, 1977), pottery making (Price-Williams, Gordon, & Ramirez, 1969), video games (Greenfield, 1993; Greenfield & Cocking, 1994b), candy selling (Saxe, 1991), money (Saxe, 1982a, 1982b; Guberman, in press a, b), weaving (Greenfield & Childs, 1977), and bartending (Beach, 1984, 1992). In each case the structure of the artifact is internalized as a partially isomorphic representation.

The method of using cultural tools embedded in cultural activities as a methodological strategy not only reveals information about how cognitive enculturation varies from culture to culture, depending on the tools available in a particular cultural niche. The method also reveals information about the *universal* role of

tools in developing processes of mental representation. Only by generating particular studies out of the specific tool-using activities that occur in a given cultural niche can the general question of the relation between cultural tools and cognitive processes be addressed. The ability to generalize cannot be based on using formally equivalent procedures across cultures. Instead, generalization is based on using common conceptual questions about situated cognition to generate a multiplicity of procedures that are appropriate to diverse cultural niches.

## Conclusion

The methodology for studying culture as process must elucidate the ontogenetic, sociohistorical, and phylogenetic origins of psychological functioning in the enculturated adult human being (Vygotsky & Luria, 1993). But methodology must go farther. It must be adequate to deal with socially shared cognition (Resnick, Levine, & Teasley, 1991) and with the participation of the individual in social relations and in a cultural community (Rogoff, in press). The development of research methodology adequate to these requirements is an extremely demanding task. The suggestions in this chapter should be of practical utility to researchers and students who wish to study culture as psychological process.

## Endnotes

1. The author wishes to thank Jennifer Jacobs, Shinobu Kitayama, Ashley Maynard, Joan Miller, Richard Shweder, and James Stigler for helpful comments on an earlier draft of this chapter.

2. Along with Jahoda, 1977, this chapter rejects the etic/emic distinction as a useful way to talk about methods for studying universal and culture-specific patterns of thinking.

3. Often the problem of variable cultural interpretations is dealt with as a statistical issue internal to a particular instrument (e.g., Berry et al., 1992; Van de Vijver & Poortinga, 1991). Statistical problems then find statistical solutions. One example of such a solution is the measurement of bias ("all unwanted factors that unequally affect

scores in different cultural groups" [p. 225]). Even when insider judgments of the cultural appropriateness of individual stimuli are used, the possibility that the very method (e.g., opinion survey) on which a particular instrument is based may have different meanings in different cultures is not dealt with.

4. An unanticipated methodological insight from this historical study was that more open-ended, naturalistic methods are more sensitive to sociohistorical change than are more controlled experimental procedures. The latter provide too much constraint on subject responses to be sensitive to future cultural change, unknown at the time of the historical baseline observations.

## References

- Ainsworth, M. D. S. (1967). *Infancy in Uganda: Infant care and the growth of attachment*. Baltimore: John Hopkins University Press.
- Ainsworth, M. D. S., Blehar, M. C., Waters, E., & Wall, S. (1978). *Patterns of attachment*. Hillsdale NJ: Erlbaum.



