# THE CONTRIBUTION OF SIBLINGS
## TO THE DEVELOPMENT OF
## URBAN BLACK CHILDREN

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# ABSTRACT

Sibling research in the past twenty years has moved away from a focus on particular variables such as sex differences, birth order, and rivalry, to a more searching investigation of the influences of sibling interaction. In this study the contribution of sibling dyads to cognitive growth is explored. Of particular interest were the implications of learning style for academic performance. To investigate the informal learning context of black township children from an ecological perspective, the household family structure and community networks are also considered.

Twenty eight sibling dyads were divided into two groups on the basis of tutor's age. The older group comprised ten to thirteen year olds, and the younger group six to nine year olds. Each tutor had a younger sibling, not attending pre-school, who was the tutee for the tasks. Tutor-pairs were presented with puzzle-tasks designed to test Western-type academic competencies. Videotaped interactions were subjected to a behavioural micro-analysis coded into seven categories, originally devised for a previous study of mother-child interaction that utilised the same tasks, and adapted to highlight certain teaching strategies.

Vygotsky's (1978) zone of proximal development provides the matrix for the discussion of results in conjunction with Feuerstein's (1980) concept of mediated learning experiences which are interpreted within a multi-cultural context.

Using both quantitative and qualitative approaches, the findings are presented in terms of teaching style. Age and sex differences are discussed. Comparisons are made between this study, other local studies, and an American sample. Related research findings, including cross-cultural studies, are considered in relation to the particular problems of black education. Home interviews yielded information about educational and occupational levels in the community studied. These provide the 'setting' for sibling transmission of culture. Family caretaking roles reveal a broad social base for urban blacks, with siblings contributing a substantial proportion.

Educational perspectives, as well as future research possibilities, are considered. The results suggest that despite the limitations of child tutors due to varying maturational factors, siblings can offer a unique resource for promoting and extending intrafamilial cognitive growth, particularly for a society in transition.

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# 1.    INTRODUCTION

'Holographically, in an implicate order, everything is in some sense enfolded or implicated in everything else; inseparable interconnectedness is the fundamental reality, and relatively independent localised parts are merely particular and contingent forms within the whole. Essentially, forms and their influences are not locatable, but are spread out and present everywhere' (Shotter & Newson 1982, p43).

From whatever angle the researcher in psychology chooses to slice the socio-cultural pie around her, the representation she obtains will reflect both her own involvement in the whole and that of the parts themselves. What she sees will depend on what she looks at and on her way of looking or 'worldmaking' (Goodman 1978). The image of the holograph is intended to encompass all that follows in these pages because it is the consciousness of the interaction between people, places, time and actions that has focussed my way of looking.

What I wanted to look at was both particular and general: the 'particular' was the learning patterns involved in sibling interaction during a Western based teaching task and the 'general' was the domestic contribution of the household routine to learning patterns within the broad socio-political context. This study was intended to be part of an overall research programme into the development of cognitive functions within a multicultural setting. Several projects relating to different aspects of this work have been completed. This project is an outgrowth of a collaborative study with Stanbridge (1984) on learning styles of sibling tutors, and was intended to reflect yet another facet of learning to add to the research on mothers and children (Beinart & Kok 1983, Craig 1985, Kok 1986), on teachers and children (Mindry 1984), and children's informal play (Mbambo 1984). However, this thesis evolved independently and therefore has its own framework. There are obviously areas of overlap and common points of reference. I have, in particular, considered the application of mediational operators outlined by Kok (1986).

The motivation to venture into this area of research at all has been explained by Miller (1983). The high failure rate of black children in the first few years of schooling raises theoretical as well as practical issues.

My own 'worldmaking' has been shaped by concern about the inequalities in education that indict our society as unjust, my teaching involvement in schools and universities, my role as parent of children seeking meaning and security in a politically violent historical period and, finally, as a feminist aroused by the oppression of all peoples in South Africa.

My perspective then is not neutral. It is not value free, nor is it non-ethnocentric in the sense that I am of a particular culture and particular race group which I believe will influence whatever hermeneutic exercise I undertake with the data. 'The kind of person that we are, and how we experience the research, all have a crucial impact on what we see, what we do, and how we interpret and construct what is going on' (Stanley & Wise 1983, p50).

Similarly Miller and Craig (1985), and Kok (1986), believe that the 'text' (or data) has a Necker Cube effect which Riccouer described as being in 'relief' because different topics do not have the same altitude because of the perspective aspect. 'Plurivocity is typical of the text considered as a whole, open to several readings and several constructions' (Riccouer 1981, in Kok 1986). This perception is one that will be relevant throughout my discussion. Particularly in this area of cross-cultural research the tentative, and perhaps contradictory, nature of interpretation should be viewed as part of the dynamic tensions with an evolving multi-cultural consciousness.

'Scientific thought ... sees revolution and evolution as two forms of development that are mutually related and mutually presuppose each other' (Vygotsky 1978, p73).

Luria (1976, p3) believes 'mental processes are social and historical in action', following Vygotsky (1978) that the developmental process is 'deeply rooted in the links between individual and social history'. Learning is mediated through people. Cole and Scribner (1974, p8) describe this relationship: 'Perception, memory and thinking all develop as part of the general socialisation of a child and are inseparably bound up with patterns of activity, communication and social relations into which he enters. The very physical environment that he encounters has been transformed by human effort. His every experience has been shaped by

the culture of which he is a member and is infused with socially defined meanings and emotions'. To add to this complexity, it must be remembered that South African cross cultural research is involved with the nuances of racial discrimination so that not only is the black child influenced by her own cultural (tribal) meanings, she is also confronted with the infusion of a dominant culture whose influence has politically, geographically, socially, educationally and legislatively permeated her own.

Wertsch (1980), whose seminal study of dyadic problem-solving provided the impetus for this research, also places interaction as firmly embedded in the social dialectic. 'Taking the social origins of cognitive processes into account may be one of the most important steps to developing a more complete understanding of their history and final form' (Vygotsky 1978, p30). The ecological approach recognises the 'interfittedness of things' in a way most appropriate for studying the developing child embedded in her unique 'mutually constitutive and mutually defining (social and historical world) ... a coherent cultural context' (Shotter & Newson 1982, pp33-36).

These authors describe Bohm's exposition of the difference between a photograph and a hologram as similar to that between the mechanistic order of physics where 'separately existing, localisable parts, by interacting form a whole', and the new view of physics, where in an implicate order, everything is contained or reflected in everything else. What constitutes a 'coherent cultural context' will implicitly be of fundamental importance to this study. Skuy (1986, p2) has recently pointed out that disadvantages for the child will arise when caregivers are unable to provide appropriate 'mediated learning experiences' due to 'postulated cultural confusion', or, 'where the culture of the disadvantaged child does not conform with the dominant culture dictates'.

It was beyond the scope of this research to investigate the actual manifestations of cultural confusion in which our sample is embedded. As the hologram is able to reflect the whole even when cut into halves or quarters, so this study must be remembered to implicitly reflect back on its context. To amplify some of this resonance, the section on black education (2.3), where revolution and evolution combine, has been presented in some detail.

Living in urban townships, the social configurations for black children are very different to those of white children (eg. single parents, extended families, cramped conditions, inadequate schooling facilities) but perhaps not dissimilar to some ghetto conditions in American cities or Third World shanty towns (Jones 1980). Nevertheless the major difficulty in drawing on overseas research is the uniqueness of the S.A. variable that the black 'oppressed' or 'disadvantaged' are the majority group. Current research is turning towards investigating various aspects of the social and domestic realities of Black school children and their families (de Haas 1984, Gordon 1985, Magwaza & Bana 1985, Burman & Reynolds 1986, Sanders 1986, Taylor 1984).

To obtain some reflection of these demographic influences on the children in this study, details of caretaking activities in the home were obtained to gain a more accurate profile of the informal learning environment. The role of siblings is seen to be particularly salient for child development as they are frequently the most consistently available family members. Cross-cultural research and an increasing output of studies on sibling relationships confirms the significance of siblings in a range of developmental areas, such as socialisation, cognition and tutoring.

The increasing trend towards qualitative research, and the move away from a strict reliance on quantitative methodology has been very marked over the last fifteen years by sociologists, anthropologists, and psychologists alike. Some argue that not only can such methods be used jointly, but that they should be so used because they have complementary strengths (Schofield & Anderson 1987, p258). On reviewing the current state of the literature (mostly American), they conclude that the combination or 'rapprochement' between the two methods is 'particularly promising' for the study for ethnic identity and intergroup relations, even though using such procedures is not without complications. Problems have been found in reconciling the qualitative data with the quantitative data. Such a predicament was also apparent in this study. The numerical data presents a useful résumé of behavioural trends but could not capture the significant nuances of interaction like intention or, most important of all, rapport between tutor and tutee. It is in the belief that methodological 'rapprochement' offers a pragmatic form of 'seeing' that both approaches are used for this dissertation.

The study set out to investigate a form of mediated learning:

a)  how siblings teach each other
b)  what differences, if any, there were between tutors of different age and sex
c)  the social ecology of the informal learning environment at home and in the neighbourhood: demographic details and caretaking profiles
d)  the interrelationship of these factors with learning style.

The aim of the study is pragmatic: to locate the findings within a broad educational context as well as investigating the possible origins of mediational operators within a cognitive developmental framework.

The following concepts are central to the two theoretical models upon which this study is based. The one is Bronfenbrenner's (1979) ecological theory of development which provides a model for investigating the interaction of various social 'systems' upon the child. The analogy of 'nested structures' is the basis for his following definitions:

a)  The microsystem: 'a pattern of activities, roles, and interpersonal relations experienced by the developing person'  e.g. as sibling, tutor, caretaker, scholar, son or daughter (p22).
b)  The mesosystem: 'the interrelations among two or more settings in which the developing person actively participates' e.g. the relations among home, school and neighbourhood peer group (p25).
c)  The exosystem refers to settings not involving the child as active participant but in which events occur that affect what happens in the developing child's setting e.g. boycotts, strikes, detentions (p25).
d)  The macrosystem refers to consistencies in form and content of the preceding lower-order systems, along with any belief systems or underlying ideologies e.g. group areas, apartheid, discriminatory practices (p26).

(Bronfenbrenner 1979)

He states his belief that, in ecological research, the properties of the person and of the environment, the structure of environmental settings and the processes taking place within and between them must be viewed as interdependent and analysed in systems terms' (Bronfenbrenner 1979, p41).

The other model is Vygotsky's (1978) theory of the higher psychological processes. Some basic tenets are:

a) Speech 'plays an essential role in the organisation of higher psychological processes' (p23). He believes that 'children solve practical tasks with the help of their speech, as well as their hands and eyes' (p26).

b) The zone of proximal development 'defines those functions that have not yet matured but are in the process of maturation ... it is the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers' (p128).

c) 'Every function in the child's cultural development appears twice, on two levels. First, between people as an interpsychological category, and then inside the child, as an intrapsychological category' (p128).

d) 'The child's system of activity is determined at each stage both by the child's degree of organic development and by his or her degree of mastery in the use of tools' (p21)

(Vygotsky 1978)

His profuse theory is subject to varying interpretations, but these points proved of central relevance to this study. Wertsch (1985) also understands the dyad-in-action as a crucial variable in the learning process.

## 2.    SIBLINGS    IN    CONTEXT

### 2.1.    Sibling Relationships

Whether sibling relationships are 'special' or just another case of mixed-age peer interaction recurs as a question surprisingly frequently in the literature although, usually, in rhetorical form such as that of Minnet et al (1983, p1072) who believe that 'more research is needed to establish whether siblings play a special role in child development'.

Stoneman, Brody and Mackinnon (1984) also seek evidence as to whether familial bonds add another dimension or not. They are, however, clear that sibling interactions are different to parent-child interactions (Lamb 1978a, 1978b and Cicirelli 1976 as quoted in Bryant 1982). Sibling relationships should not be directly compared with other kinds of peer relationships according to Abramovitch et al (1982). Their special situation should form an important focus for future research.

Common sense would tend to support such a view but it does seem that earlier studies in child development focussed on siblings in terms of age spacing, sex differences, birth order or socialisation rather than the broader cognitive contribution siblings might provide for each other. As early as 1964, Irish had lamented the lack of positive attention given to siblings, seeing them as offering a neglected 'school of mirrors' for socialisation processes. Cicirelli (1973) comments that though sibling interaction and achievement were studied in the sixties, no correlation was made between the two factors. His study on categorisation style pointed the way for closer attention to the effect of older siblings on the development of cognitive functioning in younger children but the causes were not clearly indicated and the evidence on sex differences in categorisation style continues to be controversial.

Pepler et al (1982) pointed out that of all childrens' relationships the sibling one was the least understood. Due to over-emphasis on sibling rivalry, the wider context of interaction had been minimised. Not only are the child-parent dynamics a consideration, but also the child-sibling and child-peer situation need recognition. In the Black S.A. context it is likely that grandparents, aunts, uncles and neighbours constitute part

of the on-going family context, a manifestation of the social ecology that Bronfenbrenner (1979) has described as vital to understanding human development. Sibling relationships are 'particularly salient' in the preschool years because of the frequency of interactions (Pepler et al, p211). In the Third World situation this frequency is maintained until a much later stage (Whiting & Whiting 1975, Barry & Paxson 1971).

## 2.1.1.  Theoretical Issues

The difficulties in sibling research, like any other field in psychology, arise from qualifications: which siblings? at what age? in which place? with whom? in what situation? Particularly in cross-cultural research, not examining the independent variables like age and sex, which are often based on implicit assumptions, leads to difficulties in generalising about the processes involved which Whiting (1976) refers to as the 'problem of the packaged variable'. To overcome this problem, research must consider in detail the learning environments involved in apparent 'independent' variables. Laosa (1981, p129) also acknowledges conceptual-methodological problems in research, partly he thinks because of 'lacunae' in theory and partly because of 'lack of clarity and methodological discipline in the studies themselves'. Some frequent problems would seem to be the 'confounding' of socio-economic status with ethnic-group memberships and ignoring intra-group variability, particularly within ethnic groups.

Ogbu (1981) believes the 'ethnocentrism' of the hidden curriculum of the home leading to developmental 'deficit' theories, can be transcended by studying competence in real-life situations. Miller (1983) believes Ogbu errs in not conceding that both ethnocological and universal models could be valid. The real-life situation for black children is to contend with an ethnocentric environment. Real-life demands the skills valued by Western teaching models (see 2.3. on Black Education). This is why siblings in the townships very often are the purveyors of these educational goals because so many black parents have hardly been exposed to the specific demands of Western education (Clark 1985, Craig 1983, Christie 1986, Miller 1983). What parents think they want for their children, and what they actually do to achieve this can be very different

(Craig 1985, Schaffer 1982). What they hope for, and what is realistically possible, can be sadly disproportionate.

An intensive study on siblings by Dunn and Kendrick (1982) examines love, envy and understanding between siblings. The sample is very select: white middle-class nuclear type families in a secure urban environment have probably very dissimilar experiences to other white urban children but they are more remote from our sample than the simple label of 'cross-cultural' research would suggest. The macrosystems for each are phenomenologically different in almost every respect. Dunn and Kendrick's children are from a stable working population in an established tradition, housing is good, toys are plentiful and there is daily maternal contact. Only three of her sample were used to 'daily separations'. Grandparents are thought to be 'close' if they visit weekly (Dunn & Kendrick 1982, p9).

The issue of whether siblings are more agonistic if they are males or same sex dyads or whether they are more pro-social before school-going age than after, is only of partial relevance to the township teaching situation and will be considered briefly later. It is the strategic behaviours children develop that are relevant to the 'ontogenesis of cognitive functions' (Wertsch 1980, p1215). In his view the adult-child dyad is the most significant social system for the child, though different cultures might have other significant forms of interaction.

The demographic data of this study suggests the sibling-sibling interaction is possibly the more prevalent social system but nonetheless the interaction is based on the adult-child model. That is, though the relationship between the two sets of dyads is different, cross-cultural research has confirmed that caretaking patterns reflect parental norms, very often with exaggerated features. Weisner (1982) describes this as 'overmimicry' of parental styles, or 'overplaying' of the caretaking role. Bryant (1982) has noted siblings are more punitive than their parents. However, the review of cross-cultural data on child caretaking by Weisner and Gallimore (1977, p172) reveals a very wide variation in caretaking styles from children being more tolerant than parents to those children that showed caretaking styles opposite to that of the parents.

Despite antagonism and conflicts between siblings there is also affection and co-operation usually within an hierarchy of authority (Weisner 1977). Rapport and reciprocity were reported (Dunn & Kendrick 1982) though Dunn and Kendrick described occurrences of affective mismatch where asymmetry in friendliness and agonism is shown. These authors acknowledge the hazards of generalisation from a small sample but conclude that sibling relationships do cover a very wide range. Four year olds 'can and do act as comforters, teachers, obvious manipulative bullies or sensitive companions,' all of which suggest a 'new perspective' on the development of socio-cognitive skills (Dunn & Kendrick 1982, p807). Pepler et al (1982) uphold this view of special nuances on sibling relationships. Parent-child qualities of interaction (dependency, nurturance, intimacy, caretaking) are combined with those of peer relationships (prosocial and agonistic behaviours).

Zukow (1985) also found sibling caregivers have positive consequences. Although sharing 'exuberance, patience and pride' siblings offer a unique duality through complementary (more adult status) and egalitarianism (peer reciprocity). Both she and Kaye (1982) affirm the socialising influence of siblings, and both dispute suggestions by Sutton-Smith (1977) and Zajonc (1980) that sibling input is 'inferior'. Qualitative differences in interaction do exist, but, Zukow suggests, the semantic and grammatical complexity of siblings' input is not significantly different from that of adults. Her small Mexican sample was studied from a linguistic perspective. Most mother-child or sibling-tutor studies do note differences between the adult and child modes of verbalisation, modelling, demonstration and mediation.

## 2.1.2.  Early Relationships

Early relationships have long term implications for caregivers. The importance of the early adult-child interaction for language development is well documented (Dore 1975, Kaye 1982, Lock 1978, Trevarthen 1980, Schaffer 1982). Many commentators believe interpersonal understanding should evolve before language: out of this 'primary intersubjectivity' between mothers and infants, their 'exquisitely sensitive dialogue', arises the origin of symbolic functioning (Newson & Newson 1975, Trevarthen 1980). This development depends on idiosyncratic but shared

understandings with familiar human beings who are themselves already 'steeped' in human culture. Trevarthen (1980, p336) describes 'intersubjectivity' as essential to the development of intelligence and the formation of 'intentional ... (or) motivating structures' while Geertz (1966) sees the early precursors of social skills between infant and mother (or caretaker) as promoting reciprocity and the formation of 'cultural generators'. Learning is significant because of the social context. If there were 'no press to co-ordinate that knowledge' with other children, then there would be little challenge to emerge from cognitive egocentrism (Bearison 1982, p203).

The success or depth of this interaction is either the legacy that siblings take over, or, in some cases, the kind of responsibility in which they are placed as caretakers or mother surrogates. Mother-infant studies repeatedly affirm the generation or formation of higher cognitive process through interactive encounters. Part of the 'press to co-ordinate knowledge' must depend on affective components which possibly form the 'substratum' of cognitive functioning (Zimlies 1983). It is out of interpersonal interaction that the following can be formed: shared frameworks (Maccoby 1984), subroutines of co-ordinated hierarchical goals (Bruner 1974) and cognitive dispositions forming 'patterns of curiosity, attentiveness to detail, the tendency to ask questions, to seek and expect to find solutions to problems' (Zimlies 1983, p198).

It is out of co-ordinated attention between people and objects that the slow process of 'symbolically mediated conversations' evolves, from early face to face play and triadic interaction systems (Bakeman & Adamson 1984). This supportive structure is described as 'scaffolding' by Ratner and Bruner (1978) who see the development of referential communication from engagement with picture books or object hide and seek. Stewart and Marvin (1984, p1323) suggest that the interactional partnership between mother and child precedes the childs' abilities to attend to others in a caregiving situation or to develop decentration (Piaget) or perspective-taking (Stewart & Marvin, 1984).

If this early relationship is lacking, or diffused, then higher cognitive processes are likely to be jeopardised. Sibling skill in following through these patterns could therefore be a critical link to later development.

Mothers are assumed to be more competent than peers at assisting in shared activities, possibly because of idiosyncratic 'shared memory systems' (Kaye 1982) and possibly because of affective bonds embedded in cultural values (Newson & Newson 1975). Although the role of peers at this early age is not clear, they do offer useful environmental exploration after 18 months of age (Bakeman & Adamson 1984). Newson's term intersubjectivity, meaning a reciprocal awareness between adult and child, is very similar to Vygotsky's intermental category where the mediated learning experience provides transmission of social and cultural values. Bruner (1971, p107) believes dialogue between the 'more experienced and the less experienced' is essential to the internalisation of dialogue in thought. The 'courtesy' of conversation may be the major ingredient to the 'courtesy' of teaching. This courtesy seems parallel to the 'region of sensitivity' (Wood, Wood & Middleton n.d. quoted in Greenfield & Lave 1982, p202) part of a successful negotiation in the zone of proximal development by an aware facilitator. Feuerstein (1980) believes, like Sutton-Smith (1977), that disadvantaged children suffer from insufficient adult mediation. However, such dialogues cannot be assumed to be precluded from a sibling's potential repertoire.

To what extent siblings are capable of discerning this vulnerability or displaying sensitivity to the learning/teaching interface, is controversial. It seems probable that, as with adults, some siblings would be successful, others would not, either as teachers, caretakers or parents. Such sensitivity must be alert not only to the zone of proximal development for that particular child but must also be a reflection of the qualitative relationship between the two (Feuerstein 1980, McLane 1981, Miller 1983, Schaffer 1982). There must be some motivational factors involved hidden within the inevitable packaged variables. There must be the intention to facilitate learning by the tutor and the intention to learn on behalf of the learner (Clemitson-Mohr 1982).

The affective factor referred to by Smith (1982) and Zimlies (1983) seems to underly the growth of cognitive processes: the role of intention, idea or hope is crucial to their formation. (Connolly & Bruner 1974). Emotion can 'fuel, inhibit or distort the development of thought' (Zimlies 1983, p199).

Hope would seem essential to the acquisition of competencies or 'knowing how' (the ability to perform culturally specified tasks). However, a developmental profile would also be permeated by economic realities (Connolly & Bruner 1974, Diaz-Guerrero 1987, Ogbu 1981) and these could influence the maintenance of hope and subsequent cognitive progress. Sibling caretaking is a phenomenon common to less affluent societies than the Western model. In the Whiting's 1975 study of six cultures only one, in New England, America, had mothers who were more in contact with infants than were the siblings. Sibling caretaking is a functional adaptation of low income groups the positive consequences of which have yet to be assessed but Werner (1984/5) believes the influence of peers as mediators of social change cannot be underestimated, particularly when a society is in a state of transition.

The sense of cultural purpose or hope which constitutes the child's social context is likely to influence family dynamics. Connolly and Bruner (1974, p5) are explicit: 'if it is not true that there are cultures of poverty, at least it can be said that there are sub-cultures of despair, in which groups appear to have given up trying, appear to have given up the possibility that they may be able to achieve power over their destiny, and this "ideology of despair" ... reverberates upon the mental development and affective functioning of children'. Schaffer (1967) describes a long history of poverty as discouraging to the 'interrogative use of the mind'. A history of oppression and discrimination must be equally discouraging. In the S.A. situation cross-cultural research could be a misnomer. It is not comparative studies, nor is it 'multicultural' in the polymorphic sense, but intra-cultural where the majority of the people are grappling with the demands of a minority groups' competencies, in a confused ethos of ambivalence and social engineering.

These factors all impinge on cognitive development, on ways of seeing, responding and making meaning of the world. Siblings are an integral feature in the developmental landscape as they complement or supplement parental child rearing tasks.

How they go about it will be discussed in the following section on caretaking and the teaching style of tutors, with reference to cross-cultural findings.

## 2.2.    Sibling Caretaking

The term 'caretaking' (or 'caregiving') is very broad.  Whiting (1977, p185) hastens to point out that 'caretaking behaviours are ill-defined in the literature', let alone in the important review by Weisner and Gallimore (1977) in which she is commenting.  These latter authors acknowledge their 'global' use of the term, and despite the valid criticisms of this looseness, the 'global' aspect is difficult to dislodge here, because it is the widest aspects of caretaking that are being considered for a contextual topography of siblings cognitive development. Weisner and Gallimore (1977, p169) offer this definition: 'We include as child and sibling caretaking all kinds of socialisation, training and routine responsibilities one child assumes for another'. In other words, 'caretaking' involves interaction in which the development of siblings is intimately associated.

For this study, caretaking is viewed as a multi-faceted activity involving the following aspects:

i)   socialisation    issues:    mother-child   influences,    affective consequences, peer competence, play
ii)  the influences  of sibling/peer  pedagogic roles: age and sex differences
iii) caretaking and cognition, reinforcement style and learning
iv)  the characteristics of formal  and informal  education: influences on learning style.

The questions surrounding mother/infant or institutionalised care are not considered. Barry and Paxson (1971) provide a detailed analysis of different types of caretaking patterns based on ethnographic studies from 186 societies. Their findings suggest that in most societies mothers are not the principal caretakers or companions of young children. 40% of societies used caretakers other than mothers in infancy and 80% did so for early childhood.  Weisner and Gallimore (1977) give cross-cultural examples of families where caretaking is one of many domestic tasks shared among parents, extended kin, sometimes neighbours and almost always children.  They continue, 'Differential treatment of the sexes in childhood and adulthood, the religious status of community members, and

ideas concerning the status of the elderly' are some of the factors that influence caretaking practices (Weisner & Gallimore 1977, p174). Socio-economic factors will be involved as well: 'setting', which includes size of family and household composition, is related to caretaking style (Whiting 1986, p96).

Reviewing the literature, Weisner and Gallimore (1977, pp177-179) suggest the following postulates about child caretaking (CT): that multiple CT lessens maternal attachment, that family CT patterns influence the timing of a child's movement from one stage to the next and that the nature of playgroups and pro-social nurturant behaviours will be affected. Sex role training starts earlier for girls and sibling CT reduces personality differences. A field dependent cognitive style and high affiliation motivation are likely to affect achievement.
(To this, the possibility of a more concrete operational linguistic style than a formal operational one could be added).

Scholarly reaction to their review was varied. Comments by scholars, included within the article, ranged from praise for clarity and insight (Barry, Edward, Nevlare & Koel, Rosenblatt), to anger at the paucity of research material on which so many generalisations were based (Sutton-Smith, Wilder). To the charge that their use of an interaction frequency model alone is inadequate, Weisner and Gallimore (1977) reply by suggesting they are attempting to bridge the gap between anthropology and psychology. They aim to do this by drawing on a combination of statistics, conventional psychology, systematic observational response methods and qualitative methods. Ritchie's question (in Weisner & Gallimore 1977, p184) remains: 'can frequencies of interaction lead to an understanding of significant symbolic relationships?'. And this holds, unfortunately, as a serious question mark, over the presented caretaking data that follows later.

The emphasis in the literature has been on the role of the mother, or caretaker, as promoting 'the maximal personal and social development' through varieties of stimulating and playful interaction. 'Unfortunately the intelligence to do this with ever more exciting contingencies is simply not present in child caretakers. It is difficult enough to impart these ideas of infant stimulation even to mothers.' Sutton-Smith (1977,

p184) is thus very dismissive. He implies that children are not intelligent enough, while even mothers are barely able to cope. The thrust of his argument becomes clear some sentences later: 'Gender may ultimately be removed from this choice, (of being a "liberated" or an "interactive" mother), so that anyone can be educated for the "interactive mother" role' (p185). In other words, having discounted women and children, the only remaining people intelligent enough for this task are men! It is they who will be able to comprehend their responsibilities and provide 'exciting contingencies'. (This amazing sleight-of-sexist-hand interpretation is included to illustrate the subtle passions and diversities which sibling research appears to arouse in academic breasts).

Sutton-Smith (1977, p184) concludes: 'The student of today's family may well overlook the caretaking role because that is precisely not the important impact that siblings have upon each other for today's forms of differential development. Complex cultures require forms of child training that heighten diversity, which siblings do by their rivalry rather than by their caretaking'.

While complex societies may very well require 'diversity' (flexibility?) the role of 'rivalry' as a positive contributor to differentiation must remain speculative. Etaugh (1980, quoted by Smith 1982) believes the child care literature has presented a more negative view of non-maternal care than is justified. The negative consequences of diminished rivalry in cross cultural sibling studies have not been established but the topic raises interesting issues for the cognitive developmental debate.

2.2.1. Socialisation Issues

Before considering one of the pervasive questions about sibling caretaking, that of affective development, it is salutary to recall that although Dunn and Kendrick (1982) report that 80% of families in the U.K. have a brother or sister, Weisner (1982) has pointed out that in only 20% of the world are there words glossed as 'brother' or 'sister' according to the Western model. In Zulu society 'brother' and 'sister' have a much broader application to include cousins, aunts and uncles. Marriages in Africa were traditionally relationships between groups, as against the Western stress on individual couples (Krige, quoted in de Haas 1984, p10).

Sibling or peer caretaking is considered to decrease identification with parental and authority figures. It may consequently affect adult affective bonds (Rosenblatt 1977). Children cared for by siblings in Hawaiian, Polynesian and E.African societies reflected the following characteristics: interdependence, shared functioning and benevolent authoritarianism (Barry & Paxson 1971, Whiting & Whiting 1975). It would be erroneous to consider child caretaking as uniform. Age and sex differences are considered in 2.2.2.1. and 2.2.2.2. Different styles of caretaking were manifested at different ages. Minnet et al (1983) found birth order differences in nurturant behaviours: such affective characteristics have been linked to cognitive traits.

Muus (1975) suggests that Samaoan families escape the consequences of emotional conflict, so often part of Western adolescence, between dominance and submission, because discipline is relegated to older siblings. An American study reported by Bryant (1982) revealed that siblings were only rated higher than parents in one of six behaviour categories, and that was for physical punishment. The 'meaning' and form of discipline will have different 'configurations' for different cultures. (Blau 1981, Clark 1985, p19). This point is made by Guthrie (1979, p356) where he cautions against cross-cultural interpretation where parental values are assumed to be the same as that of the (Western) researcher. 'Differences between societies are not just differences of degree but are differences in configurations'. He believes a suitable methodological approach would be multivariate studies. Individual achievement is simply not a central goal in many societies as the later discussion makes clear. Extended families who are dependent on child caretaking will have a different set of values to that of nuclear families. However, despite the view that caretaking encourages nurturance and responsible behaviours, Rosenblatt (1977) has observed diminished enthusiasm for parenting in some situations with sibling caretakers.

In general there seems consensus that positive socialisation consequences accrue from sibling relationships, but that sibling caretaking has a more controversial role in terms of achievement. Sutton-Smith (1977,p184) has disapproved strongly: 'children as major caretakers maintain life at a much lower level' than mothers or adult caretakers. In reply Weisner and Gallimore (1977,p188) ask: 'Is the quality of life engendered in societies

that use sibling caretakers unpleasant? Conversely, is life more satisfying in societies which foster individual achievement, sibling rivalry and individualism in the form of personality and creativity?'. It could be, they argue, that such pressures 'contribute to alienation and anomie in complex and mobile societies'. Child caretaking, moreover, is a 'function shared with adults' and does not therefore exclude stimulating adult contingencies and may possibly offer such opportunities by diffusing the work load. As Ritchie (1977, p183) observes he knows of no culture where child caretaking is acknowledged as primary over adult care (though the early kibbutzim children might have been such a case). He asks further, 'phenomenologically speaking, is identification with a sibling or peer the same kind of experience as having love, respect, awe or whatever for a significant adult?'. From Bowlby's (1969) studies on attachment and loss, it would seem the important issue was to have a bond with another, child or adult caretaker. It was the existential bond that was significant. What relationships can be phenomenologically correlated or evaluated and with what assumptions? Qualitative differences in relationships, adult-child, or child-child, obviously exist, but their significance developmentally has not been established (though novels and autobiographies do offer one resource. See Joubert 1981 or Mphahlele 1959).

