CONTRIBUTIONS OF ABILITY AND ATTAINMENT TESTING IN AFRICA TO A GENERAL THEORY OF INTELLECT

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Sir Cyril Burt has recently pinpointed (Burt, 1968) an area of inquiry for which work in Africa seems peculiarly relevant. This is, in his own words 'the hidden chain of processes which connect genotype with phenotype.' Stated operationally, this poses questions about what people learn, how they learn and why they learn. In turn, assuming that abilities must represent clusters of related learned skills, one must ask what relationships these clusters of skills bear to each other, and what influences are most relevant to their underlying relationships.

Hence this paper offers a review of research in Africa on abilities and attainments, particularly where such research has analysed test scores into meaningful patterns. Similarities and differences between results obtained in Africa and results obtained with other, non-western ethnic groups are noted. One study, that analyses wrong responses to a battery of factor marker tests, is presented to illustrate what happens in situations of failure to cope with western-type ability tests. These results in particular are linked with work on African thought systems. All of the empirical evidence leads to an argument for a theory of intellect that is both cognitive and affective in its origins. In other words, the hidden chain of processes that links genotype with phenotype presupposes modes of thinking of different orders. Some modes are considered primary, being the product of group environmental treatments such as language, belief and value systems and individual differences in physiology. These are probably the result of early childhood influences and can be modified formally by learning later in life. Primary modes, however, if they are alien to the material or mode of learning, will reassert themselves in a basic style of behaviour, most evident in perceptual processes and in use of language.

Ability 'patterns' and methods

Among recent work on abilities in non-western cultures have been the factor analytic studies of Vandenberg (1959, 1967) on Chinese-American and Spanish-American students, and Guthrie (1963) on Philippine students. In Africa, a growing body of factor analytic studies has included the pioneering treatment of African recruit data by Macdonald (1944-45), Biesheuvel's (1952, 1954), work with South
African mineworkers, Irvine's (1963, 1964, 1966, 1968, 1969) work on students in central and east Africa. Vernon (1967) has recently reported results from Uganda in context of a much wider cross-cultural study. Dawson (1967) and Berry (1966) have successfully concluded work on perceptual and stylistic aspects of behaviour in Sierra Leone among the Temne and Mende people. This in turn has to be regarded as an addition to the large body of work on perceptual illusions collected and discussed at length by Segall, Campbell & Herskovitz (1966).

Correlational studies of abilities involving factor analysis, however, may be contrasted with the recent work of Lesser, Fifer & Clark (1965) and Stodolsky & Lesser (1968). The material presented in these two studies of mean profiles of test results from Chinese, Jewish, Negro and Puerto-Rican children in the school systems of New York and Boston are based on analysis of variance that ignores the correlations between tests. If one regards the tests only as operational measures then their claim that the patterns of test scores are unique for each ethnic group is justified. On the other hand, if one takes test scores as the starting point for the development of constructs or underlying abilities, then the correlations between test scores for each separate ethnic group would have to come from the same population of correlations before differences in mean scores could be held to represent different levels of abilities (Irvine, 1966). In other words, the patterns of abilities, as represented in theory by correlations between tests, must be very similar before mean differences in test scores can be said to represent ability differences. At present, the work by Lesser and his colleagues, where correlations between tests used are markedly different between groups, can be said to reinforce what is well known already, namely, that test scores do not necessarily mean the same thing in different cultures, and that mean differences exist between ethnic groups for reasons that present analyses do not make clear. Hence, the correlational approach, although less than perfect, is still the major probing tool of the psychologist who is mapping ability dimensions in other cultures and offering tentative theoretical discussion which can be reformulated experimentally.

Cross-cultural correlational studies

Table 1 presents in broad summary form the main ability dimensions that have been found in the work of authors who have correlated test scores in non-western cultures.

