SECOND CARNEGIE INQUIRY INTO POVERTY
AND DEVELOPMENT IN SOUTHERN AFRICA

Psychological deprivation theories
in South African education

by
Ian Moll

Carnegie Conference Paper No. 101

Cape Town
13 - 19 April 1984
If you know mainstream South African psychology, then you know that the mood of "culture-fair" testing and research has been very much to the fore in recent years. Its injunction goes something like this: you do not measure a black child's IQ on a test standardised on white children; you know that a poor boy's CAT profile will not be similar to that of a rich boy; you expect the linguistic repertoire of a working-class child to be restricted. In other words, the psychological tests, measurements, observations and questionnaires which you use must be appropriate to the particular "social group" with whom you are working, and must not impose the standards of some other group on them. Otherwise - and I think it is fair to say that this is common cause amongst psychologists - it will always be the poor, black, working-class child who is worst at everything.

Of course, underlying this is a general recognition that "poverty" produces some kind of "psychological deprivation" in the cognitive development of children, and this is in certain respects uncontroversial. For example, there is agreement that the ravages of malnutrition produce systematic neurological and physiological retardation of the bases of a child's intellectual development, and on another level there is at least an empirical consensus that working-class children are unlikely to attain the level of intellectual performance which would give them access to centres of power in our society. But on the whole, the state of psychological theorising on the issue is a tangled web of controversy, and its conception of "poverty" even less worked out. In this paper I tackle just one instance of the relation-
The relationship between poverty and cognitive development in South African society, namely its influence on the development of mature cognitive structures in children. In doing so, I pick my way very quickly through major debates and disputes in the area, although the conclusions I reach must inevitably be major theoretical commitments on the issues involved.

But first, a few comments on the notion of "poverty": it is one of those words that we all "know" the meaning of, but none of us can actually say what it means. In my view, it is important to realise that poverty is a systematic component of the overall economic and political struggles which structure South African life. As a well-known poster put it in 1976, "we are all involved." Unfortunately most mainstream psychology, being well-behaved and somewhat American, conceives of poverty in the terms of structural-functionalist sociology. So poor people are portrayed as those who almost naturally have lino in their lounge, drink from enamel mugs, and at best own a battered, second-hand motor-car; they are one of the immutable givens of human society. There is no real conception that poverty is something which is systematically produced and reproduced in a social process, and that poverty is contested social terrain. As a result, most psychologists tend to intervene in "poverty" by attempting to offset its effects in the individual, rather than seriously confronting the problem of the social production of psychological states in people. I shall return to this problem, since it has a central bearing on the implications of my argument for education, but the point to be made here is this: given these qualifications, I think that it is reasonable to conceive of
poverty as the condition produced in people's lives by inadequate housing, low wages, poor nutrition, piecemeal social services and the like.

PIAGET ON POVERTY

In developmental psychology circles, the cognitive development theory associated with Jean Piaget has become so influential that the question as to how knowledge develops in children is almost automatically dealt with in the terms and concepts of his genetic epistemology. The theory is a particularly useful starting point for my concerns in this paper, since its "cross-cultural" application has generated a lot of evidence that poverty hampers cognitive development, especially in the finding that western children appear to undergo a more rapid cognitive development than their non-western peers.

Before I examine this evidence, however, a brief formal account of Piaget's view of cognitive development is necessary. As is well known, Piaget postulates four main stages or periods in the development of cognitive operations, and I shall examine each in turn.

The first stage Piaget calls the period of sensorimotor intelligence, which takes place before the advent of language in the period from birth to the age of two years. Here, the child can only perform motor actions, without real cognitive activity. Piaget talks of a "type of intelligence resulting in a certain number of performances," but which is not operationalised in thought.
At the end of the sensorimotor stage, the "symbolic function" appears: the child is now able to imitate simple activities which were previously only directly accessible to her as sensory and motor actions, and to internalise these in "symbolic" mental images. Importantly, the "symbolic function" makes the acquisition of language possible for the first time. All of this adds up to the onset of a new stage - that of pre-operational thought - which lasts from about two to seven years of age. During this period the child develops from what Piaget calls "preconceptual thinking", in which she learns on a conceptual level some of the things she has already mastered on the sensorimotor level, to "intuitive thinking", which is characterised by a rudimentary logic still dominated by immediate perceptions and not yet able to exhibit the essential characteristics of cognitive operations:

