



Cognitive Processes and Learning: *Reflections on a Comparative Study of “Cognitive Style” (Witkin) in 14 African Societies*¹

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Educational psychologists and designers of instructional programs and materials are being challenged to become more culture specific:

The need to develop patterns of science instruction in Liberian elementary schools, which are in consonance with the ways in which children learn and the nature of science, is an urgency. Rote learning of scientific information must give way to greater involvement of children in the learning process.²

So goes the recurrent theme.

As behavioral science becomes more accepted as a system of sources and bases for educational planning, the demands upon educational psychology, educational sociology, and educational anthropology can be expected to mount.

Questions about the “consonance” of instructional procedures and the ways in which children learn involve at least three distinct issues, all of which can be seen in the quotation above: 1) the probability of culture-related functions in mental processes, 2) the use of certain instructional procedures and the non-use of others within a given society, and 3) the probability of particular disciplines demanding certain mental processes and conceptual orderings of self and environment.

1. Cultural-related Functions in Mental Processes

The first set of issues may seem to represent the re-opening of the old case against human equality. To argue that race, creed, or social environment is contributory to superiority in any human attribute is unpopular. Yet, the evidence mounts that individuals, families, communities, societies—and mankind, in general—do things to themselves that affect their potentialities for learning, development, and self-realization. Granting that in a given value system a certain sort of learning or development may be relatively unimportant, modernization has nevertheless precipitated specific clashes. That learners in some societies seem more able to be taught the intellectual processes required for modernization does, in fact, place other societies at a disadvantage—granting modernization as a value. To what extent is this sort of societal “handicap” a function of learned mental processes inherent in socialization? Some argue that language and culture virtually program the mind so that the individual, as a learner, is both bounded and shaped according to the world-and-life view and the mental-process styles of his culture. Others, such as Piaget and Chomsky, give a much larger place to

¹ Ted Ward. Cognitive Processes and Learning: Reflections on a Comparative Study of “Cognitive Style (Witkin) in 14 African Societies. *Comparative Education Review*. Vol. 17, No. 1 (February 1973), pp. 1-10. Used with permission. Paper presented at the Comparative and International Education Society’s Annual Meeting, Boston, MA (March 20, 1972)

² C. Louise York, Theodora Ward Jackson, and Dean Mary Antoinette Brown. “*Science Education in Liberia: New Directions*” in Hubert M. Dyasi, ed., *Reports of the Science Education Programme for Africa*, No. 3. (Accra: The Science Education Programme for Africa, December, 1971), p. 24.

constants in language, maturation, mental operations, and universal human interactions (such as co-operations, oppositions, exchanges), and a much smaller place to transmissions which vary from culture to culture. Although as Flavell comments,

Piaget has . . . for a long time, freely conceded that not all 'normal' adults, even within one culture, end up at a common genetic level. Adults will show adult thought only in those content areas in which they have been socialized. . . .³

How much of the variance among peoples is attributable to culture, and how much to maturational and other factors?

The present state of the art does not allow us to make a definitive statement. As Piaget himself has pointed out:

. . . the kind of psychology we develop in our social environments remains conjectural as long as comparative, extensive, and systematic research is not available; a great effort is still to be made in this direction . . . only such studies allow us to separate the effects of biological and mental factors from those of social and cultural influences on the formation and socialization of individuals.⁴

What can we say with confidence is that regardless of the origin of differences among learners, and irrespective of the degree to which socialization is a factor in their development, differences among cognitive styles of learners are observed, and these differences become important data in educational planning.

2. Acceptance and Expectation of Instructional Procedures

The most concrete evidence of the imposition of culture on the learning potential of people is their expectations of what constitutes a valid learning experience. What is accepted as a valid learning experience in one culture may be rejected in another. The wisdom of the elders, transmitted as legends and proverbs, may be profoundly respected as a learning experience or totally rejected as having no place in an educational system. A person may be culturally conditioned to accept the pedantic ways of the lecturing teacher in a formal classroom as a valid learning experience, tending to make him suspicious of discussion groups or instructional motion pictures. In many cultures—probably the majority of societies—the function of exposition is accepted as a valid teaching method. Yet Americans, especially those Americans mightily convinced of the inherent efficacy of “discovery learning,” “freedom in the classroom,” “self-direction of the learner,” and the like, are prone to reject exposition as having none but peripheral validity as an instructional procedure. (Those who hold “the lecture method” in disdain are obliged to somehow account for the significant mental skills and creative capabilities of contemporary and historical leaders in the sciences and humanities whose cultural and ethnic distribution is strangely unrelated to whether or not any given teaching method is a dominant characteristic of their cultural background.)

