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ABSTRACT

This paper has attempted to outline some basic aspects of Piaget's theory and place them in cross-cultural perspective. Several questions concerning approaches and the relevance of cross-cultural research for classification of Piagetian theory were discussed: (1) What types of questions within Piagetian theory are amenable to cross-cultural research? (2) How well can Piagetian studies help determine the importance of and differentiate between the factors affecting mental development? (3) Of what practical significance is cross-cultural Piagetian research? and (4) What types of research within the Piagetian framework might be helpful in the future? It was concluded that although a great deal of information has been gained from cross-cultural investigations, many critical research questions are still outstanding. (Author/CS)

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Cross-Cultural Piagetian Studies: What Can They Tell Us?[1]

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Introduction

Perhaps the most significant theory of general cognitive development we presently have comes from the work of Jean Piaget. The implications of Piaget's theory go well beyond psychology itself, as it affects other sciences and the humanities. He is concerned firstly with knowing, what it means to know, and how knowledge is constructed. His considerations, though philosophical in the broad sense, are based on years of painstaking, exacting empirical work. Piaget is certainly not an armchair philosopher glibly describing developmental phenomena.

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Although sometimes cast in the mold of a behaviorist (Berlyne, 1962) or a maturationist (Beilin, 1971a), Piaget views his position as constructivistic. Knowledge for Piaget is a construction in which the individual plays a significant part as he interacts with the sensory data of his environment. The meaning the individual imparts to these stimuli is governed by his level of organization. Piaget (1971a, p. 6) points out that "Knowing does not really imply making a copy of reality but, rather, reacting to it and transforming it (either apparently or effectively) in such a way as to include it functionally in the transformation systems with which these acts are linked." This view is consistent with philosophers of science such as Hanson (1958) and Dewey (1938).

The interaction of the level of organization of schemata and structures with sensory stimulation can be diagrammatically represented as follows: $S \longrightarrow (A) \longrightarrow R$, where A represents the assimilation of the stimulus S into a schema, and R the response made (Piaget, 1971a). Through the observation of R, Piaget infers the level of knowing, in the general rather than the specific sense, the individual has obtained; more precisely, the structurization that manifests itself as knowing. Through equilibration or autoregulations, the individual attempts at once to conserve his structure as well as to modify it through the application of it to the sensory data at hand. As Furth (1969, p. 20) points out, "knowledge is in Piaget's theory never a state, whether subjective, repre-

sentative, or objective. It is an activity. It can be viewed as a structuring of the environment according to underlying subjective structures or as a structuring of the subject in living interaction with the environment." Here we see a good example of the basic dialectical process so central to Piagetian theory: the interactive effects between the individual and his environment. (For an elaboration of the dialectical aspects of Piaget's theory see Goldman, 1966).

Factors Affecting Mental Development

Piaget (1966) suggests four basic factors which affect the progressive hierarchization and differentiation involved in cognitive development. They are: (a) biological factors, which relate to genetic potential and maturation of the nervous system; (b) equilibration factors, which are viewed as autoregulatory and in continuous interaction with the biological potential of the individual and his environmental circumstance and which are assumed to be ubiquitous; (c) general social factors independent from formal schooling which engender social contact, exchange, collaborations, and so forth; and (d) factors of educative and cultural transmissions which include social pressures and language patterns. All of these factors are interactive. For example, for the individual to be affected by any aspect of socialization, he must actively assimilate the data from his milieu. This presupposes some level of cognitive organization or operatory structure and the general process of

equilibration. Development, as affected by these four factors, progresses through the integration of successive structures which are manifested through stages and substages, each having criterial attributes, each forming the necessary precursor to a higher level of organization.

What Piaget suggests concerning this progress is (a) that the order is constant through the stages, though differences in environmental milieu may be related to accelerations or retardations in age of acquisition; (b) that each stage is characterized by a general structure; and (c) that as progression is made through the stages, preceding structures are integrated into successive ones. This model has been described by Riegel (1972) as a "single sequence model", although he was careful to point out that Piaget is concerned with issues of transition and transformations across stages.