"At this stage ... the child cannot perform operations in the way that I define this term. In my terminology 'operations' are internalised actions which are reversible; that is, they can be performed in opposite directions."* (my emphasis)

The essential feature of preoperational intelligence is a tendency to centre on only one aspect of a situation and ignore others, which means that a preoperational child cannot go back to the original starting point of any cognitive problem.

From about seven to eleven years of age, the period of concrete operational thought is realised. For the first time, the child's thought is characterised by proper cognitive operations, although they are carried out only with respect to the material reality of experience - hence "concrete" operations, used
directly on objects in order to manipulate those objects.

At roughly eleven or twelve years, the fourth major stage begins, characterised by formal operational thought. With it comes the ability to engage in the abstract, hypothetico-deductive reasoning which most of us at this conference take for granted as the natural mode of human thought.

The substantive picture of the cognitive development of children which emerges from Piaget's theory, then, is the following:

0 - 2 years: Sensorimotor Intelligence.
2 - 7 years: Preoperational Intelligence.
7 - 11 years: Concrete Operations.
11 years onwards: Formal Operations.

Importantly, this account of development rests on the notion that there is a universal and necessary sequence of cognitive development in children which is ultimately sourced in biological maturation, and which reaches its pinnacle in the emergence of abstract, propositional logical operations at some point in every child's early teenage years.

Nevertheless, there is considerable evidence using Piaget tests that children in some social and cultural situations do not attain formal operational thought as quickly as their western counterparts. For example, Murray's important work on cognitive differences between Zulu and white children in Natal has shown a significant consistency with which the performance of Zulu children is below that of white children in attaining both formal operational and concrete operational thought9. And there
are literally hundreds of studies which tell a similar story, 
based on comparisons of American and European children with 
groups of Canadian-Eskimo children, Arab children in Algeria and 
Tunisia, African children in Uganda, Liberia and Zimbabwe, the 
children of Mexican peasants and working-class children in the 
West Indies (to name but a few such studies). 10

Piaget himself acknowledges this "time-lag" in the cognitive 
development of non-western children. He devotes a chapter of 
*Psychology and Epistemology* to exploring the evidence "that in 
many societies, adult thought does not go beyond the level of 
'concrete' operations, and therefore does not reach that of 
propositional operations." 11 Significantly, Piaget regards 
evidence of the retardatory impact of some forms of culture on 
the maturation of intellectual structures as a problem which 
genetic epistemology has not dealt with properly: "If a con-
tinuous action of the internal maturation of the organism and 
of the nervous system alone intervened, the stages would not 
only be sequential but also linked to relatively constant 
chronological dates." 12 However, he still believes that a 
general theory of cognitive development is possible:

"[The critical age in terms of cognitive 
development] is relative to the society 
in which one is working. We did our work 
in Geneva and the ages that I quote are 
the ages we found there. I know that in 
certain societies, for instance in 
Martinique, ... we have found a systematic 
delay of three or four years. Consequently, 
the age at which those problems are solved 
is also relative to the society in question. 
What is important about these stages is the 
order of succession." 13

Clearly, Piaget ascribed a universal and necessary sequence of
cognitive development, but he acknowledges that children in some communities develop much more slowly than others.

Now one thing stands out in all this "cross-cultural" Piagetian research: the children whose level of cognitive development is not optimal, in the terms of genetic epistemology, are all children who live in communities which we would regard as in some way stricken by poverty. They grow up in environments which are on the receiving end of underdevelopment and exploitation.

THE SOURCE OF COGNITIVE STRUCTURE?

Piagetian psychology, however, can only say in the most general way that there is a relationship between poverty and slow intellectual maturation. Nowhere, as far as I am aware, does Piaget or any of his followers rigorously tackle what it is about the structures of poverty that puts a brake on the activity of cognitive structures.

