

## RESEARCH ON COGNITIVE DEVELOPMENT IN SUB-SAHARAN AFRICA \*

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This eclectic analysis identifies three themes informing research on cognitive development in *Afrique noire* over the past ten years. (1) Extending the range of generalizability of Western theories: the application of such theories has often been too literal and too preoccupied with direct comparisons between the behaviour of African and Western children. (2) Interpreting the uniqueness of the African situation: the detailed documentation necessary for this task can usefully draw on the immersed, participant observation strategy of anthropology but needs to be focussed on microsystematic processes. (3) Deriving implications for social policy: psychological research can usefully contribute to policy debates on the choice of linguistic media for school instruction, the design of natural and social science curricula, and the planning of appropriate services for disabled children. The task of changing the Eurocentric and potentially exploitative character of psychology in sub-Saharan Africa calls for adaptation to the sub-continent's social needs and for African scientific creativity.

### Introduction

The purpose of this article is to discuss research on cognitive development in Sub-Saharan Africa. Rather than focussing on “national” trends, the discussion will focus instead on the whole of sub-Saharan Africa, which I shall regard as stretching from the northern borders of Senegal and Sudan to the southern borders of Angola, Botswana and

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Mozambique. This region, which is known in French by the more elegant name of "*Afrique noire*", houses a population of some 350 million people (about the same as Western Europe) and is fragmented into about 40 modern states, which provide a fluid political structure for more than 1000 ethnic groups differing markedly in language and other important cultural traits. Nearly half of the population in this region are children under the age of 15, while less than 5% are over the age of 60. In spite of the exclusion of the Sahara, the population of *Afrique noire* is spread over a vast area (6 times the size of Western Europe, or about the same size as the Soviet Union). Only one of the African states (Nigeria) has a population of more than 50 million, while most of them house less than 15 million each.

Most of these small states have only one, national university; and only a few of the African universities contain a psychology department: probably not more than 20 in all, and less than 10 with a history of research going back more than 10 years. A few of these departments have started offering Masters degree programmes, but (as far as I know) none of them has yet awarded a Ph.D. degree. Since doctoral studies are widely regarded as an essential training for research, a major part of the psychological research by Africans over the past 15 years has been undertaken in partial fulfilment of the requirements for a Ph.D. at a European or American university.

Another major category of psychological research in Africa during this period has been carried out by visitors from abroad who were also studying for a Western university's doctoral degree. Serious research by psychologists beyond the level of their doctorate has remained scarce in *Afrique noire*, for reasons which are really extrinsic to the field – the heavy teaching and administrative loads confronting the staff of small departments in young universities; the multiple demands placed by national politicians and planners on their small reservoir of highly educated, indigenous manpower; and the embryonic status of the institutional framework for advanced research on the continent. Much of the initiative has continued to come from outside Africa, resulting in the persistence of problems which have been documented elsewhere (Berrien 1967; Kashoki 1978, 1979; Kumar 1976; Serpell 1980a).

Publication of research is almost always external, since there are few appropriate journals published on the continent, and African book publishers experience great difficulties with both production and distribution (cf. Dean 1980). Difficulty of access to these external outlets,

and preoccupation with other aspects of their career leads many African scholars either to not publishing their doctoral research, or else to inordinate delays in doing so. As a result, a systematic survey of trends in the research being undertaken on the continent is easier to conduct from outside Africa than from inside. What follows is an eclectic, if not opportunistic analysis (cf. Sagasti 1983) which would require for its validation a more comprehensive review of the literature from a base in one of the "metropolitan" countries' libraries. I shall concentrate mainly on work done over the past 10 years, since the earlier period has been quite comprehensively covered by Wober (1975).

I shall describe three themes (rather than trends) which have informed research on cognitive development in *Afrique noire* in recent years, and comment on the ways in which they have been addressed. These are:

- (1) extending the range of generalizability of Western theories;
- (2) interpreting the uniqueness of the African situation; and
- (3) deriving implications for social policy.

### **Extending the range of generalizability of Western theories**

This has been an explicit goal of many investigators in Africa. The simplest approach was to try and replicate Western experiments with African people. Early studies of this form yielded some results surprising to their authors, so that a second phase of research has been addressed to explaining the differences in behaviour between African and European people in response to the same nominal stimuli. In the field of cognitive development, such differences were often presented as a "developmental lag": the same responses occurring at later ages in African populations.