In a recent article, Piaget (1972) has reemphasized the importance he attaches to socio-cultural factors, and professional and work specialization. He maintains and reaffirms, however, the necessity for an invariant sequence of development as well as the hypothesis that formal operational thought is available in general, rather than to specifically "culturally advantaged" groups; albeit in certain environmental contexts formal operations might not be attained until relatively late (15 to 20 years of age). Assessment of this might be difficult, though, as "They (individuals whose schooling is limited) would, therefore, be capable of thinking formally in

their particular field, whereas faced with our experimental situations, their lack of knowledge or the fact they have forgotten certain ideas that are particularly familiar to children still in school or college, would hinder them from reasoning in a formal way, and they would give the appearance of being at the concrete level" (Piaget, 1972, p. 10).

Concerning the environmental variables in Piaget's four basic factors of development, it appears as though they are similar, though certainly not as differentiated, to what Thomae (1959) called "Prägung", the general effects of socialization as manifested through early experience, schooling, the family, individual condition within the society, and so forth. Similar differentiation of factors influencing mental development has been offered by Vernon (1969) and LeVine's factors, which like Vernon's are discussed in relation to cross-cultural research are: (a) nutrition; (b) genetic factors; (c) early cognitive stimulation, which includes schooling and language; (d) social motives, which include such general variables as achievement motivation, self-reliance, delay of gratification, assertiveness, and so forth; and (e) pervasive aspects of the social structure, which includes the basic beliefs and values within the culture, and which he calls the "ideational context" of the society.

Approaches to Cross-Cultural Research

Description of approaches taken to cross-cultural research has been made by several authors (Berry, 1969; Berry & Dasen, 1973; Bruner, 1964; Bruner, et al., 1966; Cole & Bruner, 1971; Cole et al., 1971; Frijda & Jahoda, 1966; Jahoda, 1970; LeVine, 1970; Piaget, 1966; Vernon, 1969; Wallace, 1962). One approach of cross-cultural research in cognitive development is to collect comparative data from different cultural or ethnic groups and compare these data with the results obtained in the milieu in which the tests were designed. This, the etic approach described by Berry (1969), assumes the universality of the criteria involved as well as the functional equivalence of these criteria as phenomena occuring naturally within the target society. (See figure 1 for a schematization of the emic - etic distinction.)

Emic approach	Etic approach
studies behavior from within the system.	studies behavior from a position outside the system.
examines only one culture.	examines many cultures, comparing them.
structure discovered by the analyst.	structure created by the analyst.
criteria are relative to internal characteristics.	criteria are considered absolute or universal.

Figure 1 - after Berry (1969)

Lack of confirmation of the etic assumption can lead to more refined approximations of the universality of categories and comparison with criteria which are internal (emic in nature) and not dependent on universal assumptions. From the approach of the etic assumption, the modus operandi of most Piagetian cross-cultural research, poor performance on a particular test does not necessarily imply psychological deficit. It could be that the materials used, the questions asked, and the procedures employed, simply didn't elicit the "appropriate" responses, strategies, or processes. And, perhaps, under appropriate "elaboration" conditions (Rowher, 1973; Aebli, 1963), or clever modifications of the test materials, Price-Williams (1961) for conservation concepts among the Tiv children in Nigeria, and Gay & Cole (1967) for classification for Kpelle children in Liberia, very different patterns of responses might be obtained.

An interesting study showing the differential applications of strategies of solution on the same test (the Raven Progressive Matrices Test) in different cultures has been carried out by Das (1973). In western culture, rote memory or associative learning requires the sequential processing of information whereas parallel or simultaneous processing is usually employed on cognitive tests such as the Progressive Matrices. Das was able to show for a Canadian sample of white children that the Progressive Matrices test loaded on a factor requiring simultaneous processing. For an Indian sample of high caste children the Progressive Matrices loaded on a successive or sequential processing

factor. Das explained these results in terms of the fact that in India, memory is heavily emphasized in school and social learning and is therefore the preferred mode of information integration. Das's study is informative not only for its results, but also for its design and purpose, which was to look for differences in processes of cognitive functioning rather than differences in product and to relate these process differences to cultural variation.