Perhaps this is because genetic epistemology emphasises a concept of cognitive activity which is radically non-social. This is not to say that Piaget wants to deny the importance of social factors in the development of a child, but that the motor of cognitive development is contained within the individual organism, and the genesis of knowledge takes place within structures internal to the organism. Take one illustrative comment:

"The development of knowledge is a spontaneous process of embryogenesis. Embryogenesis concerns the development of the body, but it concerns as well
the development of the nervous system and the development of mental functions... It is a total developmental process, which we must restitute in its general biological context."14

In other words, Piaget's theory presupposes the epistemological primacy of individual biological activity, and in this sense it is a move for a universal theory of cognition.

"But this means that Piaget can never properly grapple with the reshaping of the structures of cognition and poverty. Susan Black-arms puts the problem as follows:

"The psychological universalist position... assumes that a general theory of cognition is possible, and thus appears to stand squarely opposed to ideologies of biological racism; but it cannot account for the frequent chronological 'lag' in test performance of non-Western samples... without implying another kind of ethnocentrism, the cultural superiority of the West."15

In Piaget's theory stands accused of socio-economic bias, which seems to me to account for genetic epistemology's inability to come with the anomaly of the social relativity of cognitive growth within its framework.

In this dilemma, I think that a major rival-theory to that of Piaget, the dialectical materialist psychology of Lev Vygotskii (also known as the cultural-historical school), provides a better appropriation of the real relations between cognitive growth and poverty. For Vygotskii, our psychological nature is a totality of social relations which have become the functions of our personality and the forms of its structure. Language, in which the material relations of society are embodied,
Vygotskii would argue, in other words, that the social relations which structure poverty come to be the cognitive relations which structure the development of a child. His theory emphasises the epistemological primacy of these social relations.

So for example, Vygotskii found that there were significant differences in the thinking of urban children and those in the isolated peasant communities of Central Asia in the 1930s, such that the latter could not cope cognitively "with the rapid socio-economic restructuring (collectivization) and cultural revolution (liquidation of illiteracy) which occurred at the time." They exhibited all the characteristics of thinking found in children who grow up in poor communities, notably an inability to move beyond concrete, practical forms of thought. Their historical circumstances produced, and indeed necessitated, certain forms of practical activity (labour) and hence corresponding structures in their fundamental psychological processes (the reason, in fact, why abstraction structured the thinking of their urban peers). Similar conclusions have come from a number of studies carried out by Vygotskiians working with children in such places as Mongolia, the mountains of Uzbekistan, and other remote areas of Asia and Eastern Europe.
This framework has important implications for our understanding of poverty and cognitive development. Vygotskians, in opposition to a romantic cultural relativism, conceive of human society, and hence the cognitive development of children, as being in a constant process of material transition to more advanced historical forms. Consequently, the cognitive development of these peasant children was retarded, not in a pejorative sense, but in the sense that the social relations which structured their everyday lives had not yet undergone the historical transformations which would bring with them abstract psychological operations. Vygotskians would also, I think, accept that certain communities can be so fundamentally underdeveloped and ontogenetically retarded by mainstream societal processes that abstraction is structured out of their everyday experience.

This last insight is crucial to our understanding of cognitive development under apartheid. The strong possibility exists that the systematic creation of overcrowded and underdeveloped bantustan enclaves, as well as the underprovision or non-provision of housing, health care and social services in the working-class townships, produces what we might call the social structures of poverty, which in turn systematically retard potential cognitive growth and elaboration in children.

Now all of this traps me in the web of controversy on developmental psychology which I mentioned earlier. I can only partially extricate myself here, since I am by no means clear at this stage on all the issues involved, and then only by means of a comment on possibilities. It is enough, however, to allow me to proceed
fruitfully with my argument in this paper. As "grand" theories of cognitive development, genetic epistemology and the cultural-historical school are mutually exclusive, resting as they do on radically opposed epistemological foundations. But I think that there is a possibility of a materialist rereading of Piaget which would do justice to his contribution to our concrete understanding of cognitive development in children, but would overcome his central theoretical flaw in the notion of an epistemologically primary organism; at the same time, such a reading would be compatible with the major insights of Vygotski's dialectical psychology. I do not intend, however, to go into detail here; suffice to say that the research I discuss next was conducted within these working presuppositions.