Criticisms of educational methodology and pedagogy seem to be based only superficially on educational theory. Actually, criticisms are more clearly based on political and social theory. For example, the idea of “freedom in the classroom” is really, at its heart, the statement of democracy and freedom of the individual. Those who champion “freedom in the classroom” are really pushing a form of democracy which underlies their educational thinking. And, significantly, this underlying philosophy has, as its basis, a view of man that sees him as dignified, responsible, free, and capable of making right choices.

The question, then, is not one of educational theory as much as political science and sociology.

³ J.H. Flavell, *The Developmental Psychology of Jean Piaget*. (Princeton: Van Nostrand, 1963)

⁴ Jean Piaget. Necessité et Signification des Recherches Comparatives en Psychologie Génétique. *International Journal of Psychology* 1, No. 1 (1966): 3-13

3. Demands of Disciplines for Particular Mental Processes

That modern science produces or demands “scientific thinking” would seem to be a truism. It is in natural and physical science and their affiliated fields of engineering that the most cogent case has been made for a cause/effect relationship between the discipline and the mental processes of its learners. It is no coincidence that the cross-cultural replications and extensions of Piaget’s research have attracted much attention and much participation of people in science education. It is no coincidence that significant questions about the relationship of schooling and culture are being raised by the multi-national Science Education Programme for Africa:

SEPA should also encourage a systematic collection of information on children’s background (especially as regards their ways of knowing) and on the significance of educational processes embedded in their culture, in order to aid both instructional strategies and evaluation.⁵

Because of the world-wide influence of modern science and technology, it is reasonable to expect that it will be in reference to these disciplines that definitive conclusions about the cause/effect relationships between the structures of a discipline and the structure of a mind will first be derived. Although it is possible to reconcile oneself to the natural environment in other ways, the educated youth of virtually every nation are being asked, as in Africa, to learn the skills of “scientific problem-solving” (Tanzania), “learning through discovery” (Ghana), “devising new methods of doing things . . . setting up experiments and recording their findings” (Malawi), “gaining major concepts rather than large numbers of minute, isolated facts” (Kenya), “linking with the everyday life of the pupils and to the actual conditions existing in the society . . . for improving living conditions” (UNESCO).⁶

We watch with interest, eager to determine what consequences these almost uniform educational forces will produce. Africa offers an especially interesting field for observations because the various societies have been rather well described in the anthropological literature, and the consequences of the emphasis on science education should be identifiable within these societies within the next 20 years. It is interesting to speculate that the effects will be differential in respect to the modal cognitive style in each society.

Interface between Social Science and Educational Practice

For social scientists, the primary accountability is for valid and reliable description. Theirs are the problems of analysis and understanding of inter-relationships.

For educational practitioners, the primary accountability is more in matters of synthesis than of analysis. Theirs are the problems of somehow getting things to happen (hopefully the right things—but not necessarily).

The interface between social science and educational practice is slowly developing. Some of us are seeking roles in shaping that interface—perhaps we are the engineers, seeking to draw on the descriptive data and the tested theories and to design more trustworthy procedures and materials for educational practice.

Aware of the vast quantities of descriptive data produced by generations of anthropological research, for example, we seek ways to draw these data out of their passive roles and turn them into bases for action. Such a motive appeals to an activist, at least; but how does one go about this? One illustration (more precisely, a part of one illustration) is presented below:

⁵ Dyasi, ed., *Reports*.

⁶ Ibid.

1. The Intention: To Identify the Concomitants of Cognitive Style

Educators are becoming more aware of the value of anthropology. As a source of useful information and new vantage points, anthropology may be especially helpful in dealing with the educational problems of educating “people who are different.” Now that North Americans have become aware of minorities—their differences and their needs—anthropology has acquired new relevance.

Several years ago, a group of faculty and graduate students at Michigan State University were pulled into the task of cross-cultural adaptation of instructional materials. At first it seemed to be more a practical than a theoretical problem. “If you want Nigerians to learn from this piece of programmed instruction, tell us what the Nigerians are like and we’ll change it to fit their characteristics.” And surely you *can* tell us what the Nigerians are like. Which Nigerians? Under what motivations? Working in their second language? What sort of English is that? How does their approach to inference differ from what we expect? Their approach to deduction? Their styles of induction? Their uses of abstract symbolism? Abstract logic? And so the task force began to unpack an intriguing bag of research and development problems.