Dunn and Kendrick (1983, p800) state very firmly that conclusions should not yet be drawn about the developmental significance of sibling caregiving, teaching, language or development. Differences in temperament and personality have yet to be accounted for. There are nevertheless a number of usefully detailed studies on interaction between mothers and children and peers and siblings involved in teaching tasks. Perhaps the gap between caregiving and teaching strategies is actually fairly small. What does seem more conclusive is the lack of longitudinal sibling studies and the omission of emic descriptions (Ritchie 1977). Children in sibling care learn through observation, demonstration and imitation, rather than through rationalisations of the sort that mothers provide. They learn through mimicry, sharing, co-operation, reciprocity and rivalry. All of these processes can have negative or positive consequences: its the context in which they occur that might be telling.

A starting point for peer socialisation is early co-operative play. Youniss (1980) believes this promotes infant's creativity. Play

experience with peers was more significant than age in determining complexity of social play. Dickman (1983) found stimulating dyadic peer relationships evoked creativity. She suggests that 'co-operative' game playing with mothers and with other infants may portend quite different experiences for most of the infants involved. Children did not continue to play as taught by their mothers - they invented their own 'games'. Competence in co-operative play with peers may only be possible through interaction and contact play with peers (Dickman 1983, p163). The significance of play is upheld by Sutton-Smith (1982, p69) as 'a kind of work of communication ... a generative grammar of cultural happenings'. Peers, and therefore siblings, are mutually involved in this transmission.

Successful adjustment in later life has been correlated with early social peer competence (Renshaw & Asher 1982). Such children had good social knowledge and interaction strategies. They engaged in co-operative play and social conversation in familiar and unfamiliar groups. Turn-taking and reciprocal activity patterns are important components of social interaction (Garvey 1974) as well as being influences on cognition. Schaffer (1982, p127) suggests that frequent use of questions is linked to the development of turn-taking skills in babies. Furthermore Vygotsky (1978, p100) believes play gives children 'a new form of desires': the rule of the fictionalised activity or imagination becomes a pleasure to follow, and these roles become the precursors of actions in real life and morality.

The significance of play is far reaching. It would seem to me to be part of caretaking, and part of sibling interaction, and part of cognitive development. Singer and Singer (1979) notice that privacy contributes to make-believe play. Opportunities for fantasy play, parental tolerance and modelling all foster imaginative play. Children who have had such opportunities to be creative are likely to be more resourceful and adaptive in situations of stress than children who have been disadvantaged in this way. [The ability to use symbolic form is referred to as a 'portable skill' that facilitated survival in wartime camps (Singer & Singer 1979, p215)].

The importance of the home environment for later development is well established (Parke 1978, Winnicott 1968). Though research is not

abundant, lack of privacy and poor school performance seem correlated (Wolfe 1978). There are cross-cultural differences in childhood experiences of privacy (Bettelheim 1969, Slater 1970, Cole et al 1971). Moller et al (1978) record the effects of the severe housing shortage in black Durban townships, an average of nine people in a two bedroomed house, but some records suggest more than twenty people per house. de Haas (1984) describes households where four families share a two bedroomed house. It has also been established that a high level of noise and inescapable stimulation are negatively related to infants cognitive development. Selective discrimination to relevant cues - and therefore achievement, are affected by high noise levels (Parke 1978). The characteristics of toys also affect cognitive functioning: the complexity and variety of inanimate objects and the responsiveness of play materials are all contributing factors (Yarrow et al 1975). There is much scope here for future local research. Mbambo (1984) reveals a high proportion (25%) of time by her black township sample of children was spent in 'imaginative play'. What sort of 'imaginative' play needs elaboration. 'Symbolic' play with object substitution and role play of caretaking and teaching activities seemed prevalent. Examples of fictionalised or fantasy play were not recorded. Zulu township homes were found to have very few toys, books or drawing materials (Clark 1985, Mbambo 1984). However, the environmental resources were creatively tapped to provide play materials: 'bricks, stones, buttons, pantihose, tomato boxes, meat bones as well as pillows, plates, spoons and wheels' (Clark 1985, p2, Nyiti 1982)

From the same local Durban study (N = 10) Mbambo (1984) reports that the mother role in caretaking is dominant. She is responsible for 44% of the activities while siblings and grandmothers together contribute 41% (siblings 20%, grandmothers 21%). This means that 62% of caretaking is adult based, though the actual meaning of this attention as on-going behaviour is not clear. That is, it is reported elsewhere in the literature, that mothers think or believe they are the dominant caretakers even though they may not physically be present much of the time. The delegation of role does not subordinate their primary status. Praise and physical punishment, affection, explanations to the child and expressions of concern were more noticeably the mother's domain. But disciplining and scolding devolved mostly on siblings and the grandmother.

Of all behaviours in the household, punishment, scolding and disciplining add up to 24% of the total. Praising amounts to 4%, showing and directing the child, answering her questions amounts to 5%. The trend for negative correcting behaviours is this much more dominant than a positive one. 'Language teaching' is rated as 0,4% of all behaviours, a single score, and attributed to an aunt. The most frequent activity of the children is singing, but the complexity and nature of the songs are not recorded. They could be simple, repetitive chants or they could be part of an evolving repertoire. The other most frequent verbal behaviour is requesting food. 'Imaginative' and physical play up constitute just over 40% of the child's activities, while sedentary behaviour like reading totals 2% and writing/drawing 4%. Although toys are scarce, 12% of the time is spent on playing with objects used as toys.

Of all the individuals involved, female aunts rank after siblings and grandmothers, and contribute about half as much as they do to caretaking. Aunts interact with the children more than twice as much as fathers, so there is a prevalent female influence: mothers, aunts, grandmothers, and usually older female siblings. This leaves the paradoxical situation of a patriarchal society where women have the same status as children but in fact undertake the major responsibilities of family life.

## 2.2.2. The Influences of Sibling/Peer Pedagogic Roles

### 2.2.2.1. Age Differences

R.D. Stewart, Jnr, (1983, p282) believes that the operative word, in Irish's (1964) conclusion that siblings are role models and 'sometimes more effective teachers than adults', lies in fact in the word 'sometimes'. Cicirelli (1976) found mothers gave more feedback and explanations than older siblings. Older siblings directed younger siblings on the basis of partial knowledge, but older females were the more effective of the tutors.

This finding raises questions for unfortunately the qualitative interaction is not commented on. Was the feedback assimilated? Did the children enjoy the task more with mothers or siblings? How did he assess

effectiveness of the transaction: was it in terms of performance/success, or predisposition to learning, or the acquisition of generalisable skills? Cognitive theory suggests 'feedback and explanations' promote learning. However, Piaget's assertion that errors revealed by children provide insights into learning, raises further questions concerning the general assumption that the adult model is necessarily the 'better' teaching situation. For what type of task? At what stage? With what set of dynamics? A mother in a local study (Miller & Craig 1983) was rated as high in mediating skills (high verbal rate of explanation, rich discriminatory cues, clear modelling strategies) yet her child as pupil appeared totally passive, unenthusiastic and very compliant. Can this mediated learning experience necessarily be termed as 'competent'? If competence means 'knowing how' we would need to know if that child did show transfer of strategies over time.

It has also been pointed out by Glachan and Light (1982, p257) that a 'passive' child may be 'mentally active', as a 'tacit interaction' between subject and model might exist. They do, however, quote studies suggesting cognitive dissonance might be as strategic in importance as modelling. Contradiction, they believe, promotes peer efficiency and cognitive stimulation if exposure to correct answers is included. i.e. trial and error on its own is not necessarily productive. Where peers do conflict in interaction, then 'two wrongs can make a right' by 'de-stabilising' inefficient strategies and thus evolving a constructive resolution. They argue for a 'typology of peer interaction and task research' to be developmentally and educationally significant.

McLane (1981) in her study based on the same puzzle task used by Wertsch (1980), and this project, reports that 'a more capable peer is not necessarily a capable teacher'. She compared mother/child teaching with child/child teaching, and believes her results show the value of 'finely tuned, sensitive and contingent other-regulation' that adults can provide. (Wertsch 1979, 1980, Wood et al 1978). McLane does not emphasise that her 'capable peers' were only 5½ years old, that there was no personality testing and that her sample was a small White middle-class one (N=8). Nor does she correlate her conclusion with her discussion on the paper by Wood et al (1978) where some mothers that he described used the very same strategies that her 5½ year olds were using: the 'swing' strategy of very

direct physical assistance and very indirect verbal assistance which had no clear implications for the child. (McLane 1981, p118). Similarly the example she gives of successful other-regulation by a child tutor leading to self regulation by the tutor is not elaborated on. In fact three of her tutors are reported as competent tutors - that is more than a _third_ of her sample. This girl tutor was acknowledged to 'in many respects ... have behaved very much like a mother or teacher' (p105). Child tutors could use scaffolding during tasks but mostly they resorted to an 'all or nothing approach' where they either did the task themselves or gave very little assistance. What is interesting, for comparative purposes, is that this select sample with pre-school experience showed a similar behaviour repertoire to the townships sample although the American children _did_ _know_ how to do the task.

R.B.Stewart (1983) believes that the teaching ability of children cannot be gauged without first assessing their perspective taking ability which he sees as crucial to communication and teaching. The success of tutoring according to Sarbin (1976, p29) depends on the kind of role relations that emerge between tutor/tutee. For an older child there should be 'profound scholastic' effects. Improvement of the tutor's performance can improve 'as much or more than' the tutee (p27). The 'more than' highlights the value of the mediating experience for the tutor. The rehearsal and reformulation of task procedures both require decentration or perspective taking. These pressures surely push the tutor in her own zone of proximal development, regardless of the tutee. Language must also be interwoven with the learner's activities, and some commentators suggest children learn language faster in adult-child relation than child-child relations. (The author's own observations, of a cosmopolitan primary school attached to an English university town, were that non-English speaking children learnt English as a second language at phenomenal speed when mixed together with local children. No special English teaching was provided. It was a case of linguistically sinking or swimming, and within three months, they 'swam' whether from French, Arabic, Spanish, Persian or Dutch backgrounds). Greenfield (1982) makes the point that language has to be assessed within a meaningful context, and not as an isolated variable. Sibling's verbal capacities will largely reflect parental modes but probably with less rationalisations.

In terms of teaching strategies, dialogue was found to be essential in seriation tasks (Heber 1977, 1978, 1979 quoted by Wood 1980). Heber concluded that guided dialogue helps the child to formulate and thus to synthesise essential serial relations. This reciprocal formulation has to be made in terms of the listener's point of view. It was this type of imaginative detachment that peers seemed unable to provide: 'dialogue between children at a similar stage of development failed to produce an improvement in performance'. This is attributed to children lacking the adults 'superior knowledge in cognitive growth'. Would an older child, at a different stage of development, not have had more success? Cicirelli (p1978) has noted changes of sibling style according to younger siblings cognitive level. This suggests some 'region of sensitivity' as tutors. Rosenthal (1979, p273) found pre-schoolers omitted key facts of a referent because 'they failed to judge meaning from another's viewpoint'. They could emulate the adult's modelled communication but still ignored content crucial to the listener. Pre-schoolers are still in the concrete operational phase according to Piaget. Despite Marvin's claim (in Stewart 1983, p50) that 75% of 4½ year olds understood the concept of perspective taking, it would seem that an age factor is involved in the mediation of certain types of structural tasks. One also wonders, however, what happens to this perspective taking ability? Does schooling blunt this natural interactional sensitivity so that childrens' responses become adapted to mimic the 'formal' structure of the institution, a sort of pedagogic 'over-mimicry' similar to that displayed in caretaking styles? Greenfield (1982) has noted the redundancy of verbalisations made by 'schooled' children in contrast to the non-schooled. Stevenson (1982, p224) has urged a 'fine grained analysis of differences in performance of schooled and non-schooled children' be undertaken before the 'sample pool' disappears altogether.

Allen and Feldman (1976) uphold the value of imaginative rehearsal or being a good 'role taker' (Rosenthal 1979, p274). Children (3rd and 6th grades) have been found to be more attentive to non-verbal cues of the subject's level of understanding on tasks than were adults. There appears to be a 'communicative format' that supplements instruction (Bruner 1977, Garvey 1982). However, Wood (1980) and Sutton-Smith (1977) believe research indicates that contingent adult-child interaction is essential to intellectual growth. This conclusion need not discount the value of peer

contributions. Both dimensions are important for optimal development, and the 'deficient' or 'different' spectre could well be laid to rest if such an hypothesis was accepted in this context.

### 2.2.2.2.    Sex Differences

Role theory is the usual explanation for sex differences in teaching (Cicirelli 1972 & 1973, Sarbin 1976, Whiting 1986). Girls teach siblings more often and more effectively than boys who are considered to be more constrained by 'sibling rivalry' (Cicirelli 1972). In this example this catch-all term is given negative attributes whereas Sutton-Smith (1977), as discussed above, suggests it heightens diversity. In a review of mammalian sibling interaction, very little substantive data was found concerning selfish sibling rivalry in non-human mammals. (Beckoff 1981, quoted in Abramovitch et al 1982). Interestingly, and perhaps predictably, Sutton-Smith and Rosenberg (1970) believed boys were more cognitively stimulating than their sisters, despite the latter being 'better teachers'. With non-siblings, girls would use less deductive methods than they used with siblings. Cicirelli (1973) concurred that boys are intellectually stimulating for younger siblings. He found male tutors used inductive methods and gave more feedback. His studies are derived from laboratory situations. Interactional features in the home setting could influence behaviours (Dunn & Kendrick 1982).

Jealousy and agonism between siblings is attributed to differential maternal treatment towards different sex dyads, according to Abramovitch, Pepler and Corter (1982). One is tempted to ask: what about fathers? Mothers were found to categorise behaviour differently to fathers, and both categorised differently when the same behaviour was attributed to sons or daughters. Thus Bacon and Ashmore (1982, p334) believe that the characteristics of the perceiver, and the perceived, and the nature of the role relationship between them will affect the 'socialisation environment of the developing child'. They report fathers appear less flexible in accommodating to a child's life cycle changes, and that social class differences affect perception of children and behaviour. These factors could also be seen as applicable to siblings. The pressures on a black girl were described as follows: 'girls, from the time they are little, are taught to be efficient wives and mothers, who can cope with any

demands made upon them ... advice (given) to brides before marriage: whatever happened ... they had to persevere, persevere, persevere; advice in which there was nothing positive'. The respondent continued, 'men, on the contrary, are never taught the responsibility of the male role, because their fathers do not set an appropriate example' (de Haas 1984, p89). This 'emic' description gives a graphic sense of a socialisation difference in the townships.

Minnet et al (1983) report mixed-sex dyads show less negative behaviours than same-sex ones. Yet same-sex tutors were preferred by tutees (Allen & Feldman 1976). Situational variations will, of course, affect interaction patterns. Similarly, studies suggesting closely spaced siblings, who show more aggression, and first borns that are more likely to praise and teach siblings than later sibs (Minnet et al 1983), need to be interpreted cautiously. First borns are widely reported in the literature as higher in dominance levels, physical power techniques and achievement (Sutton-Smith & Rosenberg 1970, Abramovitch et al 1979, Lamb 1978a, 1978b). First born females relied on more verbal and reciprocal methods of teaching. Lamb found sex differences were minimal in teaching styles but that perspective-taking males proved slightly more effective as teachers, though this finding is less well represented in the literature than Cicirelli's findings. What sort of tasks were used? Did Cicirelli's object sorting task test visual capabilities, which girls might have accomplished more easily, and Lamb's task test spatial abilities?

In the play setting, differences have been noticed, the boys engaging in more 'rough and tumble play' than girls. Female interaction is reported to be non-egalitarian and compliant, the boys 'more solitary and negative' in behaviour (Brody et al 1982, Stoneman, Brody & McKinnon 1984, p627). Abramovitch et al (1982, p83) believes males prove to be more aggressive siblings but they also 'co-operate', help and act affectionately.' Role theory was not mentioned in this study.

Cicirelli (1973, p179) hoped to identify sibling teaching behaviours to develop 'a more effective tutoring relationship' in disadvantaged families. He advocated girls should tutor young siblings and that schools use boys and girls to tutor non-siblings. However, Pepler (1981) found no evidence of sex differences in teaching, and possibly Lamb's explanation of perspective taking suggests yet another avenue for future research.

Sibling studies are clearly far from consolidated. There would seem to be consensus that 'extreme shared care' leads to difficulties in attachment relationships and social adjustments. An example of this extreme would be fifty to sixty caretakers before three years of age. Supportive caretaking fosters object permanence and a sense of self which can be related to cognitive measures (Smith 1982, p175). What does seem important is the caretaker's responsiveness and general commitment to the relationship. It is out of 'repeated, mutually contingent, interaction sequences' that an attachment relationship can be formed (Smith 1982, p177). Peers, siblings and adults are all potentially significant for a child's cognitive development where a positive affective relationship is established. Age and sex differences, interpersonal dynamics, economics, culture, personality and temperament are some of the variables contributing to the complexity and idiosyncracy of each individual.

Dunn (1983, p807) concludes her review on early siblings relationships by warning:

i) reciprocity is plausible as developmentally significant but 'not backed by clear cause-effect relations'
ii) sibling studies are very small and generalisations 'hazardous'
iii) longitudinal changes will occur
iv) relationships reflect a range of differences within themselves

## 2.2.2.3. Caretaking and Cognition

The 'indigenous theory' of childhood constructed by Craig (1985) and amplified in Kok's (1986) study of the zone of proximal development, confirms other ethnic cross-cultural studies (Diaz-Guerrero 1987, Dixon et al 1984, Stewart 1983, Weisner & Gallimore 1977) on cognitive style. These studies show common themes or dimensions in 'world-making' which appear the converse of Western child rearing aims. There is a group versus individual orientation, a need for affiliative obedience rather than attachment or self-assertion, an external locus of control reflected in a passive coping style opposed to an active or agentive locus of control which questions authority, and a belief in interdependence and community versus autonomy and the individual (See 2.3. and 7.2.).

Diaz-Guerrero (1987, p250) realises that differences between Mexican and American children's coping styles is a reflection of 'dramatically different historical and socio-cultural premises held by mothers in the two cultures'. These could however be epi-phenomena, he suggests, because the U.S. per capita income is seven times higher than that for Mexico. Secondly, the educational opportunities and intellectually stimulating resources and activities are much higher for Americans than Mexicans. What he hypothesises is that 'efficacy in societies varies in proportion to the material wealth of the society whether traditional, communist or capitalist'.

There are parallel epiphenomena in the black/white divisions in South African society too. The mediational operators detailed by Kok in the mother-child, teacher-child situation appear to reflect the absence of the 'nuts and bolts' of the 'cultural tricks' (Miller 1983) that Western education demands. What arises from these local studies is not only understanding of how another culture sees or 'construes' reality, but also the problem of assessing the strengths and contributions of such strategies in order to redirect educational practices which have been monocultural in origin and design and therefore not conducive for black children to generate effective cognitive processing in Western tasks.

The teaching signals black children receive in 'formal' educational settings are likely to be insensitive to their 'changing region of susceptibility' that constitutes the zone of proximal development. Cognitive growth is not stimulated if the mediation offered does not promote/provoke the child's progress: 'Good learning is that which is in advance of learning' (Vygotsky 1978, p89). He describes learning as 'more than the ability to think, it is the acquisition of many specialised abilities for thinking about a variety of things' (Vygotsky 1978, p83). Such opportunities have been investigated within the dominant process-product research paradigm. Ogbu (1981) is very critical of causal relationships between family process and child rearing outcomes. The assumptions of competence are based on white middle class norms which ignore the cultural realities of the minority blacks in the U.S. He claims to offer a different approach, an ethno-ecological method based on an analytic framework, with which to study adult adaptation to ecological pressures i.e. 'the institutionalised and socially transmitted patterns of

behaviour that are interdependent with features of the environment' (Ogbu 1981, p262). This does not substantially differ from the main paradigm after all. If one looks at 'competencies', one looks at attributes necessary for survival. Coping at school is a basic requirement in most modern societies. This assumes the validity of such schools.

If the co-ordinating skill between mothers and infants, and between peers or siblings, is a precursor of higher cognitive processes, then diffused caretaking systems and low one-to-one interaction patterns would seem to suggest long term negative consequences. At issue would be the development of competencies through child rearing practices and cultural differences in strategies considered appropriate to cultural goals.

While Ogbu's criticism of the apparently prevalent developmental paradigm might be well founded, the criterion for competence should not be dismissed as 'middle-class/ white'. Competence must be viewed within the global academic requirements regardless of its ethnocentric or 'colonial' roots.

Cultural 'competencies' that Black S.A. parents once assumed to be a desirable part of childrearing are currently rejected by many of the youth. The roles of compliance, conformity or 'domestication' have been rejected. This breakdown of generational harmony in social values makes transmission of cultural competencies very difficult. This is akin to a form of cultural paralysis (Miller 1983).

## 2.2.2.4. Reinforcement Style and Learning

'The way in which a child is taught may often be at least as important as what the child is taught' (Feshbach 1973, p115). This premise underlies much of Feshbach's research and her studies suggest that reinforcement is central to the learning process ('reinforcement' meaning, here, the positive connotations of rewarding or affirming desirable or appropriate behaviours). Its importance lies, she believes, in its motivational and informational functions (p83). When negative response modes have been internalised the consequences are unfortunate: they interfere with the effective transmission of information. Furthermore, as early as age four, the child seemed to duplicate the pattern of reinforcement of the parent in tutoring with peers.

Social class is reported to be an important variable in reinforcement style. In a comparison of American Black and White mothers social class differences were related to reinforcement style. White middle class mothers and children used more positive reinforcement than negative feedback (Feshbach 1976). Black lower class mothers and children used the most negative feedback. In an Israeli study middle-class children were three times more positively reinforcing than lower class children. However, education is also considered to be a determining factor (Bee et al 1969, Laosa 1981). Blau (1981, p76) believes that for Blacks the mothers current social milieu, SES and exposure to Whites were significant factors influencing a child's cognitive performance. Feshbach (1973, p107) suggests reinforcement style could be one factor 'mediating socio-ethnic differences in cognitive performance and academic achievement' and that negative responses reflect 'impatience, environmental pressures and frustration'. Hardship, in other words, is likely to promote intolerance. By age four 'the genetics of poverty has already taken place', that is, negative cognitions through modelling and identification will have reduced cognitive flexibility, though whether her assumption of irreversibility of the effects of poverty is justified, or not, is debatable. Cognitive competence and a positive reinforcing style are linked to patterns of positive maternal reinforcement (Feshbach 1976). Johnson and Breckenridge (1981) support her findings that cognitive competence is affected by positive reinforcement. Such factors contribute to the microsystem of the child. The exosystem will, in turn, be a reflection and amplification of such processes.

2.2.3.    Formal/Informal Education: Influences on learning style.

Siblings, as caretakers and tutors, are enmeshed in an exosystem of both formal and informal educational systems. Their teaching style will thus be a reflection of both structures. Although separate characteristics can be assigned to formal and informal education, Greenfield and Lave (1982, p182) prefer to consider them as a continuum rather than as polarities. The rural/urban dichotomy is too simplistic and so is the 'stereotyped association of verbal instructional strategies with formal education and non-verbal instructional strategies with informal education'. Greenfield and Lave (1982, p184) believe more empirical research is needed to

establish the characteristics of each educational situation. Test design itself is problematic, especially for cross-cultural research when tests might tap specific cultural skills. Schooling is thought to influence and increase abstract problem solving even though the processes involved are not clearly understood (Stevenson 1982, Greenfield et al 1966). Gardner (1984, p362) distinguishes between the scientific and the non-scientific mind, where one has an open-ended framework, and the other a closed system, yet the cognitive processes, he suggests, are not necessarily dissimilar.

Bearing the earlier qualifications in mind, the values of the two educational approaches discussed by Greenfield and Lave (1982, p183) are presented in summary below:

Table 2A

| INFORMAL EDUCATION | FORMAL EDUCATION |
|---|---|
| 1. Embedded in daily life | 1. Set apart from daily life |
| 2. Learner is responsible | 2. Teacher is responsible |
| 3. Personal teaching (kin) | 3. Impersonal teaching |
| 4. No explicit pedagogy | 4. Explicit pedagogy |
| 5. Continuity and tradition * | 5. Change and discontinuity |
| 6. Learning by observation * and imitation alone | 6. Learning by verbal inter- change |
| 7. Demonstration method * | 7. Presentation of general principles verbally |
| 8. Social motivation and participation in adult sphere | 8. Less strong social motivation |

Despite the risk of stereotyping, the table offers a useful overview of the two learning structures which many township children probably experience. The 'informal' values are congruent with traditional rural Zulu patterns of learning. The 'formal' values are (mostly) those presented in the teaching (school) situation. The tutors are peripatetically caught between the two; the tutees experience mostly the one, into which the tutor's increasing new 'competencies' are likely to be infused.

Characteristics marked with an asterisk indicate what I see as the crucial learning interface between black children and their educational system. Although the 'formal' values are theoretically to be experienced in schools, most black pupils encounter the traditional 'informal' educational precesses: learning by observation and imitation rather than interchange and questioning; a 'maintenance of tradition' which inhibits

critical thinking; reliance on demonstration and repetition rather than seeking or establishing general principles (Hartshorne 1985, Bot 1986). Performance, however, is assessed according to 'formal' values (at tertiary level anyway, but supposedly in secondary and primary education too) whereas the teaching and learning would have been informed by the 'informal' value system (partly because of unqualified teachers, see Christie 1986, Hartshorne 1985). Informal learning is supposed to be embedded in a meaningful context where skilled adults carry out the activities learned. The big gap in the S.A. situation is that many adults are not so engaged, or skilled, so that an important reinforcing structural variable for the children is missing. This applies to the 'formal' situation too because many parents are barely literate and cannot participate with their children in guiding 'dialogue' or scaffolding formal learning situations.

Informal education, however, offers a 'rich pedagogical heritage' (Greenfield & Lave 1982, p207) which should be utilised. Scaffolding and pacing of instruction according to learner's requirements were found to be highly effective, more so than demonstration or pure instruction. Motivation is increased if the cultural context is meaningful. From cross-cultural studies it would seem that different learning techniques may give rise to particular values, for example, the Zinacanteco weavers appreciated trial and error learning for its innovative aspects while traditional cultural values were 'actualised' through observational learning. Greenfield and Lave (1982, p186) found that trial and error learning leads to a greater transfer of skill to new tasks than errorless learning. They also noted, though, that 'successful imitation of demonstration led to perseveration of the method even where it was ineffective'. That this method worked for a given task was clear, but it was the least effective of methods for transfer to new tasks. Trial and error learning appeared to have the converse pattern. Perhaps this method is a low-level order of the 'heuristic hunches', plausible guessing and hypothesis testing that Conolly and Bruner (1974) advocate for successful cognitive progression.

In the informal setting, questioning by the learner was rare, possibly due to cultural 'configurations' surrounding such behaviour. Guthrie (1979, p366) notes a study by Macalandory et al (1978) where protecting the child

from malevolent influences and strong family pride were the main goals of child rearing. Intellectual development had minor status. Questioning would thus be subordinate to security. Filipino mothers who stifle their children's initiative, by American norms, see their 'authoritarianism' as an acceptance of responsibility and manifestation of concern. Such a difference of interpretation is a reminder of 'plurivocity'.

It has been stated that modernisation of mothers, or increased education, leads to more verbalisation on tasks (Rogoff 1977). But, as mentioned earlier, (Greenfield 1982), language should not be independently assessed, for 'schooled' children's high verbal output reflected redundancy of language, as if involved in verbal 'game-playing' rather than appropriately comprehending tasks. Thus polarities of style can become intermingled. Lindfors (1986) commented on the conditioned responses and stereotyped answers to comprehension questions in local classrooms where English was taught as a second language. There was no evidence of 'real writing' (spontaneous or critical thinking). A similar concern was expressed by Vygotsky (1978, p118) that writing should be more than 'a matter of hand and finger habits (but) a really new and complex form of speech', that is seen as 'necessary and relevant for life'.

The different formal/informal characteristics do represent striking echoes of the differences in teaching style observed in cross-cultural studies. Taking a very relevant bi-cultural study by Dixon et al (1984) on differences in mother-child interaction between African and American mothers, several parallel features are revealed. The Gusii mothers repeated instructions, used more non-verbal instruction and less verbalisation than the Americans. Tasks were modelled in their entirety, with very little positive reinforcement. The American mothers showed more praise, more reflective speech to shape activity and task modularisation. They teased and encouraged the children in order to promote problem-solving.

The authors conclude that the African children were being taught to get the job done, rather than how to learn. Compliance and obedience to authority are rewarded. Dixon et al (1984) point out the similarities in behaviours with Mexican-American mothers (Steward & Steward 1973) and the Zinacanteco (Greenfield 1972). Miller and Craig (1983), and Kok (1986)

report findings consistent with these studies from their Zulu sample of mothers. Repetition of instruction, imitation, avoidance of initiative in favour of group conformity, are part of a broader macrosystem, but one which is incongruent with a complex non-agrarian society that favours competitiveness and individualism. 'Poor black ghetto children with several closely spaced siblings reared by poorly educated mothers without work experience, organisational ties or exposure to white friends and co-workers at most at risk of entering school with severe cognitive deficits'. In this way, Blau describes evidence to show that these 'deficits' are not inherent but result from 'identifiable environmental deficits of a complex and cumulative nature' (Blau 1981, p222). Some of these 'deficits' are the lack of 'adult support for refining the use of language', (p13), not having access to 'written culture' (p196), as well as poverty (p222). Cole, (1978, p627), also, agrees: 'there may be cultural deficiencies in the existence of cognitive processes' but argues that lack of performance does not necessarily equal lack of process. Neither experiment, nor analysis of belief systems, nor folk taxonomies are adequate to understand intellectual activity: 'what we need in ethnography that analyses cognition as special sets of activities engaged in on specifiable occasions' (p630). Even this suggestion seems too inadequate for the task. Gardner (1984, p327) sees such an approach as ignoring the differences of individuals within cultures and looks for a middle ground.

It seems then that traits common to 'informal education' are associated with a configuration of values which have been suggested as reflecting 'cultural' traits. Le Vine (1977) and Dixon et al (1984, p1263) confirm that the teaching situation offers insight into the 'transmission of cultural goals' and could provide 'an index to major cultural variables and forces of adaptation'.

Rappaport describes these difficulties as requiring institutional change: 'To the extent that the children of the poor are forced to contend with an educational institution that ignores their culture, no amount of tutoring to repair their supposed individual cognitive deficits' will be able to solve the social problem of educational failure. 'Tutoring is an intervention based on the study of individuals. If the aim of community psychology is to effect change in the institutions of society,

conceptions, strategies and tactics based on appropriate institutional assessment are required' (Rappaport 1977, p181). She sees that a lack of clearly stated values and goals in research contributes to building a tower of Babel (p183). (Such problems are discussed in 2.3.).