Piaget's theory of genetic epistemology has been a favourite source of inspiration for this kind of study. Ohuche and Otaala (1981) tabulate 25 different studies from 10 different African countries published in the 1970s which used one or more of Piaget's conservation tasks. Virtually all these studies showed a change with age in the pattern of responses by African children to these now famous procedures, somewhere between the ages of 5 and 15 years. Piaget's theory provides an elaborate framework for interpreting these changes in response with age, and the

preferred mode of interpretation of the African studies has been as evidence "that basic intellectual mechanisms are universal, but that environment determines the situations in which they are applied" (Ohuche and Otaala 1981: 55).

This is a rather stronger version of the conclusion reached by Cole and his associates (1971: 233) "that cultural differences reside more in the situation to which particular cognitive processes are applied than in the existence of a process in one cultural group and its absence in another". As Van de Vijver and Poortinga (1982) have pointed out, the search for cross-cultural universals is beset with conceptual problems, and a more realistic goal for cross-cultural research is to define the range of generalizability of various parameters of behaviour. A more fundamental limitation of the research focus under discussion arises from its almost obsessive interest in *comparing* the behaviour of African people with that of Westerners. The curiosity which fired European 'explorers' in this respect seems to have left a distorting prism in the literature through which too many African scholars have been tempted to peer at their own societies. To adapt Mallory Wober's (1969) well-known caricature of "centri-cultural research", why should African psychologists be so intrigued by the question "how well can *our* children do their (Westerners') tricks?" It is tempting to impute this to a "colonial hang-over".

One counter strategy in cross-cultural research has been to identify domains or tasks in which African children will excel their Western peers. An early suggestion by Biesheuvel (1943) and Wober (1966, 1967) was that African patterns of socialization might be relatively more conducive to cognitive development in the realms of hearing and body movement than in the realm of vision. This idea has been empirically challenged (Poortinga 1971; Serpell 1979a) and Wober's supporting evidence has been criticized on methodological grounds (Witkin and Berry 1975; Serpell 1976; Okonji 1980). However, at least two other studies have shown in more specific realms that African children excel their European peers in predictable respects.

Serpell (1979a) devised a wire-modelling task to tap the skills promoted by a popular pastime among boys in Zambian towns. The same set of designs were then presented to low-income, urban school children in Lusaka, Zambia and in Manchester, England, for reproduction either by wire-modelling or by pencil-drawing. As predicted, the Zambian children performed better at wire-modelling and the British children at

pencil-drawing. More recently Jahoda (1983) compared urban Scottish and Zimbabwean children's understanding of the economic concept of profit. As predicted, the African children showed an understanding at earlier ages, especially those from families engaged in trading.

These studies can be interpreted on two levels, as providing descriptive information about the pattern of cognitive development of African children, or as addressing what Flavell (1977: 223) calls assessment questions of diagnosis. My own study was designed with the latter objective in mind, since I regarded with grave suspicion the widespread inferences from comparative studies with Piaget's and Witkin's tasks, of a "lag" in cognitive development among African children. A great deal of cross-cultural research has been preoccupied with such problems of assessment (e.g., Kamara and Easley 1977; Kiminyo 1977). With the wisdom of hindsight, I would now submit that this has been somewhat diversionary. For, as Flavell points out, arguments about the evocability and/or utilizability of cognitive processes tend to dodge more fundamental questions about the nature of the processes at work.

Another conceptual problem which has attracted some attention in reviews of cross-cultural methodology (Serpell 1976, 1982a; Cole and Scribner 1977) is that of using a single psychological dimension to characterize the ordering of individuals differing in age and those differing in cultural experience. In the case of Piaget's theory, Dasen (1975, 1977) has tackled this problem by giving prominence to the concept of horizontal *décalages*. Certain eco-cultural settings are held to promote the more rapid emergence of operational logic in one domain than another. This is somewhat similar to the notion that perceptual skills are relatively specific to the medium in which they are learned and practised (Serpell and Deregowski 1980). The further theorists move in this direction of domain-specificity, the less useful it remains to talk about studying "the pace of intellectual development of African children in different environments" (Ohuche and Otaala 1981: 77).