Piagetian Cross-Cultural Research

When one considers cross-cultural Piagetian research there are several questions which should be dealt with. 1. What types of questions within Piagetian theory are amenable to cross-cultural research? 2. How well can Piagetian studies help determine the importance of and differentiate between the factors affecting mental development, i.e., those proposed by Piaget, Vernon, Thomae, and LeVine? 3. Of what practical significance is cross-cultural Piagetian research? 4. What types of research within the Piagetian framework might be helpful in the future? In some ways these questions are interrelated; in some ways they are independent. For sake of clarity they will be discussed independently and in order.

1. What types of questions within Piagetian theory are amenable to cross-cultural research?

A. Logic - For Piaget, logic mirrors thought. It is a natural consequence of the development of intelligence, for at the base of rational thought, logic must exist. The logical analysis Piaget applies to thinking processes allows for formalization of their contents and their commonalities. Hence, an appropriate mode of analysis of structures is through the logical properties they possess. Concerning the universality and relevance of the development of logical processes, Piaget argues that logical formulation is essential; it is a necessity for the development of thought.

Lévi-Strauss (1966) points out that logic is the basis of action and rational inquiry in both technologically advanced and nontechnological societies. He suggests that there are certain universals such as the forming of classes. Although such formations manifest themselves in different ways and at different levels of abstraction between groups of people, they are based on the same types of mental operations.

Smedslund (1969) posits that logic is a necessary precondition for effective mental functioning and that there are indeed some logical universals. He suggests that one such universal is the elementary notion of number. This concept is not based upon specific content but reflects basic operations that cannot be understood or specified in any way other than logical. The

central question of exactly what these forms of logic are and how helpful analysis in Piagetian terms is, is now an area of research. Such an analysis necessarily depends not only on the study of the development of logical thinking in children, but also on an understanding of the logics employed by the adult population. It might turn out that the logical bases for classifactory behavior, number and other areas requiring concrete operational thought, are universal. But would such universality hold for all stages of development, e.g., formal questions?

B. Age of acquisition - Though considered important at one time by researchers in the field, Piaget has essentially discounted the importance of finding children from various cultures passing through the same stages at the same ages. He points out (Piaget, 1972, p. 7) that "the average age at which children go through each stage can vary considerably from one social environment to another, or from one country or even region within a country to another." This he posits to be due to the quantity and quality of the intellectual stimulation afforded by the environment and suggests that these factors are of increasing significance as one moves up through the stages.

Support for the differential effects environmental stimulation plays in development during the sensorimotor stage has been offered by Paraskevopoulos and Hunt (1971). Using age as a dependent variable, they compared the ages of infants living in Athenian orphanages with different infant-caretaker ratios

(10:1 and 3:1) with home-reared infants on a criterion from the ordinal scales developed by Uzgiris and Hunt (1966). The children in the 10:1 ratio could follow an object through hidden displacement without reversibility at 45 months of age; for the children in the 3:1 ratio, the average was 30 months. The results were interpreted as showing the strong effects of environment on age of acquisition of the criterion.

Similar findings of differential ages of acquisition of concrete operational thought due to milieu are numerous (Bovet, 1968; Dasen, 1973; deLacey, 1970; Goldschmid, et al., 1973; Goodnow, 1962; Peluffo, 1962; Price-Williams, Gordon, & Ramirez, 1969; Za'rour, 1971). It is important to note that in each of these investigations it was shown that concrete operational thought was obtained, although often delayed by environmental factors. Conversely, Price-Williams, Gordon, & Ramirez (1969) found acceleration for the conservation of substance for pottery-making children in Mexico over a group of non-pottery-making children matched on age, years of schooling and socioeconomic level. They found no differences between the groups for conservation of number, liquid, weight, and volume, however.