There are problems, too, with simplifying complex behaviours - or people- along cultural or educational/economic dimensions. For example, there is an interesting study by Miller and Bizzell (1984) who examined the long term effects of pre-school programmes. They found in their follow-up study of low-income black youths from kindergarten to ninth and tenth grade, that the highest achieving males in mathematics had participated in the Montessori programme. I give their explanation in some detail because their hypothesis permeates the cultural/ethnic/economic models. Miller and Bizzell (1984, p1586) explain the differences shown by the Montessori group, over other methods, from the premise that cognitive development proceeds from a sensorimotor and kinaesthetic mode to a verbal/symbolic mode. Therefore, they speculate, girls who mature neurologically faster than males, would be able to benefit from observation and verbal instruction more readily than boys, who would still need 'kinaesthetic methods of interaction and/or hands-on manipulation of materials in the learning of specific concepts. Physical manipulation of concept oriented materials, patterned drill and rhythmic and kinaesthetic accompaniments should accompany the learning of verbal and mathematical programmes'.

The interest here lies in the combination of strategies attributed to 'formal and informal' educational systems: observation, demonstration, full participation, repetition, meaningful learning, shared responsibility. In other words, teaching that is suited to the learner's requirements and challenging to their 'emerging functions and capabilities' (John-Steiner & Souberman 1978). Here is a functional description of intervention appropriate to the individual's zone of proximal development: 'If one changes the tools of thinking available to a child, his mind will have a radically different structure' (Vygotsky 1978, p126). These American boys were given tools of thinking that enabled them to transcend 'cultural', 'ethnic' and stereotyped learning systems. Their learning was meaningful, upheld and valued by their social context and imbued with purposefulness or sense of hope or commitment that motivated the pupils individually. But here I perceive the insidious tentacles of

ethnocentrism. By Western achievement criteria, these boys were 'successful'. Though the tests included a broad ranging battery including personality, there is no evidence offered of the meaning of this success for those individuals and families. One can but hope their real success lay in those 'tools of thinking'.

In the next section the focus is on the contemporary institutional context which is meant to provide tools of thinking.

## 2.3.    Black Education

The purpose of this review is to provide the broader context in which this sample of children is located, both from their immediate contemporaneous situation and from that of a forward looking perspective. Here is part of the exosystem into which the tutor and tutee groups belong, and these are the issues directly related to the purpose of this investigation: the development of cognitive processes within an ecological setting.

### 2.3.1.    Some Contemporary Conflicts

Although Hartshorne (1985, p150) believes S.A. 'remains in a state of educational crisis' because of its separate and isolated black educational system which fails 'to meet the needs and aspirations of the people they were set up to serve'; the consequences of the Bantu Education Act of 1953 have led ironically to a situation where the legislation meets the 'needs and aspirations' of the people it serves - that is, the white ruling Nationalist minority - but not the black people who receive the consequences of that ruling.

These consequences are well documented (Christie 1986, H.S.R.C. 1982, Kallaway 1984, S.A.I.R.R.) but briefly include declining academic standards, an extremely high drop out rate (only 1% of black pupils entering school actually matriculate), a teaching staff that is 95% lacking in professional qualification, a teacher pupil ratio of 1:44, and most significant of all, a classroom style of teaching that Hartshorne describes as one of 'survival, characterised by dependence on the text book, disinclination to allow pupils to question and discuss and discipline which is rigid and authoritarian' (Hartshorne 1983).

Such consequences serve the ends of an education system designed to 'domesticate' the population in order to be subordinate the needs of the ruling class (Freire 1973).

In the seventies and eighties, these ends have been rejected by pupils and community leaders (Bot 1986, Christie 1986, SPCC 1985). What is particularly relevant to this study is the classroom style Hartshorne describes because it matches exactly the teaching style of tutors as young as seven years old who also discourage questions, block initiative, use non-specific directives instead of discriminating cues, and generally deny responsibility to the tutee by completing the task themselves. They maintain dependency on themselves, an alleged superior, instead of inviting a collaborative or mutual learning endeavour. Craig (1985) and Kok (1986) would offer a different interpretation.

In this way the 'norms' of the 'oppressor' in the formal learning situation have been internalised by the 'oppressed' and thus serve in fact to perpetuate the ends of the minority dominant group. This phenomenon Freire (1973) has described as the outcome of a 'culture of silence' because the oppressed, 'trapped in ignorance ordained by the oppressor, have not experienced any other model of power', although later commentators have argued for more complex analyses (Walters 1986, p5) particularly in terms of class alliances. However, the empirical finding of this present study suggests the validity of Freire's hypothesis.

Ngugi wa Thiong'o (1981, p12) also described the neo-colonialist phase of imperialism where education and culture have become powerful 'instruments of domination and oppression'. The petit bourgeoisie have so assimilated their 'European textbooks' that they become 'not even the replica of Europe, but its caricature' (p13). This fate seems equally possible for black or white 'petit-bourgeois' who are removed from the organic processes of cultural growth through isolation and a rigid maintenance of the status-quo. The classroom style described by Hartshorne could be the echo of an obsolete Western pedagogy or, as he suggests, the results of the 'traumatic experience in which they (the teachers) are subjected to intense and conflicting pressures from pupils, parents and officials'. Morale is low, explains Hartshorne (1985, p150), because teachers 'cannot commit themselves fully to their work in a system to which the majority do

not subscribe'. Bot (1984, p11) also suggests that black teachers are 'caught in the middle (between) dissatisfied students' and 'authoritative, unqualified principals' while being subjected to inadequate salaries, poor facilities, overcrowded classrooms, and frequently corrupt administrative procedures. Two years later the future of African education is described as at an impasse between state control and community pressures (Bot 1986). As Freire (1973, p85) noted, 'education is not neutral', and the macrosystem cannot be neutral either. 'Time for neutrality on the part of teachers and parents has really passed. We must overcome the fear of change, fear that an unjust world will be radically transformed, fear of getting lost in an uncertain future' (Khotseng 1986, p6). He goes on to claim 'schools, teachers and homes which will be a springboard for the alternative need a new "pansophia" - an education that seeks unity in plurality not separation' (Khotseng 1986, p7).

## 2.3.2. Alternative Education

The rejection of apartheid's education system has escalated rapidly since 1985 (Bot 1986, Christie 1986). Alternative education was being used as a label for everything critical of State policies. Though in confusion, there appears a clear central purpose: a 'non racial, non-exploitative education (that would) liberate and develop society' (Samuels 1986, p21). Education was to be seen as a process not a product (Hartshorne 1986, Rhensburg 1986) but the dynamics, aims and strategies of this process do not seem to be in any kind of co-ordination (Ashley 1986). Like the more pedantic arguments of the pre-school theoreticians, the conceptual questing for an educational blueprint for the future has also had Babellian overtones (Rappaport 1977).

Change is agreed upon: what form it will take is not clear. This is the context into which this sample of children is heading. This confusion signifies the flux of social transition, contributing to the 'incoherence' of the cultural context in which the black township child must develop.

## 2.3.3. Pre-School Education

The problems with the provision of pre-school education, especially for black children, are major: theoretically, politically and economically.

In June 1985 (Educational Statistics 1984 + 1985 Summary) estimates are that the total number of children in the 0 - 6 year age group is 6,4 million of which 5,9 million are black (81%) and only 50,000 of these or 2% receive pre-school provision (Bot 1987) (or 0,8% my calculation). White children (84%) of this pre-school group are State subsidised at the rate of R1 per child; the black child's rate is determined by the local development boards and can vary from 0 cents to 30 cents per child (Bot 1987).

The 'problems and priorities' of pre-school education have recently been summarised (van den Berg & Vergnani 1986): the concept central to their discussion of the current situation is that of inadequacy. The following areas are inadequate: facilities, state subsidies, policy control, staff qualifications, co-ordination of support groups, health and nutrition services, resource distribution, community participation. If the overwhelming evidence is of inadequate planning and use of resources, it is also overwhelmingly clear that lack of co-ordination between theorists is a major issue which exacerbates debate over the provision of facilities into almost Tower of Babel proportions and one into which this project must inevitably be placed.

A review of the collected papers from the enterprising international Montessori Conference, (Johannesburg 1986), called 'To Educate the Human Potential', reveals a very heterogenous range of panaceas, some of which are : teaching music from birth (Solomon), encouraging creativity, developing understanding of LOGO, training teachers, and training parents (Fullard), using writing to read programmes, (Cillie), open-framework systems (Ter-Horzhuizen), assessment devices (Skuy), and provision of minimal day care to ensure normal development (Liddell).

Each approach may have had something valuable to offer, but it is hard to imagine any of the theoreticians willingly giving up any of their trees for the sake of the wood.

An example of the academic tensions inherent in research into this topic are reflected in the paper by Liddell, a research psychologist. Her findings showed acutely inadequate facilities, lack of adult interaction and lack of cognitive materials. The amount of time spent by children in

mediated learning experiences at the Pretoria peri-urban crèche was precisely nil. Her breakdown of the facilities presents a graphic picture because it is probably a very typical, and therefore relevant, example.

There were eighty-three children in the crèche. Available space per child averaged 0,6²M (recommended space: 3²M). The child/staff ratio was 42:1, double the recommended minimum. Time spent in caretaker/child interaction was 2%. Time spent in adult-led educational activity (mediated learning experiences) was nil. There were 71 broken toys and 55 intact toys. There was no large play apparatus and no play/construction materials such as paints, blocks, or lego (Liddell 1986). Despite these 'disadvantages' she suggests these children show 'no abnormalities' of social play and behaviour from naturalistic observations of free play, based on British and American norms. Similarly the Bushman sample she observed living under constrained political and social circumstances in Namibia showed 'normal patterns of activity and social behaviour' despite environmental and 'intermittent paternal' deprivation. There was a single story book for this group and the amount of time spent playing with toys was 3%. But, Liddell warns, 'we should not assume we can identify areas of maximum impoverishment' (Liddell 1986, p4). Overcramped, overcrowded conditions, little or no construction or play material, and a dearth of educational adult-directed activities seems clear evidence of 'impoverishment' according to most theories of child development (Bruner, Piaget, Vygotsky). In the absence of mediated learning experiences what prospect can there be of cognitive processes developing normally however much the childrens' 'free play' may appear normal? The criteria for this 'normal' play would need to be made explicit if its relevance for formal education is to be assessed.

de Lange (1981) recommended a two year bridging scheme to start in 1987 for black pre-primary children. Recently the Minister of Education (Daily News, August 1987) spoke of 1990 as the proposed date. This means ± another 900,000 children will remain un-privileged in pre-school preparation in the interim. Liddell (1986) argues for an adaption of Grade I, which offers a useful pragmatism. It is, however, as well to remember Oyewole's (1984) work in Nigeria (which she quotes) attributing the high failure/drop out rate to be due to malnutrition and late entry

into school. Vergnani (1986) suggested one in three black S.A. children show the effects of malnutrition and the long term cognitive effects of such deprivation have been well documented (Stoch & Smythe 1967).

Bot concludes her recent pre-school review (1987) by emphasising that 'the greatest stimulus for personal growth and educational development resides in the home' and, consequently, co-ordination between all phases of educational provision including adult education is essential. Given the current political and economic unrest this premise may no longer apply. The pressures of 'liberation before education' have been broadly social and political with tremendous pressures from sometimes shadowy sources outside the home on the children themselves. Schooling in S.A. for black children has been chronically disrupted, and the role of the family drastically overshadowed by sectarian conflict and economic upheaval (Burman & Reynolds 1986). The stimulus for 'personal growth' must perhaps now lie in a more collective political ideological compromise and reconciliation before the formative significance of the family can re-establish itself. This 'society in transition' is one whose children are being dominated by the exosystem at this stage.

Although van den Berg and Vergnani (1986) presented an apparently realistic and pragmatic set of recommendations within the current educational order, there are two major drawbacks:

i)   change is unlikely in the present political and economic context
ii)  the sheer magnitude of the number of children involved demands a critical evaluation of their premise that a national system of a presumably Western type pre-school education is a major priority.

This particular sample of children was chosen with the criterion of their not having attended a pre-school i.e. they were typical of most black children.   Their tutor siblings were at primary school. The possible interactional level between siblings is very much higher and more intense theoretically than would be possible in an overcrowded crèche as described by Liddell (1986). In Natal there are no qualified pre-primary teachers and only custodial care at registered crèches (Gering 1986). Can it be

assumed that this custodial care is necessarily 'better' than the home environment where, no matter how disadvantaged and unstimulating the setting, the numbers of children assembled together is much lower and the possibility of sibling custodianship, if not adult caretakers, would be proportionately much less diffuse and, qualitatively, possibly more appropriate? The lack of educational stimulation is apparently on a par for crêche or home. What further adds to the disadvantage of the crêche system is the greater risk of cross-infection for young children in such overcrowded conditions when they are probably highly vulnerable through poor physical health (Loening 1986).

The socio-economic variable of the poverty/hunger/deprivation/oppression cycle remains like a Medusa's head to spring up underneath every apparently well-intentioned 'reform' scheme. In considering future directions for pre-school provision such factors will have to be considered.

# 3. THE PRESENT STUDY

The study has two parts. These are separately described. The first is an ethologically based analysis of sibling interaction in a teaching situation, and the second, a demographic survey of caretaking tasks in the family household.

## 3.1.    Part 1:  Task teaching by siblings

The aim of this part of the study was to investigate the teaching style of an older sibling with a task similar in style to Western educational games used in primary school.

### 3.1.1.    Subjects

The sample consisted of 56 Zulu siblings comprising  28 tutor-tutee dyads, all residents  of E  section Kwa Mashu.  The tutees' age range was from 2½ years to 4½ years old.  The tutors' age range was from 6 years to 13 years of age,  being subdivided  into an  older group  of 10-13 years (OT) and a younger group of 6-9 years (YT).

Subjects were recruited by word  of  mouth  and  by  informally recruiting people   passing by  the testing venue which was near a busy intersection. This took place during the school holidays when children were available to participate.  Criteria for participation were the following:

i)   No preschool  educational experience  for the tutees (age range 2½-4½ years).

ii)  School attendance for tutors (age range 6-13 years).

iii) Within the limitations of the above  sample criteria,  an attempt was made to obtain as balanced an age-sex ratio as possible (males; N=12, females: N=16)

The distribution of subjects by age and sex is shown in Table 3A.

Table 3A

Distribution of sample by sex and age of tutor and tutee

| YOUNG TUTOR (6 – 9 YEARS) N = 13 | | | | | | | |
|---|---|---|---|---|---|---|---|
| YOUNG MALE TUTOR N = 5 | | | | YOUNG FEMALE TUTOR N = 8 | | | |
| Siblings Younger N = 2 Group | | Siblings Older N = 3 Group | | Siblings Younger N = 2 Group | | Siblings Older N = 5 Group | |
| Young Male Sib | Young Female Sib | Old Male Sib | Old Female Sib | Young Male Sib | Young Female Sib | Old Male Sib | Old Female Sib |
| N = 1 | N = 1 | N = 2 | N = 1 | N = 2 | N = 1 | N = 3 | N = 2 |

Table 3B

| OLD TUTOR ( 10 – 13 YEARS ) N = 15 | | | | | | | |
|---|---|---|---|---|---|---|---|
| OLD MALE TUTOR N = 7 | | | | OLD FEMALE TUTOR N = 8 | | | |
| Siblings Younger N = 4 ‹3½ years | | Siblings Older N = 3 3½+ years | | Siblings Younger N = 3 ‹3½ years | | Siblings Older N = 5 3½+ years | |
| Young Male Sib | Young Female Sib | Old Male Sib | Old Female Sib | Young Male Sib | Young Female Sib | Old Male Sib | Old Female Sib |
| N = 2 | N = 2 | N = 2 | N = 1 | N = 2 | N = 1 | N = 2 | N = 3 |

## 3.1.2.   Apparatus:   The Puzzle Task Material

Four problem-solving puzzle tasks, designed to test typical  Western style cognitive competencies, were presented to the children.  The first puzzle, a demonstration task, was based on simple colour/shape matching.  This was intended to  familiarise the subjects with the nature of the task problems they would encounter.  The second and third tasks were  progressively more difficult, the  third puzzle requiring more detailed discriminations.  The fourth task introduced an  empirico-spatial dimension.   In  each case the subjects were required to copy a model identically.  Two of the tasks, the truck puzzle and the  demonstration  puzzle,  were  adapted  from Wertsch (1980).   Each  task  is  described  and  illustrated below.  A more complex version of the fourth task was dropped from the study as it  proved beyond the tutor's level of competence.

### 3.1.2.1.   Demonstration puzzle

This  is  a  two  dimensional  puzzle  (20cm  X  13cm) consisting of three different coloured geometric shapes:  triangle, circle and square.
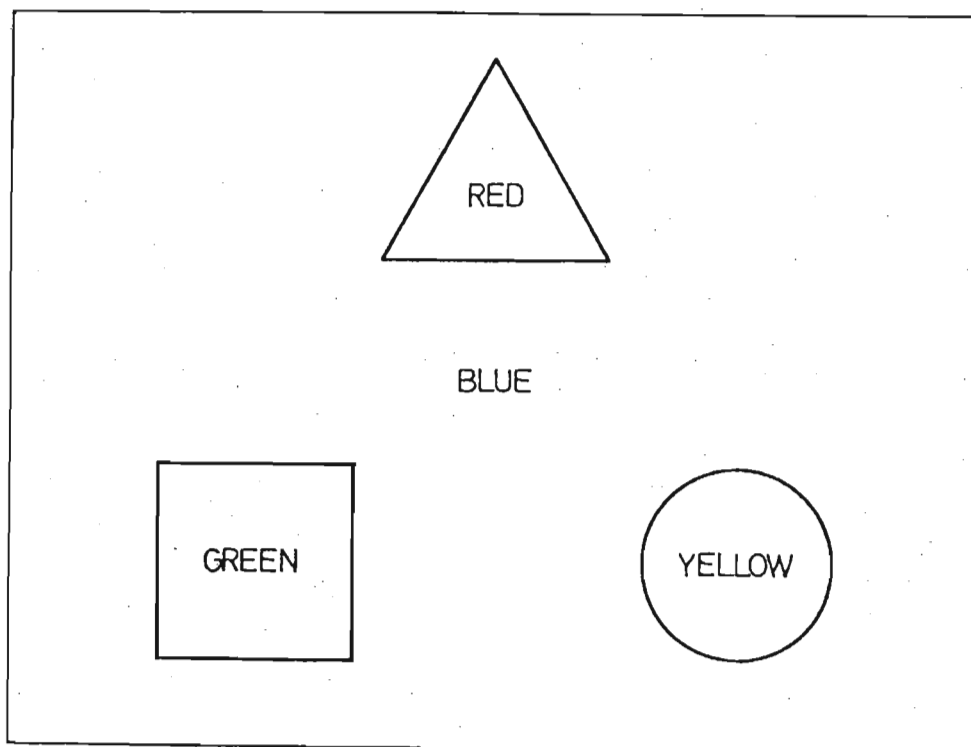


Figure 3(i):   Demonstration Task

3.1.2.2. Task 1:  Truck  Puzzle  (Simple)

This two  dimensional puzzle measuring 27 cm by 20 cm is of a truck design consisting of 14 pieces.  The outline of the truck forms the framework and is the  largest piece.  Each of the following fits a particular recess in the truck base:  2  wheels,  each  comprising  2  concentric  pieces;  a headlight and  2 windows.  In  the cargo  carrying section  of the truck, there are 6 different coloured uniform sized square pieces.  Their correct positions can  only be determined by reference to the model.
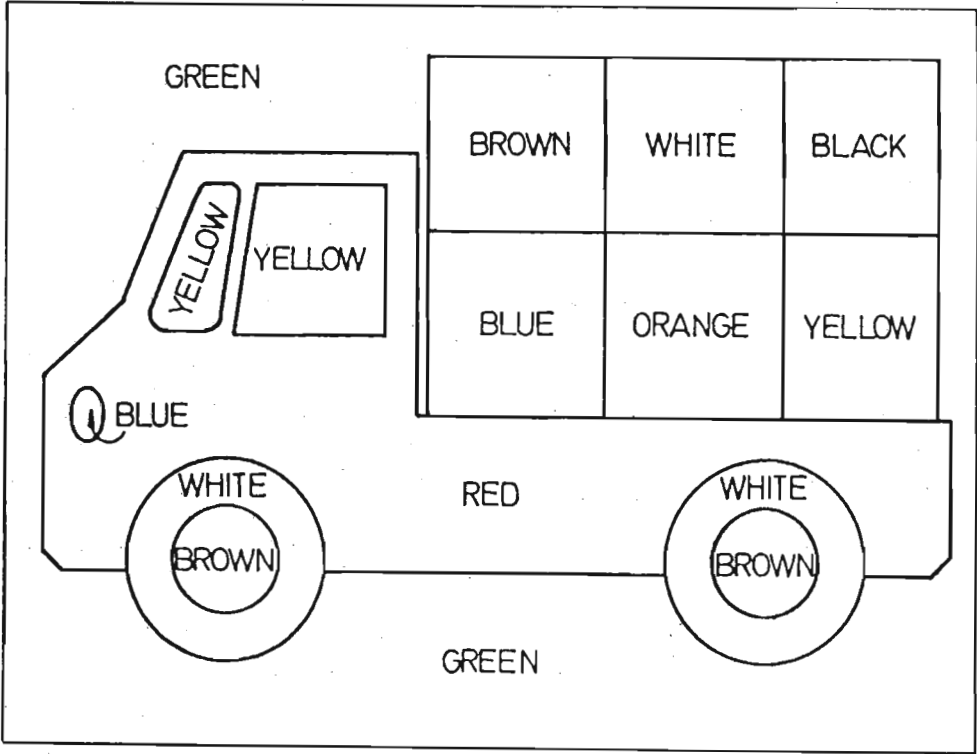


Figure 3(ii):  Truck Puzzle with Simple Cargo

3.1.2.3. <u>Task 2: Truck Puzzle</u> (Complex)

This puzzle is identical to the previous puzzle except for the cargo which
had five pairs of differently shaped pieces in a range of colours.
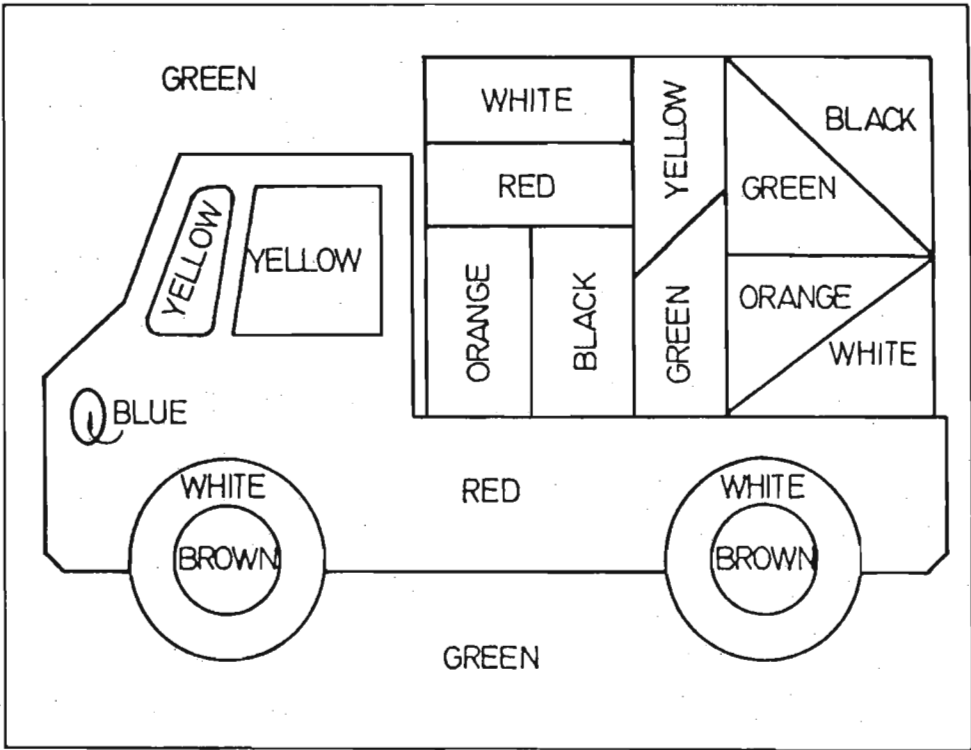


<u>Figure 3(iii):</u>  Truck Puzzle with Complex Cargo

3.1.2.4.  <u>Task 3:  Block Puzzle</u>

This 3 dimensional puzzle consists of the following:  a base board;  3
differently shaped rods (square, triangular and rectangular);  a  set of
blocks that  can be  stacked on  the rods.   The 9 blocks are varied: <u>in</u>
<u>colour</u> (black,  white  and  red);     <u>in shape</u>    (square,  triangular and
cylindrical);   and in  <u>inner shape</u>  i.e. the holes through which the rods
were placed (square, triangular and rectangular).

The colours black, white and red were chosen because there  are Zulu terms
for these colours.  The dimensions of the puzzle pieced are as follows:

Board:        27cm X 34cm        Blocks:        4,5cm X 4,5cm
Rods:         23cm               Inner Hole:    1cm X 1cm

In all  tasks extra pieces were included that were either correctly shaped
but incorrectly coloured  or  vice  versa.   This  misleading  factor was
introduced to increase cognitive complexity of the task.
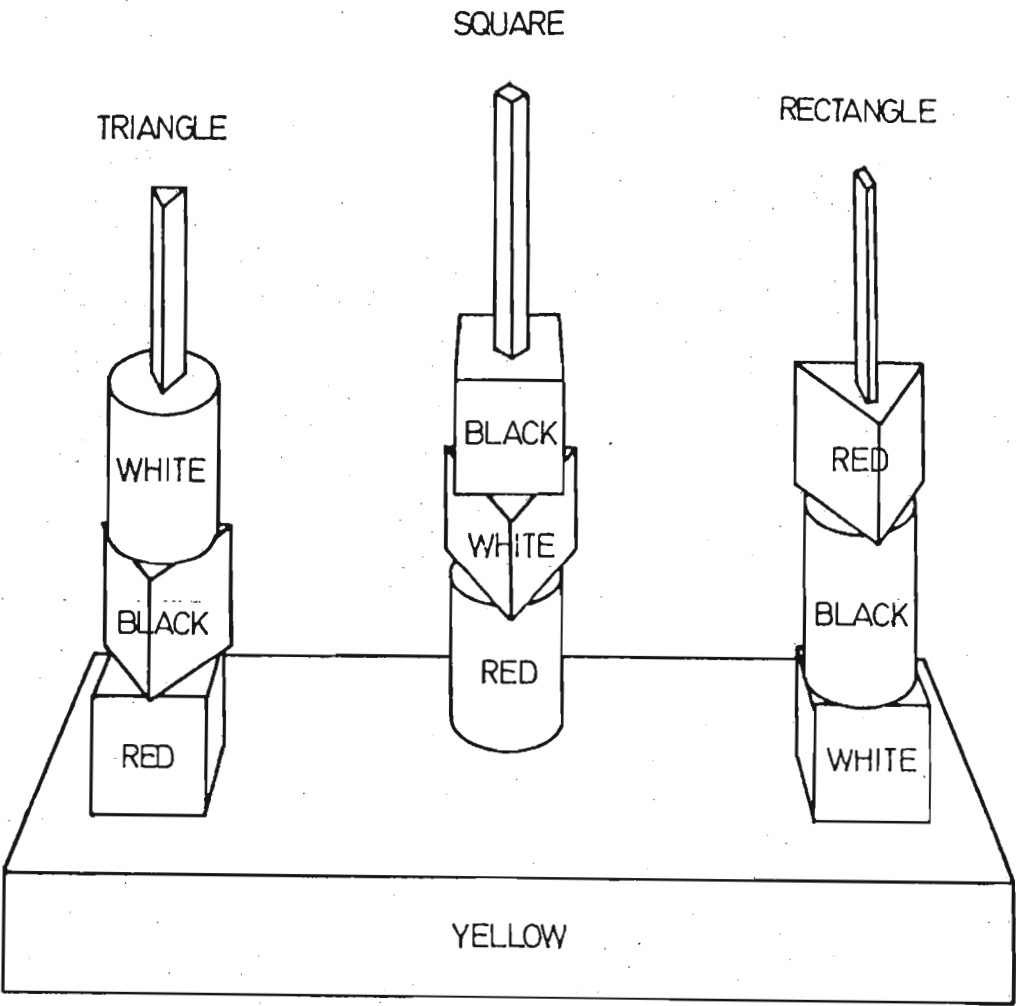


Figure 3(iv):  Block Puzzle

### 3.1.2.5. The Recording Apparatus

In the small hall used for the study, a video camera and trained operator were screened from view by a curtain. The children were seated side by side at an ordinary wooden table. A small distance away from them, the author, fellow student and supervisor were also screened. The Zulu demonstrator acted as spokesperson.

All interactions by the children on the tasks were videorecorded. The demonstrator initially modelled the demonstration puzzle for the subjects prior to the filming of each dyad. If problems with the task became dominant, or the tutor failed to teach the sibling, the demonstrator would intervene and advise the tutor by recapping her instructions.

### 3.1.3. Procedure

### 3.1.3.1. Venue

A church hall situated near shops and clinic was chosen as the setting for this study. The atmosphere was friendly and informal. Other subjects awaiting their turn sat outside or played in the shade.
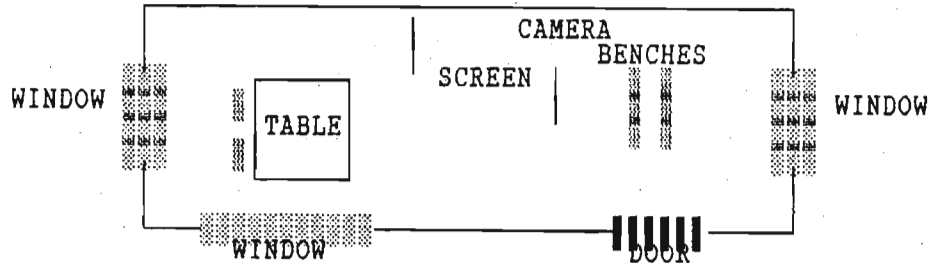


Figure 3(v):  Layout of Venue

### 3.1.3.2. Instructions – to Subjects

All instructions were given by a trained Zulu research worker. A translated transcript of the instructions is included in the Appendix. Children were told that they were to play a new game and that the older sibling (tutor) would teach the young one (tutee) how to do this. It was emphasised that the child should be the main executor of the task. The tasks were presented sequentially then each child was rewarded with a small sum of money, sweets and a new pencil.

3.1.3.3. <u>Data Analysis</u>

The processing of the data proceeded through four stages.
Firstly, the dialogue on the video tapes was transcribed, translated and dubbed into English by the bilingual Zulu research assistant. These tapes were then coded by the author and Stanbridge (1984). The tape was stopped at approximately 5 second intervals to allow for micro-analysis of task behaviour, using both the dubbed video tape and the transcript.
Secondly, coding for a content analysis was carried out using a set of categories devised to identify the task behaviour of the tutor and tutee. (Miller & Craig 1983, Kok & Beinart 1983). These provided a quantitative basis for analysis and interpretation of the learning interaction. The coding system is detailed below.
Thirdly, the quantitative data were subjected to statistical analyses.
Fourthly, a subjective commentary on each tutor, based on the translated transcript of their videotaped performance, provided a qualitative overview of the sibling interaction. This complements the statistical findings.