While interpretation of Table 1 requires caution, because of different levels of education in the samples, different sex ratios and different tests, it is quite possible to advance the basic proposition that tests and people will interact in various cultures in ways that are fairly similar. Second, the constructs derived from test scores fall into the major first-order factor dimensions, reasoning, spatial, manipulative, verbal and numerical. General factors emerge in heterogeneous populations, the differentiation of abilities coming with more homogeneous, and progressively
### Table 1. Summary of African factor analyses related to other major studies involving non-western cultures

<table>
<thead>
<tr>
<th>Author</th>
<th>Year Group</th>
<th>Years education</th>
<th>Sex</th>
<th>Reasoning</th>
<th>Perceptual</th>
<th>Spatial</th>
<th>Mech./ Spatial</th>
<th>Physical manipulative</th>
<th>Verbal</th>
<th>Numerical</th>
<th>Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Macdonald</td>
<td>1944-45 East African recruits</td>
<td>Largely illiterate</td>
<td>M</td>
<td>General practical</td>
<td>—</td>
<td>Visualisation</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boschkep</td>
<td>1952-54 South African miners</td>
<td>Largely illiterate</td>
<td>M</td>
<td>General practical</td>
<td>—</td>
<td>Visualisation</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vandenberg</td>
<td>1959 Chinese-American</td>
<td>13+</td>
<td>M&amp;F</td>
<td>Figural</td>
<td>Speed</td>
<td>Visualisation</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vandenberg</td>
<td>1967 Spanish-American</td>
<td>13+</td>
<td>M&amp;F</td>
<td>Figural</td>
<td>Speed</td>
<td>Visualisation</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Guthrie</td>
<td>1963 Philippines</td>
<td>13+</td>
<td>F</td>
<td>(1) Inductive</td>
<td>Figureal</td>
<td>Speed</td>
<td>Visualisation</td>
<td>—</td>
<td>Motor speed</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Irvine</td>
<td>1962 Mashona</td>
<td>8</td>
<td>M&amp;F</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Irvine</td>
<td>1963 Mashona</td>
<td>9</td>
<td>M&amp;F</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Irvine</td>
<td>1963 Zambian</td>
<td>8</td>
<td>M&amp;F</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Irvine</td>
<td>1963 Zambian mine school</td>
<td>7</td>
<td>M</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Irvine</td>
<td>1963 Zambian</td>
<td>10</td>
<td>M&amp;F</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Irvine</td>
<td>1964 Kenya</td>
<td>10-12</td>
<td>M</td>
<td>Inductive</td>
<td>Clerical</td>
<td>Speed</td>
<td>Visualisation</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Irvine</td>
<td>1968 Mashona</td>
<td>12</td>
<td>M&amp;F</td>
<td>(1) Inductive</td>
<td>Inductive</td>
<td>Speed</td>
<td>Visualisation</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Irvine</td>
<td>1968 Mashona (among)</td>
<td>12</td>
<td>M&amp;F</td>
<td>(2) Figural</td>
<td>Inductive</td>
<td>Performance Drawing</td>
<td>Educational</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Vernon</td>
<td>1967 Buganda &amp; Others 44%</td>
<td>All 12 years old</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
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</tr>
</tbody>
</table>

* Guthrie's five verbal factors were: comprehension, verbal fluency, ideational fluency, English vocabulary and Philippine vocabulary.

† The correlation matrices for these analyses were carried out for the Northern Rhodesia Mental Ability Survey (Macarthur, Irvine & Brimble, 1964).
more educated groups. Briefly, when western-based tests purporting to identify abilities are used, they will generally reproduce the same theoretical dimensions in other cultures, although the contributions of individual tests are by no means constant.

Vandenberg (1959) suggests that these correlations are essentially explainable in a basic similarity of neurological structure in all ethnic groups. It is possible to advance, however, the proposition that they are explainable because of basic similarity in educational objectives throughout the world that cause certain skills to be overlearned (Ferguson, 1954, 1956); and because they are in turn highly valued by society (Irvine, 1966, 1968, 1969).

Vandenberg and Guthrie's own findings that show unique language factors for ethnic groups, a finding partially confirmed by Irvine's 1968 Mashonaland study of memory in the Shona language, indicate that these factors are probably primary mode factors that are overlearned early before formal educational systems take over. They are also distinct from English language skills which are much later acquisitions for a great many non-western groups. The two language factors then suggest different modes of thinking that could only have emerged as interactive processes which various influences, neurological and environmental, moderate during development.