A more radical strategy is to abandon altogether the concept of a unilinear sequence of development. Berry (1981) and Okonji (1980) have hinted at such an option in respect of another Western theory which has been widely used in African research: Witkin's theory of psychological differentiation in terms of cognitive styles marked by varying degrees of field dependency. Thus Okonji (1980: 41) states that "at any given level of societal development either field dependence or field independence may be more adaptive and hence preferable". This

proposition, taken in the context of the many African studies showing relatively field-dependent scores on Witkin's tests, echoes an old theme in the anthropological literature about Africa. Field-dependent individuals in the USA are said to be attentive to social cues, to be interested in others and to like social interaction. It therefore seems not unreasonable at first sight to propose that rural African societies would favour such a cognitive style and seek to promote it. But the term "dependent" should be enough to remind us of the less positive features of field-dependency as documented by Witkin: reliance on external referents for a definition of one's thoughts and feelings, and a lack of cognitive differentiation. Likewise it is hard to escape the implications of the fact that a single test, Koh's Block Design Assembly Task, is used as an indicator of both field independence and intelligence. We are faced therefore with a dilemma: to accept Witkin's construct in its original form, in which case the notion that it is an adaptive style of cognitive functioning in *any* society seems implausible; or to modify the construct into something more representative of an African socialization goal, in which case we must drop the idea that it denotes an ontogenetically primitive, undifferentiated style of cognition. It is to be hoped that the long-awaited final report on the Central African Differentiation Project (Berry 1982) will offer a constructive way out of this dilemma.

The concerns I have expressed about the use of both Piaget's and Witkin's theories in research on cognitive development in *Afrique noire* point in the same direction. The capacity of these two theories for generating new insights into the substantive nature of cognitive development in Africa will be much greater if those who espouse them relinquish the practices of (a) replicating Western test procedures, and (b) comparing the rate of changes with age in African and Western children's responses. As Greenfield (1976: 333) has put it admirably, "if Piaget has, in the past, led the cross-cultural enterprise astray it is because researchers have followed his procedures rather than his theory". In order to make more constructive use of these theories, researchers will need to borrow only their most abstract levels of formulation and to search with a more open mind for culturally appropriate descriptors of the stages or dimensions which will serve to characterize cognitive development in an African setting.

A not unrelated but distinct issue is the role of comparison in such research. It is worth noting that psychological comparisons across

cultures need not take the form of directly comparing responses by sets of individuals. It seems likely that a more fruitful type of comparison will be between patterns or relationships within different cultures. Rather than asking whether a certain group of African children give similar responses to a given task to those elicited by this or an analogous task from Western children, we should be asking whether a given dimension of (e.g.) dyadic interaction (A) has the same impact on a given cognitive process (B) in the two cultures. The indicators of A and B might be entirely different in the two cultures, but the comparability of the two relationships would be underwritten by a theoretical analysis of both constructs and an explicit justification of the ways in which they were operationalized and measured in each cultural setting. From this analysis, however, it follows that in most cases the project of cross-cultural comparison is premature. For it is only in the Western societies that fully articulated theories of such relationships have been developed and systematically validated. The other half of the equation remains to be worked out before we are ready to embark on comparisons.

This rather severe admonition has been greeted with some scorn by the enthusiastic advocate of cross-cultural research, Brislin (1983: 392) who accuses me of launching a tradition of "emphasizing the difficulties of cross-cultural comparisons without putting forward any positive suggestions for what they would consider a better alternative". The next part of my article will be devoted to an examination of such an alternative. Brislin himself in the same review anticipates the value of this perspective when he writes: "more *true* collaborations will occur as social scientists in other countries" (by which he presumably means non-Western countries) "become less deferent to imported concepts and instead put forward their own alternatives". (Brislin 1983: 392, *italics added*.) In my opinion this passivity in theory-building by African psychologists reflects more than a conventional attitude: it arises from a dearth of inward-looking, detailed, analytic documentation of psychological development in traditional African socio-cultural settings.