- Beach, K. (1984). The role of external memory cues in learning to become a bartender. *The Quarterly Newsletter of the Laboratory of Comparative Human Cognition*, 6 (1 & 2), 42-43.
- Beach, K. (1993). Becoming a bartender: The role of external memory cues in a work-directed educational activity. *Applied Cognitive Psychology*, 7, 191-204.
- Bentler, P. (1989). *EQS structural equations manual*. Los Angeles: BMDP Statistical Software, Inc.
- Berry, J. W., (1976). *Human ecology and cognitive style: Comparative studies in cultural and psychological adaptation*. New York: Sage/Halsted.
- Berry, J. W. (1979). Unobtrusive measures in cross-cultural research. In L. Sechrest (Ed.), *New directions in methodology of behavioral science*, 1, 47-57.
- Berry, J. W. (1980). Ecological analyses for cross-cultural psychology. In N. Warren (Ed.), *Studies in cross-cultural psychology*, (Vol. 2, pp. 157-189). London: Academic Press.
- Berry, J. W. (1983). Textured contexts: Systems and situations in cross-cultural psychology. In S.H. Irvine & J.W. Berry (Eds.), *Human assessment and cultural factors* (pp. 117-125). New York: Plenum.
- Berry, J. W., & Bennett, J. A. (1992). Cree conceptions of cognitive competence. *International Journal of Psychology*, 27, 73-88.
- Berry, J. W., Poortinga, Y. H., Segall, M. H., & Dasen, P. R. (1992). *Cross-cultural psychology: Research and Applications*. Cambridge: Cambridge University Press.
- Blake, I. K. (1994). Language development and socialization in young African-American children. In P. M. Greenfield & R. R. Cocking (Eds.), *Cross-cultural roots of minority child development* (pp. 167-195). Hillsdale, NJ: Erlbaum.
- Boesch, C. (1991). Teaching among wild chimpanzees. *Animal Behavior*, 41, 530-532.
- Bruner, J. S. (1964). The course of cognitive growth. *American Psychologist*, 19, 1-15.
- Bruner, J. S. (1972). The nature and uses of immaturity. *American Psychologist*, 27, 1-22.
- Bruner, J. (1986). *Actual minds, possible worlds*. Cambridge, MA: Harvard University Press.
- Bruner, J. (1990). *Acts of meaning*. Cambridge, MA: Harvard University Press.
- Bruner, J. (1993). Do we "acquire" culture or vice versa? *Behavioral and Brain Sciences*, 16, 515-516.
- Bruner, J. S., Greenfield, P. M., Olver, R. R., et al. (1996). *Studies in cognitive growth*. New York: Wiley.
- Campbell, D. T. (1970). Natural selection as an epistemological model. In R. Naroll & R. Cohen (Eds.), *A handbook of method in cultural anthropology* (pp. 51-85). New York: Natural History Press.
- Carey, S., & Gelman, R. (Eds.). (1991). *The epigenesis of mind: Essays on biology and cognition*. Hillsdale, NJ: Erlbaum.
- Childs, C. P. & Greenfield, P. M. (1980). Informal modes of learning and teaching: The case of Zinacanteco weaving. In N. Warren (Ed.), *Studies in cross-cultural psychology*, (Vol. 2, pp. 269-316). London: Academic Press.
- Choi, S.H. (1992). Communicative socialization processes: Korea and Canada. In S. Iwawaki, Y. Kashima & K. Leung (Eds.), *Innovations in cross-cultural psychology*, (pp. 103-122). Lisse, Holland: Swets & Zeitlinger.
- Cole, M. (1990). Cultural psychology: a once and future discipline? In J.J. Bergman (Ed.), *Nebraska symposium on motivation, 1989: Cross-cultural perspectives*. (Vol. 37, pp. 279-336). Lincoln: University of Nebraska Press.
- Cole, M. (1992). Context, modularity, and the cultural constitution of development. In L. T. Winegar, & J. Valsiner (Eds.), *Children's development within social context*. Hillsdale, (pp. 5-31) NJ: Lawrence Erlbaum Associates.
- Cole, M. (1995). Culture and cognitive development: From cross-cultural research to creating systems of cultural mediation. *Culture and Psychology*, 1, 25-54.
- Dasen, P. R. (1984). The cross-cultural study of intelligence: Piaget and the Baoule. In P. S. Fry (Ed.), *Changing conceptions of intelligence and intellectual functioning: Current theory and research* (pp. 107-134). Amsterdam: North-Holland.
- Deacon, T. (in press). *The idea that changed the brain: The coevolution of language and brain*. New York: W. W. Norton.
- Delgado-Gaitan, C. (1993). Parenting in two generations of Mexican American families. *International Journal of Behavioral Development*, 16, 409-427.

- Delgado-Gaitan, C. (1994). Socializing young children in Mexican-American families: An intergenerational perspective. In P.M. Greenfield & R.R. Cocking (Eds.), *Cross-cultural roots of minority child development* (pp. 55-86). Hillsdale, NJ: Erlbaum.
- Draper, P., & Cashden, E. (1988). Technological change and child behavior among the !Kung. *Ethnology*, 27, 339-365.
- Eckensberger, L. H. (1979). A metamethodological evaluation of psychological theories from a cross-cultural perspective. In L. H. Eckensberger, W. J. Lonner, & Y. H. Poortinga (Eds.), *Cross-cultural contributions to psychology*. (pp. 255-275), Amsterdam: Swets & Zeitlinger.
- Eckensberger, L. H. (1995). Activity or action: Two different roads towards an integration of culture into psychology? *Culture and Psychology*, 1, 67-80.
- Eckensberger, L. H., Krewer, B., & Kasper, E. (1984). Simulation of cultural change by cross-cultural research: Some metamethodological considerations. In K. A. McCluskey & H. W. Reese (Eds.), *Life-span developmental psychology: Historical and generational effects* (pp. 73-107). Orlando, FL: Academic Press.
- Edwards, J. A., & Lampert, M. D. (Eds.). (1993). *Talking data: Transcription and coding in discourse research*. Hillsdale, NJ: Erlbaum.
- Enriquez, V. G. (1977). Toward cross-cultural knowledge through cross-indigenous methods and perspectives. *Philippine Journal of Psychology*, 12, 9-16.
- Feldman, C., Bruner, J., Kalmar, D., & Renderer, B. (1993). Plot, plight, and dramatism: interpretations at three ages. *Human Development*, 36, 327-342.
- Fisher, C. (1994). Qualitative and quantitative empirical methods: Their relative power. Paper presented at the American Psychological Association, Los Angeles.
- Gallistel, C. R., Brown, A. L., Carey, S., Gelman, R., & Keil, F. C. (1991). Lessons from animal learning for the study of cognitive development. In S. Carey & R. Gelman (Eds.), *The epigenesis of mind: Essays in biology and knowledge* (pp. 3-36). Hillsdale, NJ: Erlbaum.
- Gaskins, S. (1994). Integrating interpretive and quantitative methods in socialization research. *Merrill-Palmer Quarterly*, 40, 313-333.
- Gauvain, M. (1995). Thinking in niches: Sociocultural influences on cognitive development. *Human Development*, 38, 25-45.
- Geertz, C. (1973). *The interpretation of cultures*. New York: Basic Books.
- Goodall, J. (1986). *The chimpanzees of Gombe: Patterns of behavior*. Cambridge, MA: Harvard University Press.
- Goodenough, W. H. (1980). Ethnographic field techniques. In H. C. Triandis, & J. W. Berry (Eds.), *Handbook of cross-cultural psychology: methodology*. (Vol. 2, pp. 29-55). Boston: Allyn and Bacon.
- Goodnow, J. J. (1985a). Change and variation in parents' ideas about childhood and parenting. In I. E. Sigel (Ed.), *Parental belief systems* (pp. 1235-1270). Hillsdale, NJ: Erlbaum.
- Goodwin, C. (1994) Professional vision. *American Anthropologist*, 96, 606-633.
- Grando, N. I. (1988). *A matematica na agricultura e na escola* [Mathematics in agriculture and school.] Unpublished master's thesis, Universidade Federal de Pernambuco, Recife.
- Greenfield, P. M. (1966). On culture and conservation. In J. S. Bruner, R. R. Olver, P. M. Greenfield, et al., *Studies in cognitive growth*, (pp. 225-256). New York: Wiley.
- Greenfield, P. M. (1972). Oral or written language: The consequences for cognitive development in Africa, the United States, and England. *Language and Speech*, 15, 169-178. Reprinted in M. Maer & W. M. Stallings (Eds.), *Culture, child, and school: Socio-cultural influences on learning*. Monterey: Brooks/Cole Publishing, 1975.
- Greenfield, P. M. (1984). A theory of the teacher in everyday life. In B. Rogoff & J. Lave (Eds.), *Everyday cognition: Its development in social context* (pp. 117-138). Cambridge, MA: Harvard University Press.
- Greenfield, P. M. (1991). Language, tools, and brain: The ontogeny and phylogeny of hierarchically organized sequential behavior. *Behavioral and Brain Sciences*, 14, 531-551.
- Greenfield, P. (1993). Historical change and cog-