We are learning to put cross-cultural instructional issues into anthropological perspective. For example, we have come to accept six distinct levels of tasks in the adaptation of instructional materials:

Level 1: Translation (language)

Level 2: Adjusting the vocabulary (to make the reading level of the adapted material match the level of the original.)

Level 3: Changing the illustrations to refer to local experiences.

Level 4: Re-structuring the instructional procedures implied and/or specified to accommodate pedagogical expectations of the learners.

Level 5: Re-casting the content to reflect local world-and-life views.

Level 6: Accommodating the learning styles (“cognitive styles”) of the learners.

The lower-level problems are relatively easy to understand, and the means of adapting instructional materials through Levels 1 to 3 are rather well developed (even though rarely used!) But Levels 5 and 6 present difficulties, many of which arise from partial understanding of cognitive style and how it relates to, is part of, or is affected by the learner’s world-and-life view.

The characteristic self-consistent modes of functioning found pervasively throughout an individual’s cognitive activities (perceptual and intellectual).⁷

Inquiries have focused on the *perceptual* manifestations of cognitive style that Witkin identifies as the global-articulated continuum. Descriptions of the poles of this continuum follow:

Articulated: Style of functioning which involves the ready ability to overcome an embedding context and to experience items as discrete from the field in which they are contained.

Global: Style of functioning that involves submission to the dominant organization of the field and the tendency to experience items as ‘fused’ with their background.⁸

Does a person’s cognitive style influence the way he learns in school?

For teachers and for designers of educational materials and procedures, there are unanswered questions about the implications of cognitive style for the classroom. The first question asks about the influence of cognitive style on what a learner learns in school. The high incidence of science educators participating in studies pursuing both the research of Piaget and of Bruner into the cross-cultural

⁷ H.A. Witkin, “A Cognitive-Style Approach to Cross-Cultural Research,” *International Journal of Psychology* 2, No. 4 (1967), p. 234

⁸ H.A. Witkin, et al., *Psychological Differentiation: Studies of Development*. (New York: John Wiley and Sons, Inc., 1962), p. 80

arena suggests that educators want to know more about the way culture interacts with scientific reasoning. Is *cognitive style* that point of interaction?

What are the implications for teaching and learning?

If we accept the validity of *cognitive style* and conclude that it relates in various ways to the effectiveness of school learning, the most practical questions follow. What are the facets or aspects of cognitive style that can be accommodated by alterations of the instructional procedures and materials? Which of these are worth accommodating (in the sense of cost/effectiveness)? Which elements of cognitive style are inconsistent (incapable of being reconciled) with particular significant learning? Which of the elements in a given cognitive style must be educationally altered in order to enable a person to learn particular subject matter? The last two questions, above, underlie much of the participation of science educators in the study of cognitive characteristics of learners in cross-cultural situations.

How important are differences in cognitive style?

If cognitive style and learning potentialities (capabilities or tendencies) are related, how important are these differences in learning that are keyed to cognitive style? Is cognitive style persistent or easily altered? Is it a limiting factor—in the sense of its producing inability or disinclination to perceive or comprehend? Or could it be that cognitive style is fairly fluid—that a person's cognitive style is subject to shift over some reasonably short period of time. If so, it may be easier to change the learner than to change the instruction. (If it should be definitively demonstrated that a given discipline demands or produces a certain sort of cognitive style, the question of importance would be easier to answer.)

2. The Hovey Study of Concomitants of Cognitive Style

It is a reasonable assumption that a given characteristic in cognitive style is an important factor in learning to the extent that it is a manifestation of, or concomitant with, a persistent and basic characteristic of the culture of the learner. To inquire into the validity of this assumption, a study was conducted by Hovey.⁹ Using descriptive data from standard anthropological sources on 14 societies in Africa, a correlational analysis was made. First, a descriptive composite was prepared for each of the societies, combining into one index (indicator) all the known characteristics having direct reference to the global-articulated continuum. This index was then correlated with each of the 457 items from Textor's, *A Cross-Cultural Summary*.¹⁰

The actual procedure in Hovey's study consisted of three operations:

- (1) Identifying the societies for which Textor's *A Cross-Cultural Summary* provided data relating to the continuum of global-articulated cognitive style (from Witkin.)
- (2) Describing the societies (as identified above) in terms of the factors defined as being manifestations of cognitive style.
- (3) Identifying (through correlation) those factors from Textor's *A Cross-Cultural Summary* that are concomitants of the given cognitive style.