3.1.3.4. <u>Content Analysis Coding System</u>

There are 7 main behavioural categories, namely Executions, Directives, Questions, Demonstrations, Mediations, Confirmation/Negation and Other.
The subdivisions of each category were coded to facilitate a fine-grained behavioural analysis. These are listed after the broad description of each strategy.

i)      Executions (Exec)
All behaviours involving the choice and placement of puzzle pieces. For example, motor manipulation to get precise placing, removal and correction.

ii)     Directives (Direc)
This category includes verbal and non-verbal instructions in which one member of this dyad (usually the tutor), attempts to direct the activities of the other (usually the tutee) without reference to the model. Directives could be general (e.g. 'Put it here') or specific. Directives offering discriminatory cues based on shape, colour, size or position were separately coded e.g. 'Take the yellow one' or 'Put it above'.

iii)     Questions (Ques)

All attempts to elicit information or feedback concerning  task behaviour,
i.e. verbal and non-verbal checking questions as well as those relating to
specific features of the pieces.


iv)     Demonstrations (Demo)

The tutor verbally or non-verbally models a task for the tutee to imitate.
Included  here  are  any  short-cut manoeuvres designed to facilitate task
execution.


v)     Mediations (Med)

This category includes any signs of  joint mediated  learning having taken
place.  This involves  a correlational  reference between the puzzle task
and the model in order to place the pieces appropriately.  These  could be
verbal or non-verbal, explanatory or referential.


vi)     Confirmation/Negation (C/N)

Verbal/non-verbal feedback of a positive or negative nature.


vii)     Other

This category consists of miscellaneous behaviours ranging from active and
passive forms of attending to task, to aimless  chatter, attention getting
and general comments.


3.1.3.5.  Behaviour  category  codes


10      Task execution: any picking up and placing of pieces.

10+     Execution with comment: e.g. 'This one goes here' whilst placing
        piece.

10      Execution with another shadowing  the activity:  tutor  or
        sibling's hand hovers next to the execution of the piece.

10-     Removal of a piece: when a piece is taken out after being placed
        in the puzzle or sibling reaches for piece.

10R     Sibling (tutee) reaches for a piece:  when  tutee  uses own
        initiative to choose a piece and reaches for it.

10M     Taking piece  from model:  when sibling (tutor or tutee) removes
        piece from reference model.

| 11 | Trial and error: when sibling attempts to place pieces at random and without thought. |
|---|---|
| 12 | Motor manipulation: a fine movement, where a piece is fiddled this way and that in an attempt at execution. |
| 13 | Execution using force: hammering in a piece. |
| 14 | Correction: changing a piece after definite execution. |
| 14+ | Self correction: executor repositions or changes piece after realising that it's incorrectly placed. |
| 16 | Asynchronous activity: when tutor and tutee are not engaged in the same task but are occupied on two separate activities at once. |
| 17 | Preparation for executions: tutor glances at model for own purposes without referring child to model. |
| 19 | Inspection: checking to see if placing is correct. |

| 20 | <u>Directives</u> (Any verbal or non-verbal instructions) |
|---|---|
| 20 | Verbal directive: e.g. 'Take this one and put it there'. |
| 2F | Directive to force execution: e.g. 'Push/smack it in'. |
| 20 | Directive to be precise: 'Put it in properly'. |
| 2A | Non-verbal directive: indication by nodding in the direction or pointing to a piece without using words. |
| 2L | Non-verbal levering of child's hand: tutor picks up child's hand and positions it on the puzzle. |
| 20V | Verbal 'levering' of child's activity: where tutor's physical indication of the position for the piece on the puzzle is accompanied by a verbal indication. |
| 20 - | Instruction to 'leave it' after failed attempt to execute: tutor gets impatient. |
| 21 | Restraint: tutor pulls back tutee's hand and prevents involvement in the task. |
| 26 | Child instructed to wait to afford tutor thinking time. |

| 2C | Colour directive: 'Take the red one'. | |
|---|---|---|
| 2N | Naming of piece: e.g. 'Take the wheels'. | discrim- |
| 2P | Position directive: e.g. 'Put it above the red one'. | inatory |
| 2S | Shape directive: e.g. 'Take the square one'. | cues |
| 2Z | Size directive: e.g. 'Take the little one'. | |

| 30 | Questions |
| --- | --- |
| 30 | Verbal questions: e.g. 'Which one next?' |
| 31 | Verbal checking question: e.g. 'This one?  Is this one right?' |
| 30A | Non-verbal question: looking up inquiringly for confirmation. |
| 301A | Non-verbal checking question: |

| | | |
| --- | --- | --- |
| 3C | Question regarding colour | questions |
| 3N | Question regarding piece name | regarding |
| 3P | Question regarding position | specific |
| 3S | Question regarding shape | features of |
| 3Z | Question regarding size | a piece. |

| 40 | Demonstrations |
| --- | --- |
| 40 | Demonstration: tutor  places a piece, removes it and then allows the tutee to copy his/her example. |
| 41 | Short-cut manoeuvres: where tutor or tutee makes the task easier by, for  example, arranging  pieces to facilitate recognition or placing. |

| 50 | Mediations |
| --- | --- |
| 50 | Referring to the model: when tutor refers tutee to the model and tutee takes note.  This can  be looking, pointing or verbal reference. |
| 51 | Model comparison: an explicit attempt to draw attention  to both the model and the attempt to copy it. |
| 52 | Organisation according  to model: the task explained in terms of the general layout e.g.  'See how the  truck  looks  with the wheels, the light and the back'. |
| 53 | Questioning with  regards the  model: questions e.g.  'Should it look like that truck?' |
| 54 | Out of context reference: comment relates to the task but refers to an extra task factor e.g.  'See this truck is like the one we saw in town'. |
| 55 | Task explanation in context: the task is explained in detail but without reference to the model. |

| 22 | Confirmation/Negation |
|---|---|

22      Confirmation: positive verbal or non-verbal feedback e.g. 'Yes' or a nod of the head.

$\overline{22}$      Negation: negative verbal or non-verbal feedback e.g. 'No' or shake of the head.


15      <u>Other</u>

15      Aimless activity: attention is distracted from task and tutor or tutee engages in activity which is not task related.

18      Awaiting instructions: tutee is attentive to the ongoing task proceedings but sits passively awaiting direction from the tutor.

18 +      Engages in task: tutee participates actively in the task. Denotes greater participation than previous category.

23      Remark re conduct: e.g. 'You're being naughty'.

24      Attention getting: attempt to attract attention either to ask a question or to get participation in task.

42      Comment: any passing remark e.g. 'I'm tired'.

43      Asynchronous comment which is task related: comment which is totally unrelated to the task e.g. 'When am I going to get a sweet?'

44      Chatter: when tutor and tutee have lost interest in the task and talk to each other about unrelated topics.


### 3.1.3.6. <u>Modifications to previous coding system</u>

As this system of coding was originally devised for a mother and child sample but was retained in the present study for comparative purposes, it was decided to re-allocate some of the codes to provide a sharper perspective of siblings' teaching behaviours. The modifications that were felt to be necessary are the following:-


Directives

As tutors appeared to give very few references to specific features of pieces and their positioning, these directives (2c -2z) were singled out from general instructions and quantified separately as cues. It was hoped that this would give some indication as to the amount of discriminatory regulation provided by tutors.

## Executions

Behaviours that contributed actively to selection and placing of pieces (10 - 16) were separated out from the 'looking' behaviours i.e. glances at the model and inspection (17 + 19). This distinction was made so that if a tutor had a high proportion of executions it could be discovered if these were due to the tutor doing the task for the tutee, or if this could rather be attributed to preparatory and checking behaviours. A new code was added, IOR, to try and describe the tutee's gestures towards initiating task execution. The number of times the tutee reached for a piece was monitored to yield a quantifiable result of this attempt at autonomous execution. This was contrasted with a frequency of physical restraints (21).

## Confirmation/Negation

In assessing reinforcement patterns the contributions of negative (22 + 21) versus positive (22) feedback were individually analysed. It was felt that such a differentiation would enable inferences to be made as to the amount of discouragement or encouragement the tutee received (or in some cases gave). The 'restraining' category of Code 21 (Directives) was included here as a negating influence on the tutee's initiative in attempting self-regulation.

### 3.1.4.   Reliability

Disagreement between the two coders was resolved by reviewing the tape until consensus was reached. Coders trained until they reached 90% agreement with the analysis used in coding the mother/child study (Miller & Craig, 1983, Kok & Beinart 1983) from which the categories were taken.

### 3.1.5.   Problems with Part 1 of this Study

The following problems were experienced in this section.

### 3.1.5.1.   The Sample

a)   Subgroups were very small, eg. young male tutors N = 5. A large number of behaviours were scored zero for non-activity thus limiting the suitability of a range of tests. Thus it was not possible to examine the interaction of age and sex in a single analysis.

Although recent work by Whiting (1986) and colleagues reveals small sample sizes, (ranging from six to ten or twelve pairs in a group) she is working with a large pool of such studies. (It is also interesting to see some of her samples date back to field work done 20 years ago).

b)   Subjects were grouped according to age. This meant there was no selection according to school performance i.e. some 13 year olds were in Std 2. Several explanations could be offered: lack of access to earlier schooling, financial problems, lack of settled residency, overcrowding in schools, domestic responsibilities, or lack of resources. There were no criteria of cognitive competence so that a tutor's performance might reflect an age or a cognitive factor. Within the limitations of this study an age factor was assumed to be the more relevant variable. Personality factors were not considered. Tests for perspective-taking skills, field-dependence or independence, would have given useful measures to correlate with teaching style.

### 3.1.5.2.   The Venue

The advantage of the centrally situated hall was at times jeopardised by the disturbances caused by outside noise or curious onlookers offering distractions through the windows. This was counteracted to some extent by make-shift curtains. The camera spotlight was also worrying for some tutees. A friendly atmosphere was established but the arrangements were too novel for the participants to allow them to really feel relaxed and 'to play'. The preferred setting would be the individual homes but this posed insurmountable problems, for video recording as well as for arranging access, avoiding interruption and finding sufficient space, and would have greatly added to the time factor.

### 3.1.5.3.   Procedure

Task/Role Comprehension
One of the difficulties in posing such tasks for children is ascertaining their role comprehension. Do they perceive the requirements of the task in the way envisaged by the researcher? Such uncertainties are of course

compounded by the cross-cultural context of this task. Secondly, there are linguistic complications which may not have been obviated by the demonstrator being Zulu-speaking herself. Her style of speech may be within the Western convention (as could be deemed proper for the task) and this in itself could have obscured the project's intentions. Words like 'play', 'game', 'make identical' might not carry the same connotations for the Zulu child as they would for a White/Western child. The flow of instructions (length of sentences, rhythmic intonations) might not have been presented as informally/colloquially as might have been appropriate. i.e. the style of instructions was sensible to the adults concerned, including the demonstrator: how it sounded to the children, in this setting, might have been different/non-sensible.

It was striking how many of the female tutors seemed unable to comprehend the interventions made by the demonstrator when the tutor was 'stuck' in her task or else working without regard for the tutee. The constraints of the situation appeared to 'paralyse' the tutors so that they continued behaving as they had before the intervention.

Similarly, the transcription of dialogue (very often it is more monologue) and the dubbing of the tape can only be seen as a 'compromise' strategy due to lack of Zulu fluency by the researchers. The 'flavour' of the interaction must be somewhat reduced by translation. Two dyads had to be dropped from the study as the sound was too poor to transcribe.

### 3.1.5.4. The Apparatus

It is interesting that some labels were unfamiliar to the children eg. the headlights of the truck are commonly referred to as the 'torch', indicating the greater familiarity of the latter.

Some of the younger tutors had difficulty in orientation of the puzzle. The demonstrator's exhortations to 'make it straight' or to 'face it the same way' did not necessarily help. It seems as if some children would have preferred to try the puzzle vertically instead of lying it flat. Possibly a greater period of rehearsal with practice tasks would have eased the children's handling of the puzzle, or an opportunity presented for the tutors to first rehearse the task themselves.

The block puzzle in Task 3 would seem to have been more easily manipulated as it could be picked up and tangibly experienced as differently shaped. However, the permutation of variables (colour, outer shape, inner central shape) made the task difficult. As noted earlier, the complex version of this task (the actual blocks are segmented in different ways and have to be assembled prior to threading on the sticks) was abandoned. The tutors who were given the task did not themselves abandon the puzzle as too difficult nor did they ask for help: they continued trying to randomly assemble the pieces although obviously baffled by the task.

Perhaps a more familiar task involving conceptual classification or matching should have been included as well as the intentionally novel task. In this way a broader reflection of teaching strategies might have been obtained.

### 3.1.5.5. Analysis of the Data

a) The subdivision of categories into finely detailed actions illuminates the interaction and behavioural strategies of each dyad. A good deal of this coded complexity is lost when the scores are collapsed together in the broad categories. Although some refinement of code grouping was attempted (eg. feedback behaviours, restraint, inspections) it would seem that re-grouping some of the behaviours into more specific teaching strategies would have been helpful.

The coding for Mediation is meant to provide for this interaction but very few behaviours that coincided with this perception were evidenced. Possibly a more basic form of categorisation was needed. McLane's (1981) study used broader groupings based on the amount of self-regulation, other-regulation and looks to the model (akin to Feuerstein's mediation). A compromise between these two approaches would seem to suggest that the coarse-grained and fine-grained requirements of this type of research could thus be accommodated.

At other times the codes seemed to overlap each other eg. 18,18+ (passively attending) and 30,31 (verbal + verbal checking question). 'Passively attending' formed the bulk of the Other category for tutees and should have been separately coded as this behaviour is an important aspect of the tutor-tutee interaction pattern.

b) There are problems of interpretation with the quantitative data. Interactional differences are not necessarily revealed by frequency scores on selected behaviours. The assessment of competency becomes difficult when the broad categories blur performance eg.a high score on directives includes 'do this' and 'put here' (simple instructions) as well as cues for colour, shape or position i.e. the style may be a basic deietic form of instruction or it may be one of conceptual discriminations. The analysis, however, does give an indication of trends and patterns in the teaching situation.

## 3.2. Part 2: Caretaking Survey Interviews

The aim of collecting this empirical data was to discover:

(i) the extent of sibling participation in caretaking roles and
(ii) the broader context of the children's informal learning environment.
(Bronfenbrenner, 1979)

The purpose of these interviews was to establish:

a) The number in the household and its composition.
b) The proportion of mothers who worked.
c) The ratio of adults to children.
d) The number of single sex parent families.
e) The level of education both in the immediate home and in the surrounding social network.
f) A profile of employment levels, e.g. unskilled, semi-skilled, clerical/professional.
g) A record of the distribution of caretaking activities in the home.

## 3.2.1. Subjects

The same sample of subject families as for Part 1 was used. An interview was conducted with the main caretaker of each tutee's family household as well as with the older sibling of the tutoring dyad (in two cases the children were from the same kinship group).

## 3.2.2. Apparatus

Questionnaires were used to investigate the following aspects of the social context of the subjects.

a) Demographic details: number in household, type of kin relationship, age, sex, educational level, type of job, and time at home.

b) Caretaking activities: thirteen typical parenting/family tasks are listed. The main persons responsible for them are recorded and commented on. This set of questions was applied twice: once to the main adult caretaker and once to the sibling caretaker, to provide a second point of reference (reality check).

c) Neighbourhood interaction: demographic details of those adults and children in the vicinity of the household with whom the target dyad came into contact.

## 3.2.3. Procedure

The interviews were conducted in the children's homes by a Zulu research worker trained in social work and interviewing techniques. The same research worker had assisted as demonstrator during administration of the puzzle tasks to the children, and was therefore not unfamiliar to the respondents. She was also familiar with the research programme as she had translated the videotapes of the sibling tasks into English. Access to the families' household was facilitated by her being a township resident with common points of reference so her credibility was not in question. These interviews took place prior to October 1984 when the tenor of township life began to change radically due to the socio-political climate.

## 3.3. Problems with Part 2 of this study

a) An attempt was made to distinguish whether tasks in the household were learnt through observation or imitation. However, most respondents gave both methods interchangeably.

b)  Respondents might have answered the questions in what they thought were appropriate or desirable terms eg. the educational qualifications and ages might not be objectively reliable.

c)  It was not clear in some cases if the adolescents were still actively attending school or whether temporarily withdrawn from schooling. Some scholars therefore appear to be in their early twenties which is not uncommon in the townships but the interviews did not clarify their status. Ages were not always consistently reported eg. the age given during the task session at the hall did not always tally with the reported age at the interview.

d)  A reflexive account of how caretakers, especially the siblings, perceived their roles would have valuably supplemented the frequency model. The qualitative involvement of the caretakers cannot be interpreted from the existing data.

# 4. TASK TEACHING BY SIBLINGS
## Analysis of results Part 1

This section is divided into Quantitative Results (4.1) and Qualitative Results (4.2).

## 4.1. Quantitative Results

The data is grouped into five sections with a corresponding analysis for each section.

i)  Teaching Style: overview.

In this section the broad trends that are apparent from tutors' performance over 3 tasks are discussed. To complement these results the data from a study by Kok and Beinart (1983) is used for a comparison between adult caretakers (mothers) and sibling caretakers to note comparable trends. These women were not related to the sibling sample but are drawn from the same township section and are considered representative of such households.

ii) Age Analysis:

Tutors are divided into Old Tutors (OT: 10 - 13 years) and Young Tutors (YT: 6 - 9 years) in order to assess developmental trends.

iii) Sex Analysis:

Tutors are separated into male and female tutor groups to explore possible gender related behavioural patterns.

iv) Combined Age-and-Sex Analysis:

The sample is divided into male/female (M/F) groups and old/young (O/Y) groups in various permutations. In this way possible interactions between sex and age trends in behavioural style can be noted.

v)  Category Refinement:

Certain categories are assessed according to selected coded behaviours formerly subsumed by these broad categories.

## 4.1.1.  Teaching Style: Overview

Table 4A

Tutor's Teaching Style: Proportions (and frequencies) of coded behaviours over three tasks

| CODE | TASK 1 | (X̄) | TASK 2 | (X̄) | TASK 3 | (X̄) | TOT X̄ |
|---|---|---|---|---|---|---|---|
| EXEC | 40 (438) | (16) | 41 (667) | (24) | 44 (522) | (19) | 42 |
| DIREC | 43 (481) | (17) | 39 (646) | (23) | 39 (466) | (17) | 41 |
| QUES | 2 ( 19) | ( 1) | 1 ( 15) | ( 1) | 1 ( 17) | ( 1) | 1 |
| DEMO | 1 ( 10) | ( 0) | 0 ( 6) | ( 0) | 1 ( 10) | ( 0) | 0 |
| MED | 3 ( 30) | ( 1) | 4 ( 70) | ( 3) | 2 ( 22) | ( 1) | 3 |
| C/N | 9 (105) | ( 4) | 12 (197) | ( 6) | 11 (132) | ( 5) | 10 |
| OTHER | 2 ( 26) | ( 1) | 3 ( 52) | ( 2) | 3 ( 31) | ( 1) | 3 |
| (TOTAL) | (1109) | | (1653) | | (1200) | (3962) | |

Table 4A presents the summary of tutor's behaviours over three tasks.  The dominant feature is the placing and directing of pieces which accounts for 83% of the total behaviours, both categories being about equal.  Tutor's therefore place the pieces themselves as often as they give directions to the tutees on how to place them.  Feedback of positive and negative types is the third prevalent behaviour (C/N = 10%).  The teaching strategies for joint interaction, and the hypothesised crucial area for mediated learning, is the Mediation category which constitutes 3% of the total behaviours.    Questions  (1%)  and  demonstration  are  negligible proportionately.  The final category coded as 'Other  behaviours' is rated as 3%  which is relatively high for miscellaneous (off task) activities in relation to the Questioning  and Demonstration  categories which  would be salient for  teaching purposes.   However, this total is constant over the three tasks.

There is some within task variation.  On  Task 3  the executions increase slightly (by 3% to  44%)  whereas on  Tasks 2  and 3 the directives have dropped to lower than they were on Task 1. (from T1:43%, to T2 and 3:39%). Mediation on  Task 2  (4%) doubles  that shown  on the  other tasks but is still very low overall.  The total number of responses on Task 2 is higher than on  the other tasks (Mean responses T2:N = 60; T1: N = 40; T3: N=43).

Table 4B

Mother/Tutor Comparison: Proportions (and frequencies) of coded behaviour over three tasks (T = task)

| CODE | MOTHERS* | | | | TUTORS | | | |
|---|---|---|---|---|---|---|---|---|
| | T1 | T2 | T3 | $\bar{X}$ | T1 | T2 | T3 | $\bar{X}$ |
| EXEC | 16 (329) | 28 (547) | 29 (740) | 24 | 40 (438) | 41 (667) | 44 (522) | 42 |
| DIREC | 53 (1075) | 35 (703) | 45 (1138) | 44 | 43 (481) | 39 (646) | 39 (466) | 41 |
| QUES | 1 (20) | 2 (37) | 2 (48) | 2 | 2 (19) | 1 (15) | 1 (17) | 1 |
| DEMO | 1 (17) | 1 (28) | 1 (17) | 1 | 1 (10) | 0 (6) | 1 (10) | 0 |
| MED | 13 (266) | 18 (364) | 7 (174) | 12 | 3 (30) | 4 (70) | 2 (22) | 3 |
| C/N | 13 (258) | 11 (224) | 11 (267) | 12 | 9 (105) | 12 (197) | 11 (132) | 10 |
| OTHER | 4 (84) | 4 (81) | 5 (116) | 4 | 2 (26) | 3 (52) | 3 (31) | 3 |
| TOTAL | (2049) | (1984) | (2500) | | (1109) | (1653) | (1200) | |

(6533)          (3962)

$\bar{X}$ = MEAN

* : Mothers' N=33 (T1), 22 (T2), 33 (T3) Kok & Beinart (1983).

The mothers in the earlier study reveal a different trend in that their executions are only half of the child tutor levels (mothers:24%; tutors:42%). The directives show similar proportions (mothers:44%; tutors:40%). The major and most important difference between the groups is in the mediation category. Mothers score 4 times higher (12%:3%). They also offer slightly more feedback (12%:9%) but whether the type of feedback is positive or negative is not known as it is not recorded in the mother-child study.

There is also a major similarity in the absence of questions and demonstrations, usually regarded as important teaching strategies. In both cases these behaviours do not rate more than 3% of the total. However interaction is at a much higher level for the mothers. They average 79 responses per task while the tutors average 47 behaviours per task i.e. mother's input is greater.

Figure 4(i)  Mother/Old Tutor/Young Tutor Comparison

Proportions of coded responses in main behaviour categories
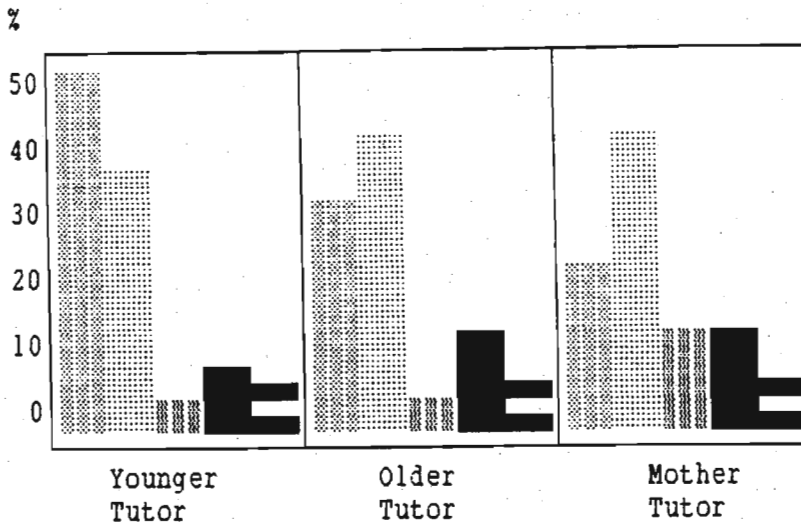


(Diagrammatic representation)

▓ executions

▒ directives

▓▓ mediations

■ confirming/negating

═ other (demo. and ques. included)
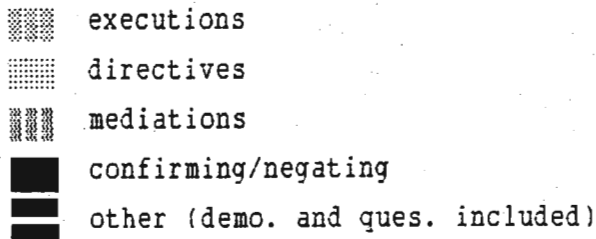
In Figure 4(i) the prevailing trends are graphically represented in this mother/old tutor/young tutor comparison. The increase in mediation from younger tutor to older tutor to mother tutor is clearly demonstrated: the mothers' rating is six times that of the younger tutors, and four times that of the older tutors. The mothers' executions are half that of the younger tutors. Though the confirming/negating category for mothers and older tutors has a very similar rating, it is not possible to discriminate between the proportions of positive and negative feedback.

Table 4C

Children/Tutees Comparison: Proportions (and frequencies) of coded behaviour over three tasks

| CODE | CHILDREN | | | | TUTEES | | | |
|------|------|------|------|------|------|------|------|------|
| | T1 | T2 | T3 | $\bar{X}$ | T1 | T2 | T3 | $\bar{X}$ |
| EXEC | 44 (716) | 51 (672) | 63 (662) | 53 | 50 (472) | 44 (567) | 52 (498) | 49 |
| DIREC | 0 (3) | 1 (9) | 0 (1) | 1 | 1 (13) | 1 (19) | 3 (25) | 2 |
| QUES | 16 (258) | 18 (235) | 19 (254) | 18 | 13 (119) | 14 (182) | 8 (74) | 12 |
| DEMO | 0 (3) | 0 (4) | 0 (0) | 1 | 1 (7) | 1 (7) | 0 (1) | 1 |
| MED | 14 (228) | 22 (281) | 8 (114) | 15 | 3 (26) | 3 (39) | 1 (11) | 2 |
| C/N | 0 | 0 | 0 | | 1 (7) | 1 (8) | 1 (11) | 1 |
| OTHER | 4 (421) | 8 (110) | 11 (145) | 16 | 31 (291) | 37 (480) | 37 (360) | 34 |

$\bar{X}$ = MEAN

\* Mothers' N = 33(T1), 22(T2), 33(T3) Kok & Beinart (1983)

In Table 4C the results of the adult and child tutoring behaviours on their tutees are compared. The patterns are similar: a predominance of executions (Mo.C:53%; T.T.:49%). The children working on the puzzles with their mothers ask somewhat more questions (18%:12%) and engage in mediation seven times more often than do the siblings with the child tutors. It is also noticeable that passive waiting or irrelevant behaviours (OTH) are twice as high for the sibling tutees (T.T.:34%: Mo.C:16%). This is the second largest category for both groups constituting over a third of the total behaviours.

This category is not only a measure of distractability. Its importance really lies in revealing how little time was actually spent by the tutees on actually 'solving' the problem i.e. working on the puzzle. Two of the codes, 18 and 18+, indicated the passive participation of the child. The tutee would sit compliantly awaiting instructions, sometimes without interest (18) and sometimes alert to the tutor's activities (18+). The child was not necessarily restless or obdurate and the greater bulk of this category consisted of this 'passive behaviour'. There was little

aimless activity or chatter or comment and little attempt at attention getting. Asynchromous comments did occur with some of the younger tutees but the overall impression provided by this category is of compliant 'pupils' awaiting instruction. It was not considered worthwhile subdividing this category but it is important to note the real meaning of the term.

4.1.2. Age Analysis: Old Tutors (OT) / Young Tutors (YT)

Table 4D

OT/YT: Proportions (and frequencies) of coded behaviours over three tasks

| CODE | OLD TUTORS | | | | YOUNG TUTORS | | | |
|------|----|----|----|-----|----|----|----|-----|
| | T1 | T2 | T3 | $\overline{X}$ | T1 | T2 | T3 | $\overline{X}$ |
| EXEC | 33 (195) | 36 (337) | 34 (213) | 34 | 47 (243) | 46 (330) | 54 (309) | 49 |
| DIREC | 45 (265) | 43 (395) | 43 (270) | 44 | 42 (216) | 35 (251) | 35 (196) | 37 |
| QUES | 2 (14) | 1 (9) | 2 (13) | 2 | 1 (5) | 1 (6) | 1 (4) | 1 |
| DEMO | 1 (6) | 0 (3) | 2 (10) | 1 | 1 (4) | 0 (3) | 0 (0) | 0 |
| MED | 4 (24) | 5 (51) | 2 (13) | 3 | 1 (6) | 3 (19) | 2 (9) | 2 |
| C/N | 13 (74) | 13 (127) | 15 (95) | 14 | 6 (31) | 10 (70) | 7 (37) | 8 |
| OTHER | 2 (12) | 2 (19) | 3 (19) | 2 | 3 (14) | 5 (33) | 2 (12) | 3 |
| TOTAL f | 590 | 941 | 633 | 2164 | 519 | 712 | 567 | 1798 |

GRAND TOTAL 3962

$\overline{X}$ = MEAN          f = frequencies

By separating older and younger tutors (Table 4D) several nuances in behavioural trends emerge. The most striking result is the inversion of proportional scores between the 2 groups on the dominant categories. For OT's executions only reach 34% while for YT's the score rises to virtually 50% of behaviours. The number of directives for OT's is 44% while that of the YT's is 37%. The general trend of low questioning, demonstration and mediation ratings remains though the OT's score is nearly double the YT's for mediation on Task 2 (OT:5%; YT:3%). Feedback by OT's is nearly double YT's (OT:14%; YT:8%).

Table 4E

Age Analysis: Proportions (and frequencies) of coded behaviour yielded by tutees of old and young tutors over three tasks

| CODE | TUTEES OF OLD TUTORS | | | TUTEES OF YOUNG TUTORS | | |
|---|---|---|---|---|---|---|
| | T1 | T2 | T3 | T1 | T2 | T3 |
| EXEC | 45 (222) | 46 (329) | 50 (250) | 56 (250) | 42 (238) | 51 (248) |
| DIREC | 1 (3) | 1 (5) | 1 (5) | 2 (10) | 2 (14) | 4 (20) |
| QUES | 17 (83) | 11 (80) | 8 (41) | 8 (36) | 19 (102) | 7 (33) |
| DEMO | 1 (5) | 1 (4) | 0 (1) | 1 (2) | 1 (3) | 0 (0) |
| MED | 5 (23) | 4 (31) | 2 (11) | 1 (3) | 1 (8) | 0 (0) |
| C/N | 1 (5) | 0 (2) | 1 (5) | 0 (2) | 1 (6) | 1 (6) |
| OTHER | 30 (148) | 38 (271) | 37 (184) | 32 (143) | 35 (199 | 36 (176) |

In looking at Table 4E the differences in tutee performance of the two groups can be compared. The trends are similar : executions are the major behaviour (±50%) but on Task 2 this drops to 42% for YT tutees. Tutees of young tutors are twice as busy giving directives as those of the older tutors. For both groups questioning forms about 12% of the total behaviours. OT tutees show a steady decline in this behaviour over tasks. Mediation is still obviously proportionately low, but more so for the young tutors' group (1%). The OT tutees have a 4% mean rating with scores dropping steadily over tasks from 5% (T1) to 2% (T3).