- nitive change: A two-decade follow-up study in Zinacantan, a Mayan community of Southern Mexico. Paper presented in P. Greenfield (Chair), Sylvia Scribner Memorial Symposium: Culture, Activity, and Development, Society for Research in Child Development, New Orleans.
- Greenfield, P. M. (1994). Independence and interdependence as developmental scripts: Implications for theory, research, and practice. In P. M. Greenfield & R. R. Cocking (Eds.), *Cross cultural roots of minority child development*, (pp. 1-37). Hillsdale, NJ: Erlbaum.
- Greenfield, P. M. (1995). Review of *The Significance of Schooling* by Robert Serpell. *Mind, Culture, and Activity: An International Journal*, 2, 54-58.
- Greenfield, P. M., Brannon, C., & Lohr, D. (1994). Two-dimensional representation of movement through three-dimensional space: The role of video game expertise. *Journal of Applied Developmental Psychology*, 15, 87-103.
- Greenfield, P. M., Brazelton, T. B., & Childs, C. (1989). From birth to maturity in Zinacantan: Ontogenesis in cultural context. In V. Bricker & G. Gossen (Eds.), *Ethnographic encounters in Southern Mesoamerica: Celebratory essays in honor of Evon Z. Vogt* (pp. 177-216). Albany: Institute of Mesoamerican Studies, State University of New York.
- Greenfield, P. M., & Bruner, J. S. (1966). Culture and cognitive growth. *International Journal of Psychology*, 1, 89-107. (A revised version appears in D. Goslin (Ed.), *Handbook of socialization theory*. Chicago: Rand McNally, 1969, pp. 653-657).
- Greenfield, P. M., & Childs, C. P. (1977). Weaving, color terms and pattern representation: Cultural influences and cognitive development among the Zinacantecos of Southern Mexico. *Inter-American Journal of Psychology*, 11, 23-48.
- Greenfield, P. M., & Childs, C. P. (1978). Understanding sibling concepts: A developmental study of kin terms in Zinacantan. In P. R. Dasen (Ed.), *Piagetian psychology* (pp. 335-358). New York: Gardner Press.
- Greenfield, P. M., Childs, C. P., & Maynard, A. (unpublished data).
- Greenfield, P. M., & Cocking, R. R. (1994a). *Cross-cultural roots of minority child development*. Hillsdale, NJ: Erlbaum.
- Greenfield, P. M., & Cocking, R. R. (Eds.). (1994b). Effects of interactive entertainment technologies on development. *Journal of Applied Developmental Psychology*, 15(1), 1-39.
- Greenfield, P. M., & Lave, J. (1982). Cognitive aspects of informal education. In D. Wagner & H. Stevenson (Eds.), *Cultural perspectives on child development* (pp. 181-207). San Francisco: Freeman.
- Greenfield, P. M., Raeff, C., & Quiroz, B. (in press). Cross-cultural conflict in the social construction of the child. In S. Harkness, C. Raeff, & C. Super (Eds.), *New directions for child development*. San Francisco: Jossey-Bass.
- Greenfield, P. M., Reich, L. C., & Olver, R. R. (1966). On culture and equivalence-II. In J. S. Bruner, R. R. Olver, P. M. Greenfield, et al., *Studies in cognitive growth* (pp. 270-318). New York: Wiley.
- Greenfield, P. M. & Savage-Rumbaugh, E. S. (1991). Imitation, grammatical development, and the invention of protogrammar. In N. Krasnegor, D. Rumbaugh, M. Studdert-Kennedy, & R. Schiefelbusch (Eds.), *Biological and behavioral determinants of language development* (pp. 235-258). Hillsdale, NJ: Erlbaum.
- Grice, H. P. (1975). Logic and conversation. In P. Cole & J. L. Morgan (Eds.), *Syntax and semantics* (Vol. 3, *Speech acts*, pp. 41-58). New York: Academic Press.
- Guberman, S. (in press a). The development of everyday mathematics in Brazilian children with limited formal education. *Child Development*.
- Guberman, S. (in press b). Children's mathematical activities and achievements: A comparative study of Latino and Korean American children. *SRCD Monographs*.
- Guberman, S., & Greenfield, P. M. (1991). Learning and transfer in everyday cognition. *Cognitive Development*, 6, 223-260.
- Harkness, S. & Super, C. H. (Eds.). (1995). *Parents' cultural belief systems: Their origins, expressions, and consequences*. New York: Guilford Press.
- Harwood, R. D. (1992). The influence of culturally derived values on Anglo and Puerto Rican mothers' perceptions of attachment behavior. *Child Development*, 63, 822-840.