The age of acquisition though of formal thought seems to be much more variable and related to milieu effects than development during the sensorimotor period or the acquisition of concrete operational thought. For example, severe delay and even nonacquisition of formal operational structures for lower

SES American samples has been found (Graves, 1972; Karplus and Peterson, 1970). Similar results of nonacquisition of formal thought for nonAmerican samples have been reported by Goodnow (1962) and Peluffo (1967).

C. Sequence of acquisition - The question of stage sequence is more critical than age of acquisition. Three interpretations of sequence need to be distinguished: (a) succession of global stage (sensorimotor, concrete operational, and formal), (b) discrepancies due to horizontal décalages, and (c) the sequence of sub-stages for any particular test.

Concerning the succession of global stage, Flavell (1971) tentatively suggests that such a sequence is neither due to genetic programming, as does Beilin (1971b), nor the way in which the environment affects the individual. The sequence from concrete to formal thought is logically necessary inasmuch as those operations which are required for formal thought are the results of already available concrete operations. This interpretation, though not necessarily implying that formal thought will be acquired, would mean that sequence is unalterable .

The second point concerning horizontal décalage raises some very difficult and certainly unresolved issues. Piaget (1971b) suggests that time lags are due to the resistances which objects offer. For example, in a classification task some types of materials will present greater difficulty for the child than

other types of materials. Hence, a lower level of performance will be obtained. These differences cannot be predicted in advance by his theory, however, and become evident only after the fact.

Though a number of reversals of acquisition have been reported (see Dasen, 1972a), they are not based on longitudinal data. Too, since horizontal décalage is accepted as a general, though perhaps pesky, phenomenon, it is not crucial to confirmation of Piaget's general theory. It is certainly of lesser significance than the issue of global sequence or sub-stages on a particular test.

The third point is on stage progression on individual tests. The overwhelming majority of research studies has found the same stages as Piaget has described. It is possible that Piagetian tasks are less "culture-bound" than other assessment devices and that the "natural" environment of the child is such that etic approximations can be found. A central question remains, however, and it pertains to process rather than product: Although children seem to be giving correct responses to a Piagetian problem, say conservation or classification, are they really employing the same, or at least very similar, conceptual bases for their responses? It seems as though we know very little about the conceptual bases actually employed and it might be that attention of cross-cultural Piagetian researchers should be directed toward this area.

D. Causation - Generally when one thinks of causation he refers to factors in an individual's or in a group's genetic make-up as well as all the factors form the individual's or the group's environmental milieu which contribute in some way to the acquisition of a particular characteristic, behavior, or developmental pattern. What is meant here by causation is much more circumscribed and refers to specific postulates that certain sets of environmental circumstance are related to a particular acquisition or developmental sequence. An example which might be used to make this clearer comes from the area of moral development.

Piaget (1965) views the development of moral judgment to be strongly related to cultural-environmental factors. For example, in the area of justice two divergent attitudes present themselves: punishment by expiation, which is stern, unbending, arbitrary, and not specifically related to the act of transgression, and punishment by reciprocity, which is imposed in a sense relative to the content and nature of the transgression. The latter has value in terms of the prevention of future transgressions. Piaget considers the movement from expiatory punishment to punishment by reciprocity to be largely due to the relationships which hold between children. He suggests that "the sense of justice, though naturally capable of being reinforced by precepts and practical example of the adult, is largely independent of the influences, and requires nothing more for its development than the mutual respect and solidarity

which holds among children themselves" (Piaget, 1965 edition, p. 198). It is clearly hypothesized that the quality of peer group relationships is of great significance and that punishment by reciprocity and mature view of the effect of punishment on later deed are related.