### **Interpreting the uniqueness of the African situation**

Studies of this nature were originally regarded as the province of anthropology and ethnography. The research traditions established by

these sister disciplines have much to offer psychology, as many writers on cross-cultural psychology have acknowledged (e.g., Donald Campbell, Gustav Jahoda, Michael Cole, John Berry). Most notable in my view are the wide scope of data collected, the long-term immersed, participant observation strategy and the attempt to identify systematic interdependencies. Partly because of their emphasis on the last of these, however, anthropologists have seldom generated accounts which are sufficiently focussed on microsystematic processes to be of immediate theoretical value to developmental psychology.

An ambitious psychological study which draws on this tradition is Rabain's (1979) *l'Enfant du lignage*, which traces the development of Wolof boys and girls from the age of 2 to 6 years in rural Senegal. Based on ethnographic immersion in Wolof society, the study is replete with detailed and psychologically focussed field notes, which the author selects in order to illustrate her themes, rather than marshalling any quantitative evidence. The scientific hazards inherent in this kind of eclecticism are too well-known to need repetition. But the quality of the data illustrates the kind of fine-grain analysis which African scientists need in order to bolster their hypotheses and to present them as deserving of equal attention to those formulated by their Western predecessors in other cultural settings.

Rabain's descriptions, of the way in which Wolof adults delegate the socialization of their children to their age-mates, of the way in which the importance of food-sharing is used to teach children the principle of social reciprocity, of the way in which physical contact is used to symbolize and regulate social relations, are more than impressionistic statements. They carry the same kind of weighty conviction as Piaget's early theoretical speculations based on careful observation of his own children's behaviour.

These and other ethnographic speculations deserve far more attention than they have received by the authors of empirical studies of cognitive development in *Afrique noire*. After the initial retreat in the 1960s from exaggerated extensions of Freudian theory for instance, the importance of weaning seems to have been overlooked. Rabain, who eschews the notion of abrupt weaning as a traumatic episode, nevertheless vividly illustrates in her descriptions how the mother-child dyad in the first two years of Wolof development operates as a tightly-knit "microsystem" (c.f. Bronfenbrenner 1979) which serves as a strategic base from which the young child explores the wider environment.



Confronted with this indivisible mother-child unit, Dasen et al. (1978) found it necessary to keep the child on his or her mother's knee while assessing "sensori-motor" intelligence of Baoule children in rural Côte d'Ivoire. One consequence of this "ecologically valid" testing procedure was that the researchers were able to observe a cognitive strategy which was absent from their European protocols: babies pushing their mother's hand towards a novel object to bring it within the safe confines of their microsystem. Naturalistic observation suggests that this is a widely used strategy by African infants in their normal environment. But, because of their determination to permit comparison with Western data, the authors "controlled out" this variable by forbidding the mothers to respond naturally – a striking illustration of how the premature commitment to a comparative agenda can treat as "extraneous noise" or "error variance" a dimension of behaviour which may be of intrinsic importance in the less well documented socio-cultural setting.

A similar attitude in Western-inspired research tends to require children to respond to intellectual tests in social isolation, face-to-face with an adult experimenter. The observations of Rabain in Senegal, of Harkness and Super (1977) in Kenya and of Kingsley (1977) in Zambia would suggest that in many rural African communities children are actively encouraged in their normal environment to solve problems as a group. Yet scarcely any systematic research has been addressed to the analysis of the cognitive strategies promoted by this pattern of socialization.

The identification of criteria by which children are judged to be intelligent in rural African communities has attracted a number of studies. Most of the methods have been indirect. Irvine (1966) analyzed the content of Shona proverbs in Zimbabwe (then Rhodesia); Wober (1974) studied the "semantic differential" responses by Ba-Ganda adults with various levels of formal education to a Lu-Ganda word related to the concept of intelligence; Putnam and Kilbride (1980) analyzed the content of commissioned essays by Malian and Kenyan secondary school pupils on the subject of intelligent behaviour.

My own work in Zambia on this subject has involved a process of triangulation. Our first step was to elicit from rural A-Chewa adults a set of ratings of children in their community in relation to hypothetical situations in which they might find it necessary to assign responsibility to a child, and in the process to record their vocabulary for justifying

these ratings (Serpell 1974, 1977). Subsequently we have examined the relationship between these "insider's" assessments of children and the performance of the same children on a variety of locally developed tests of specific cognitive functions. We have also followed the educational careers of the children over a period of years in order to assess the relevance of our various estimates of intelligence to the demands of the primary school curriculum (Serpell 1982b).