- Hatano, G. (1995). Cultural psychology of conceptual development: The need for numbers and narratives. In F. S. Kessel & M. Cole (Chairs), *Towards a cultural psychology of development: I. Methodological matters*. Symposium at the biennial meeting of the Society for Research in Child Development, Indianapolis.
- Hatano, G., Miyake, Y., & Binks, M. G. (1977). Performance of expert abacus operators. *Cognition*, 5, 57-71.
- Heath, S. B. (1983). *Ways with words: Language, life, and work in communities and classrooms*. Cambridge, MA: Cambridge University Press.
- Hirschfeld, L. & Gelman, S. (Eds.). (1994). *Mapping the mind: Domains, culture and cognition*. New York: Cambridge University Press.
- Ho, D. (1989). Continuity and variation in Chinese patterns of socialization. *Journal of Marriage and the Family*, 51, 149-163.
- Hofstede, G. (1980). *Culture's consequences: International differences in work-related values*. London: Sage.
- Illyenkov, E. V. (1977). The problem of the ideal. In *Philosophy in the USSR: Problems of dialectical materialism*. Moscow: Progress.
- Jacobs, J. (in press).
- Jacobs, J. K., Yoshida, M., & Fernandez, C. (1996). Teachers' beliefs: Japanese and American teachers' evaluations of fifth grade mathematics lessons. Unpublished manuscript, Department of Psychology, University of California, Los Angeles.
- Jahoda, G. (1977). In pursuit of the emic-etic distinction: Can we ever capture it? In Y.H. Poortinga (Ed.), *Basic problems in cross-cultural psychology* (pp. 55-63). Lisse: Swets and Zeitlinger.
- Jahoda, G. (1990). Variables, systems and the problem of explanation. In F. J. R. van de Vijver & G. J. M. Hutschemaekers (Eds.), *The investigation of culture: Current issues in cultural psychology* (pp. 115-130). Tilburg: Tilburg University Press.
- Jahoda, G. (1992). Foreword. In J. W. Berry, Y. H. Poortinga, M.H. Segall, & P.R. Dasen, *Cross-cultural psychology: Research and Applications* (pp. x-xii). Cambridge: Cambridge University Press.
- Jones, E. E. & Thorne, A. (1987). Rediscovery of the subject: Intercultural approaches to clinical assessment. *Journal of Consulting and Clinical Psychology*, 55, 488-495.
- Kim, U., & Berry, J. W. (Eds.). (1993) *Indigenous psychologies: Research and experience in cultural context*. Newbury Park: Sage Publications.
- Kitayama, S., Markus, H. R., Matsumoto, H., & Norasakkunkit (in press). Individual and collective processes of self-esteem management: Self-enhancement in the United States and self-depreciation in Japan. *Journal of Personality and Social Psychology*.
- Korner, M. J. (1972). Aspects of the developmental ethology of a foraging people. In N. Blurton Jones (Ed.), *Ethological studies of child behaviour*. Cambridge: Cambridge University Press.
- Labov, W. & Waletzky, J. (1967). Narrative analysis. In J. Holm (Ed.), *Essay on the verbal and visual arts* (pp. 12-44). Seattle: University of Washington Press.
- Lave, J. (1977). Cognitive consequences of traditional apprenticeship training in West Africa. *Anthropology and Education Quarterly*, 8, 177-180.
- Lave, J. (1988). *Cognition in practice*. New York: Cambridge University Press.
- Lave, J., Murtaugh, M., & de la Rocha, O. (1984). The dialectic of arithmetic in grocery shopping. In B. Rogoff & J. Lave (Eds.), *Everyday cognition: Its development in social context* (pp. 67-94). Cambridge, MA: Harvard University Press.
- Lerner, D. (1958). *The passing of traditional society: Modernizing the Middle East*. Glencoe: Free Press.
- LeVine, R., Dixon, S., LeVine, S., Richman, A., Leiderman, P. H., Keefer, C. H., & Brazelton, T. B. (1994). *Child care and culture: Lessons from Africa*. New York: Cambridge University Press.
- LeVine, R. A. & Miller, P.M. (1990). Commentary. *Human Development*, 33, 73-80.
- LeVine, R. A. & Shweder, R. A. (1995). Culture, psychic pluralism, and the nature-nurture problem. In F. S. Kessel & R. A. Shweder (Chairs), *Towards a cultural psychology of development: I. Theoretical themes*. Symposium at the biennial meeting of the Society for Research in Child Development, Indianapolis.