In a recent study (Carlson, 1973) it was found that for Laotian children, ages six through fourteen, there were many more mature responses, even for the youngest groups of children, to a protocol separating punishment by expiation from reciprocity than one finds for European children. On the other hand, for an item dealing with the effect of punishment on later deeds, there seemed to be no developmental pattern at all. It was concluded that these two areas, in contrast to conclusions based on data from western cultures, are quite distinct and that the latter, effect of punishment on later deed, cannot be attributed to the quantity and quality of peer group interactions, which in Laos are very highly developed. This gives just one example where divergencies in development, studied in a cultural setting different from the one in which the original work was done, can shed light on developmental phenomena which otherwise might be assumed to be structurally related or to stem from certain environmental conditions.

2. How well can cross-cultural Piagetian studies help differentiate and determine the importance of the factors of mental development?

A. Hereditary factors - As far as can be determined there is only one investigation which gives support to the notion of a strong hereditary factor to Piagetian cognitive development (de Lemos, 1969). De Lemos administered conservation of number, substance, length, weight, area, and volume tests to two groups of Australian Aboriginals: one group with mixed blood, one group totally Aboriginal. Her findings were as follows: (a) there was a similar, though much retarded, progression on the Piaget measures as found for European children, (b) there was a reversal in the expected order of conservation, conservation of quantity followed conservation of weight, and (c) there was evidence of better performance by the mixed-blood than the full-blood Aboriginals. The latter finding was interpreted as being due to genetic factors as it was argued that the environments of the two groups were the same. Eysenck (1971) used the de Lemos results to support his argument that there is a large genetic component in IQ and that individuals with more negroid blood are more deficient on measures of IQ than those with mixed blood. From the de Lemos study such a conclusion is inappropriate for a number of reasons, of which only three shall be mentioned here.

First, it cannot be argued, as Eysenck (1971, p. 95) does, that just because a progression of development similar to European children was found, that the tests themselves were relevant to the Aboriginal samples. Second, although it has been shown

that conservation and mental age are fairly closely related in American samples (Anooshian & Carlson, in press; Goldschmid, 1967; Kooistra, 1963), it doesn't necessarily follow that such a relationship will obtain for individuals from vastly different environmental circumstances. Third, and perhaps more important, Dasen (1972b) was unable to replicate de Lemos' findings and in another study (Dasen, deLacey, & Seagrim, 1972) found that Aboriginal children raised in European families attained concrete operations at almost the identical rate as middle-class European children.

Based on Piagetian cross-cultural research, it would appear that too little is known about genetic factors to warrant the conclusion of their relative importance or unimportance to development. Furthermore, the interactive aspects of genetic potential and environmental stimulation play a central role in Piaget's theory and perhaps cannot be separated in a quantitative manner (Furth, 1973; Overton & Reese, 1973).

B. Environmental stimulation and schooling - The effects of early stimulation on development during the sensorimotor period has been discussed (Paraskevopoulos and Hunt, 1971). In a study of considerable interest Dasen (1973) examined the relationship between divergent ecological demands and the development of (a) conservation of quantity, weight, volume, and length; (b) seriation, and (c) spatial tests of orders rotation, and horizontality. Three groups of subjects were used: Australian Aboriginals with medium contact with European culture, Aboriginals with low contact

with European culture, and a European group. It was hypothesized that (a) though differential rates of development would be found, the stage sequence of the Aboriginals development would be the same as that found for the Europeans; (b) the rate of development would be faster in the medium as opposed to the low contact Aboriginals; and (c) due to the ecological and cultural background of the Aboriginals, especially the low contact group for whom survival requires the use of detailed "cognitive maps", spatial concepts would develop more readily than logico-mathematical ones (i.e., conservation and seriation).