FROM FARM SCHOOL TO PRIVATE SCHOOL

We have seen that cognitive development theory in general seems to suggest that poverty has an influence on the course of a child's cognitive development. The research I report on briefly here will, I think, help to clarify some of the issues, and had two broad purposes:

(1) to establish, using Piaget's tests, whether there are differences in the attainment of formal operations in different communities in South Africa;

(2) to establish whether or not the determinants of cognitive development and deprivation can be discovered in social processes and practices.

Perhaps it should be pointed out that the research was not conducted with explicit considerations on poverty in mind. But the
results can clearly be interpreted in such a way as to shed light on these problems, and that is what I attempt to do here.

Four samples of 10 children were randomly drawn from the available twelve-year olds at each of four South African schools: (1) Farm school in the Great Marico district of the Western Transvaal, (2) Temba Primary School in a township of that name adjoining Hammanskraal, and which serves as a labour reservoir for the Ntabaqnl Industrial area, (3) Mmathame Higher Primary in the rural village of Mahubane, about 30 km. north of Hammanskraal, and (4) St. John's Preparatory School in Houghton, Johannesburg.

In the first part of the research, each child was interviewed and tested on tasks involving the mental operations of seriation, conservation and classification. The findings were then classified according to whether or not the child showed evidence of formal operational thinking ability. Table I is a summary of the findings, and shows clearly that different cultural groups,

<table>
<thead>
<tr>
<th>SAMPLES</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>FARM SCHOOL</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MMATLHAME H P</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TEMBA PRIMARY</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ST JOHN'S</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SERIATION TASK</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>CONSERVATION TASK</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>CLASSIFICATION TASK</td>
<td>1</td>
<td>0</td>
<td>7</td>
<td>10</td>
</tr>
</tbody>
</table>

Table 1 - Number of children in each sample whose performance was classified as evidence of formal operational thought.
on Piaget's model, tend to reach formal operational ability at different ages. It should be noted that the two samples of urbanised children (C & D) are significantly more advanced, on Piaget's model, in their acquisition of knowledge than their rural counterparts. This presumably supports the contention which I discussed earlier that westernised children mature more quickly than their non-western peers.

Now anyone with even an inkling of the realities of apartheid society will see that these results are prima facie evidence that poverty produces some kind of psychological deprivation in children. However, it is to the second part of my research that we need to look to obtain a better understanding of what this might mean.

On the basis of interviews with the children themselves, their teachers and in some cases their parents and relatives, the following details emerged for each sample:

A Farm School: All the children's parents were labourers on farms in the district; they all lived in huts on the various farms in extremely overcrowded conditions, ranging from 6 people sharing a one-roomed hut to 14 people sharing a two-roomed hut; the average monthly income of these households was in all cases less than R75, which meant that these children could not afford adequate school books, stationery and clothing. As one teacher put it, "I teach, but the life is bigger than me."

B Mmathame H P: Seven of the children's fathers were migrant workers on the Witwatersrand, Pretoria or (in one case) Phalaborwa, whom they saw only once or twice a month.24
They all lived in small houses with their mothers, siblings and other relatives (or in three cases where mothers were also migrants, with members of their extended family), and all indicated that they were very poor and did not have a lot of money.

C Temba Primary: All the children's fathers were workers at factories in either Babalegi or Pretoria; nine had mothers of whom six were unemployed, two worked as domestics in Pretoria and one worked at the Jubilee Hospital in Hammanskraal. All lived with their immediate families in "matchbox" houses in Temba; the mean monthly income of six of these households (we were unable to obtain details for the others) was just under R200.

D St. John's Prep.: All the children came from wealthy families; six were the sons of businessmen, and four the sons of wealthy farmers in the Natal Midlands. They were all boarders in the hostel at the school.