- Lonner, W. J., & Berry, J. W. (1986). Sampling and surveying. In Lonner, W. J. & Berry, J. W. (Eds.), *Field methods in cross-cultural research* (pp. 85-110). London: Sage.
- Lucariello, J. (1995). Mind, culture, person: Elements in a cultural psychology. *Human Development*, 38, 2-18.
- Luria, A. R. (1976). *Cognitive development: Its cultural and social foundations*. Cambridge: Harvard University Press.
- Marcus, G. E., & Fischer, M. M. J. (1986). *Anthropology as cultural critique: An experimental moment in the human sciences*. Chicago: University of Chicago Press.
- Markus, H. R., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review*, 98, 224-253.
- Matsuzawa, T. (1991). Nesting cups and metatools in chimpanzees. *Behavioral and Brain Sciences*, 14, 570-571.
- Mauss, M. (1954). *The gift: Forms and functions of exchange in archaic societies*. Glencoe, IL: Free Press.
- Maxwell, J. A. (1992). Understanding and validity in qualitative research. *Harvard Educational Review*, 62, 279-300.
- McGrew, W. C. (1992). *Chimpanzee material culture: Implications for human evolution*. Cambridge: Cambridge University Press.
- Miles, M., & Huberman, A. M. (1984). Drawing valid meaning from qualitative data: Toward a shared craft. *Educational Researcher*, 13 (5), 20-30.
- Miles, M., & Huberman, A. M. (1994). *Qualitative data analysis. An expanded sourcebook*. (4th ed.). Thousand Oaks, CA: Sage.
- Miller, J. G., Bersoff, D. M., & Harwood, R. L. (1990). Perceptions of social responsibilities in India and in the United States: Moral imperatives or personal decisions? *Journal of Personality and Social Psychology*, 58, 33-47.
- Morelli, G. A., Rogoff, B., Oppenheim, D., & Goldsmith, D. (1992). Cultural variation in infants' sleeping arrangements: Questions of independence. *Developmental Psychology*, 28, 604-613.
- Munroe, R. L., & Munroe, R. H. (1986). Field work in cross-cultural psychology. In W. J.
- Lonner & J. W. Berry (Eds.), *Field methods in cross-cultural research* (pp. 111-136). London: Sage.
- Nelson, K. (1989). *Narratives from the crib*. Cambridge: Harvard University Press.
- Nishida, T. (1987). Local traditions and cultural transmission. In B. Smuts, D. Cheney, R. Seyfarth, R. Wrangham, & T. Struhsaker (Eds.), *Primate societies*. Chicago: University of Chicago Press.
- Nunes, T., Schliemann, A. D., & Carraher, D. W. (Eds.). (1993). *Street mathematics and school mathematics*. Cambridge: Cambridge University Press.
- Ochs, E. (1979). Transcription as theory. In E. Ochs & B. B. Schieffelin (Eds.), *Developmental pragmatics* (pp. 43-72). New York: Academic Press.
- Ochs, E. (1982). Talking to children in Western Samoa. *Language in Society*, 11, 77-104.
- Ochs, E., & Schieffelin, B. B. (1983). *Acquiring Conversational Competence*. Boston: Routledge & Kegan Paul.
- Ochs, E., & Schieffelin, B. B. (1984). Language acquisition and socialization: Three developmental stories and their implications. In R. A. Shweder & R. A. Levine, (Eds.), *Culture theory: Essays on mind, self, and emotion*, (pp. 276-320). New York: Cambridge University Press.
- Ochs, E., & Taylor, C. (1992). Science at dinner. In C. Kramsch (Ed.), *Text and context: Cross-disciplinary perspectives on language study* (pp. 29-45). Lexington, MA: D.C. Heath.
- Ogbu, J. (1978). *Minority education and caste: The American system in cross-cultural perspective*. New York: Academic Press.
- Ogbu, J. (1994). From cultural differences to differences in cultural frame of reference. In P. M. Greenfield & R. R. Cocking (Eds.), *Cross-cultural roots of minority child development* (pp. 365-391). Hillsdale, NJ: Erlbaum.
- Packer, M. (1995). The logic of interpretive inquiry. In F. S. Kessel & M. Cole (Chairs), *Towards a cultural psychology of development: I. Methodological matters*. Symposium at the biennial meeting of the Society for Research in Child Development, Indianapolis.
- Patai, D. (1994). Sick and tired of scholars'