These trends were further analysed by computer using three different non-parametric tests. The Kruskal-Wallis One-Way analysis of Variance by ranks was chosen for its usefulness in deciding whether independent samples, such as male and female tutors, did form different populations. The differences in sample values were tested to see if they signified genuine population differences, or chance variations. It is regarded as more efficient than median tests because the magnitude of the scores is more fully preserved (Siegel, 1956). The Mann-Whitney U Test is considered 'one of the most powerful of the non-parametric tests, and is a most useful alternative to the parametric "t" test' (Siegel 1956, p116). Only the significant findings are presented. (See Table 4F 6 - Age Analysis). The other test used is the Wilcoxon Matched-Pairs Signed-Ranks.

4.1.3.   <u>Sex Analysis: Male Tutors (MT)/Female Tutors (FT)</u>

<u>Table 4F</u>

<u>MT/FT:  Proportions (and frequencies) of coded behaviours over three tasks</u>

| CODE | MALE TUTORS | | | | FEMALE TUTORS | | | | TOTAL f |
|---|---|---|---|---|---|---|---|---|---|
| | T1 | T2 | T3 | $\bar{X}$ | T1 | T2 | T3 | $\bar{X}$ | |
| EXEC | 33 (153) | 34 (265) | 41 (219) | 36 | 44 (285) | 46 (402) | 45 (303) | 45 | 1627 |
| DIREC | 49 (228) | 42 (322) | 39 (208) | 43 | 39 (253) | 37 (324) | 39 (258) | 38 | 1593 |
| QUES | 3 (12) | 0 (9) | 1 (5) | 1 | 1 (7) | 1 (6) | 2 (12) | 1 | 51 |
| DEMO | 0 (1) | 0 (3) | 2 (9) | 1 | 1 (9) | 0 (3) | 0 (1) | 0 | 26 |
| MED | 2 (10) | 1 (42) | 2 (10) | 2 | 3 (20) | 3 (28) | 2 (12) | 3 | 122 |
| C/N | 10 (48) | 13 (103) | 12 (62) | 12 | 9 (57) | 11 (94) | 10 (70) | 10 | 434 |
| OTHER | 3 (13) | 4 (29) | 4 (19) | 4 | 2 (13) | 3 (23) | 2 (12) | 2 | 109 |
| TOTAL f | 465 | 773 | 532 | 1770 | 644 | 880 | 668 | 2192 | 3962 |

$\bar{X}$ = MEAN          f = frequencies

The pattern of Table 4F reveals similar teaching tendencies : low questioning, demonstration and mediation, high executions and directives. The males provide more directives (MT:43; FT:38) while their executions are virtually 10% less per task than that scored by the females. (MT:36; FT:45). Female tutors engage in slightly more mediation (FT:3; MT:2) but offer less feedback (FT:10; MT:12). The Male tutors are twice as much 'off-task' as the female tutors (MT:4; FT:2).

Table 4F 1

MT/FT: Mean and standard deviations of coded behaviours over three tasks

| CODE | MALE TUTORS | | | | | | FEMALE TUTORS | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | TASK 1 | | TASK 2 | | TASK 3 | | TASK 1 | | TASK 2 | | TASK 3 | |
| | $\bar{X}$ | V | $\bar{X}$ | V | $\bar{X}$ | V | $\bar{X}$ | V | $\bar{X}$ | V | $\bar{X}$ | V |
| EXEC | 13 | 8 | 22 | 9 | 18 | 11 | 18 | 11 | 24 | 12 | 19 | 7 |
| DIREC | 19 | 9 | 27 | 11 | 17 | 7 | 16 | 7 | 20 | 9 | 15 | 8 |
| QUES | 1 | 2 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 2 |
| DEMO | 1 | 3 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| MED | 1 | 2 | 3 | 5 | 1 | 2 | 1 | 3 | 2 | 4 | 1 | 1 |
| C/N | 4 | 4 | 9 | 7 | 5 | 5 | 4 | 6 | 5 | 5 | 4 | 3 |
| OTHER | 1 | 1 | 2 | 3 | 2 | 1 | 1 | 2 | 1 | 2 | 1 | 1 |

$\bar{X}$ = MEAN
V = STANDARD DEVIATION

In Table 4F 1 the trend for males to give more directives than females continues (M mean = 19, F mean = 16). In Task 2 the male tutors on average offer more feedback than females (M mean:9; F mean:5). Some of these differences reached significance as reflected in Table 4F 6.

On Task 1 MT's offer more directives to their tutees than do the FT's (P<0,05) and display less executions. This pattern still holds to a lesser extent for this category on Task 2, with a further trend occurring in the amount of mediation offered. The FT's provide a lower number of mediations than the MT's across tasks.

The standard deviation is in some cases larger than the mean. This is a reflection of the many zero scores within the data.

## 4.1.4.  Combined Age/Sex Analysis

Table 4F 2

OMT/YMT: Proportions (and frequencies) of coded behaviours over three tasks

| CODE | YMT<br>T1 | OMT<br>T1 | YMT<br>T2 | OMT<br>T2 | YMT<br>T3 | OMT<br>T3 |
|---|---|---|---|---|---|---|
| EXEC | 44<br>(70) | 27<br>(83) | 46<br>(117) | 29<br>(148) | 61<br>(129) | 28<br>(90) |
| DIR | 44<br>(70) | 51<br>(158) | 35<br>(89) | 45<br>(233) | 31<br>(65) | 45<br>(143) |
| QUES | 3<br>(4) | 3<br>(8) | 1<br>(3) | 1<br>(6) | 2<br>(4) | 0<br>(1) |
| DEMO | 0<br>(0) | 0<br>(1) | 0<br>(1) | 0<br>(2) | 0<br>(0) | 3<br>(9) |
| MED | 3<br>(4) | 2<br>(6) | 5<br>(12) | 6<br>(30) | 1<br>(3) | 3<br>(8) |
| C/N | 4<br>(7) | 13<br>(41) | 6<br>(16) | 17<br>(81) | 4<br>(8) | 17<br>(54) |
| OTH-ER | 3<br>(4) | 3<br>(9) | 6<br>(16) | 3<br>(13) | 2<br>(5) | 4<br>(14) |
| TOT | (159) | (306) | (254) | (519) | (213) | (319) |
| N = 12 | | | GRAND TOTAL =(1770) | | | |

The effect of age as an important factor in tutor's teaching style is striking when the two groups, OT and YT, are compared together over the three tasks.  The high execution pattern is much more emphasised for the YMT's than the OMT's (Tl: YMT:44, OMT:27;      T2:  YMT:46;OMT:29;      T3: YMT:61;OMT:28). Correspondingly the directives are all at least 10% higher per task for the older tutors than for the younger ones.  The rate of questioning drops after Task 1 to zero for OMT in T3 and 2% for the YMT's. Demonstration is not used as a strategy at all except by OMT's on T3 (3%). Both groups appear to offer similar amounts of mediation (mean:4%) with OMT's providing slightly more than the YMT's on T3 (OMT:3; YMT:1). Feedback is nearly three times more prolific per task from the OMT's. Their average is C/N: 14%, whereas the YMT's average is C/N:5%. Distraction from the task by YMT's on T2 is twice that of the OMT's (T2: YMT:6; OMT:3 in Other), but this trend is reversed in T3 where OMT's (T3:4) are twice as 'distracted' as the YMT (T3:2).

Table 4F 3

OFT/YFT: Proportions (and frequencies) over three tasks

| | YFT | OFT | YFT | OFT | YFT | OFT |
|------|------|------|------|------|------|------|
| CODE | T1 | T1 | T2 | T2 | T3 | T3 |
| EXEC. | 48 (173) | 39 (112) | 48 (213) | 45 (189) | 51 (180) | 39 (123) |
| DIR | 41 (146) | 38 (107) | 37 (162) | 39 (162) | 37 (131) | 40 (127) |
| QUES | 0 (1) | 2 (6) | 0 (3) | 1 (3) | 0 (0) | 4 (12) |
| DEMO | 1 (4) | 2 (5) | 0 (2) | 0 (1) | 0 (0) | 0 (1) |
| MED | 1 (2) | 6 (18) | 2 (7) | 5 (21) | 2 (7) | 2 (5) |
| C/N | 7 (24) | 12 (33) | 9 (54) | 9 (40) | 8 (29) | 13 (41) |
| OTH-ER | 3 (10) | 1 (3) | 4 (17) | 1 (6) | 2 (7) | 2 (5) |
| TOT | (360) | (284) | (457) | (423) | (354) | (314) |
| N = 16 GRAND TOTAL =(2192) | | | | | | |

This table represents a similar breakdown of behaviours to that in Table 4F 2 with the female tutors showing similar age difference to those shown in the male sample.

Again it is older tutors who execute less (OFT: mean:41; YFT: mean:49) though with a smaller discrepancy than that found between the two male groups. There is very little difference in amounts of directives. Somewhat surprisingly YFT's offer more directives on Task 1 (YFT's:41; OFT's:38) but on Tasks 2 and 3 the older tutors direct more. Very little questioning is done. The OFT's offer the most on Task 3 (YFT:0; OFT:4). As in the male group, demonstrations are negligible.

OFT's show more signs of mediation than YFT's especially on Task 2 (YFT:2; OFT:5). On Tasks 1 and 3 they offer much more feedback than YFT's (YFT:7; OFT:12) on Task 1 and (YFT:8; OFT:13) on Task 2.

Young female tutors are also more prone to being off-task than the older tutors (Other:T1: YFT:3; OFT:1). On Task 2 the ratio is 4:1 but balances out for Task 3 at 2% each.

In the following three tables P<0,10 is recorded as denoting a behavioural trend which could warrant further research.

Table 4F 4    Mann-Whitney U Test.  Tutors Across Tasks

|  | GROUP | TYPE | LEVEL OF SIGNIF. | COMMENT |
|---|---|---|---|---|
| ACROSS TASK | OMTd1/OMTd2 | Rank | P<0,10 | On T2 directives increase |
|  | OMTm1/OMTm2 | Rank | P<0,10 | On T2 mediation increases |
|  | YMTe1/YMTe2 | Rank | P<0,10 | On T2 execution increase |
|  | YMTd1/YMTd2 | Rank | P<0,05 | On T2 YMT's direct less |
|  | YFTd1/YFTd2 | Rank | P<0,10 | On T2 YFT's direct less |

In Table 4F 4 the results of the Mann-Whitney U Test for two independent samples are recorded across Tasks. On Task 2 the older male tutors offer more mediations and directives than they did on Task 1. The only difference in behaviour that reaches significance at P<0,05 is that the YMT's direct less on Task 2 than on Task 1.

For young male tutors executions increase from T1 to T2. The difference in YFT's in directives between T1 and T2 only approaches significance at P<0,10 i.e. the YFT's direct less on T2 than they do on T1.

Table 4F 5    Wilcoxon Matched-Pairs Signed-Ranks Test. Tutors: Intergroup

|  | GROUP | TYPE | LEVEL OF SIGNIF. | COMMENT |
|---|---|---|---|---|
| TASK 1 | OMT1e/OFT1e | Pairs | P<0,05 | OM's execute less |
|  | YMT1/YFT1 | Pairs | P<0,05 | YM's respond more |
|  | OMT1/OMT2 | Signs | P<0,05 |  |
|  | YMT1/YFT2 | Pairs | P<0,05 | YM's respond more |
| TASK 2 | OMT2/OFT2 | Pairs | P<0,05 | OM's respond more |
|  | OMT2e/OFT2e | Pairs | P<0,10 | OM's execute less |
|  | OFT2e/YFT2e | Pairs | P<0,10 | OF's execute less |
| TASK 3 | OMT3e/YMT3e | Pairs | P<0,05 | OT's execute less |

The Wilcoxon Signed-Ranks Test was used to further examine intergroup differences (Table 4F 5). The overall number of responses for males on T1 is significantly more for YMT's than for the YFT's (P<0,05). The OMT's also respond more than OFT's but it is only for the second task (T2) that the difference is significant (P<0,05). There is a trend towards difference between the same two groups in executions on T2: OMT's execute less than OFT's (P<0,10). OFT's execute significantly less than the YFT's on the same task (P<0,05). The only significant difference between pairs on Task 3 was that old male tutors execute less than young male tutors.

Table 4F 6

Kruskal - Wallis Analysis: Age and Sex Differences

| | GROUP | TYPE | LEVEL OF SIGNIF. | COMMENT |
|---|---|---|---|---|
| TASK 1 AGE | OMTel/OFTel | Rank | P<0,05 | OM's execute less |
| | OMTdl/OFTdl | Rank | P<0,05 | OM's direct more |
| SEX | MTel/FTel | Rank | P<0,10 | M's execute less |
| | MTdl/FTdl | Rank | P<0,05 | M's direct more |
| TASK 2 AGE AND SEX | OMTe2/OFTe2 | Rank | P<0,10 | OM's execute less |
| | OMTcn2/OFTcn2 | Rank | P<0,10 | OM's more feedback |
| | YMTm2/YFTm2 | Rank | P<0,10 | YM's mediate more |
| | OFTe2/YFTe2 | Rank | P<0,10 | OF's execute less |
| AGE | OTe2/YTe2 | Rank | P<0,05 | OT's execute less |
| | OTd2/YTd2 | Rank | P<0,05 | OT's direct more |
| SEX | Me2/Fe2 | Rank | P<0,10 | M's execute less |
| | Mm2/Fm2 | Rank | P<0,10 | M's mediate more |

(P<0,10 is recorded as denoting a behavioural trend which could warrant further research)

On Table 4F 6 the Kruskal-Wallis Analysis reflects that on Task 1 old male tutors execute less and direct more than old female tutors (P<0,05). On Task 2 this pattern remains for executions:- OMT's execute less than OFT's and they give more feedback (P<0,05).

The difference between male tutors and female tutors for executions only approaches significance (P<0,10) for Task 1 and Task 2 but there are significantly more directives given by male tutors (P<0,05) than given by female tutors on Task 1. The older tutors as a whole, execute significantly less, and direct significantly more, than the younger tutors (both P<0,05) on Task 2. Mediation and execution differences only approach significance (P0,10) in Task 2 between the male tutors and the female tutors: males mediate more often and execute less than the females.

On Task 2 the YMT's offer more mediations than the YFT's while the OFT's execute less than YFT's on this task. Neither trend reaches significance.

4.1.5.    Category Refinement:  Selection of Specific Codes

Table 4G

Tutor/Tutee Comparison showing proportions (and  frequencies) of

'reaching' versus 'restraint' behaviours  (10R vs 21)

| AGE | TUTEE | | | | | TUTOR | | | | |
|-----|-------|----|----|----|-------|------|----|----|----|-------|
|     | CODE | T1 | T2 | T3 | $\bar{X}$ | CODE | T1 | T2 | T3 | $\bar{X}$ |
| OT  | EXEC | | | | | DIREC | | | | |
|     | 10R | 14 | 16 | 14 | 15 | 21 | 12(33) | 17(68) | 10(28) | 13 |
|     | (TOT. EXEC) | (28) | (54) | (29) | (111) | (TOT. DIR.) | (265) | (395) | (270) | (129) |
| YT  | 10R | 22 | 13 | 15 | 16 | 21 | 18(38) | 15(37) | 16(31) | 16 |
|     | (TOT. EXEC) | (54) | (43) | (46) | (143) | (TOT. DIR.) | (216) | (251) | (196) | (106) |

Within the  executions category the behaviour  coded 10R  was selected to
examine  whether  autonomous  attempts  by  the  tutee  i.e.  'reaching'
behaviours, where  the child  stretches a  hand towards  the puzzle or its
pieces, were counteracted by tutor's blocking  action i.e.  restraining or
pushing  away  tutees  hands,  which  had  been  coded  in  the Directives
category.

The results are presented as proportions of the  original categories.   In
Task 1  and 3 for the old tutor's pupils and Task 1 for the younger group,
tutees' attempts  to participate exceeded  that of  the tutors' restraints
(T1,  OT.Tutee 14,  OT:12;   YT.Tutee 22,  YT:18;   T3: OT.Tutee 14: OT:10).
The mean proportion of behaviours over the 3 tasks reaches equilibrium for
the YT's  : (YT  Tutee mean:16,   YT mean:16)  i.e. the  number of reaching
behaviours is counteracted by an equal number of restraints by the tutors.

For the OT Tutees the mean  is slightly  above the  Tutor mean   (OT Tutee
mean:15, YT  mean:13).   That is,  they are  able to  attempt to reach the
puzzle more often than they are blocked by the tutor.

Table 4H        Confirming/Negating (C/N)

Confirming (22): Negating ($\overline{22}$ + 21)

Category Refinement: Proportions (and frequencies) of positive and negative feedback (OT:YT) over three tasks

| CODE | OT | | | | YT | | | |
|---|---|---|---|---|---|---|---|---|
| | T1 | T2 | T3 | $\overline{X}$ | T1 | T2 | T3 | $\overline{X}$ |
| 22 | 62 (51) | 60 (76) | 70 (67) | 64 | 23 (16) | 29 (33) | 20 (14) | 24 |
| $\overline{22}$ + 21 | 38 (31) | 40 (51) | 30 (29) | 36 | 77 (53) | 71 (81) | 80 (55) | 76 |
| TOTAL | (82) | (127) | (96) | | (67) | (114) | (69) | |

In distinguishing between praise and adverse feedback the OT's reveal a much higher frequency of positive feedback than the YT's (OT:67; YT:13). The negative feedback is interestingly reversed: older tutors use just over half as much negative feedback as positive, while the younger tutors use almost double the negative feedback as positive (YT:76; OT:36).

Table 4I        Confirming/Negating (C/N)

Category Refinement: Proportions (and frequencies) of positive and negative feedback (OT:YT) per task

| CODE | OT | | | | YT | | | |
|---|---|---|---|---|---|---|---|---|
| | T1 | T2 | T3 | $\overline{X}$ | T1 | T2 | T3 | $\overline{X}$ |
| 22 | 9 (51) | 8 (76) | 11 (67) | 9 | 3 (16) | 5 (33) | 2 (14) | 3 |
| $\overline{22}$ + 21 | 5 (31) | 5 (51) | 5 (29) | 5 | 10 (53) | 12 (81) | 10 (55) | 11 |
| TOTAL PER TASK | 576 | 942 | 633 | | 513 | 600 | 564 | |

If considered as a proportion of all behaviours per task the above tendency is clearly reflected. The OT's positive feedback is proportionately three times more than the YT's (OT:9, YT:3). The OT negative feedback is half that of the younger group (OT:5, YT:11) i.e. virtually 10% of all behaviours per task contained positive feedback from older tutors but for younger tutors the equivalent proportion is for negative feedback (YT:11%).

Table 4J 1     Discriminatory Cues

Category Refinement: Proportions (and frequencies) of total behaviours over three tasks

| CODE | OLD TUTORS | | | | YOUNG TUTORS | | | |
|------|----|----|----|---|----|----|----|---|
|      | T1 | T2 | T3 | X̄ | T1 | T2 | T3 | X̄ |
| DIREC 2c – 2z | 9 (55) | 9 (87) | 6 (35) | 8 | 6 (29) | 6 (43) | 3 (19) | 5 |
| EXEC 10 – 16 | 19 (114) | 21 (193) | 15 (98) | 15 | 26 (185) | 31 (222) | 39 (221) | 35 |
| EXEC 17 – 19 | 14 (81) | 16 (144) | 18 (115) | 16 | 11 (58) | 15 (109) | 16 (88) | 14 |

Table 4J 2     Discriminatory Cues

Category Refinement: Behaviours within original categories over three tasks

| CODE | OLD TUTORS | | | | YOUNG TUTORS | | | |
|------|----|----|----|---|----|----|----|---|
|      | T1 | T2 | T3 | X̄ | T1 | T2 | T3 | X̄ |
| DIREC 2c–2z | 21 (55) | 22 (87) | 13 (35) | 19 | 13 (29) | 17 (43) | 10 (19) | 13 |
| EXEC 10–16 | 58 (114) | 57 (193) | 46 (98) | 54 | 76 (185) | 67 (227) | 72 (221) | 71 |
| EXEC 17–19 | 42 (81) | 43 (144) | 54 (115) | 46 | 24 (58) | 33 (109) | 28 (88) | 28 |

These codes (2c – 2z) which form part of directives were separately classified to ascertain how many, if any, discriminating cues about colour, size, position or shape of puzzle pieces were given to the tutee. There is a definite trend towards more responses being provided by the OT's than by the YT's. Both groups gave less cues on Task 3. For Tasks 1 and 2 the ratio for OT:YT is 9:6 but this drops to OT:6; YT:3 in Task 3, where OT's provide double the proportion of discriminations compared with the YT's. From the executions category the YT's spend twice as much time placing the pieces themselves (10-16) than the OT's (YT: mean:35; OT:mean:15). In terms of glances to the model to check progress (17 – 19) the mean difference between these two age groups is not very marked (OT:mean:16; YT:mean:14). In Table 4J 2 these 'discriminatory' behaviours are presented in terms of the original category instead of the total behaviours per task. The emphasis shifts and the proportions for OT's are much higher than for the YT's (OT mean:46; YT mean:28). OT's place pieces themselves 54% of the time but this rises for the YT to 71% of the time. Of the directing behaviours of the OT's 19% is used for discriminating cues, whereas for the YT's this proportion is 13%.

## 4.2.    Qualitative Results

### 4.2.1.    Transcript Commentaries

In this section a descriptive commentary of the style of tutor interaction is given. A sample of the individual's coded behaviours is presented in box form. Task 2 was chosen for this purpose as the most important task for evoking teaching skills, and the four most relevant categories were selected: Executions (Exec), Directives (Direc), Mediation (Med), and Confirming/Negating (C/N). Where considered appropriate, proportions from other categories are included.

The commentary includes a consideration of the six mediational operators suggested by Craig (1985) and Kok (1986) as the functional attributes of the 'indigenous theory of childhood' they seek to elaborate. This theory is constructed from the perspective of the township mothers and is thought to reflect the implicit values about childrearing embedded in their social construction of reality. If this viewpoint is accepted, it would reasonably follow that the township children would have experienced such 'rules for being' and would also reflect them in their 'teaching' interaction.

### 4.2.2.    Six Mediational Operators   (Kok 1986, p40)

This term is derived from Feuerstein's (1979) emphasis on 'mediation' provided by adults as crucial to cognitive development in the child, and Pascual-Leone's term 'operators' meant to explicate Piaget's processes of 'accommodation and assimilation' (Kok 1986, p36). Kok does acknowledge that these operators are 'rationally reconstructed' and represent one possible formulation of 'generative mechanisms' (Kok 1986, p39).

The operators are listed below:

i)    Maintaining mutually exclusive role.

ii)   Emphasising the manifest task demands.

iii)  Embedding interaction in a 'know-how' (practical) paradigm (i.e. action → performance, rather than comprehension → performance).

iv) Embedding instruction in a 'know-it' (experimental) paradigm (minimal verbal cues, evoking intuitive compliance).

v) Providing an accepting environment for guided discovery.

vi) Construing the task in terms of social motives and goals (to do task with people; to subordinate one's own goals and desires).

### 4.2.3. Individual Tutor Commentaries

This qualitative résumé of each dyad is presented to substantiate the quantitative results that preceded this section. Such a descriptive method is similar in some respects to the phenomenological method which extracts 'clusters of themes' from an analysis of susbject protocols or transcripts. In this case the written descriptions provide a basis for protocol analysis to complement the statistical calculations. 'Each particular psychogical phenomenon, in conjunction with the particular aims and objectives of a particular researcher, evokes a particular descriptive method' (Colaizzi 1978, p53).

It is only through reflecting on the nuances provided by each tutoring dyad that the interactions can be empathically understood. In this way a 'methodological rapprochement' can usefully be obtained.

Twenty-two dyads-in-action are listed and presented. The protocols of six tutor pairs (Subjects 4, 9, 12, 23, 28 and 29) were considered as adequately represented by the interaction of other tutors and are not, therefore, included in this collection of commentaries.

Table 4 K

* = High
mediator

| Subject | Tutor | Page | Subject | Tutor | Page |
|---------|-------|------|---------|-------|------|
| 2 | OMT | 80 | 14 | YMT | 84 |
| 5 | OMT | 80 | 24 | YMT | 86 |
| 10 | OMT | 81 | 31 | YMT | 86 |
| 21 | OMT | 82 | 27 | YMT | 87 |
| 30 * | OMT | 83 | | | |
| | | | 1 | YFT | 94 |
| 6 | OFT | 88 | 8 | YFT | 95 |
| 13 | OFT | 89 | 11 | YFT | 95 |
| 15 | OFT | 90 | 16 | YFT | 97 |
| 17 | OFT | 91 | 18 | YFT | 98 |
| 20 | OFT | 92 | 22 | YFT | 99 |
| 26 * | OFT | 93 | 25 | YFT | 100 |

Subject 2:　　　　　YFC : 2½ years
　　　　　　　　　　OMT : 13 year

| TASK 2 | EXEC | DIREC | MED | C/N | (QUES) |
|--------|------|-------|-----|-----|--------|
|        | 32   | 49    | 0   | 20  | 1      |

The sibling tutor works confidently and the child questions and places each piece as directed being affirmed as she does so: 'you are a bright girl'.   She also gets plenty of 'position' directives - 'face it upwards, or downwards'.  The interaction is maintained throughout so that the sense of joint involvement is sustained but no categorised mediation is scored on this or the other tasks.   The vocabulary input of the tutor remains functional and stereotyped; his role is directive and dominant (role division).   Good rapport is maintained - the accepting environment, reflected in the high C/N score.  This 13 year old tutor is in Std 4, the most educationally advanced of the tutors and his tutee is one of the youngest.

Subject 5:　　　　　OMC : 4 years
　　　　　　　　　　OMT : 13 years

| TASK 2 | EXEC | DIREC | MED | C/N |
|--------|------|-------|-----|-----|
|        | 33   | 53    | 3   | 10  |

Colour cues are generously provided by this tutor, plus positioning cues and affirmation for correctly executed moves.

C　:　Fit where, here?
T　:　Ehe.
C　:　Here?
T　:　Ehe.
C　:　Should I turn it?
T　:　Yes, fit like that.
C　:　(pointing) Like this?
T　:　Yaa, good.  Now take another orange one.

The child's sense of potency is reinforced by the tutor's obviously careful cues which allow the child to execute the positions himself. The tutor is cautious when in doubt about his next selection: 'wait, let's see', and on completion of Task 2 says, 'let's have a look at this one' as he checks the model for a cross-reference, urging the child to notice the match and being satisfied with their work. The third task is competently done but with only one shape use: 'fit in the sharp hole' which leaves the child in a compliant rather than comprehending role. The relationship is cordial throughout, both participating in the task, but without the child's initiative being extended or affirmed.

This dyad illustrates what Kok has described as 'a collaborative endeavour - a process of co-agency' where the role of 'teacher' and that of the 'learner' must be mutually exclusive and complementary. The teacher in the problem-solving situation operates on the premise of being the 'one who knows' while the learner is cast in the role of 'one who does' (Kok 1986, p55).

Subject 10:        YMC  :  3 years
                   OMT  :  11 years

| TASK 2 | EXEC | DIREC | MED | C/N |
|---|---|---|---|---|
| | 34 | 44 | 1 | 13 |

The tutor keeps up a running commentary of directives: 'take this ... fit it properly ... there you are' so that he affirms the child for placing the pieces but does not encourage the child to observe or compare his puzzle with the model, nor does he contribute any naming cues. His confidence ensures his dominance and he is reluctant to allow the child to experiment. In Task 3 there is a lot of shadowing of the tutor's movements by the tutee as he _tries_ to participate. This tutor does verbalise his own difficulty: 'How on earth is this done?' but the child is not invited to solve the problems with him; the child remains submissive and compliant, without interest or enthusiasm, mechanically placing blocks in position as indicated by the sibling in the final task (this behaviour is not seen as co-agency but instead is interpreted as

compliance).   The tutor's confusion is expressed as irritation (high C/N)
which enforces the tutee's subordinate position.   This tutor is eleven
years old  in Std  I.  Task demands were not made manifest. Role division,
trial and error and minimal verbal cues are evidenced but  without a warm,
accepting environment.

Subject 21:          OMC  :  3½ years
                     OMT  :  12 years

| TASK 2 | EXEC | DIREC | MED | C/N |
|--------|------|-------|-----|-----|
|        | 34   | 37    | 3   | 21  |

(Ques and Demo both score 1%)

Interaction is  straight forward, the tutee compliant and interested.   The
tutor copes with the problems by checking the model, cautioning  the child
to  wait  till  directed.    This  tutor  uses  'yes' and 'no;' to confirm
positioning of pieces, asking at times for the  child to  check:   'do you
see?'  There is a sense of dialogue:

C :  Where shall I fit?
T :  Wait ... yaa, fit now ..... fit this one ... do like this,
which is  sustained throughout  the tasks.  This corresponds to Kok's term
of 'joint-action' as a mediational operator.

There are no discriminatory cues, no specific focussing on detail.   There
is co-operation and joint  accomplishment  though  the  tutor's role is
surprisingly passive and he does  not  check  the  model  continuously to
confirm his choices.

Subject 30 * :     OFC  :   4½ years
                   OMT  :  11½ years

| TASK 2 | EXEC | DIREC | MED | C/N | QUES | OTHER |
|---|---|---|---|---|---|---|
| | 3 | 32 | 27 | 32 | 5 | 18 |

These particular two children make up a very interesting dyad. The tutor encourages the child's actions and autonomy, the <u>tutee</u> uses questions and colours. There is mutual interaction on the tasks and possibly learning is through imitation. Mediation is clearly social, co-operative: the tutor and tutee are co-agentive but not as a teacher-role prescription would suggest. The high mediation score (the top score in the sample) reflects joint engagement on the task where action leads to greater confidence and gradual competence. The input is not however highly cognitively structured. It's almost suggestive of an evolutionary stage of learning which would not be evidenced from the quantitative data. The number of executions on Task 2 is very low, but neither this fact nor that of the directives score conveys the interweaving of action between the two agents, the dialogic interchange. This is presumably an example of the <u>social</u> context Vygotsky emphasises in mediation. In many of the subjects the tasks were asynchronous in any personal sense, and therefore not 'social' (except at a superficial level) The 'zone of proximal development' may not have been effectively tapped in such cases because the tension between actual and prospective development was not evoked. This particular tutor-tutee dyad seems to have been engaged at such an interface where learning could have occurred.

A description such as this give rise to various questions:

i)      How subjective or idiosyncratic is such a rendering of the 'text'?

ii)     In what ways are the mediational operators suggested by the indigenous theory superseded?

iii)    In what 'perspective' can these operators then be placed?

These issues will be considered again in the final discussion but the problems they contain need to be alluded to at this stage.

OMC  :  4 years

                                YMT  :  8 years

| TASK 2 | EXEC | DIREC | MED | C/N |
|--------|------|-------|-----|-----|
|        | 33   | 30    | 8   | 12  |

Ques  : 4
Other : 16

In Task 1 the child uses initiative while the tutor gradually abandons his
passive stance and offers a good succession of colour <u>discriminating</u> cues.

T :  'The white one .... let's see now.... and then take this one  out and
     put in a black one ...  do you know a black thing?  Take this out and
     put in a black  one.   Ehe.   Put in  a blue  one here  ... an orange
     one....'