Attributes and influences correlated with constructs

Despite the basic similarity of constructs identified in African testing surveys, there are some unique results that illustrate firmly the relationship of attributes and environmental influences with abilities. These are worth stating briefly in order to complete the present picture before new perspectives are introduced.

1. Maleness is correlated with mechanical-informational and verbal abilities in English at the end of primary and in secondary education. Femaleness was associated with coloured bead-stringing seriation tests in one study where bead-work was a handicraft practised by girls. These results have been largely explained by Irvine (1966) as due to differences in male and female roles in central Africa.

2. Although Dawson (1967) reports that field dependence (a cognitive style involving the combination of high verbal, low spatial skills) was associated with African males in Sierra Leone suffering from gynaecomastia, an imbalance of female hormones, this finding has not been repeated in studies involving comparison of males and females in central Africa because of male superiority in both spatial and verbal tests. Nevertheless, if field dependence as a style of behaviour is more prevalent in females for neurological, or hormonal, or even role-acquisition reasons, its manifestation in mean differences in verbal and spatial skills need only be relative. That is, the construct of field dependence-independence does not need to be identified by mean differences in the same tests in different societies, especially as, we have argued, these test results do not necessarily mean the same thing.
3. Of environmental variables studied in population samples, including socio-economic status, family size, family position and school quality, only school quality showed significant and consistent relation to ability and attainment tests. Other sources of variation were irrelevant to the skills being learned. This opens up the question of what environmental influences are associated with the formation of 'western' abilities in any society and, on the other side of the coin, what skills in any society are necessarily open or closed to such environmental influences as exist within that society. There may be skills in African societies that environmental variables influence directly but are simply not tested at present by western tests of ability.

To conclude this section on environmental influence, mention must be made of Vernon's extensive studies in English, Hebridean, Eskimo, Canadian Indian, Ugandan and Jamaican groups of children aged 11 or 12 years. His preliminary results from all of these groups, circulated in mimeographed form (Vernon, 1967), show that environmental influences or abilities are by no means constant through these groups. Figural tests of embedded figures, held to be a good measure of field-independence were positively correlated with measures of female dominance in English and Hebridean samples, and male dominance in Jamaica. In the Eskimo sample, noted for its success in spatial and figural tests (a finding confirmed independently by Berry, 1966), none of the measured environmental variables was related to the factor involving tests of field dependence. In this group none of male dominance, linguistic background, cultural stimulus, delayed gratification among others was related to individual differences in spatial-perceptual tasks. It seems plausible to suppose that these tasks were all overlearned in an environment demanding acute awareness of minute changes in a relatively featureless landscape, so that variations in home and educational background were irrelevant to such individual differences that existed. Heron (1966) reports no significant median differences in numerical facility between ethnic groups in Zambia at the end of primary school, primarily because the skills were all overlearned and ethnicity, background, language, and other sources of environmental variation were redundant. Schools are often the sole source of environmental influence relevant to learning culturally alien skills in a second language. It is hardly surprising that school quality should be related, in central Africa, to the acquisition of second-language verbal abilities, which were by no means as overlearned as simple number bonds, where 90% of students came from rural homes and almost without exception the parents have only functional literacy in the vernacular language.

Clearly, it is now difficult to ascribe large proportions of variance in test scores to environmental influences as if these influences were static for all societies and as if they acted in the same fashion for all societies. Studies in Africa confirm the need for a close examination of environmental influences free of western assumptions about what variables should or should not be measured, and on a much
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greater scale than has been achieved by Vernon, whose work has the virtue of sys-
tematic synthesis that enables replication to be carried out, as indeed it must be
because of unrepresentativeness of his samples and their small size, especially as
factor analysis has played a major and insightful part in his findings.

The whole of the first part of this paper, concerned with a review of factor
analytic studies of abilities and the influences on these of environment and attrib-
utes, has raised the issue of whether or not our present theories of abilities, so
clearly tied to rather sanguine assumptions of what tests best sample abilities of
certain kinds and what environmental influences are liable to affect these test re-
sults, can encompass the diversity of results illustrated here. The second and third
parts of this paper attempt to answer these questions more fully.