- nouveau solipsism. *The Chronicle of Higher Education*, Feb. 23, A52.
- Perusse, D. (1993). Human parental behavior: Nurture as nature? In P. Hefner & W. Irons (Chairs), *Models of biocultural evolution: Understanding human social and moral development*. American Association for the Advancement of Science, Boston.
- Piaget, J. (1928). *Judgment and reasoning in the child*. New York: Harcourt, Brace.
- Piaget, J. (1965). *The child's conception of number*. New York: W. W. Norton.
- Pinker, S. (1994). *The language instinct*. NY: William Morrow.
- Plooj, F. X. (1978). Some basic traits of language in wild chimpanzees. In A. Lock (Ed.), *Action, gesture, and symbol: The emergence of language* (pp. 111-131). New York: Academic Press.
- Poortinga, Y. H. (1989). Equivalence of cross-cultural data: An overview of basic issues. *International Journal of Psychology*, 24, 737-756.
- Poortinga, Y. H., & Malpass, R. S. (1986). Making inferences from cross-cultural data. In W. J. Lonner & J. W. Berry (Eds.), *Field methods in cross-cultural research* (pp. 17-46). Beverly Hills, CA: Sage.
- Price-Williams, D. (1980). Toward the idea of cultural psychology: A superordinate theme for study. *Journal of Cross-Cultural Psychology*, 11, 75-88.
- Price-Williams, D. R., Gordon, W., & Ramirez, M. (1969). Skill and conservation: A study of pottery-making children. *Developmental Psychology*, 1, 769.
- Rabain, J. (1979). *L'enfant du lignage. Du sevrage à la classe d'âge chez les Wolof du Sénégal* [Child of the lineage. From weaning to age-graded peer group among the Wolof of Senegal]. Paris: Payot.
- Rabain-Jamin, J. (1994). Language and socialization of the child in African families living in France. In P. M. Greenfield & R. R. Cocking (Eds.), *Cross-cultural roots of minority child development* (pp. 147-166). Hillsdale, NJ: Erlbaum.
- Resnick, L. B., Levine, J. M., & Teasley, S. D. (Eds.). (1991). *Perspectives on socially shared cognition*. Washington, DC: American Psychological Association.
- Rizzo, T. A., Corsaro, W. A., & Bates, J. E. (1992). Ethnographic methods and interpretive analysis: Expanding the methodological options of psychologists. *Developmental Review*, 12, 101-123.
- Rogoff, B. (1990). *Apprenticeship in thinking: Cognitive development in social context*. New York: Oxford University Press.
- Rogoff, B. (in press). Developmental transitions in children's participation in sociocultural activities. In A. Sameroff & M. Haith (Eds.), *Reason and responsibility: The passage through childhood*. Chicago: University of Chicago Press.
- Rogoff, B., Baker-Sennett, J. Lacasa, P., & Goldsmith, D. (1995). Development through participation in sociocultural activity. In J. Goodnow, P. Miller, & F. Kessel (Eds.), *Cultural practices as contexts for development* (pp. 45-65). San Francisco: Jossey-Bass.
- Rogoff, B., & Morelli, G. A. (1989). Perspectives on children's development from cultural psychology. *American Psychologist*, 44, 343-348.
- Rosch, E. (1973). On the internal structure of perceptual and semantic categories. In T. Moore (Ed.), *Cognitive development and the acquisition of language* (pp. 111-144). New York: Academic Press.
- Sahlins, M. (1976). *Culture and practical reason*. Chicago: Chicago University Press.
- Saxe, G. B. (1981). When fourth can precede second. *Journal of Cross-Cultural Psychology*, 12, 37-50.
- Saxe, G. B. (1982a). Developing forms of arithmetical thought among the Oksapmin of Papua New Guinea. *Developmental Psychology*, 18, 583-594.
- Saxe, G. B. (1982b). Culture and the development of numerical cognition: Studies among the Oksapmin of Papua New Guinea. In C. J. Brainerd (Ed.), *Children's logical and math-*