The picture becomes clearer. There is obviously a strong correlation between the attainment of abstract, propositional logical operations in children of this age and the relative conditions of poverty or affluence in which they are raised.

And there is another strand to the second part of the research which further cements this impression.

Part of the interview with each child elaborated on a set of questions designed to elicit important factors in their socialization which may have had an impact on their cognitive growth. Three sets of these questions are important for my considerations.
here, and I shall call them X, Y and Z:

X: What do you like playing with? Now and in the past? Why?

Y: Have you ever made or built anything? With what? Have the people you live with ever helped you/shown you how to make or build anything?

Z: Do you know how a motor-car works? How did you find out?

My underlying concern here derives from the reading of Vygotskii which I discussed earlier: perhaps there are fundamental social-historical structures which are mediated to the child and come to be the structures of her cognition.

Once again, the findings are illuminating, as an examination of Table II will reveal. Clearly, there is a radical difference in the way the social world is mediated to the rural children (samples A and B) on the one hand and the urban children (samples C and D) on the other. Responses to all the questions indicate a clear dichotomy between their respective preoccupations: the tendency is for the rural children to engage in concrete, practical activity while the urban children tend to be involved in abstract, theoretical activity. For example, question Y shows that both sets of rural children make things as part of everyday, productive activity - they learn by learning to work - whereas their urbanised counterparts make things in a way which is representative of a world outside of their immediate, everyday lives. Question Z reveals a similar pattern: the abstract understanding of the workings of a motor-car is much more accessible to children in samples C and D by virtue of the opportunities they have to discuss and experience the concepts involved. For the rural children it is almost defined out by their very concrete existences. And question X supports this argument in
another way: the rural children play with things that are either very simple in concept (a ball) or else are very much part of the material, concrete universe around them, whereas their urban fellows play with toys which are conceptually complex and often derive or originate from places outside of their immediate environs.

Turning to the differences between Temba pupils and St. John's pupils as revealed by Table II, there is also a tendency for the everyday activity of the former to be more concrete and that of the latter to be more abstract. The St. John's boys are clearly consumers in a technological world, so much so that the games
they play, the things they make, and even their thoughts on motor-cars and the like, all consist in an abstract relationship to the world. The manufacture and acquisition of commodities takes place outside of their immediate, concrete lives. While the Temba group tends in this direction, they are not nearly as removed as their private school counterparts.

To attempt to capture the differences which Table II reveals in a few words: I think that we can say of the farm school children and Mahubane children that concrete activity structures their social world, while the opposite is true for the St. John's children. Abstraction structures their universe. The Temba children's experience tends in this latter direction as well, but still exhibits certain features of everyday concrete activity.

We can now step back from the immediacy of the empirical evidence which I have presented, and attempt to discover to what extent abstractions from this evidence will reveal the relations which link the structures of poverty to those of cognitive development. Firstly, it seems that there is a clear explanation of the differing attainment of formal operations by different groups of South African children (Table I) to be found in their everyday experiences, activities and socialization (Table II). The premium placed in urban children's lives on abstract activity means it is likely that they will develop formal operational abilities quickly; the domination of abstraction in the St. John's pupils lives accounts for their faster cognitive development in relation to the Temba pupils, whose activities are abstract, but still more concrete than them; and the practical nature of the
rural children's lives probably explains why their thinking is concrete operational in character. So Vygotskii's insight, that cognitive structure is itself social structure, seems to be legitimated.

In the second place, the conditions and consciousness revealed by Table II can be shown to be determined by the overall social conditions of poverty in the various communities. So the expensive books, toys and equipment, as well as the amount of leisure that characterises their lifestyle, are things which the children in sample B have access to by virtue of their affluence. The Temba sample, C, is exposed to less sophisticated toys, and less absolute leisure play, because it is drawn from a poorer urban community. At the other end of the spectrum, the stark poverty of the rural samples is reflected in the daily struggle for survival and its reflection concrete, production-oriented activity.