They <u>work together</u> with an apparent sense of common purpose and desire for
achievement.  The sibling does  not  restrain  the  child.   Discussing a
piece:

C :  Leave it, leave it ... don't show me.
T :  Alright  then  -  you  copy  for  yourself  here  (pushing  the model
     forward),
     look and be sure you make it truly beautiful ...

After an intervention from the demonstrator to <u>teach</u> the child,  the tutor
launches  forth  into  a  detailed  description,  offering colour cues and
questioning the child, maintaining a good repartee.

T :  'do you  know  a  white thing?  ... You  don't!   Do you  know a white
     thing? ...  Not that  one ...  there's a white one over here ... see,
     you're now closing this space ... now do a red  one ...  your own red
     car, one  for here, a red car ... one for here ... we are going for a
     ride ...'

Later after an altercation with the tutee, he says: 'You  do not  know the
building of  our car...our car is going to hurt us if we make it like this
...'

Here the tutor personalises the task and displays an imaginative play involvement which fans the child's enthusiasm and interest. The tutor works aloud, explaining his difficulty when a piece doesn't fit: 'it means we placed it (the piece) wrongly by this one ..... this is truly difficult I tell you ...... there are some difficult ones .... do you see that there is no space ...... It's got its own wheels, your car, but how is it going?' He invites the child's observation all the time, always using colour references.

The child dismantles the model to the tutor's frustration;

T : 'It would have been better if it had been me who came here alone or with Zalehale – but you! you don't know a thing .... see my car is complete .... yours is not complete .... its this small ..... look at mine here, and then look here at yours'.

This is a delightful rare example of mediation – where the tutor, after good humouredly maintaining his status, invites the child to compare the puzzles, to use referencing and to consider the purpose of the task-making the car 'beautiful'.

In the third task the two work together, the tutor verbalising the process as he goes along, and referring to the model. He uses shape and colour, questions himself aloud, teases his brother 'you're a real dunderhead', but keeps up an active and informative commentary approving his pupil's successes. In fact the task is performed by trial and error despite the tutor's discriminatory skills but the positive significance is the co-operation between the two children to cope with a challenge. In this case the 'problem-solving' is co-agentive, co-operative and collaborative. Role division, that of the 'knower' and 'doer' is maintained, and social motives and goals evidenced. The environment is accepting and the task demands made manifest. The experimental 'know-it' paradigm is not used: cues are explicit and generous. A trial and error sequence suggests the 'know how' paradigm forms one of the mediational operators.

<u>Subject 24:</u>          OFC : 4½ years

                            YMT : 7 years

| TASK 2 | EXEC | DIREC | MED | C/N |
|--------|------|-------|-----|-----|
|        | 56   | 39    | 3   | 0   |

(Demo : 1)
Only 3 children use demo
on T2: Subj. 24, 16, 11.

The maintenance of role of instructor despite the lack of competence is evident here. There is no struggle for status or power. Perhaps it is significant that the tutor in this case is male whereas in Subject 31 the tutee and sibling were both male. Here the tutor dutifully attempts the task with the pose of demonstrating how it's done but in fact the directives form a set of self instructions while the tutee passively looks on or plays independently, being ignored by the sibling (in this case, a non-competent peer). The rules of the game are that the older child should know what to do, and this is exactly what the tutor tries to uphold. Interestingly both teachers and mothers also maintained the semblance of competence even when baffled by the task, not acknowledging confusion or varying their approach to resolving difficulties. Trial and error provided the ritual action while the words presumably formed the liturgy or magic with which, if one persisted long enough, some result or reward would surely be forthcoming. This type of interaction probably sadly reflects what occurs all too often in educational settings and confirms the claim by some observers (Fanon 1973, Ngugi wa Thiong'o 1981) that colonial institutions have frequently provided a caricature not an imitation of the Western system of education.

<u>Subject 31:</u>          YMC : 3 years

                            YMT : 6 years

| TASK 2 | EXEC | DIREC | MED | C/N |
|--------|------|-------|-----|-----|
|        | 79   | 17    | 3   | 0   |

(high exec's, low direc.,
low C/N.)

Here the child's interest is ludic! He sees the car as a fantasy vehicle; 'Have you ridden it?', attempts the task and on being discouraged plays by

himself.  The tutor is not able to do the task or mediate.  Child taunts Tutor, 'are you a cry baby?' and undoes part of the puzzle.  Being bored with the puzzle task, he calls on the Demonstrator to defy the sibling. In the third task the child actually is assertive and places pieces successfully, in between mocking the sibling, at times parodying the directives 'like this, like this'.  He leaves the task to attend to nature, a self-assured and lively child, undaunted by camera or stranger.

This liveliness might be due to an extrovert nature on the part of the tutee and an unassertive and very young sibling tutor.  It might be that the child's developmental ability is more advanced than that of the older boy.  This subject pair is unusual in that it shows a 'turning of the tables' when the tutee is more dominant than the tutor, and more successful in task exploration.  The tutor's attempt to control the situation is aggressive: 'I'll hit you, do you hear', or 'I'll tell on you, you're being naughty' rather than any appeal for co-operative problem solving or joint fun in choosing pieces.  Again what is highlighted here is the importance of role where task engagement is seen as dependent on authority or superiority, and when this fails, the learner usurps the role of dominance.  What could be being 'learnt', is an awareness of personal power politics!

Subject 27:          OFC  :  4 years
                     YMT  :  7 years

| TASK 2 | EXEC | DIREC | MED | C/N |
|--------|------|-------|-----|-----|
|        | 60   | 36    | 0   | 0   |

(Other : 4)

The tutor's uncertainty provokes a blocking of any initiating manoeuvres made by the child:  'No, leave it, leave it', is the response to the child's attempted selecting of pieces.  There is a fairly desperate searching for pieces despite the demonstrator's intervention.  In Task 3 the child is silent and the tutor valiantly battles on with a trial and error process saying, 'Take this, put it here' with a monotonous and unproductive determination.  No mediation can be said to have taken place. The tutor may have begun to establish for himself some realisation of

different forms but no dialogue or exchange is possible where the tutor is totally baffled by the task and his role. At no time does he ask for help or acknowledge defeat. Endurance or perserveration is the mode of response, or, it may illustrate a developmental time lag. Little C/N is used and the high proportion of executives indicates the tutor's attempts to do it himself is in lieu of teaching his sibling. Exclusive role division is maintained and also the so-called 'know-it' and 'know-how' paradigms of instruction.


Subject 6:          OMC : 3½ years

                    OFT : 11 years


| TASK 2 | EXEC | DIREC | MED | C/N |
|--------|------|-------|-----|-----|
|        | 38   | 55    | 0   | 5   |


The sibling tutor is verbally restrictive and restricted in her vocabulary, directions are terse and there is an overriding dominance which incapacitates the child.


T : leave that ... you'll confuse me (continues fiddling with pieces, then) take this one.

C : this one?

T : Ehe.

C : But its mine!

T : Do like this now (and executes piece herself).
    Later she adds:
    Where will we fit this one in? (whispers to C) say 'here'.

C : Here.


The tutor offers little in way of instruction or encouragement, and plays mostly silently by herself to complete the task. Her executions total 10 moves in Task 1 and the child's executions equal zero. Similarly in Task 3 she completes the puzzle despite interventions by the demonstrator during the session to get her to involve her tutee. (It is not clear if such demonstrations are perceived as tuition, or advice).

In Task 1 executions total a proportion of 77% of behaviours. In Task 2 this has dropped to 38% after intervention, but the higher percentage of directives (55%) is not an indication of a more fruitful endeavour as the sample exchange illustrates. The exclusive role, the paradigms for 'know-it' and 'know-how' instruction are all evidenced here.

Subject 13:     YFC : 3½ years
                OFT : 10 years

| TASK 2 | EXEC | DIREC | MED | C/N |
|---|---|---|---|---|
| | 57 | 39 | 0 | 3 |

| TASK 3 : | MED | C/N |
|---|---|---|
| | 0 | 15 |

The tutor assumes sole responsibility for Task 2 by giving directives and executing these herself (57%). She offers no discriminatory cues, nor is there any attempt to 'mediate' the task. At the end of Task 1 the tutee's only comment was, 'Are we now going to go home?'. The tutor's performance is an unvarying monologue: 'Take this ... and put it here'. By the end of the second task the demonstrator intervened and the pair repeat the task. The tutor does then provide more directives, particularly of position, but she does not refer the child to the model. Her role is very definitely a dominating one rather than a 'facilitating' one (in Western terms) for she continues to mostly place the pieces herself. (The child only places the pieces herself three times). In Task 3 the relationship of stick shape to the stick hole in the block remains baffling. After two interventions the tutor does manage to direct the tutee sufficiently, using colour cues, to complete the task but she does not make any reference to these distinctive shapings that make the puzzle's significance. Such a 'text-in-action' is very difficult to 'read'. One interpretation would be that the sheer novelty of the task blocks the tutor from absorbing the purpose of the instructions: she has no 'context' in which to place the information so it remains non-sense to her. She therefore continues to perform in order to maintain an appearance of competence (to 'save face' or to ensure her 'reward'). Or, alternatively, she _is_ performing competently as she understands the role of 'teacher' which _is_ to 'do' everything. There is no experimental encouragement for the tutee. From where does the difference in role perception stem as this subject is at such odds with

fellow peers like Subject 26 or Subject 30? Such discrepancies in role perception suggest that the zone of proximal development may be more complex than the formulated six mediational operators.


Subject 15:         OMC  :  4 years
                    OFT  :  12 years


| TASK 2 | EXEC | DIREC | MED | C/N | DEMO | OTHER |
|--------|------|-------|-----|-----|------|-------|
|        | 33   | 44    | 8   | 8   | 3    | 5     |


The tutor knows her colours but finds the orientation of the model impossible to match despite receiving help from the demonstrator. There seems confusion about transferring the concept of direction from the flat position of the model to the 3-D form as suggested by the intervention (i.e. the tutor kept trying to hold the puzzle up to view it vertically). Task completion was achieved through verbal exchanges like this:

C  :   Put this one? (holding up piece questioningly)
T  :   Put this one (points).
C  :   This one? (holding up piece)
T  :   Put this one (points).

This simple format continues, but by Task 2 the tutor does attempt to assist her pupil by giving some colour cues and direction cues:

T  :   Make it (the car) face that way, in the direction of the shop.

The tutor makes some of the sample's few explicit references to the model, which brings the mediation total up to 8% for Task 2, but this was after the demonstrator had encouraged a change in interaction. Verbal cues or the vocabulary to apply them - seemed limited. This could also be interpreted as the suggested 'experimental' mediational operator providing minimal verbal cues. In Task 3 the two children struggle with the blocks trying to fit them on the sticks but do not check the model for guidance. The tutor executes most of the task herself. The pupil has been willing to perform but was not given any scope by the baffled tutor.

The role division of tasks seemed to supersede the action/doer paradigm. The tutee was not meant to 'do' - just to 'watch', despite his eagerness to participate. This tutor, in Std 3, does not live with her parents but stays with her grandmother. Her uncle and aunt are surrogate parents.

Subject 17 :     OFC : 4 years
                 OFT : 11 years

| TASK 2 | EXEC | DIREC | MED | C/N |
|--------|------|-------|-----|-----|
|        | 94   | 0     | 6   | 0   |

Demo: 6%

This tutor is virtually silent. When she does speak she responds to the demonstrator in whispers, completes the tasks silently while the child silently watches. In the last task, near the end the child ventures: 'what about this one?' There is no verbal response from the sibling who fits the blocks silently!

The demonstrator tries to get a re-run on Task 1 and intervenes very soon to say she wants to hear:

T : 'Hear what?'
D : 'I want to hear you telling her...instructing her and guiding her..'

Some verbal comments follow - 'fit in this one' and the child selects a piece which the tutor confirms and child places, but there is very little personal interaction here.

This tutor seems to perceive her role as performer: She is 'knower' and 'doer'. In Task 2 there are no directives at all, executions are 94% of the behaviours, the remaining 6% being a single mediation. In Task 3 executions drop to nearly 80%, directives increase to 14%, and mediation is 7%. This subject gives the lowest number of responses.

The only mediational operator noticeable is that of exclusive role division. The 'environment' is neither accepting nor construed in social terms or motives.

Subject 20:           YMC :  2½ years
                      OFT :  10 years

| TASK 2 | EXEC | DIREC | MED | C/N |
|--------|------|-------|-----|-----|
|        | 38   | 48    | 0   | 13  |

In a whispered conversation, the tutor assures the child that she (the tutor) will 'do it all for you', despite the task instructions. Several false starts ensue where the tutor continues to monopolise selection and placing of pieces, actively discouraging the child's tentative attempts. In Task 2 the child is restless, wondering where 'his sweets and money' are and the desperate tutor threatens punishments, finally smacking the child after he'd pinched her. In the third task there is some co-operation where the tutee complies with the instructions: 'take this .... fit here'. The task is rapidly completed by the tutor. The mechanics of the 'lesson' are joylessly endured.

The tutor is assertive and <u>competent</u> at doing the puzzles, but her interest totally functional and expedient. The tutee is quelled into submission, but would like to have participated. Task 1 was all based on non-verbal directives, revealing the child's good observation skills but the trial and error of Task 2 provoked his frustration and in Task 3 the tutor completed each stage to the tutee's annoyance. The tutor does not explain or use colours.

Here the tutor abandons the role division of 'teacher' and 'pupil' and operates as both 'knower' and 'doer'.

Subject 26 * :       OFC  :  4½ years
                     OFT  :  12 years

| TASK 2 | EXEC | DIREC | MED | C/N |
|--------|------|-------|-----|-----|
|        | 25   | 34    | 22  | 14  |

low questions : 1%
demo 5 % on Task 3

This tutor maintains a friendly encouraging tone and invites comparison
with the model puzzle.

C :  And this one?
T :  Hm, this one, look here ... where is the one like this?
C :  Like this?
T :  Nono, not that one, the one like this (demonstrates)?

The child is asked to look for the comparison herself. No cue is provided
but the child is clearly able to match the piece which would confirm her
actual developmental level so that her potential level will be challenged
to include shape, colour and size although this remains implicit in most
of this mediation example. After an initial task completion the tutor
invites the child to repeat the process: 'I won't tell you now ... copy
from me ... take again' and actively affirms each successful move the
child makes. This is an exceptional exchange. The dialogical rapport is
evident and a sense of competence is transmitted to the pupil.

In the second task, shape and colour are provided as cues as well as a
continued exhortation to place pieces independently: 'now put it for
yourself'. When a piece is mismatched she pauses, testing some out,
saying 'Hmm, somewhere we made a mistake ...... what about this one?' and
the child says 'it is here, look' and provides the piece, but they do not
finally complete the puzzle accurately. In the third task the child sees
which piece to select and reflects excitement at her success (the tutor
was uncertain at that point). They continue working together, a co-
operative endeavour, where the tutor is unwavering in her purpose to allow
the child to master the task herself. ('Co-operative endeavour' is
understood here as a mutual engagement in the task: an egalitarian rapport
is evident, not the authoritarian/hierarchical type as reflected in Kok's
use of 'co-operative' problem solving).

That point of excitement where the tutee has grasped the conceptual relationship required for the task seems to be an illustration of the flashpoint in proximal development. Crudely, the description 'something clicked' would similarly reflect this moment of development, perhaps the nearest glimpse one gets to the hypothesised notion of structural change in cognitive development. The learning has arisen out of the socially mediated experience of collaboration but without extensive verbal discriminations having been employed. Such learning is assumed to be relevant to the formation of 'generative mechanisms' i.e. the child should be able to generalise from this experience to other learning situations. 'Learning' in this example refers to the consolidation of concepts presented by the puzzle, not the effects of 'cultural operators'.

Subject 1:          OFC  :  4 years
                    YFT  :  7½ years

| TASK 2 | EXEC | DIREC | MED | C/N |
|--------|------|-------|-----|-----|
|        | 40   | 27    | 1   | 21  |

Although the instructions remain simple the dyadic interaction is good. The tutor and child keep up a running interaction of question and answer: there is a responsiveness to each other. The older sibling does refer to the model, 'See how it is?' and offers some colour cues, but is not competent herself to comprehend the problems or to offer useful directives and by Task 3 she resorts to a trial and error system repeating the same instructions 'fit it here', without insight and yet without abandoning her role of tutor. Rapport is good despite a high negative feedback rate.

As will be seen repeatedly throughout the tapes, this pseudo-mastery of the task is consistent with cross cultural findings on sibling caretaking where mimicry of adult roles is observed sometimes to the point of an over-mimicry and exaggeration of perceived parental behaviours so that tyranny or domination can become an established pattern for the sibling caretaker (Weisner, 1982). A definite form of hierarchy persists despite sibling rivalry, jealousies and conflicts.

Subject 8:          OMC  :  4 years

                    YFT  :  6 years

| TASK 2 | EXEC | DIREC. | MED | C/N |
|--------|------|--------|-----|-----|
|        | 60   | 36     | 0   | 4   |

Here the young tutor does not find the task easy but keeps up a cheerful flow of instructions and confesses that one is 'unable to fit sometimes while at the beginning you could'. The child is eager to participate but the sibling tutor seems to feel control lies in issuing instructions and suppresses the child's spontaneous efforts to explore for himself. 'Wait', she says, 'I'll fit it'. She does however show awareness of the child's position. 'I'm confusing you ... do fit like this .... do you see ... do you see?' but mostly she undertakes the work herself. This pseudo-teaching, especially by the maintenance of voice and role, is an attempt to maintain status but she blocks the child's efforts to 'learn' herself. This power struggle erupts briefly in Task 2 where sibling rivalry usurps the semblance of control she fosters as tutor, but this is regained by Task 3 where she randomly selects pieces in a confident monotone without checking the model. The high execution level, low directives and negligible feedback indicate the priority she has given to completing the task through the 'know-how' paradigm. Her manner is mostly accepting if her status is not threatened. She is in Class 1 and lives with her grandparents (The grandmother was a teacher of Std 8).

Subject 11:         YMC  :  3 years

                    YFT  :  6 years

| TASK 2 | EXEC | DIREC | MED | C/N |
|--------|------|-------|-----|-----|
|        | 55   | 24    | 0   | 6   |

Though the tutor really does not ever grasp the way to resolve her tasks she struggles to make her car 'work' through trial and error, supplemented by demonstrator interventions. She uses names and colours in a way that suggests a clear grasp of the car's symbolic function, the lights, the

wheels, and though she keeps up an attempt to engage the younger child, she tends to ignore his direct questions for help or clarification (as if there were no time to attend to him!)

C   :   The wheels .... you haven't put them in, Mali ...... do put on the wheels ... please put on the wheels ....

T   :   Do like this ... like this ... (continues selecting and placing pieces)

C   :   Please put on the wheels (holding a wheel in the air). Let me fit on the wheels ... oho! (manipulates piece).

T   :   Do like this .... lean these wheels here .. they are moving!.. (continues her placing).

This excerpt reflects the child's initial eagerness to participate and the tutor's preoccupation with placement so that reciprocal problem solving is not facilitated and the child's frustration level rises. By Task 2 his confidence in the tutor is very low. He keeps asking 'Is this how it's put in?' but the tutor has realised there are problems with the truck's position and finally re-orients the puzzle correctly, saying 'Oho, this is how it's done'. The child takes pieces, naming their colours and tries to place them although the tutor tries to redirect him. The last task reflects the mutual confusion as both children try to find the correct positions, neither accepting the credibility of the other. The tutor has learnt something - she corrects the model's position herself. There are however interactions by the demonstrator for each task, twice for the third puzzle. There is no mediation and in all tasks the tutor's execution level exceeds that of the tutee.

The older child does recognise some of the manifest task demands and certainly understands role division. Her younger - male - sibling is still optimistic about role flexibility - or wary of peer competence.
The working mother (Std 7) is middle-aged. Her husband (Std 2) is on a disability grant and stays at home, with the grandmother (Std 4).

Subject 16:      YMC :   3½ years

                 YFT :   8 years

| TASK 2 | EXEC | DIREC | MED | C/N |
|--------|------|-------|-----|-----|
|        | 38   | 40    | 0   | 19  |

There is keen interest from the child: 'I want to place ...' but the sibling is in a flurry of indecision and selects and places and removes pieces to the child's bewilderment.   On Task 2 the tutee exhorts the sibling to 'play' as she hesitates and finally admits 'we don't know!' This is the only time a tutor admits this.

The demonstrator intervenes and encourages the tutor to teach which she then tries to do: the child asks:

C  :     Should I take this one?

T  :     Ehem (affirming) ... where will you put it in?

C  :     Here? (points)

T  :     Ehe (confirms position)

C  :     Like this? (positions piece)

T  :     Ehe, ehe.

and later:

C  :     Here?

T  :     No,no

C  :     How?  Like this?

This exchange of question and answer is rapid and continuous and very lengthy as the tutor is continually struggling to make the pieces fit. The child yawns but does not oppose, baulk or threaten the sibling but by Task 3 the tutor's patience is wearing thin and she threatens a hiding to quell the child's assertiveness to place pieces.

T  :     Fit this .. no not there .. fit here .. not like that .. like
         this ... like this .. hai, its not the right one ...

She discriminates colour and shape at times but the child finally succeeds in placing blocks himself saying triumphantly:

C    :    I'm the one who got it in.

The sibling continues to struggle to find blocks - and towards the end of the task once again the child is full of glee: 'It's I who put it in, it's I who put it in'.

This is a rare glimpse of an achieving child who is not discouraged by an incompetent sibling but who perseveres and resolves the task. In this example the role playing of the tutor does not deter the tutee. Interaction is maintained throughout - the high C/N score reflects the attempted shaping behaviour of the tutor - her attempts to uphold her role. By Task 3 the C/N has dropped to 9% and the mediation score (her only one) reaches 9%. The tutee however has not been awed by 'role division' and increasingly enjoys his assertions of independence and goal achievements: the stirrings of personal autonomy.

The tutor is 8 years old in Std 1, and her mother has passed Std 10, the highest grade of all the mothers. The tutee's ebullience could be interpreted as gender related, or perhaps a reflection of lesser peer status due to the smaller age gap.

Subject 18:          OFC :  4 years
                     YFT :  6 years

| TASK 2 | EXEC | DIREC | MED | C/N |
|--------|------|-------|-----|-----|
|        | 44   | 42    | 2   | 12  |

This young tutor was faced with a task which was obviously not part of her usual experiences. She struggles to carry out the requirements using one method only which is trial and error, the so called know-how paradigm. A strong sense of role allows her to dominate and to reject suggestions made by the tutee who, in Task 1, seemed to have grasped the need to match her puzzle with the model. (In 'natural', unobserved play, this interaction may have evolved differently and raises interesting issues). By Task 2 and 3 the tutee has relapsed into a more passive role while her sibling places the pieces, despite her intermittent protests. She attempts to participate at times.

The demonstrator gives a lengthy re-explanation of task but the difficulties remain. The tutor (Class 1) continues to retain her pose of coping with the task without varying the strategy of endless trial-and-error. Her sense of role division is thus strongly developed, which as caretaker to her sibling, would be appropriate. The female tutee is aware of the compliance expected of her role, (unlike the young male tutees apparently), but yearns to establish greater role flexibility. The mother has a Std 6 qualification and is at work. The father is not resident. The grandmother (Std 2) is the primary caretaker.

Subject 22:           OMC : 3½ years
                      YFT : 9 years

| TASK 2 | EXEC | DIREC | MED | C/N |
|--------|------|-------|-----|-----|
|        | 34   | 53    | 0   | 10  |

This is a lengthy session where the tutor is perplexed by the tasks and has to rely on trial and error to complete them. The child gets restless and has to be reminded that his rewards (sweets) depend on his co-operation; he is fairly explicit about his reluctance to stay, hoping to go and play outside but not being aggressive or rude (role division). The older sibling also remains non-threatening (accepting environment):

T : Put it in nicely, do you hear - you'll get sweets if you put in nicely, yaa ...

C : They don't give me (any)!

T : They will give us ... take this ... wait, old man, don't go yet ... you won't get sweets if you refuse.

The interaction is sustained throughout and the tasks eventually accomplished, but without explanation or labelling, or the child's real involvement in the task. Mediation score is nil throughout. The tutee is thwarted by the sibling's indecisions and lack of clear success. What is interesting is the pseudo-pedagogic manner of the tutor in maintaining her role.

She is reported as being in Std 3 which is unusual for her age. Her mother is very young (24 years) and has Std 5. The father is in residence and while the mother works there is an aunt as caretaker (Std 2).

Subject 25:  YMC :  3 years
             YFT :  7 years

| TASK 2 | EXEC | DIREC | MED | C/N |
|--------|------|-------|-----|-----|
|        | 52   | 30    | 0   | 4   |

In this interaction both tutor and tutee are assertive. The child actively attempts to select pieces while the tutor attempts both to instruct and monitor any overtly autonomous selections (role division). The tutor does notice colour. In the first task she succeeds in directing her charge to complete the task. By the second task the child's patience has waned and in frustration hits his tutor and later bites her. She continues with her task uttering threats 'I'll report you', without conviction, and without quelling her pupil's indignation. He begins to mock her teaching style, and question her actions, 'Lungile, what are you doing ... Lungile, exactly what are you doing?' as her incompetence in the task is clearly obvious to him. As Task 3 continues to prove formidable, he wails 'what am I to do?' while the sibling perseveres with trial and error executions. Despite lengthy interventions by the demonstrator the sibling cannot or will not allow the child to carry out the task. He finally resorts to song and leaves the session after six songs including 'Tana, Tana, hallelujah' indicating that learning has successfully taken place elsewhere! There is no mediation and minimal feedback (4%).

The tutor's working mother is still young (25 years). She has Std 7. The father is not in residence and the family live with the grandmother (Std 7) and relatives.

5.    CARETAKING   SURVEY   INTERVIEWS
          Analysis of results Part 2


5.1.    Demographic Details

Note: These tables were compiled by the author, and have appeared elsewhere as part of the research programme (Clark 1984, 1985).


5.1.1.    Household

Household family composition was grouped according to four categories:


5.1.1.1. Family Type


Table 5A

| Nuclear | Both parents | 11% |
|---------|--------------|-----|
| Extended | Both parents | 36% |
| Extended | Mothers only | 43% |
| Extended | Grandmothers | 11% |


The most prevalent type of household is that where the mother is living amongst relatives usually with one, but not infrequently both grandparents (43%). The presence of 'both parents', in extended families for a reported 36% of the sample, suggests a possibly more stable pattern than that reflected in the interviews.

The fathers are 'present' in that contact and visits are maintained, but permanent residential status within that household can be somewhat flexible depending on job demands.  In one of the extended-grandparents type households, both paternal and maternal grandparents were involved while the mother lived next door with her immediate family.  Caretaking was thus spread between the two households. Fathers were described in a participatory way in 48% of the families.

5.1.1.2. Educational and Occupational Levels:

Household Members

| | Table 5B | | Table 5C | |
|---|---|---|---|---|
| | Educational Level | | Occupational Categories | |

| Educational Level | N | % |
|---|---|---|
| Tertiary | 2 | 1 |
| High (8-10) | 41 | 16 |
| Middle (5-7) | 68 | 26 |
| Primary | 94 | 36 |
| Unknown/None | 14 | 5 |
| Preschool | 43 | 17 |
| | 262 | |

| Occupational Categories | N | % |
|---|---|---|
| Skilled | 8 | 3 |
| Semi-skilled | 22 | 8 |
| Unskilled | 33 | 13 |
| Scholar | 110 | 42 |
| Unemployed | 46 | 18 |
| Preschool | 43 | 16 |
| | 262 | |

In Table 5B the very small proportion (1%) of household members with tertiary education is but the peak of an hierarchial apex system described as common in Third World situations by educationalists (Illich 1972, Kearney 1979). Some 16% of these families had high school experience (Std 8 or over) but the bulk of the sample (62%) is made up from those who had reached the lower primary or upper primary standards. The number of preschool children reflects that group of children who are pre-school age. It does not indicate attendance at pre-school institutions.

In Table 5C a similar pattern is found to that in the preceding table. The apex reflects the number of skilled employees (3%). The unskilled, semi-skilled, and unemployed adults constitute 39% of the household. In almost equal proportions are the scholars (42%), to which the prescholars can be added (16%), to give the total children (58%). Therefore the overwhelming majority (97%) in the household are not likely to have reached optimal intellectual potential. Of the 46 unemployed adults just under half consists of youth who have left school and found no work opportunities.

5.1.1.3. Educational and Occupational Levels:

Neighbourhood

| Table 5D | Table 5E |
|----------|----------|
| Educational Level | Occupational Level |

| | N | % |
|---|---|---|
| Tertiary | 1 | 0 |
| High (8-10) | 43 | 16 |
| Middle (5-7) | 93 | 34 |
| Primary | 45 | 17 |
| Unknown/None | 56 | 21 |
| Preschool | 34 | 13 |
| | 272 | |

| | N | % |
|---|---|---|
| Skilled | 9 | 3 |
| Semi-skilled | 22 | 8 |
| Unskilled | 49 | 18 |
| Scholar | 85 | 31 |
| Unemployed | 69 | 25 |
| Preschool | 34 | 13 |
| | 272 | |

A most striking aspect of this set of data (Tables 5B, 5C, 5D, & 5E) is the size of the sample population (N:534). These are people with whom the twenty-eight children in this study have regular contact through proximity even if not through deliberate sociability.

For Educational level, the milieu presents patterns consistent with those observed within the families, except that the size of the Primary group of school children is halved and the number of persons for whom the educational level is not known, is much higher. Only one individual has received tertiary education, which is less than 1%.

Occupational Level in the neighbourhood community continues the pattern observed in Table 5E. The wider group base reveals a much greater proportion of unskilled and unemployed adults (43% combined total) than that of skilled (3%). Proportionately the school-going and pre-school groups form an equivalent component of the immediate social context.

## 5.1.1.4. Household and Neighbours Combined:

Neighbourhood

| Table 5F | Table 5G |
| --- | --- |

| Educational Level | Occupational Level |
| --- | --- |

| | N | % |
| --- | --- | --- |
| Tertiary | 3 | 1 |
| High (8-10) | 84 | 16 |
| Middle (5-7) | 161 | 30 |
| Primary | 139 | 26 |
| Unknown/None | 70 | 13 |
| Preschool | 77 | 14 |
| | 534 | |

| | N | % |
| --- | --- | --- |
| Skilled | 17 | 3 |
| Semi-skilled | 48 | 9 |
| Unskilled | 82 | 15 |
| Scholar | 196 | 37 |
| Unemployed | 114 | 22 |
| Preschool | 77 | 14 |
| | 534 | |

For the purpose of understanding the demographic data more fully, the household and neighbours tables are combined to present an overall perspective of the children's community context. About 56% of the community have middle or primary education. Nearly a third have no education or are still at a pre-school stage. Sixteen percent of the group have high school education and less than 1% have received tertiary education.

In Table 5G the occupational category within the community that predominates is the school-going group (37%). The unemployed constitute 22% of the total while the unskilled constitute 15% of the total, similar to the pre-school group. Skilled and semi-skilled workers number about 12% or one-eighth of the total.

Attempts to identify possible relationships between household demographic variables and individual tutor performance by inspection of the data, failed to yield any identifiable patterns. Maternal education and maternal employment did not appear to be consistently related to higher or lower levels of tutor competence (as reflected in mediation levels), but some suggestive trends are noted. Father's involvement in CT roles also appears to be of relevance (see Mediation Table 5L).