A study of wrong answers

In August 1966 the author administered thirty tests to a group of 59 male and 23
female predominantly Shona-speaking African pupils in the twelfth year of educa-
tion. The tests were given in four sessions a week apart. The tests were drawn from
the Kit of Reference Tests for Cognitive Factors (French, Ekstrom & Price, 1963)
and the original aim was to replicate in Africa Guthrie’s (1963) study. Although this
aim was only partially realized, tests were chosen to identify the major factors of
flexibility and speed of closure, word and ideational fluency, induction, rote
memory, number facility, perceptual speed, visualization, verbal comprehension,
syllogistic and general reasoning. The results are summarized in Table 1.

After analysing the right answers and studying the correlations between right
answers and wrong answers among those answers reached, it was decided to factor
the wrong answers because the correlations did not warrant the conclusion that the
right and wrong answers could be accounted for by the same set of factors. The
hypothesis was that cognitive processes in fairly continuous failure would be dif-
ferent from those in fairly constant success in a number of culturally alien tasks. It
was also considered possible that the analysis would show the emergence of dif-
ferent levels of cognitive control or direction if higher order factors could be un-
covered. Of the tests available, twenty-two were scorable for wrong answers and the
data from these were submitted to a principal factor analysis and varimax and
promax rotation. Promax rotation was retained and a second-order analysis
carried out subsequently. The factor analysis produced eight definable factors:
three correlated factors of errors in reasoning and short-term storage, two rela-
tively independent factors of errors in number facility and rote memory and three
other factors, showing only slight correlation with reasoning errors but fairly well
intercorrelated among themselves, involving errors in scanning perceptual material,
inability to separate known patterns from a complex perceptual field and lack of
facility in word usage and verbalizing in complex mental tasks.

These primary factors were analysed once more and this analysis, together with
the intercorrelation of the three second-order factors comprise Table 2. The analysis in Table 2 shows three main points. First, numerical facility and memory tend to remain at the first order. These seem to be efficiency skills that are specific, over-learned and non-transferable. Next, the first factor relates together three components of mental ability that are of more generalized nature. Finally, factors II and III are related together and would form a single third-order factor of perceptual skills of a stylistic and, probably, determinant nature. Because this last factor emerges at the third level of abstraction it remains a theoretical construct but it may be closely related to the field dependence-independence dimensions already discussed. Note that it involves both low perceptual and low verbal scores. It seems that for these students the English language is an analytical tool of some importance, even in perceptual tasks.

<table>
<thead>
<tr>
<th>Primary factors</th>
<th>Second-order factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Errors figural reasoning</td>
<td>69</td>
</tr>
<tr>
<td>Errors short-term storage</td>
<td>67</td>
</tr>
<tr>
<td>Errors number facility</td>
<td>23</td>
</tr>
<tr>
<td>Errors rote memory</td>
<td></td>
</tr>
<tr>
<td>Errors 3D reasoning</td>
<td>72</td>
</tr>
<tr>
<td>Errors perceptual scanning</td>
<td></td>
</tr>
<tr>
<td>Errors field independence</td>
<td>47</td>
</tr>
<tr>
<td>Errors analytical verbal</td>
<td>75</td>
</tr>
<tr>
<td>Intercorrelations</td>
<td>-19</td>
</tr>
<tr>
<td>Second-order factors</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>37</td>
</tr>
</tbody>
</table>

There now remains the problem of knitting together the strands of the material so far presented: and this can be done only with reference to work carried out on African thought systems.

African systems of thought and the notion of primary modes

Previously, the most telling arguments for a use of knowledge in a causal system that is different from that of western societies have come from anthropologists such as Evans-Pritchard (1936), Gluckman (1944) and Colson (1962). There has also been a growing awareness that systems of thought in different societies throughout Africa south of the Sahara are in many respects similar (Jahn, 1961). These systems
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present a unity of assumptions about the world and man's place in it. Briefly, everything that exists contains force. Man and the spirits of his ancestors can activate forces directly and consciously, or inadvertently and by accident. Animals, plants and inanimate objects have forces too, but these can only be released by man and the spirits of men. The reason for man's eminence is mainly his control over words, which themselves have force (nommo) and because they are prime movers of actions, transcend space and time and fuse space and time into a single modality. Words themselves have overtones; and the same word can have different meanings according to the tone of the speaker.