All of Dasen's hypotheses were supported. There were some unexpected results, though, as he found greater lag in performance for the Aboriginals than expected. Too, although performance on the spatial relations test was higher than on the logico-mathematical test for the Aboriginals (the opposite was found for the Europeans) and the medium contact Aboriginals outperformed the low contact group on the logico-mathematical relations test, no difference in performance between the medium and low contact Aboriginal groups was found on the spatial relations test. This was surprising as the low contact group is dependent on nomadic hunting and was expected to develop spatial skill at a faster rate than the medium contact group which is less dependent on traditional food gathering techniques.

The results of research concerning the effects of formal schooling on the acquisition of Piagetian concepts are divergent. A number of studies (Goodnow & Bethon, 1966; Mermelstein &

Shulman, 1967; Heron, 1971) have shown the relative lack of importance of schooling for the development of concrete operational thought. Other investigators (Greenfield, 1966) dispute this, however, and argue for the importance of schooling as an aid in the development of concrete operational thought. Certainly the effects of schooling on development are not clear (for a review see Furby, 1971). One reason for the confused results might be that the nature of the schooling involved has not been adequately examined. Perhaps only certain types of school experiences will make significant contribution to the development of children's logical thinking capabilities. Evidence for this has been offered by Allen (1968). He found performance for children exposed to a cognitively based science curriculum (Science Curriculum Improvement Study) was significantly better on Piagetian measures of logical thinking than performance for children whose science instruction followed the traditional pattern. The question is not schooling versus no schooling; rather, type of schooling versus no schooling. If this question is to be seriously investigated cross-culturally, it would require an experimental and interventionist approach, an approach which heretofore has been lacking in cross-cultural Piagetian research.

As development progresses it might well be that environmental factors, including schooling, play an ever more important role. This implies that formal thought would be more affected by these variables than concrete operational or sensorimotor development. The few studies (Collis, 1971; Graves, 1972) done to date on

formal operational thought and the schooling variable suggest that this is the case, but again, clarity of type versus amount of schooling is necessary.

What this implies is a model that shows not only increasing variability of performance with increasing age, but greater importance of environmental factors with age. The latter is in contrast to the model posited by Bloom (1964) in which environmental circumstance plays a decreasing role in development with age, although individual variation might continue to increase.

Another area of differentiation which should be drawn is between general versus specific effects of environment on Piagetian development. Indeed a number of studies have attempted to do this (Furby, 1971) but a more "anthropologically based" approach might be necessary for the types of distinction desired. As Galperin (1967) has pointed out, one must consider the societal nature and organization of all symbols (including all the forms of work engaged in by individuals) within the society. This requires a thorough knowledge of societal organization and transmission as well as an understanding of how the individual will be affected and will affect such organization. To look at just the "tools" of the society and infer how they affect individual development is not enough. The nature of these tools and their dialectical relationship to societal organization and individual cognition must be understood. For such an analysis, fusion of the efforts of psychologists and anthropologists is necessary.

Another approach, also requiring psychological and anthropological expertise, which could extend analysis into specific aspects of environment is to extend the work of Dave (1964) and Wolf (1963). (Their work was discussed in detail by Bloom, 1964.) Their approach was to hypothesize a number of environmental process variables and empirically relate these to later achievement in school (Dave) and intelligence (Wolf). Perhaps it would be possible to employ a similar approach in cross-cultural Piagetian studies.

Little work has been done in the assessment of personality factors as they relate to acquisition of such Piagetian concepts as conservation. Using American samples, the investigations of Goldschmid (1968) and Peters (1967) are instructive, however. Goldschmid found that such affective variables as objectivity of self-evaluation, peer preference, less domination by mothers, and general social attractiveness and passivity were related to various measures of conservation. Peters found attentiveness, impulse control, resistance to distraction, independence to task oriented situations, and friendly assertiveness to be correlated with acquisition of conservation of number. The generality of such findings has not been adequately tested through cross-cultural research, however, and work along these lines could be most informative.

In summary, cross-cultural research efforts designed to differentiate between and determine the importance of the many factors related to cognitive development is in its infancy. We

are in position of having many more questions than answers.