The overall construction of cognition, and cognitive development, within the total social formation is now obvious. The structures of poverty - inadequate housing, health, education, resources, etc. - produce a grinding emphasis on practical, concrete activity, which in turn militates against the development of abstract logical operations in children's thinking. The "prima facie" evidence which we sensed earlier takes on a much more concrete aspect.

In the broadest terms, then, it seems fair to say that poverty produces psychological deprivation in children which hampers their cognitive development.
EDUCATION FOR DEVELOPMENT

Up to this point, I have spoken in a very broad sense about the education of children and its impact on their intellectual maturation. I want to conclude with a few remarks about the implications of my arguments for more specific educational interventions.

One commentator has said that the conception of a cognitive "deficit", such as that which my arguments here have thrown up, often leads to education policy recommendations that the "deprived" group should receive special, remedial attention. Now I do not believe that this, as it stands, is either a good thing or a bad thing, and here I am opposed to a group of people whom I characterised earlier as "romantic cultural relativists." What these people say is that different cultures are based on their own strengths and function within their own radically unique life-worlds, and that any attempt to intervene in a supposed "deprivation" in those cultures smacks of ethnocentric bias. But I think that we, at a conference of this nature which is centrally about poverty and about apartheid, are in a position to quickly see the problems with this approach. Deficits and deprivations are structured into particular communities by the fundamental political and economic struggles in which we all engage, and the nature of exploitation and underdevelopment in South Africa makes this perfectly obvious.

Within this context, education has an important role to play in offsetting the effects of cognitive deprivation. But far too
many efforts of this kind on the South African scene have been guilty of precisely the same flaw which Vygotskian psychology finds in Piaget's genetic epistemology: an emphasis on the epistemological primacy of the individual. Individuals do not come to be the bearers of knowledge as isolated subjects, and it is not enough to provide remedial support to particular individuals who suffer the consequences of a systematic cognitive underdevelopment, because then we ignore the fundamental social structures which produce psychological deficits in the first place. Educationists need to develop a remedial educational practice which is at once a solution to both cognitive and social underdevelopment.

Perhaps that is the fundamental message of any analysis of poverty and psychological deprivation in South African education.

FOOTNOTES:

1. The children's equivalent of the clinical Thematic Apperception Test (TAT) which is used as an indicator of emotional and certain kinds of cognitive states.


4. I am referring to the dominant Anglo-American orthodoxy in South African psychology, which is strongly positivist and places great emphasis on research "uncontaminated" by "speculative" theory and philosophy.

5. The best-known example of this was Operation Headstart in the USA.

6. This despite the tendency of mainstream psychology to misread Piaget as a positivist. See Moll, I. "Interpreting Piaget to South Africa." Paper delivered to the Developmental Psychology Conference, University of Natal (Durban), July 1983.


20. I'm working on it.!

21. This research was conducted as part of my MA dissertation, Op cit, although my treatment of it is slightly different here.

22. Since I was at the school without the permission of the farmer who owned that land, the farm must remain nameless.

23. These are Piaget's three classical tests of the reasoning ability of a child during the developmental stages.

Conservation refers to the ability to understand that any substance will maintain its volume or weight even when it changes in outward form.

Variation refers to the ability to understand complex ordered relation-
ships between objects based on one or more graded dimensions. Classification is the act of grouping objects or phenomena according to their similarities.

At each stage of development in Piaget's model, children exhibit a particular mode of reasoning on each of these tests.

24. The remaining three said that they did not have fathers.


26. I sense something of this view in Cole and Bruner, Ibid., and also Buck-Morss, Op. cit., although not explicitly so in either case.
These papers constitute the preliminary findings of the Second Carnegie Inquiry into Poverty and Development in Southern Africa, and were prepared for presentation at a Conference at the University of Cape Town from 13-19 April, 1984.

The Second Carnegie Inquiry into Poverty and Development in Southern Africa was launched in April 1982, and is scheduled to run until June 1985.

Quoting (in context) from these preliminary papers with due acknowledgement is of course allowed, but for permission to reprint any material, or for further information about the Inquiry, please write to:

SALDRU
School of Economics
Robert Leslie Building
University of Cape Town
Rondebosch 7700