Despite their methodological diversity, all of these studies have pointed in the same general direction. Small-scale agricultural communities in Africa seem to value a socially cooperative disposition as an integral part of intelligence. Cognitive alacrity which is not tempered with a desire to put it to socially constructive use is regarded as at best a rather dangerous asset. Kingsley (1977), Goodnow (1980) and Nerlove and Snipper (1981) have all discussed in interesting ways the possible relevance of such definitions of valued cognitive traits to the form taken by socialization practices. My own predilection in this regard has been to emphasize the need for theoretical formulations by psychologists to make communicative contact with the culture of the community (Serpell 1979b, 1980a, 1982a). In order for this to occur the layman must be able to make some sense of what the theorist is saying (c.f. Joynson 1974). This does not mean that the layman must recognize all of the theory as what he/she already knows, nor even that he/she must agree with all of the theory at first encounter. Thus a programme of "indigenization" or of "enraciner la psychologie en Afrique" need not be a conservative or romantic enterprise.

In our continuing work in the A-Chewa villages we have invited parents to compare their own socialization goals, practices and outcomes with those of the local primary school [1]. Too often it seems the assumption has been made that a cognitive psychology of use in Africa must be one which has been proven in the context of Western schooling. But we know all too well that the institution of the Western school is of dubious relevance to the majority of children in Afrique noire. In the community dialogues we have sought to provoke, we are inviting rural African parents to appropriate the domains of psychological assessment and curriculum development with a view to their fuller participation in the design of a programme of social change for their

[1] A photographic slide was projected at this juncture to illustrate the social context in which family discussions were conducted in the villages.

own community. This brings me to the last of the three themes I wish to discuss.

### **Deriving implications for social policy**

Research on cognitive development has always been of interest to educational theorists, planners and practitioners. The tradition of research on test development has continued in Africa to focus on the topic of selection. Advocates of this line of work (Vernon 1967; Heron 1975; Durojaiye 1984) have stressed the value of its "objectivity" as an alternative to personal or sectional favouritism, and defended its use of culturally foreign tests on the grounds that they have predictive validity within African secondary schools and modern industrial occupations. These arguments, however, fail to take account of the increasing trend towards class-formation based on privileged access to formal education in many African countries or of the growing discontent among educational theorists with the elitist, if not alienating, character that much of the African secondary school education has acquired. (Serpell 1974, 1977.)

A similar debate which has received less attention, is concerned with the role of *preschool* education in Afrique noire. The concept of 'enrichment' has appealed to many elite African families, especially those with two working professional parents and those who have brought up some of their children while studying for further degrees in industrialized countries which have well-established nursery-school systems. Others, fired by a remedialist orientation, have sought to promote the concept of pre-school education as a way of compensating for what they regard as the cultural deprivation of the life in African shanty-towns. Unfortunately most of these enthusiasts seem to be unaware of the problems identified by Cole and Bruner (1971), Ciborowski (1976), Howard and Scott (1981) under the heading of the deficit orientation. As with the business of educational selection there is a great danger of well-intentioned efforts by developmental psychologists in promoting pre-school education being coopted and manipulated in the interests of a small but powerful elite in African cities.

An important aspect of education in Africa to which a small number of psychological studies have been addressed is the linguistic medium of instruction. Inspired by the success of the Canadian immersion experi-

ments (Lambert and Tucker 1972), a number of psychologists lent their support to more politically and economically motivated plans formed in the early 1960s by several African governments to introduce English or French as the sole medium of instruction in the starting grades of primary school. (Mozambique has adopted the same policy with Portuguese.) The impact of these experiments has only been assessed in a very piecemeal fashion, but it is already clear that they have not resulted in unqualified success. The scope for further research on this topic is enormous, and includes a need for a much wider *base* of information about the psycholinguistic and sociolinguistic parameters of language development during the *preschool* years. The great importance of older children in African socialization patterns as models of linguistic and other behaviour for 2- to 5-year-olds, and the prevalence of multilingual environments in African cities (Parkin 1974, Serpell 1980b) are just two of the unique features deserving thorough exploration.