3. Of what practical significance is cross-cultural Piagetian research?

One area of great practical significance and applicability of Piagetian research is education. It has been clearly demonstrated that level of cognitive function is of critical importance to performance on cognitively based curricula (Freyburg, 1966; Field & Cropley, 1969; Szeminska, 1965) and, in turn, exposure to such a curriculum can affect level of cognitive functioning (Allen, 1968). Knowledge of a child's level of development can and should be used to help "make the match" (Hunt, 1961) between capability and expectation.

Hunt (1967) makes this point in respect to general motivation. He suggests that there is an optimum level of incongruity between the incoming information and the level of development which the individual is at. Too little incongruity probably produces boredom; too much incongruity produces emotional stress; just the right amount of incongruity produces the motivation underlying intellectual growth. This is similar to Dember and Earl's notion of "pacer" stimuli, which refers to the discrepancy between expectation and stimulation (Dember & Earl, 1957).

The evidence presented on the relationship between school achievement and level of development was for science and the methods of instruction accompanying this curriculum area.

Unfortunately, far too little effort is made in both technologically advanced and nontechnological countries to develop curricula which go beyond memory and rote learning. (Or even if the effort is made, as it has been done in the United States, it remains largely unimplemented.) It has been demonstrated that cognitive variables account for only 30% to 50% of the variance for school achievement in the U.S.; non-intellective predictors account for the rest (Fend, 1971). One can more than surmise that in nontechnological societies even less variance in school achievement would be in the cognitive domain. Accordingly, schools seem to require a great deal about which Piaget's theory of intellectual development has little to say. This conclusion reflects not on Piagetian theory so much as on the goals and practices which one finds in education today.

4. What types of research within the Piagetian framework might be helpful in the future?

In this section only a summary of avenues of research which would appear to be fruitful for the future will be dealt with. In many instances these have been anticipated in the previous discussion.

A strategy which has only very rarely been employed in cross-cultural developmental research is the longitudinal approach. The longitudinal approach can be used in the study of causal factors involved in growth and can ably describe both childhood experiences and the result, adult behaviors. Too, through the

use of longitudinal studies with co-twin controls, a closer approximation of the relative effects of environment and heredity factors can be gained.

Often cross-cultural research compares one age sample in a particular culture with the same or a similar age sample from another milieu. Such studies are of interest but do not provide for analysis of developmental trends. Developmental data are needed in order to make appropriate comparisons so that problems of time displacement (décalage) will not lead to the perhaps spurious conclusion that a true deficit exists. Fortunately, most of the recent cross-cultural Piagetian studies take this consideration seriously and look for developmental trends rather than single age groups comparisons.

A basic problem remains, though: lack of intensive knowledge of the culture under study. The psychologist and anthropologist must combine their efforts so that a genuine understanding of the processes of development might be arrived at. A study of the products of development through comparative studies is informative, but necessarily falls short without the necessary analysis of the societal conditions, in all their complexity, in which the individual grows and develops. What this implies is the requirement of combining the emic approach described by Berry (1969) with the etic assumptions which might have motivated the research question in the first place.

Another approach which would be helpful in understanding processes of development would be through the use of experimental

studies in conjunction with ex post facto designs. Correlational methods can provide baseline data and indications of the probable causal effects of a variable or a number of variables. Extending this approach to the manipulation of variables thought to be causal in an experimental design would lead to extension of external validity and perhaps confirmation of etic processes. There is a wealth of data, for example, from a host of training studies carried out in the U.S. and Europe on acquisition of various Piagetian concepts. The question of how widely these findings are applicable is still open, however.

In summary, this paper has attempted to outline some basic aspects of Piaget's theory and place them in cross-cultural perspective. Several questions concerning approaches and the relevance of cross-cultural research for clarification of Piagetian theory were discussed. It was concluded that although a great deal of information has been gained from cross-cultural investigations, many critical research questions are still outstanding.

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