The importance of these concepts lies in their unalterable relation to a system of classification of the world and its objects according to a system of causality that western minds find difficult to grasp. Some recent work on how the world is classified for individuals of traditional knowledge learned by children, has been carried out with African proverbs collected in the Mashonaland regions of Rhodesia.

The author of the Shona dictionary (Hannan, 1959) generously provided over one hundred sayings and beliefs. Although they are not exhaustive by any means, they are believed to be representative of those that are at present in common use and are passed on verbally to children from an early age in the villages, and to some extent in the towns. They regulate behaviour in the social system and it is not putting too great a stress on the word to say that they represent ground rules for intelligent and purposive acts that can be fully understood only within a world view that is African. The Shona word for intelligence, for example, is ngware meaning to be cautious and prudent, particularly in social relationships, since the misfortunes of kin always have a spiritual history and a gestalt or field of human relationships.

Table 3 summarizes the content of the Shona proverbs, omens and beliefs regulating behaviour in villages, where all but 10% of the African population live, but three of them are used as examples:

1. A woman must not sit on a hearth stone; her husband might die.
2. Do not express admiration for natural objects (e.g. a tree or its fruit); you might develop an antipathy to marriage.
3. Do not destroy the eggs of a crow; you may cause no rain to fall in your area.

It is possible to classify such statements in terms of the kind of knowledge the learner must have before the statement has meaning; and second, to classify the statements in terms of the consequence of non-observance of the rule; that is, whether the effects are on kin (statement 1) or on oneself (statement 2), or on natural phenomenon (statement 3, although this is a rare example).

Table 3 clearly shows that the most common kind of knowledge is of natural objects and animals, followed by objects with social functions or functions specific to one or other of the sexes, then comes knowledge of one's personal habits or symptoms and knowledge of utensils and utilities.
The consequences of non-observance rebound on self, kin and community while little or no conscious control seems to be exerted on the environment by contrast. In societies such as these intelligent acts are then of a conforming kind having primary reference to the affective climate of one's own relationships with the spiritual force of the living and ancestral spirits of the kin group.

From this evidence there now emerges the basic support for the major hypothesis of the paper. It is that African children develop a primary thought mode that perceives events and uses knowledge in a complex field of personal relationships whose organization is essentially affective. As adults, they continue to use knowledge and to cognize events in this way since their theory of knowledge within a system of spiritual causation demands that they do so. This kind of cognition,

<table>
<thead>
<tr>
<th>Consequence of action on:</th>
<th>Knowledge required</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Nat. obj., anim.</td>
<td>Kin, sex, social</td>
</tr>
<tr>
<td>Self</td>
<td>22</td>
<td>19</td>
</tr>
<tr>
<td>Kin and community</td>
<td>14</td>
<td>9</td>
</tr>
<tr>
<td>Natural phenomenon</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Natural objects, animals</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Totals</td>
<td>42</td>
<td>31</td>
</tr>
</tbody>
</table>

which imputes purpose and force to inanimate objects has been compared to Piaget's work on child animism, but to do this is to confuse the processes of children who think animistically because they are not fully developed with those of mature adults who exercise formal logic within the frame of knowledge at their disposal. This primary mode, for Shona subjects at least, seems to be one of permanent, not transitory, involvement in a field of great complexity and a relative conformity to its demands and vagaries.

It is further contended that certain western skills, particularly in science, technical and medical knowledge, vocabulary of a particularly western nature and spatial orientation would be taught only by inhibiting successfully the primary, causal, social and visual perceptions of African students. Finally, repeated failure would cause learners to regress to the vernacular for solutions (we have evidence of mixed English-vernacular strategies in dealing with *Raven's Progressive Matrices* (Klingelhofer, 1967; Irvine, 1967) and this would precipitate perception in a field dependent way. The error analysis of the second part of this paper is the starting point for the argument just developed. We would hope that experimental verification of these corollaries to the main hypothesis could be undertaken.