- emational cognition (pp. 157-176). New York: Springer-Verlag.
- Saxe, G. B. (1991). *Culture and cognitive development: Studies in mathematical understanding*. Hillsdale, NJ: Erlbaum.
- Schegloff, E. (1993). Reflections on quantification in the study of conversation. *Research on Language and Social Interaction*, 26, 99-128.
- Schieffelin, B. B. (1983). Talking like birds: Sound play in a cultural perspective. In E. Ochs & B. B. Schieffelin, *Acquiring conversational competence*, (pp. 177-184). London: Routledge & Kegan Paul.
- Schliemann, A. D. (1984). Mathematics among carpenters and apprentices. In P. Damerow, M. W. Dunckley, B. F. Nebres, & B. Werry (Eds.), *Mathematics for all* (pp. 92-95). Paris: UNESCO.
- Schneider, B., Hieshima, J. A., Lee, S., & Plank, S. (1994). East-Asian academic success in the United States: Family, school, and community explanations. In P. M. Greenfield & R. R. Cocking (Eds.), *Cross-cultural roots of minority child development* (pp. 323-350). Hillsdale, NJ: Erlbaum.
- Schubauer-Leoni, M. L., Perret-Clermont, A., & Grossen, M. (1993). The construction of the adult-child intersubjectivity in psychological research and in school. In M. von Cranach, W. Doise, & G. Mugny (Eds.), *Social representation and the social bases of knowledge*. Bern: Hans Huber Verlag.
- Scribner, S. (1984). Studying working intelligence. In B. Rogoff & J. Lave (Eds.), *Everyday cognition: Its development in social context* (pp. 9-40). Cambridge, MA: Harvard University Press.
- Scribner, S. (1984). Cognitive studies of work. *Quarterly Newsletter of the Laboratory of Comparative Human Cognition*, 6 (1&2).
- Scribner, S. (1985). Vygotsky's uses of history. In J. V. Wertsch (Ed.), *Culture, communication, and cognition: Vygotskian perspectives* (pp. 119-145). Cambridge: Cambridge University Press.
- Scribner, S., & Cole, M. (1981). *The psychology of literacy*. Cambridge, MA: Harvard University Press.
- Scribner, S., Sachs, P., Di Bello, L. & Kindred J. (1991). *Knowledge acquisition at work* (Tech. Rep. No. 22). New York: Center City University of New York, The Graduate School and University.
- Segal, N. L. (1993). Twin, sibling, and adoption methods: Tests of evolutionary hypotheses. *American Psychologist*, 48, 943-956.
- Serpell, R. (1993). *The significance of schooling: Life journeys in an African society*. Cambridge: Cambridge University Press.
- Shweder, R. A. (1990). Cultural psychology: What is it? In J. W. Stigler, R. A. Shweder, & G. Herdt (Eds.), *Cultural psychology: Essays on comparative human development* (pp. 1-4). Cambridge: Cambridge University Press.
- Shweder, R. (1995). The confessions of a methodological individualist. *Culture and Psychology*, 1 (1), 115-122.
- Shweder, R. A., & Bourne, E. J. (1982). Does the concept of the person vary cross-culturally? In R. A. Shweder & R. A. Levine (Eds.), *Culture theory: Essays on mind, self, and emotion* (pp. 158-199). New York: Cambridge University Press.
- Shweder, R., Jensen, L., & Goldstein, W. (1995). Who sleeps by whom revisited: A method for extracting the moral goods implicit in practice. In J. J. Goodnow, P. Miller, & F. Kessel (Eds.), *Cultural practices as contexts for development* (pp. 21-39). San Francisco: Jossey-Bass.
- Shweder, R. A., & Miller, J. G. (1985). The social construction of the person: How is it possible? In K. J. Gergen & K. E. Davis (Eds.), *The social construction of the person* (pp. 1-22). New York: Springer-Verlag.
- Shweder, R. A., & Much, N. C. (1987). Determinations of meaning: Discourse and moral socialization. In W. M. Kurtines & J. L. Gewirtz (Eds.), *Moral development through social interaction* (pp. 197-244). New York: Wiley.
- Shweder, R. A., & Sullivan, M. (1990). The semiotic person of cultural psychology. In L. Pervin (Ed.), *Handbook of Personality*, (pp. 399-416). New York: Guilford.
- Shweder, R. A., & Sullivan, M. A. (1993). Cultural psychology: Who needs it? *Annual Review of Psychology*, 44, 497-523.
- Siegal, M. (1991a). A clash of conversational