The relevance of cognitive developmental research to curriculum development has been quite widely recognized by writers on African psychology and two introductory text books on educational psychology have appeared in recent years with an African slant (Durojaiye 1976; Siann and Ugwuegbu 1980). Deregowski (1980) Jahoda (1979, 1980) and others have amassed a considerable body of detailed information on the specific issue of technical training for the interpretation of drawings, maps and diagrams. But other important aspects of scientific education have received in the main only discursive or incidental treatment: nutrition, water supply, sanitation and the transmission of infectious diseases, for instance, are all widely documented problem areas for the promotion of health in sub-Saharan Africa. But the course of development of children's understanding of these topics has received no systematic psychological attention, as far as I am aware. Of equal interest to educational planners would be studies of the development of understanding of the many complex social and political issues confronting African societies.

Last but not least I should like to mention the subject of childhood disabilities. The International Year of Disabled Persons (1981) raised the awareness of this complex topic among administrators, planners and the general public. This awareness together with an intense need for more information was transmitted to researchers in at least two African countries, Botswana and Zambia. Major concerns of the studies

undertaken have been to document public attitudes towards the disabled (Phiri 1979; Mazonde 1982); to estimate the numerical size of the problem (now thought to affect between 3 and 10% of the population) (Ng'andu and Sinyangwe 1981), to evaluate the adequacy of existing health and educational services to the special needs of these children (Serpell 1982c, 1984) and to develop appropriate assessment procedures for the diagnosis of those needs by personnel with limited training (Belmont 1981). In Zambia all three of these concerns have been addressed within the context of an ambitious nationwide campaign to reach disabled children (Ng'andu and Sinyangwe 1981) [2].

There is a great deal of interest among African scholars in applied social research, reflecting the intense social pressures on them to contribute to public life to which I alluded in the introduction above. While it is conventional for many scientists in the international community to regard such undertakings as somewhat incidental to the mainstream of serious research, I think this is an unwise perspective to adopt towards the efforts of Third World scientists. Social sciences for the most part and psychology in particular face a credibility problem in countries which are engaged in a process of cataclysmic transformation (cf. Sinha 1984). African psychologists need at this point in history to demonstrate to a wide range of audiences the actual and potential value of their discipline in many different spheres of life. One way of attempting this is by discursive overviews (e.g., Jahoda 1973; Mwanalushi and Ng'andu 1984). Another, more demanding approach is for psychologists to join forces with theorists, practitioners and administrators in various fields to coordinate their efforts in what Bronfenbrenner (1979) has termed "transforming experiments".

A proper balance in such endeavours between responding to the needs expressed by governments and testing the hypotheses formulated by scientists is not always easy to find. Policy-makers are evidently an important audience for research especially in a rapidly developing country. But they cannot be assumed to have a monopoly of the correct priorities, and still less of objectivity. The scientist may often need to draw attention to existing biases (e.g., in respect of discrimination by

[2] A series of photographic slides were projected at this point in the lecture illustrating various aspects of the community-based rehabilitation strategy followed in the Zambia National Campaign to Reach Disabled Children.

social status, gender or region) in negotiating an acceptable set of terms of reference for applied psychological research (Serpell 1981).

## Conclusion

The contribution of Africa to the current state of psychology bears a disconcerting similarity to the continent's contribution to modern technology. Political economists are fond of pointing out that Africa has been trapped into a role in the world economy of producing primary raw materials which are processed in the industrialized world and then sold back at inflated prices to the African population. Likewise Western psychology has established a tradition of sending its emissaries (white and black) to test out Western theories in Africa by collecting raw data in the form of responses by African adults or children to Western tests. The data are processed in Western Psychology Departments, and then packaged in Western publications and sold back to the African consumers in African or Western universities.

Underlying Africa's compliance, if not connivance, in this process of exploitation is perhaps a belief in the universality of the science being developed. Western psychology is supplied with raw data and "bought" for the training of African students on the assumption that it has the same kind of universal applicability as the bicycle, the radio, and the computer. But as Chombard de Lauwe (1979: 15), has put it, "the transfer of knowledge cannot succeed socially unless it arouses in the recipient a creative process that enables him to transform the knowledge received and appropriate it, adapting it to his needs and aspirations". This challenge faces research on cognitive development in *Afrique noire* just as poignantly now as it did in the 1960s.

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