Elsewhere (Irvine, 1968) a schema was presented for the relationship of (a) tests
of cognition that would be made up of traditional ability and attainment tests of
the kind that Spearman, Burt, Thomson and Vernon would have advocated for
testing intelligent behaviour defined as a highly valid prediction of socially valued
academic success (designated Rn); (b) tests of the kind that Guilford has used in
his structure of intellect model, seeking to find theoretical constructs whether
socially valued or not (designated R22) and (c) tests of the skills of intelligence, in
the ngware sense of the Shona language, that the collection of proverbs indicate
(designed R3). Text-fig. 1 represents the model for a factor analysis study involv­
ing all these kinds of tests. Particularly important would be the Rn, and R2, parts
of the matrix to determine the relationship of skills peculiar to the African with those

<table>
<thead>
<tr>
<th></th>
<th>R12</th>
<th>R3</th>
</tr>
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<tbody>
<tr>
<td>Rn</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R21</td>
<td>R22</td>
<td>R23</td>
</tr>
<tr>
<td>R31</td>
<td>R32</td>
<td>R33</td>
</tr>
</tbody>
</table>

TEXT-FIG. 1. Hypothetical factorial study of western and African abilities.

imported by educational and other means. It was also suggested in the previous
paper (Irvine, 1968) that Guilford’s theory of intellect gave more freedom to ex­
plor e the possibility of certain processes being common in all tests, and here the
factor analysis across all cultures suggest that number facility, rote memory and
other efficiency tasks, such as clerical and motor speed, would each be character­
ized by a fairly homogeneous process. There is also strong evidence for the presence,
across cultures, of modes of reasoning that result from exposure to educational
influences if the treatments are similar enough. Nevertheless, it is suggested that
primary modes of perceiving the world exert strong cognitive and affective in­
fluences on learning. These primary modes may also define sub-cultures within
any single society, and Bernstein’s work on restricted and elaborated codes of
language may be only one manifestation of differential modes within societies.

Research in Africa, then, may call for revaluation of theories of intellect. If we
conceive of intelligence as a construct with absolute meaning or meanings across
cultures that clearly evaluate intelligent acts differently and reinforce learning by
sanctions that are tied to different ideologies and philosophies, then we could
seriously mislead further efforts to clarify the roles of language, affect and ecology
in the hidden processes that Burt mentions. To understand these processes our
theories of intellect cannot afford to inhibit the sampling of behaviours that seem
irrelevant to the western eye but nevertheless must be examined closely. Without
investigation present and past controversies over levels and structures of abilities in
different ethnic groups will not be resolved.
Ability and attainment testing in Africa

Summary

Factor analytic studies in Africa are compared with other cross-cultural investigations into the structure of abilities in different ethnic groups. Similarities and differences are noted; and environmental influences on the acquisition of skills are also summarized. A correlational study of wrong answers to a battery of thirty marker tests given to a group of predominantly Mashona students indicates that efficiency skills of numerical facility and memory remain at the first order of factor extraction, reasoning abilities emerge in second-order analysis, while perceptual styles are present in the third-order level. This study is used to hypothesize, in the context of African systems of thought, the existence of a primary thought mode that asserts itself in conditions involving repeated errors. The controlling aspects of primary-mode thinking are considered to be sociological, in that language and the logic of belief systems are involved, and individual, in that styles of behaviour, both cognitive and affective, that are physiological in origin will effectively moderate learning situations. Postulating primary-mode thinking implies that some of the skills that are essential to the formation of abilities as they are understood in western societies, may be learned by different ethnic groups and, indeed, by distinct cultural enclaves within ethnic groups, when primary modes are successfully inhibited. In short, investigations into the structure of abilities within Africa suggest a revision of current theories of intellect in order to encompass results that point to the importance of modes of perceiving and communicating as determiners of ability.

References

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