- worlds: Interpreting cognitive development through communication. In L. B. Resnick, J. M. Levine, & S. Behrens (Eds.), *Perspectives on socially shared cognition* (pp. 23-40). Washington, DC: American Psychological Association.
- Siegal, M. (1991b). *Knowing children: Experiments in conversation and cognition*. Hove, UK: Erlbaum.
- Siegal, M. (in press). Conversation and cognition. In R. Gelman & T. Au (Eds.), E. C. Carterette & M. Friedman (Gen. Eds.), *Handbook of perception and cognition: Vol. 13. Perceptual and cognitive development*. San Diego, CA: Academic Press.
- Sigman, M., Beckwith, L., & Cohen, S. E. (1994). Caregiver-infant interactions in rural Kenya and the United States. Paper presented at the International Conference on Infant Studies, Paris.
- Sinclair, J., & Coulthard, R. M. (1975). *Towards an analysis of discourse: The English used by teachers and pupils*. London: Oxford University Press.
- Stigler, J. W. (1984). "Mental abacus": The effect of abacus training on Chinese children's mental calculation. *Cognitive Psychology*, 16, 145-176.
- Stigler, J. W., Chalip, L., & Miller, K. F. (1986). Consequences of skill: the case of abacus training in Taiwan. *American Journal of Education*, 94, 447-479.
- Stigler, J. W., & Perry, M. (1990). Mathematics learning in Japanese, Chinese, and American classrooms. In J. W. Stigler, R. A. Shweder, & G. Herdt (Eds.), *Cultural psychology* (pp. 328-353). Cambridge: Cambridge University Press.
- Stigler, J. W., Shweder, R. A., & G. Herdt (Eds.) (1990). *Cultural psychology: Essays on comparative human development*. Cambridge: Cambridge University Press.
- Takahashi, K. (1986). Examining the strange situation procedure with Japanese mother and 12-month-old infants. *Developmental Psychology*, 22, 265-270.
- Takahashi, K. (1990). Are the key assumptions of the 'strange situation' procedure universal? A view from Japanese research. *Human Development*, 33, 23-30.
- Tobin, J. J. (1989). Visual anthropology and multivocal ethnography: A dialogical approach to Japanese preschool class size. *Dialectical Anthropology*, 13, 173-187.
- Tobin, J. J., Wu, D. Y. H., & Davidson, D. H. (1989). *Preschool in three cultures: Japan, China, and the United States*. New Haven: Yale University Press.
- Tomasello, M., Davis-Dasilva, M., Camak, L., & Bard, K. (1987). Observational learning of tool use by young chimpanzees. *Human Evolution*, 2, 175-183.
- Tomasello, M., Kruger, A. C., & Ratner, H. H. (1993). Cultural learning. *Behavioral and Brain Sciences*, 16, 495-552.
- Trevarthen, C. (1980). The foundations of intersubjectivity: Development of interpersonal and cooperative understanding in infants. In D. R. Olson (Ed.), *The social foundations of language and thought* (pp. 316-342). NY: Wiley.
- Triandis, H. C. (1980). Introduction to Handbook. In H. C. Triandis & W. W. Lambert (Eds.), *Handbook of Cross-Cultural Psychology* (Vol. 1, pp. 1-14). Boston: Allyn and Bacon.
- Triandis, H. C. (1995, July). Discussion. In J. Adamopoulos (Chair), *Psychology and culture: The search for appropriate paradigms*. Symposium presented at the European Congress of Psychology, Athens.
- Valsiner, J. (1989). How can developmental psychology become "culture-inclusive"? In J. Valsiner (Ed.), *Child development in cultural context* (pp. 1-8). Toronto: Hogrefe & Huber.
- Valsiner, J., & Hill, P. E. (1989). Socialization of American toddlers for social courtesy. In J. Valsiner (Ed.), *Child development in cultural context* (pp. 163-179). Toronto: Hogrefe & Huber.
- Van de Vijver, F. J. R., & Poortinga, Y. H. (1991). Testing across cultures. In R.K. Hambleton & J. N. Zaal (Eds.), *Advances in educational and psychological testing: Theory and applications* (pp. 277-309). Dordrecht: Kluwer.
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes* (pp. 52-57). Cambridge, MA: Harvard University Press.
- Vygotsky, L. S., & Luria, A. R. (1993). *Studies on the history of behavior: Ape, primitive, and child*. V. I. Golod & J. E. Knox (Trans.). Hillsdale, NJ: Erlbaum.
- Wagner, D. (1984). Ontogeny in the study of cul-

ture and cognition. In D. A. Wagner & H. W. Stevenson (Eds.), *Cultural perspectives on child development*. (pp. 105-123). San Francisco: W. H. Freeman.

Wartofsky, M. (1979). *Models: Representations and and Scientific Understanding*. Dordrecht, Netherlands: Reidel.

Wassmann, J. (1995). The final requiem for the omniscient informant? An interdisciplinary approach to everyday cognition. *Culture and Psychology*, 1, 167-201.

Wassmann, J., & Dasen, P. R. (1994). "Hot" and "cold": classification and sorting among Yupno of Papua New Guinea. *International Journal of Psychology*, 29, 19-38.

Weisner, T. S. (in press). Why ethnography should be the most important method in the study of human development. In A. Colby, R. Jessor, & R. Shweder (Eds.), *Ethnography and human development*. Chicago: University of Chicago Press.

Weisner, T. S. (1994). What is culture? Seminar on culture and human development. Los Angeles, UCLA.

Weisner, T., & Gallimore, R. (1977). My brother's keeper: Child and sibling caretaking. *Current Anthropology*, 18, 169-190.

Wells, A. S., Hirshberg, D., Lipton, M., & Oakes, J. (1995). Bounding the case within its context: A constructivist approach to studying detracking reform. *Educational Researcher*, 24, 18-24.

Whiting, B. B. (1976). Unpackaging variables. In K. F. Riegel & J. A. Meacham (Eds.), *The changing individual in a changing world* (Vol. 1, pp. 303-309). Chicago: Aldine.

Wober, M. (1974). Towards and understanding of the Kiganda concept of intelligence. In J. W. Berry & P. R. Dasen (Eds.), *Culture and cognition*, (pp. 261-280). London: Methuen.

Zukow, P.G. (Ed.). (1989). *Sibling interaction across cultures: Theoretical and methodological issues*. New York: Springer-Verlag.

Zukow, P.G. (1984). Folk theories of comprehension and caregiver style in a rural-born population in Central Mexico. *Quarterly Newsletter of the Laboratory of Comparative Human Cognition*, 6, 62-67.

# 9

## TOWARDS CONVERGENCE?

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