5.2.    Caretaking (C.T.) Tasks

5.2.1.    Responsibility Profiles

Table 5H

Caretakers in Rank of Responsibility (proportions)

|  | % | f |
|---|---|---|
| 1. Mother | 39 | 372 |
| 2. Sibling | 28 | 266 |
| 3. Grandmother | 12 | 111 |
| 4. Aunt | 6 | 61 |
| 5. Father | 6 | 54 |
| 6. Older female | 3 | 31 |
| 7. General | 3 | 30 |
| 8. Grandfather | 2 | 15 |
| 9. Uncle | 1 | 10 |
|  | TOTAL | 950 |

A superficial glance at the Caretaking Table 5H might not reveal anything particularly remarkable to a Western (male) eye, for example, mothers do 40% of the work. A closer examination would however disclose some features not typically experienced in White (middle class) households. Nor is it the father's low level of participation in caretaking (6%) that might arouse comment: instead attention might be drawn to the high responsibility rating (28%) given to siblings in township families. Their caretaking load is four times more extensive than that of their fathers and nearly twice that of their grandmothers.

The grandmothers (Gm) do twice as much (12%) for the third generation as do their sons (or sons-in-law), and almost double what the 'aunts' in the family might be doing. Grandfathers (Gf, 2%) and uncles (unc, 1%) barely participate in household routine it would seem, but when they do, for grandfathers especially, their role is seen as one of reinforcing behaviours and providing rewards, though even in this regard, grannies are twice as active as they are (Table 5I, Gm:20%; Gf:8%) What is noticeable here is that the 'rewarding' functions of the grandfathers constitutes nearly 50% of their recorded behaviours.

Siblings, according to this study, have in sum as much caretaking responsibility (3/10 of CT tasks) in their families as grandmothers, aunts, fathers, grandfathers and uncles combined (3/10 of CT tasks). The importance of this point is further amplified by closer analysis of responsibility allotments task by task.

Table 5I

Caretaking: Proportionate Responsibility per Task

| TASKS | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|
| | mo | fa | Gm | Gf | au | unc | sib | ofe | gen |
| food (a) | 42 | 2 | 9 | 0 | 10 | 2 | 31 | 2 | 1 |
| self help(b) | 56 | 1 | 8 | 0 | 10 | 1 | 19 | 4 | 0 |
| manners (c) | 49 | 9 | 19 | 3 | 5 | 0 | 9 | 1 | 4 |
| words (d) | 38 | 4 | 13 | 3 | 3 | 1 | 31 | 6 | 3 |
| songs (e) | 25 | 3 | 9 | 3 | 5 | 2 | 43 | 3 | 8 |
| games (f) | 10 | 10 | 1 | 0 | 1 | 1 | 63 | 5 | 8 |
| colours (g) | 23 | 3 | 3 | 0 | 6 | 1 | 60 | 1 | 1 |
| shops (h) | 23 | 6 | 3 | 0 | 8 | 2 | 46 | 6 | 6 |
| rewards (i) | 39 | 4 | 20 | 8 | 7 | 1 | 18 | 0 | 4 |
| obedience(j) | 47 | 16 | 16 | 0 | 6 | 0 | 11 | 2 | 1 |
| toilet (k) | 61 | 0 | 7 | 1 | 10 | 0 | 16 | 4 | 0 |
| duties (l) | 45 | 7 | 21 | 1 | 6 | 0 | 17 | 3 | 0 |
| care (m) | 44 | 6 | 17 | 0 | 6 | 1 | 17 | 4 | 6 |

key:   mo = mother            au  = aunt
       fa = father            unc = uncle
       Gm = Grandmother       sib = sibling
       Gf = Grandfather       ofe = older female
                              gen = general

Social responsibility can clearly be seen as part of maternal functioning. Household chores and duties, responsibility to the sick or hurt, obedience and training in manners are all so attributed. She does get some back-up from grandmothers and siblings (approximately 17% each respectively). The one consistently high rated score attributed to mothers' tasks was ipso facto toilet training (61%). Fathers had a zero score here and aunts their highest rating (10%) on a par with their food providing duties (10%). Perhaps not surprisingly the mother's highest score, after the

facto toilet training (61%). Fathers had a zero score here and aunts their highest rating (10%) on a par with their food providing duties (10%). Perhaps not surprisingly the mother's highest score, after the 'toilet training' ranking, is in the teaching of self help and independence for the children (56%).

Games, songs, manners and caring for others are quite important in terms of community involvement (about 7% on average) so perhaps parents participate in a more general way in these activities.

Obedience training is very definitely part of parental duty: mothers 47%, fathers and grandmothers each contribute 16%. This is the highest rating for fathers. The father's role is particularly difficult to assess quantitatively because his presence might be very peripatetic. When he is at home, he might in fact contribute and participate more in these areas but the data suggests that in the overall patterns of household management fathers' presence is peripheral (see too the comments quoted about the absence of fathers as male models: de Haas, 1984).

The giving of food is mainly the mothers role but the siblings contribute only 10% less, so that three-quarters of this task is virtually shared between mother and siblings (mothers 42% ; siblings 31%). Grandmothers and aunts in the household contribute about 20% with the remaining household members making up the difference.

## 5.2.2.   Selected CT tasks

Figure 5(i)   CT: Proportionate Responsibility per Selected Tasks



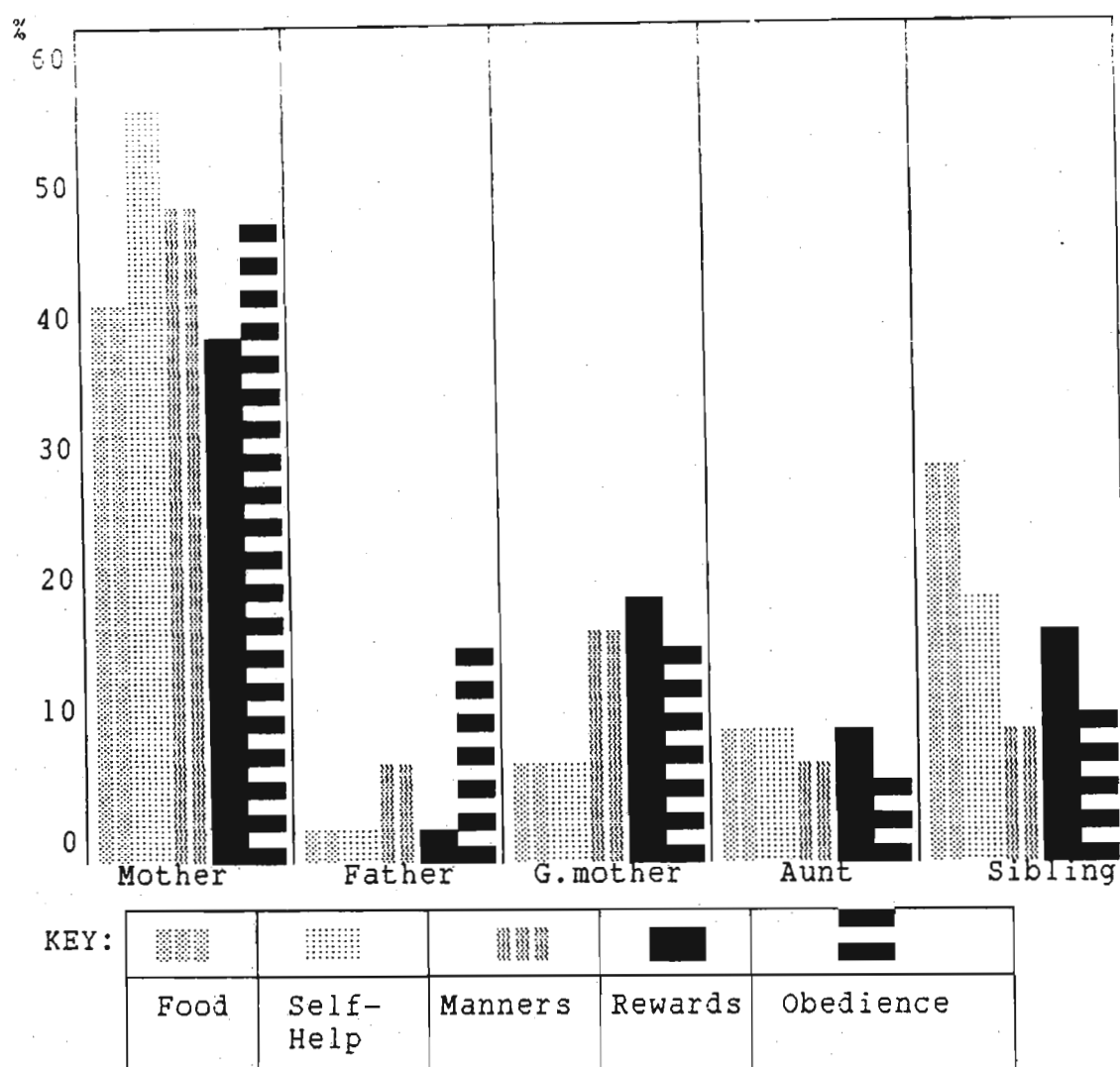| KEY: | Food | Self-Help | Manners | Rewards | Obedience |

Figure 5(i) graphically illustrates the main nurturant tasks  as fulfilled
by five of the main caretakers.   The father's contribution, though
proportionately small, is considered  very relevant to teaching style (see
Mediation Table  5  L).   Such  a  proportion,  however,  appears  very
overshadowed by the combined roles of mothers, aunts and grandmothers.

From Figure 5(ii) it is  evident  that  the  basic  cognitive experiential
nexus for  children is  provided by  children themselves:  the learning of
colours, games, songs and new words  lies overwhelmingly  in the siblings'
hands.   It is perhaps inevitable that the rating for games and maybe songs
would be high (63% and 43%  respectively) but  it does  suggest how little
the parents  or adults  are involved  in such items (about 23%).   It would
seem that 'play' is for the  young, and  shared ludic  enterprises or even
sports are not experienced as areas of mutual child/adult encounter.

The learning of colours is mostly seen as the siblings' role (60%).
Mothers score a little higher (38%) on the new words rating which suggests
the task is jointly borne. As over 50% of the mothers are working this
means the largest part of the day for a black urban child will be
linguistically and conceptually circumscribed by their immediate peers,
although a variety of adults appears to be in the background due to high
unemployment levels and extended household systems.

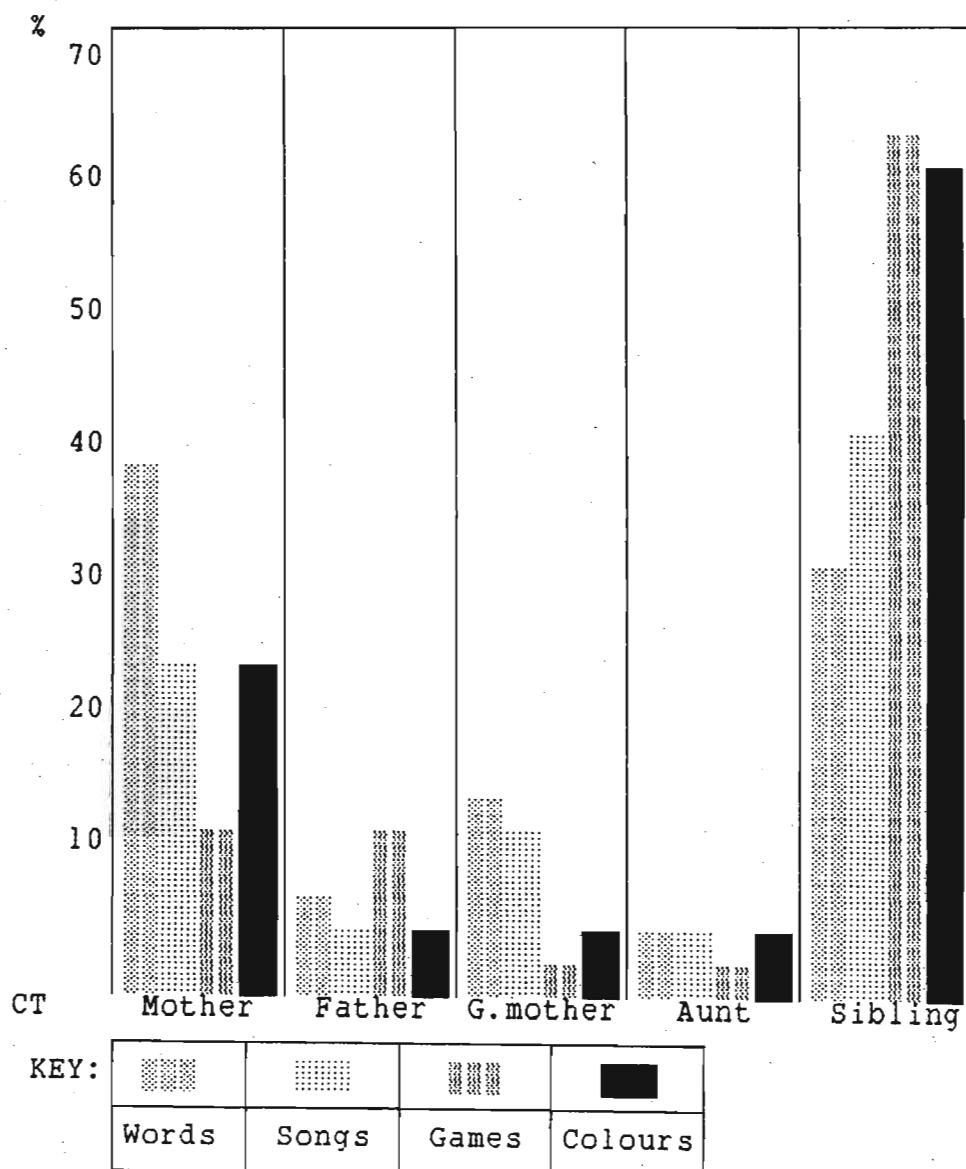Figure 5(ii)   CT: Proportionate Responsibility for Selected Tasks



Figure 5(ii) reflects the dramatic weighting given to siblings in some
conceptual learning tasks. The father's role is also much more
substantial here, though still very low proportionately (less than 10% on
all four roles). Colours are scarcely represented (10% or below) except
for siblings (61%). Both grandmothers and aunts contribute less than 10%
in these roles.

The sibling CT responsibilities as well as the high pupil/teacher ratio in black schools contribute to the impression of a restricted learning environment i.e. mediated learning is likely to be less adult based than peer based. Resources, in the household, are not very varied or plentiful. There are few toys, books or games to stimulate interaction at a symbolic level.

An informal content analysis of the transcribed teaching mode reveals a very limited vocabulary range which is further commented on in Sections 4.2.1. and 6.1. It is in conceptual learning tasks (or those assumed to reflect the possibility of such gains) that the mothers' scores are actually the lowest.

The overall picture of caretaking responsibility is one of a much broader social base than nuclear families or even 'extended' families as commonly understood in White households. Township households have various kinship connections (aunts, uncles, cousins) and a much broader inter-community networking system. Children in one household are exposed to a range of caretaking styles if personality, age and sex all contribute as variables. These were not however considered separately in this survey. Teaching style, as linked to caretaking roles, is discussed in 5.4.

## 5.3.    Role Perception: Intrafamilial Reliability

In separate interviews the mothers, or adult caretakers, and the sibling caretakers of the tutees were asked who they thought carried out certain caretaking tasks (these tasks are shown in Table 5I). They reflect various 'nurturant' roles associated with food giving and prosocial behaviours. Information about primary and secondary caretakers was required but could not be recorded separately as responses blurred these divisions. The responses were then grouped together to give overall frequencies of the main caretakers for each task. In order to assess differences between adult and sibling caretaker responses, the results were separately tabulated to obtain some form of reality check.

Table 5J

Role Allocation: Mother/Adult Caretaker and Sibling Caretaker Perceptions
Across Roles (OT/YT and Combined Frequencies)

| CT | OT | | YT | | TOTAL | |
|---|---|---|---|---|---|---|
| | Mo | Sib | Mo | Sib | Mo | Sib |
| 1 (mo.) | 112 | 95 | 93 | 72 | 205 | 167 |
| 2 (fa) | 21 | 11 | 13 | 9 | 34 | 20 |
| 3 (Gm) | 40 | 27 | 23 | 21 | 63 | 48 |
| 4 (Gf) | 4 | 6 | 2 | 3 | 6 | 9 |
| 5 (au) | 14 | 22 | 14 | 11 | 28 | 33 |
| 6(unc) | 2 | 8 | 0 | 0 | 2 | 8 |
| 7(sib) | 69 | 67 | 53 | 77 | 122 | 144 |
| 8(ofe) | 4 | 10 | 9 | 8 | 13 | 18 |
| 9(gen) | 12 | 2 | 5 | 11 | 17 | 13 |

In this table (5J), the data is divided into adult and sibling caretaker
perceptions of all the CT roles to investigate whether subjective factors
influenced the results. Overall broad consistencies in pattern are
present but it is noticeable that mothers tend to 'overestimate' their
contribution as against the siblings' estimations of their role (mo:205,
sib:167). The siblings in turn appear to 'overestimate' their own
contributions in comparison to the mothers' views (mo:122, sib:144).

The OT/YT breakdown reveals the YT's perceive themselves almost as
responsible as their mothers in caretaking (mo: 72, sib: 77) whereas their
mothers see a greater discrepancy (mo: 93, sib: 53). The OT's virtually
concur about their own roles (sib: 67) with that estimated by their
mothers (mo: 69), but discrepancy over the mother's role fulfillment is
reflected in their respectively different estimates (mo:112, sib: 95). In
the combined total the mothers appear to have almost doubled their
perception of their contribution as against the siblings role (mo: 205,
sib: 122).

The mothers also give higher ratings than the siblings for the
contributions of father (fa: 34) and grandmothers (Gm: 63). The siblings'
ratings are fa: 20 and Gm:48. The children, however, record a higher
level of CT involvement than do the mothers for aunts, uncles and older
females. As many mothers work, it is possible that the siblings' views
represent the more realistic overview of the functional patterns of

represent the more realistic overview of the functional patterns of caretaking. The mothers record a higher proportion of role responsibility to 'general' household members (12%) which the siblings rate much lower (2%). The general trends, though, are not dissimilar, suggesting a reasonably reliable profile of role responsibilities has been ascertained. However, on reviewing the data, it was noticeable that sometimes different viewpoints about who was involved in each role were recorded. To assess the general trends with more confidence, agreement or disagreement over who carried out which tasks was scored. The 'agreement' or 'disagreement', or 'match' and 'mismatch', between the mothers and tutors role perceptions is termed 'congruence' and 'discrepancy' in the following discussion.

By comparing the number of cases where mothers had concurred, or been 'congruent' with tutors, with the number of cases where there was 'discrepancy' in the reported caretakers' fulfillment of the allocated roles, a measure (ratio) was devised, and converted to a percentage, to determine the possible consistency of perceived caretaking role. It has been noted that African mothers perceive themselves as the main caretakers whether or not they actually fulfil this role in functional (i.e. practical) terms. The 'level of congruency' was sought to try and obtain a more realistic picture of role allocation in the household as it seemed possible subjective factors (like self-esteem) could have biased the raw data. The maximum number of caretakers cited for any one role is four.

The histograms reflect the proportional differences (given in Table 5K) obtained between the amount of congruence or discrepancy, scored in the thirteen caretaking roles. OT's and YT's are both represented. Congruence or agreement is scored where both parties agreed on the role person. If they both suggested a different person, this was scored as discrepancy or disagreement. The conventional formula was used:

$$\frac{\text{Agreements}}{\text{Agreements + Disagreements}} \times 100$$

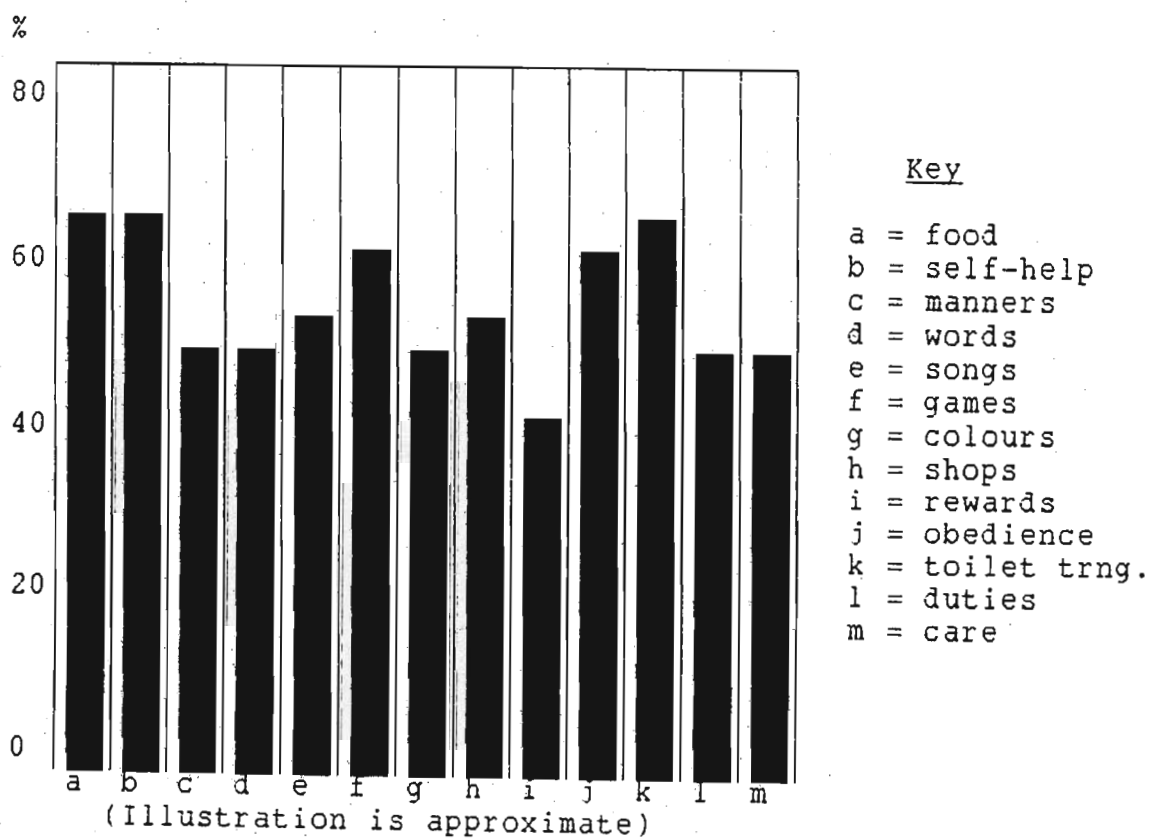The following table illustrates the percentage of agreements.

Table 5K     Percentage of Agreements in Role Perceptions by Caretakers

(Mother/Child)  (Distinguishing between OT's and YT's)

| a | | b | | c | | d | | e | | f | | g | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OT | YT | OT | YT | OT | YT | OT | YT | OT | YT | OT | YT | OT | YT |
| 65 | 65 | 52 | 76 | 50 | 47 | 47 | 50 | 41 | 66 | 52 | 69 | 35 | 59 |
| X 65 | | 64 | | 49 | | 49 | | 54 | | 61 | | 47 | |

| h | | i | | j | | k | | l | | m | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OT | YT | OT | YT | OT | YT | OT | YT | OT | YT | OT | YT |
| 59 | 50 | 43 | 37 | 59 | 65 | 68 | 59 | 45 | 50 | 59 | 35 |
| X 55 | | 40 | | 62 | | 64 | | 48 | | 47 | |

Key: a – m  (see below)

Figure 5(iii)     Percentage of Agreements in Role Perceptions by

Caretakers  (Mother/Child)



Key

a = food
b = self-help
c = manners
d = words
e = songs
f = games
g = colours
h = shops
i = rewards
j = obedience
k = toilet trng.
l = duties
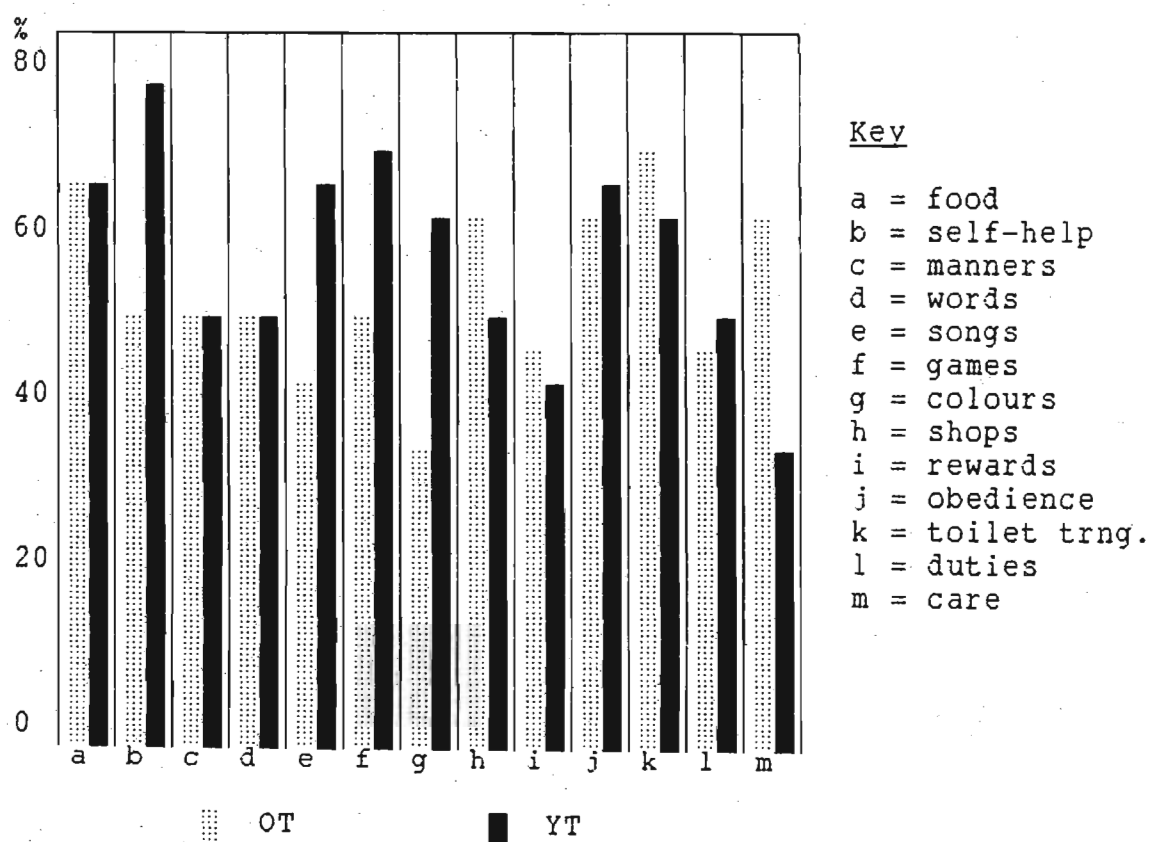m = care

(Illustration is approximate)

Congruency (or agreement) is shown to be greater than discrepancy (disagreement) in over half of the thirteen tasks.    If   the two 'borderline' roles (c and d) are included, then agreement reached nearly 70%.  Food-giving (a) is most consistently perceived by both OT's and YT's (65% agreement),  which is followed by (k) toilet training (64%).  Rewards (i) is the least agreed upon role (40%) while the teaching of  colours (g) and  care  (m)  are  both  uncertainly  viewed  in terms of role allocation (47%).  Colours (g) and new words (d)  are also  discrepantly viewed, both reaching less than 50% agreement.

Figure 5(iv)

Percentage of  Agreements in Role Perceptions by Caretakers (Mother/Child)

(Distinguishing between OT's and YT's)



(Illustration is approximate)

Key

a = food
b = self-help
c = manners
d = words
e = songs
f = games
g = colours
h = shops
i = rewards
j = obedience
k = toilet trng.
l = duties
m = care

When the caretakers responses  are separated  into OT  and YT  groups, the slightly less  differentiated views of the YT's are shown in that nine out of thirteen roles have the same or greater amount of agreements than OT's. The range  between agreements  and disagreements  is greater for YT's than OT's (YT: b:76%;  m:35%).

## 5.4. Caretaking Roles and Teaching Style

Table 5L

Mediation Rating: Proportions per Tutor on Task 2

| | NO. | TUTOR | MED PROP. | EDUC. mo | CARETAKING | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | mo | sib | Gm | Fa |
| HIGH MED. (Above 20%) (N = 2) | 30 | OM | 27 | Std 8 | 13 | 3 | 4 | 0 |
| | 26 | OF | 22 | Std 8 | 13 | 0 | 0 | 8 |
| MEDIUM MED. (From 20% to 5%) (N = 6) | 4 | OM | 11 | Std 1 | [9] | 6 | 9 | 2 |
| | 12 | YF | 9 | Std 7 | [9] | 4 | 1 | 1 |
| | 9 | YM | 9 | Std 6 | [9] | 6 | 5 | 0 |
| | 14 | YM | 8 | Std 8 | 11 | 6 | 1 | 5 |
| | 15 | OF | 8 | Std 8 | [3] | 7 | 6 | 0 |
| | 17 | OF | 6 | Std 6 | 11 | 3 | 7 | 5 |
| LOW MED. (Below 5%) (N = 8) | 5 | OM | 3 | - | 10 | 8 | 0 | 1 |
| | 24 | YM | 3 | Std 6 | 12 | 4 | 1 | 2 |
| | 21 | OM | 3 | Std 3 | 13 | 3 | 0 | 3 |
| | 10 | OM | 2 | Std 8 | 3 | 2 | 10 | 4 |
| | 28 | OF | 2 | Std 6 | 7 | 9 | 2 | 0 |
| | 31 | YM | 2 | Std 4 | 10 | 6 | 0 | 3 |
| | 1 | YF | 1 | - | 4 | 13 | 1 | 0 |
| | 18 | YF | 1 | Std 6 | 7 | 6 | 4 | 1 |

[Brackets = surrogate mother. Only tutors with a mediation score are listed i.e. the balance of the sample (N=12) had zero mediation scores]

Although no apparent trends between demographic data and task competence were apparent through inspection, it is possible that relevant variables remain embedded in the data. Blau's (1981) predictors of academic performance for black children may not be adequate for this sample. Variables such as mother's educational status, though suggestive, may not be of similar significance here. Extended households may have additional or different predictors.

Another perspective may be the influence of caretaking roles on teaching style (Table 5L). Tutors are ranked (based on Task 2 scores) according to a mediation hierarchy. Four of the dominant caretaking persons in the household are presented with their respective contributions to the thirteen roles.

Two tutors (7%) score above 20% proportionally for mediation. Both have mothers with Std 8, who are not working and who are involved in every one of the thirteen CT roles. Subject 26 has the highest role allocation rating (8) for fathers of all the tutors. This father is also a teacher. In both these cases, sibling caretaking is minimal. Nine of the mothers of the total mediation groups are not working. In eleven cases fathers are involved with CT tasks, which is interesting as only two other tutors in the total sample (N = 28) have actively 'responsible' fathers according to role allocations.

The variation within the group is illustrated by Subject 1 (YT) where siblings are reported to be active in every single CT role. In only six of the thirteen roles is someone else mentioned. In Subject 21 (OT) the mother is active in all thirteen roles, with siblings active in only three roles (games, colours, shops). Subject 1 has good interaction and a responsive style but only a 1% mediation score. Subject 12, who has scored 9% for mediation, shows no rapport or positive interaction as the tutor. This mediation score was probably influenced by the demonstrator's interventions. Subject 14 has excellent rapport, engages in fantasy, but only scores 8% for mediation. The mediation category, though useful, is not an adequate indicator of performance as tutor.