There were two analytical stages: first, to identify which end of the global-articulated continuum (if either) was indicated by the presence of a characteristic seen as having face validity as a manifestation of cognitive style. (For example, the existence of multiple levels of formal political state organization suggests itself as being somehow related to cognitive style, but it must be checked against other reasonable characteristics to see whether it indicates the global or the articulated direction.) Second, there was an analysis to determine which, if any, of the descriptive data *not* seen as

⁹ Richard L. Hovey, *Cognitive Style in African Cultures: The Global-Articulated Dimension*. (Ph.D. diss., Michigan State University, 1971)

¹⁰ Robert Textor. *A Cross-Cultural Summary*. (New Haven: HRAF Press, 1967)

manifestations of cognitive style were, in fact, correlated with characteristics judged to be representative of one or the other of the directions of the continuum. (For example, it was found through this analysis that availability of a plentiful food supply was associated with the societies identified as tending in the global direction of the global-articulated continuum.)

Thus, 14 African societies (Massai, Ganda, Fon, Ashanti, Venda, Lamba, Nyakyusa, Thonga, Mbundu, Chagga, Azande, Nuer, Tiv, and Tallensi) were selected since, for these, 'Textor' data provided sufficient information on factors thought to be related to cognitive style.

Fifty-two of the 467 Textor items were assumed to be face-valid manifestations of cognitive style as described by Witkin. The societies were then ranked in terms of more-to-less articulation as indicated by these items.

A set of five societies was derived from each end of the ranking. The societies of the polar *global* cluster were the Chagga, Azande, Nuer, Tiv, and the Tallensi. The societies of the polar *articulated* cluster were the Masai, Ganda, Fon, Ashanti and the Venda.

The following list of most significant indicators was derived through an item analysis of the 52 face-valid items (in reference to the items commonly distinguishing between the two polar clusters):

- (1) Community organization variables dealing with the homogeneity of the population.
- (2) Infancy and childhood variables dealing with development and performance of certain behaviors, and the indulgence and affection shown toward the child.
- (3) The political organization variable dealing with state organization.
- (4) The writing system variable dealing with the presence of a system employing mnemonics or the absence of a writing system.
- (5) The societal complexity variables for the number of levels present in a national jurisdictional system.
- (6) The occupational specialization variable concerned with full- or part-time specialization.
- (7) Justice and law variables dealing with type of social sanctions and the ratio of restitutive to repressive sanctions.
- (8) The lineality of kin group variables for patrilineal or double-descent in contrast to quasi-lineage.
- (9) The cousin marriage variable for permitting such marriages.
- (10) The mode of marriage variables for the age of the male at the time of marriage.
- (11) The pregnancy and childbirth variable dealing with post-partum sex taboos and their deviation.
- (12) The adolescence variable concerned with segregation of boys.
- (13) The illness and therapy variable for the explanation of illness due to aggression causes.
- (14) The religion, magic, and eschatology variables dealing with beliefs about supernatural sanctions of human beings.

Analysis of the relationship of the global-articulated aspect of cognitive style and other cultural variables (those Textor items not having a "logical" or face-valid relationship to cognitive processes) revealed the following factors to be associated with the polarity of a society on the global-articulated continuum:

- (1) Natural environment variables for the location of the societies in either tropical grasslands and/or in tropical or sub-tropical rainforests.
- (2) The settlement variable for the compactness of field settlements.
- (3) The diet variable for the supply of food available in the societies.
- (4) The writing system variable dealing with the absence of such a system or one that is mnemonic.
- (5) The societal complexity variable concerned with the number of levels in the national jurisdictional system.

- (6) The occupational specialization variable of the presence of full-time specialization, but not for surplus or part-time specialization only.
- (7) Justice and law variables dealing with social sanctions.
- (8) The linearity of kin group variables concerned with the presence of a patrilineal or double-descent lineage in opposition of a quasi-lineage,
- (9) The cousin marriage variable which deals with permitting such practices.
- (10) The mode of marriage variable concerned with the age of the male at marriage.
- (11) The pregnancy and childbirth variable dealing with post-partum sex taboo and their duration.
- (12) An additional infancy and childbirth variable about the time at which serious socialization commences.
- (13) The adolescence variable for the degree of segregation of adolescent boys.
- (14) The illness and therapy variable dealing with the absence of explanation of an "aggression nature."
- (15) Five variables of religion, magic, and eschatology which are presence of beliefs about supernatural sanctions, fear of human beings, fear of spirits, and the incidence of asceticism in mourning behaviors.

Conclusions

The conclusions derived as a result of the study are listed below:

- (1) On a theoretical level, by matching the cultural data of a society with the cognitive-style paradigm of Witkin, it appears possible to identify the place of a society on the global-articulated dimension.
- (2) All of the societies investigated appeared to manifest different amounts of articulation and, thus, to occupy different places on the global-articulated dimension.
- (3) Some of the cultural variables deemed manifestations of cognitive style were more significantly associated with one direction of the dimension than with the other direction.
- (4) Some of the cultural variables not deemed manifestations of cognitive style were more significantly associated with one direction of the dimension than with the other direction.¹¹

In Hovey's findings there is little to suggest which characteristics are causes and which are effects. Indeed, we have no strong reason to believe that all of these concomitant phenomena are anything more than related symptoms or consequences of some other and more profound causative element.

Nor do the findings in the Hovey study provide closure on the issue of persistence of cognitive style. But the earlier assumption now seems worthy of testing as a hypothesis: In a given society, those elements of cognitive style which are closely related to dominant and persistent characteristics of life-style are apt to be more persistent than those which are related to less persistent or less dominant life-style factors. This hypothesis is suggested by the evidence that the investigated factor of cognitive style, the global-articulated continuum, was related to such typically persistent factors as achievement behavior, patterns of kinship behavior, and child-rearing styles.

But there is also an unresolved theoretical problem in the concepts underlying this research: Piaget would say that taking things apart ("articulated style") is one of several "logical-mathematical" operations, an internalization of manipulations which the person has already mastered with physical

¹¹ Richard L. Hovey. *Cognitive Style in African Cultures*, 1971

objects and with representations of objects. The major difference between a Piaget and Witkin approach is that Piaget is looking at cognitive “phonemes” and “morphemes” while Witkin is trying to interpret poetry. The poetry may increase our appreciation of culture, but we will truly understand it if and when we look at the word and sentence structure.

Summation

The feasibility of using previously derived descriptive data from anthropological sources in order to better understand issues relating to instructional design were demonstrated. It is possible to draw inferences about the cognitive styles characteristic in particular societies. To the extent that such data as in Textor’s *A Cross-Cultural Summary* reflect present conditions, planners and designers of educational programs could be aided by efforts of engineers, who help draw on these data.

It seems like such a short time ago when educators discovered the reality of individual differences in learners, and yet how slowly educational systems have been altered to accommodate the implications of individual differences. And how uneven and inconsistent are the accommodations: a given school boasts of its elective alternatives, its rate-of-learning variations through the use of individualized and programmed instruction, yet the school persists in its assumption that all learners relate similarly to a given system of rewards and punishments. How uneven is the profession’s assimilation of new knowledge!

Swinging (on a grand scale) away from the view of people as racially and nationally variable—“some are inherently superior and others inherently inferior”—we approached another exaggeration and now seem to be swinging back. Our temporary rapture with the proposition that all learners are potentially the same (in terms of our idealized view of education and learning as the golden road to freedom and equality) turned somewhat sour. We discovered that environment forces in societies rarely conform to idealistic dreams. Some people have been damaged, in a physiological sense and, thus, cannot be accounted for as being merely the low portion of a “normal distribution.” Others acquire value systems in which the virtues of erudition play no significant part; that such value systems exist within our own subcultures is slowly dawning on the controllers of North American educational systems. People indeed differ along ethnic and subcultural lines—hardly in the old sense of inherent superiority and inferiority—but nevertheless in very real ways.

Our comprehension of the meaning and implications of cultural differences among learners is at a stage roughly equivalent to the awareness of individual differences in the early 1950s: we are surely coming to accept the phenomenon but we have little knowledge of what we might do to relate educational resources to the needs of those who are different.

Perhaps from the cross-cultural activities of educators and researchers (in the sense of international and *gross* cross-cultural) the insights for more adequately meeting educational needs in North America will arise. If so, those who are exploring the relationships between cultural characteristics and cognitive styles of learners will play a useful part.