From these results it is not possible to make generalisations. It does seem education is a factor. Of the medium to high mediators, all eight mothers have high school education. The role of fathers appears to be cognitively relevant. The high percentage of grandmothers (81%) active in this group, may also suggest a factor for further research. The siblings' active role is again illustrated by their fulfilling seven out of thirteen CT roles on average. Dynamics in the township households, therefore, need to be assessed from as wide a methodological perspective as possible. The variety of caretakers is indicative of the density of relevant research variables.

It is interesting to note that in Kok and Beinart's study (1983) thirteen of the mothers 'dropped out' of Task 2. Of the remaining twenty mothers, 48% scored in the high-medium mediation category. The percentage of child tutors in the corresponding category is 29%.

# 6.    DISCUSSION

## 6.1.    Teaching Style

In a recent article on Piaget and Vygotsky's views on early peer relations, Musatti (1986) acknowledges that Vygotsky does not appear to have been specifically concerned with the role of peer interaction in the child's developmental and educational processes. However, Vygotsky's perspective 'offers interesting questions: what is the role of a peer in a child's acquisition of the cultural means of knowledge?' (p33). She concludes that 'early peer relations and cognitive developmental processes appear to be closely related' (Musatti, 1986, p44).

The present study also pursued the question of the child's role in the cultural transmission of knowledge and believes the evidence suggests that siblings do indeed have a special role in cognitive development. The results support the conclusion that 'children teach differently than do adults' (Ellis and Rogoff, 1986, p302). These authors continue: 'managing instruction itself is a problem-solving task' which necessitates what other authors have termed 'perspective-taking' (Stewart & Marvin, 1984) and which Piaget (1966) so long ago termed 'decentration'.

One of the major purposes of this dissertation has been to uphold the particular contribution that siblings can provide as tutors. The findings of this study are supported by recent peer research such as that of Cooper et al (1986) who claim that 'the characteristics of effective peer tutoring styles may differ from the adult model upon which the tutor's training is based'. (Cooper, Marquis & Edward 1986, p272) Such a contention is also based on Piaget's belief that an internal state of disequilibrium was 'the most important factor in cognitive development' (Piaget 1965, p 274). The qualitative analysis of the tutor's protocols suggests that collaborative interaction or rapport between siblings can facilitate this disequilibrium towards equilibration. These terms do not substantially differ in concept from Vygotsky's zone of proximal development, which focusses on the guidance offered by adults or skilled peers in bridging the gap between actual, and potential, problem solving development. Cooper, Marquis and Edwards (1986) believe there are 'developmental differences in age and competence levels' where peers are

concerned, particularly in 'cognitive modes and discourse skills' (p295). Some interactions involve co-operative learning which they term 'doer-doer' interactions, and some involve didactic learning or 'knower-doer' interactions. A close analysis of tutoring styles within a specific cultural group reveals both types of interaction were manifested, though with a preponderance of the knower-doer style of interaction. The importance of cognitive modes and discourse skills are also found to be of fundamental importance in shared problem-solving tasks. Younger tutors in the operational mode mostly showed little verbal flexibility. Instructional style was not adapted to the demands of the situation, which suggests lack of perspective taking by these children.

An overview of the main trends of the study will be discussed in terms of general findings and in terms of the age and sex differences which gave a structured framework to the research. Whiting (1986, p 97) has also argued that 'setting variables help explain differences between cultures and universal gender differences also predict individual differences within cultures'. The 'setting' variables are considered in 6.2.

A comparison of patterns between the mother tutors (Kok & Beinart 1983) and the child tutors in the present study revealed similar trends: most behaviours involved the placing or directing of pieces and only a low proportion of activities reflect mediation between tutor and tutee. Both tutor groups use very little questioning and demonstration, though in most categories of behaviour older child tutors are closer to the adult model than the younger tutor group.

Mothers engage in mediating the task to their children four times as often as the tutors with their tutees. The mothers probably understand the purpose of involving the child more directly in the task and were more active in checking the model in order to comprehend the task.

Nevertheless, the mediation category for mothers remains a very small proportion, one-eighth, of the whole. Executions are very much lower than for the child tutors, virtually half their rate. It is interesting to note that in McLane's (1981) sample none of her mothers placed any of the pieces so that all executions were performed by their children. This important cross-cultural finding could be seen in different ways:

i)   The Zulu mothers were teaching their tutees by 'doing' (the Kok-know-how paradigm).

ii)  The Zulu mothers did not know how the puzzle should be done (it was chosen for its unfamiliarity) so that <u>they</u> had to learn themselves by placing the pieces to see how things worked. This activity provided them with a semblance of know-how or competence. The Western mothers were not in this predicament.

iii) Could the Kok paradigm fit Western mothers as well? The American mothers (from the excerpts given) ask questions and give colour directions that enable the child to execute the task. Some typical instructions were:

Mo  :   Then what comes after the purple one?   (pointing to the model)
        What colour's this?
C   :   White?
Mo  :   Okay, find a white one.
C   :   (picks up white square)
        <u>or</u>
Mo  :   Now show me another colour where (sic) they have in this truck.
C   :   (picks up orange piece).        (Kok 1986, p65)

The mothers <u>are</u> providing cues and encouraging active selection and placing by the child which suggests a different set of mediational operators on this familiar task. One wonders what they would do on an unfamiliar task in a situation where they might be anxious not to be seen as 'disadvantaged' or 'incompetent'.

It would seem from across task variation in this local study that when difficulty is experienced, tutors resort to trial and error placing of pieces in order to 'learn' the task themselves or to maintain a pose of competence. Very rarely do tutors acknowledge defeat. Of the mothers in Kok and Beinart's (1983) study only twenty of the thirty-three mothers completed the task.

An age factor is suggested in the development of mediating skills.

Alternatively the older child tutors could perform more effectively than their younger siblings because of greater exposure to school experiences which would theoretically have made them more conversant with tutoring interaction. As some of the younger tutors were in the same school grades as the older tutors, it would seem age is a more relevant factor.

The actual gap in teaching style between child tutor and adult would probably be larger if the adult sample had all received higher schooling. Most mothers had primary school experience, some had high school qualifications. McLane's (1981) study showed variation in mother's performance although all had a higher level of education than the township mothers. Some of the American women performed not unlike the 5½ year old tutors. Age appears to be a contributing factor but it is not sufficient on its own as an explanation for difference in performance. Half of the tutors in the medium mediation group were young tutors, and half of the low mediation group were also young tutors.

The younger tutors were found to have tutees who gave double the number of directives in comparison to the tutees of the older tutors. Possibly the younger children felt a greater sense of collaboration on tasks or else they lacked confidence in their tutor's status and preferred to attempt self-regulation. Alternatively role division was not as entrenched for either of the pair. It is probably relevant that the tutees of the young tutors were usually of a slightly older age group (mostly 4 year olds) than those of the older tutors.

It is also noticeable that older tutors offer more mediation, more discriminating cues and provide more positive feedback than younger tutors. Possibly without any status struggle, the older tutors could afford to be more affirmative. The younger tutors are more experimental in their manoeuvres and their preoccupation with mastering the task left little room for affirming their tutees. Anyway, they could not themselves be sure what was appropriate action.

## 6.1.1.     Sex Differences

The young female tutors (YFT's) (N=8) were noticeably consistent in their assumption of a pseudo-teaching style mostly relying on tone of voice as

well as the litany of repeated instructions to sustain their dominant role. In the same-sex pairs rapport was more evident, with interaction (usually of a simple question and answer format) being maintained throughout the tasks. Tutees were compliant with one child keenly trying to achieve (Subject 16).

The opposite sex dyads (N=5) were marked by frustrated or restless male tutees who were not convinced by the tutor's role playing and in all cases (Subjects 8,9,11,12,22) the interaction was suggestive of power struggles. Thus the learning situation becomes more of an engagement in sibling rivalry. In such cases problem solving efforts diminish. It is not clear how this manifestation of 'differentiation' assists cognition, as suggested by Sutton-Smith (1975), unless as a form of disequilibration. Cognitive progress needs 'conflicting confrontation between partners ... degree of generalisation seems to depend on the type of relationship in the interaction situation. The horizontal one (child-child) provokes more generalisation than vertical (adult-child) interaction' (Perret-Clement & Brossard 1985, p313/314).

The young male tutors (N=5), a small group, rarely displayed this element of power struggle even though the tutees were largely incompetent in their task. The two same-sex pairs showed good rapport and some imaginative involvement with the 'game' but the opposite sex pairs were the stereotyped compliant-pupil situations with trial and error and pseudo-teaching methods used to simulate task competence.

With the older tutors (N=15) it is the female tutors who appear more inhibited and inhibiting as if the responsibility of their role has blocked their willingness to interact playfully or co-operatively, or to acknowledge either their own difficulties or those of the tutees.

The same-sex group of OFT's (N=4) have only one pair (S:26) working with any rapport and this tutor does acknowledge her mistakes and encourage the initiative of her sibling. The other three tutors show rigidity in responses being unable to adapt to suggestions made by the demonstrator. Neither directives nor colour cues were provided by two tutors who actually remained silent as much as possible, either executing the task themselves or using pointing to convey instruction (see McLane 1981).

The opposite-sex OFT pairs were also inflexible in their approach to problem solving. The tutor's perception of her role is perhaps best illustrated by these extracts:

Subject Pair No: 6

T :      Put the piece here (pointing). Say 'here'.

C :      Here (places piece).

T :      Don't worry ... I'll do it all for you.

There are some dyads where a willing pupil is encouraged and also referred to the model itself as well as given colour cues but despite these apparent mediating skills the tutor (for example Subject:15) was really baffled by her task and could not utilise her sibling's enthusiasm to try co-operative problem solving. This hiatus between 'skill' and 'performance' does not emerge clearly from the quantifying process, possibly because success of outcome was not included as a relevant factor.

The other tutors repressed or inhibited their charges who remained duly compliant and submissive. What has been referred to as the 'pseudoteaching' manner of the female tutors has been observed in various forms in the literature. Pepler (1981) noted that the heightened 'prosocial' behaviour of girls may not be 'the most optimal developmental milieu' for younger siblings. Berman and Goodman (1984) believed that older females could be intrusive and smothering' which is consistent with the reports of 'overmimicry' by children of parental roles when caretaking (Weisner 1982). Cicirelli (1973) has suggested that laboratory research shows older sisters teaching more effectively than older brothers and offers the hypothesis that girls identify more with mothers and teachers (Cicirelli 1976). Girls in this study seem more conscious of role division and preservation of status. This may be one variable which suggests closer mother-identification, as their adherence to the role division mediational operator is so strong.

However, these results also suggest that the male tutors are using skills that resemble the adult style more closely than do those of the girls i.e. they encourage more collaboration and are not so insistent on the tutee totally subordinating her autonomy.

6.1.2.        Age Differences

The older male tutors (OMT) appear much more at ease in their tasks than the female group. There is also none of the struggle for authority in either of the older groups that was seen in the young tutors' groups. Only one of the males seems confused but at no stage does his dominance flag; in fact he blocks the child's initiatives to safeguard his status.

The remaining tutors (except one) show affirmation, mostly offer colour cues and establish good rapport with the tutee. Their competence is functional, not highly verbalised but the co-operative tone of these dyads suggests some measure of cognitive reciprocity - or mediation - was established. This assumes that for 'mediation' to be 'social' it has to have this interactive or reciprocal aspect.

Perhaps 'mediated learning experiences' are very variable, (hierarchical or on a continuum), and while some of the tutors in the teaching situations provided for in this particular sample may not always have challenged the zone of proximal development in Vygotsky's eyes, it would seem that one of the stages of this development could depend on the combination of rapport and problem-solving together in order to provoke a positive 'cognitive set'. It seems reasonable to hypothesise that constructive qualitative interaction (rapport) would facilitate the formation of cognitive structures (Piaget 1965). Cole (1982) refers to the importance of rapport in child problem solving as creating 'a more effective zone of proximal development supporting children's overall problem-solving performance. It functions like play in this respect' (Vygotsky quoted in Cole 1982, p712).

In those cases where mechanical performance through observation is perceived as the teaching strategy, and the tutee compliantly places pieces according to instruction, there is less likelihood of the development of cognitive structures. Imitation without understanding does not seem a useful teaching strategy to the Western analyst.

The 'cognitive paralysis', evidenced by female tutors in response to the demonstrator's attempts to redirect their task, offers another perspective on the apparent phenomenon of restrictive mediational operators. Possibly

it is sex-role conditioning that is a variable here, and girls have experienced their roles passively as having to conform, comply, imitate- and not to allow responsibility for choices to their charges.

The males seemed less constrained by their 'teaching' role and able to perceive the tasks more as challenge than 'dutiful performance'. They therefore perform the task 'better' and their self confidence allows them more flexibility. ('Better' performance here refers to their tutorial role of allowing the tutee opportunity to learn, as invited by their task instructions). Whiting (1986, p95) suggests that as boys spend more time than girls in play, 'without specified adult goals', they have 'experience in conflict resolution and acquire more strategies for influencing playmates ... Girls are trained to help others reach their goals'.

The quantitative data reveals clearly the less 'authoritarian' role taken by male tutors than female tutors and confirms that older tutors execute less and question more. Older tutors compared to younger tutors offer more positive feedback, provide some demonstration, give more discriminating cues and engage in more mediating activities.

The qualitative analysis corroborates this information but provides a fuller understanding into the nature of the dyadic interaction. The positive rapport between tutor and tutee is not revealed in the proportional data. This factor might, a speculation, be of crucial significance in fostering less convergent/less rigid thinking, or even learning itself (not imitation only).

'Human learning presupposes a specific social nature and a process by which children grow into the intellectual life of those around them' (Vygotsky 1978, p55). It is only through 'interacting with people in his environment and in co-operation with his peers' that internal developmental processes can be awakened. Perhaps this social situation needs clearer definition: that a positive situation must exist where rapport is manifested and where co-operation is based on reciprocal subjective involvement, not the stereotyped 'teacher-pupil' rituals described here as pseudo-teaching.

The older tutors encourage more independent placing of pieces than the younger tutors. This suggests an increased ability in 'perspective taking' and may reflect developmental changes in their understanding of their task requirements as well as more confidence in their authority. Such a proposition is in keeping with McLane's (1981) hypothesis that a developmental continuum is involved in teaching style.

The differences between her sample and this one could reflect educational levels as much as cultural ones. McLane's mothers are verbal, cue-giving, independence encouraging - and white, high-school, middle-class. The sample of local mothers (Kok 1986) have only been exposed to limited and apartheid-style education. It is therefore possible that these mothers' 'perspective' may represent a sub-set within a culture.

Some tantalising questions do remain. If some of the township children employ a broader set of mediational operators, what does this suggest about the adult operators? Why do some American mothers match their children's mediational operators and some Zulu children transcend their adult's mediational operators? Could personality factors be involved? And what about the constraints of the situation? Taking behaviours on such tasks as a paradigm for all instructional modes could be speculative.

What does it mean for an analyst (Craig 1985) to claim such behaviours signify a moment in change, not 'deficiencies' of instruction? How practical is this concept for the actual modus operandi of such caretakers at this point? 'Change is now. The past and future are now'. The 'moment' may well represent a temporary state of affairs but its consequences have to be consciously considered.

So, there remain, like Popper's (Magee 1975) one black swan amongst the white flock, these exceptions that defy attempted generalisations. Why there should be these exceptions is not clear. There do not appear to be simple, overt defining characteristics like age, education or socio-economic status revealed by the demographic details. The 'exceptions' also suggest some sort of qualification might be necessary for Kok's (1986) mediational operators, which could point to a more universal set of operators as well as a culturally specific one (Miller 1983).

Such a possibility is also raised by the finding that the male tutors in this sample were mostly more stimulating than the female tutors, as noted also in Cicirelli's study (1975). Were those boys he studied subjected to a similar set of cultural mediational operators as the local sample? Or are such 'operators' universal as well as 'indigenous' as Whiting suggests (1986) and as Vygotsky (1978) might dispute?

Unlike the Greenfield and Lave (1982) conclusion that trial-and-error learning can be productive for informal education, the same strategy used by these tutors did not provide promising material for mediation. As those authors had observed with their Mexican sample, so this study also found that imitation of demonstration could lead to perseveration even where it was ineffective. This tendency was earlier described in this study as cognitive rigidity or 'paralysis' of adaptative tactics, especially with the female tutors. Perhaps trial and error is a 'universal' operator where lack of competence is a key issue. Cole (1978) believes that skills can be context-specific and that certain environments and cultures may promote the development of certain cognitive domains more fully than other environments. It may be that individuals, from whatever cultural context they come, resort to such basic or 'primitive' strategies when dealing with the unfamiliar. McLane (1981) describes how some of her sample of 5½ year old tutors had a tendency to use an 'all-or-nothing' approach where children provided either too much assistance-placing the pieces themselves - or too little - providing no regulation. Such children she sees as 'rigid' in approach and suggests a developmental phenomenon might be involved which could be checked out by having an older experimental group, say 7½ year olds.

This present study shows differences between the older and younger tutors indicating that with increasing maturity a greater ability to allow for other-regulation emerges, and the gap between older tutor and mother teaching styles become less marked. In commenting on the observed differences in the literature between mothers' and teachers' styles of teaching, McLane reflects that mothers could usefully be 'trained' to encourage greater independence in learning.

A local study (Fullard 1986) investigated interaction within families of pre-school children and found those children judged as being of high or

low competence (as rated by teachers) came from families with different communication patterns. Ways of communicating affect coping skills. And coping at school is one of the ways of being culturally 'competent' for societies in transition as well. Fullard's work seems based on the 'deficit' model - community based programmes to 'encourage parents in the adequate fulfillment of their educational task' are recommended. Patterns of communication are shown to be related to problem-solving in this analysis of tutor's instructional style.

The Dixon et al (1984) study graphically illustrates how American and Gusii mothers differed from each other in teaching style, as did the Chicano-American studies by Laosa (1981) who considers education and social class are relevant variables. The call for mothers to be 'trained' to behave like teachers is one that seems based on good intentions but faulty developmental premises. Mothers might usefully 'teach' but their relationship is such that their style of communicating should surely be different. Perhaps children need both types of interaction. Why should the change of teaching style only be relevant for the non-Western mothers, or, for mothers to emulate teachers? This is assuming the norm of autonomy is quintessential. McLane and Fullard could argue that Western mothers and teachers need to incorporate the less competitive, more socially oriented style of the community-based groups. Cognitive development will surely reach optimal development more successfully through assimilation and accommodation of both techniques rather than a reliance on a single competitive dimension that Western commentators conventionally uphold.

Cole (1978, p616) has referred to the well established 'proclivity' of Africans to learn by rote but he does not acknowledge the proclivity to teach by rote. This surely is the issue however much of a chicken-and-egg question it may seem. He asks for an ethnography that analyses cognition as 'a special set of activities engaged in on special occasions'. These would not answer the question of how these processes developed in the first place. He warns against assuming lack of performance equals a lack of processes. If Vygotsky's and Piaget's views are accepted, that if performance is not called for - culturally/socially, then it follows that such processes will not be developed or manifested. This does not preclude the potential for such processes to develop. The point is that

without the sustained stimulus of certain environmental/cultural demands, it is unlikely that cognitive processes will spontaneously progress i.e. cognition could remain developmentally dormant. An interesting example of environmental stimulus having long term effect can be seen in the case of Watu Kobese, a Sowetan fourteen year old black chess expert, who recently played against the International Chess master Miguel Quinteros. As Kobese started playing chess with his father at the age of 4 years, the child's developmental domain encouraged the relevant cognitive skills (Upbeat: 5, 1987).

Bruner (1971) suggested that information was encoded in three different modes: the enactive, the ionic and the symbolic. He believed that language provided a 'ratiocinative amplifier' which would aid and develop abstract concepts. Sengalese, Mexican and Eskimo children were found to remain at a level of environmental manipulation that is concretely iconic and lacking in symbolic structures at an age where in American children symbolic thinking would have appeared. Unschooled adults could also remain at that level because their cognitive domains made no further demands on them. Kohlberg's (1969) stages of moral development, when tested cross-culturally, confirmed that large numbers, of the several populations sampled, remained at a concrete level of thinking.

In reading the protocols or transcripts of the dyadic interaction on these teaching tasks, the pronounced dominance of concrete terms, the limitations of the teaching strategies and the restrictive manner within which dialogues operated, suggest an iconic mode of thinking applies for the majority of tutors and mothers and teachers. In recalling the holographic metaphor of the introduction, the cultural context in this country must also be emphasised. Not only are these tasks unfamiliar but the teaching situation itself is one embedded in an historical context that favours non-questioning, compliance and rigid role divisions. 'Education for domestication' and apartheid have permeated the cultural context. Racial classification predetermines every aspect of the individual's life choices. An 'indigenous' theory of childhood when applied to a teaching situation is likely to reflect the political consequences of that education, as much as any specifically culturally cohesive characteristics or principles.

It is striking that McLane's (1981) mothers mostly <u>did</u> ask questions, <u>did</u>
provide indirect regulation and <u>did not</u> subordinate their children's
autonomy.   The Zulu mothers concentrated on 'getting the job done' rather
than letting the children  learn how  the task  was to be done.   Whiting
(1986), on  the other hand, is struck by similarities across cultures that
share 'ecological  niches,  economic  pursuits  and  technical  knowledge'
(p82).   She believes there are cultural-types of mother-child interaction
based on three variables:

(i)        the workload of the mother
(ii)       the number of females present in the household
(iii)      the values the families place on schooling (Whiting 1986, p90)


This means that, in  her  view,  settlement  patterns  and  educational
institutions 'programme  the nature of a child's social experience'.  Such
experience will influence the way she thinks about things and  what things
she needs  to think  about.  Whiting's comments seem to be anthropological
confirmation of Bronfenbrenner's proposition  of  interacting  'nested
structures' influencing cognitive development (see page 5).


None of the mothers in McLane's study, nor Craig's (1985), or Kok's (1986)
studies, seemed to  'play'  in  the  tasks.    It  is  this distinguishing
characteristic of  some of the child tutors, although admittedly very few,
that highlights some of the 'specialness'  of sibling  tutor relationships
and affirms  the highly  constructive and  unique dimension such dyads can
offer in teaching interaction.  To use fantasy and humour  as some  of the
child tutors could do, evokes a rapport that engages the tutee to mutually
attempt problem solving.  The tutee enters into a transmission of cultural
importance, a  social  learning  which will generate, possibly, cognitive
change.


The discourse mode reflected by the Zulu tutors,  adult and  child, lacked
varied verbal  labels and appeared not to provide the amplification needed
for such tasks.   The concrete  instructions 'take  this thing ... put it
here', are not likely to generate cognitive change in themselves.  Colours
and shapes did not appear to  be  readily  used  as  part  of  the tutor's
everyday cognitive  domain.   But children  in crêches are learning these,
and singing songs at home that they have learnt at  school and  watched on

TV in some cases. Thus cognitive amplification is 'in transmission' but it is still on a very small scale. The tutors have the 'intention to facilitate learning' that Clenitson-Mohr (1982) upholds as so important. But their primary tool, language or discourse skill, is not facilitating their progress. This rudimentary operator would seem to be a crucial superordinate mediator. To the children (Subjects 14 & 30) who wished to make the truck/car puzzle beautiful, the iconic had been superseded by the symbolic. The tools of thinking - in this case the wish to 'make it beautiful' - provided a discourse mode that freed the tutees and themselves to create a new reality. This exemplifies the task of the mediator: to extend potency, or in Vygotsky's terms, promote self-regulation. The context for the appearances of such development is considered through the caretaking 'setting'.

## 6.2.    Caretaking

'Situational constraints provided by large family size, one parent status, overcrowding' are some of the features affecting 'disadvantaged' children (Rutter 1985). One of the many consequences of such constraints is the reduction of conversational interchanges likely to provoke intellectual growth. In the earlier discussion (6.1.) language was suggested as being the superordinate mediational operator, and in the Introduction, Vygostsky's value on the essential role of speech was emphasised. Children who experience situational constraints tend to be 'below average intellectual skills ... on virtually every type of cognition test' (Rutter 1985, p 129). British working class children, not from disadvantaged homes, scored on average 16 points lower than the middle-class children (Tizard 1985).

This finding highlights the likelihood of children being 'academically vulnerable' (Jardine 1986) from black working class households, that are also disadvantaged. In a comprehensive review on Black/White American children's competencies, Blau (1981) contends that 'the social milieu is a variable of great importance in understanding observed differences in black and white children's test scores' (p17). Family size is one negative predictor. Maternal fatalism, authoritarianism and suppression of autonomy are also negatively correlated with IQ and achievement scores. The mother's tenure in the labour force, her social class origins and

access to White social structures are some of the positive predictors of academic success. Important as these may be, there are probably other variables relevant for township children as yet untapped. Gordon (1983) has described some of the environmental contraints of Sowetan children and hypothesises separation from parents as a contributing factor to poor academic achievement. Educational status of siblings could be linked to increased competence in younger siblings.

The demographic profiles provided by this preliminary survey suggest conditions which fit all the factors conducive to a disadvantaged background i.e. the structural variables are loaded in almost every way against the optimal development of black children's cognitive skills for school achievement. Furthermore, according to Blau (1981, p8) 'low educational achievement is the strongest prediction of poverty in later life'. Households are, on average, large (7-10 per household is probably a conservative estimate. See de Haas, 1984). This means privacy and space for imaginative play, or study, is limited, constituting a negative factor for cognitive development (Parke 1978, Singer & Singer 1979).

The collective 'pool' of educational achievement (home and neighbourhood) clusters around a primary school level. High failure rate in the schools is one explanation for twelve and thirteen year olds being in Std II or III grades. Rutter (1985, p165) upholds that 'friends of high achievement foster cognitive growth whereas friends with low intellectual abilities will probably inhibit such growth'. Attitudes to education about its value are likely to be ambivalent as explained in an earlier section (2.3). Scholars will be caught between peer pressure to resist a discounted institutional system, and parental pressure (and possibly their own motivation) to seek upward mobility.

A large proportion of the population are school-going children. A quarter of the community is unemployed. For the children 'going to the shops' was often the major form of excursion. Economic factors and lack of opportunities for recreational or leisure pursuits would suggest a high frustration level for such community members. Radke-Yarrow and Sherman (1985, p236) found that even very brief background disturbances (a few minutes) could cause radical changes in the quality and amount of social behaviour in children: anger, for example, could be very disorganising.

Anger is likely to be part of the mesosystem for the frustrated younger members of their community (Bronfenbrenner 1979, p284). In 1981 Blau commented that American black youth were declining to work in low status jobs as their idealised expectations from education had turned sour. Discriminatory race policies had added to the 'cumulative environment' of disadvantage. The same consequences can be expected here.

So the impression of the social milieu of township children is not promising for school achievement or IQ scores. But this, of course, is only one perspective. The amount of possible social relationships, the flux of household members involved in caretaking tasks and the more extensive and intimate social kinship system provides an open-family type situation which is regarded as conducive to greater social skills and peer adjustment (Kaslow 1981). Jessie Bernard (1975 p19) denounced the Western model of motherhood (nuclear type family units) as having 'selected the worst features of all the ways motherhood is structured around the world', because, she claims, mothers without extended help became less nurturant and more unstable. The incidence of child abuse in Western societies in recent years is a possible reflection of such tensions though, in most cases, both parents are culpable. Where the township children are less fortunate is that the 'coherent cultural context' (Shotter & Newson 1982, Skuy 1986), important for cognitive development, is increasingly less feasible. The townships are fraught with dissensions and value conflicts, diagrammatically represented below (in a very simplified form).

Figure 6(i)

VALUE CONFLICTS
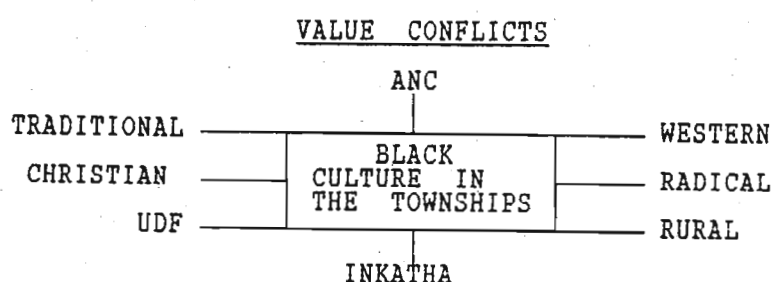


Though Ignatovic-Savic believes Vygotsky does not see the child as 'shaped by the environment but ... actively formed through interaction' (in Hinde et al 1985, p293), it is somewhat obscure as to how the two are separated. Blau (1981) believes achievement is influenced by socialisation practices more than structural variables, but, again, it is not easy to see how her claim could stand in this context. Gainful employment for mothers is

suggested to be more useful as a modernising process than formal schooling. In this study about half the tutor's mothers worked, but there was nearly always an older female in the house to care for the children, as well as the siblings. The mother's role is still dominant but the grandmothers and siblings together contribute a similar amount to caretaking. In a Johannesburg survey it was found that 40% of black mothers left children in the care of grandmothers, and 10% in the care of siblings (the population of children registered daycare in Soweto 1984 was 0,3%). 'The main form of childcare amongst working class women was the extended family' (Cock 1986, p81). The influence of different caretakers was considered in this study in relation to the mediation style of tutors. Though intragroup differences precluded generalisations, adult involvement in more than half the roles, high-school education for the mother and father's participation in caretaking roles, were features noted in the mediation group of tutors.

It has been suggested by Weisner and Gallimore (1975) that multiple caretakers lessen attachment bonds. It has also been argued by others (Diaz-Guerrero 1986) that caretaking by children increases affiliation ties and diminishes an authority-orientation with consequences for educational settings (see 7.1.). The findings of this study are mixed. It is suggested that assumed educational mannerisms of an authoritarian nature become mingled with sibling status factors and some egalitarian peer traits.

Edwards (1985) believes that the caregiving experience for a child facilitates appreciation for the desirable consequences of observing social rules and norms, not only for themselves but for the family as a whole. Her cross-cultural study (the Philippines and Kenya) showed multi-age settings for childcare involved much formal and informal authority for the child caretakers, which is also the case with the township children. In carrying out their duties such children should 'develop abilities to think about certain kinds of social situations and to influence and convince others when necessary' (Edwards 1985, p119). She sees social responsibility as promoting cognitive skills. Flavell (1978) has also stressed how describing an event to others uses strategic and metacognitive skills though Feldman (1979) believes young children are limited in their understanding of metacognition.

Such a limitation is revealed in this study of teaching style by the younger tutors who are often unable to explain how to do the puzzle task confirming those who uphold the limiting value of child caretakers to child development (Sutton-Smith 1975, Smith 1982). However, some young tutors were good mediators (Subjects 1 & 14) and some older tutors were not effective (Subjects 6 & 20).

Explanations were also not easy for the adults in the local studies of mothers and teachers ((Craig 1985, Kok 1986, Mindry 1984). These findings could also suggest styles of communication or patterns of explanation that are biassed towards the operational mode rather than the symbolic mode. However, these researchers suggest that within the terms of their cultural operators these women were performing 'superbly' (Craig & Miller 1983). It is only from a Western analyst's perspective that their competence would be questionable. In this discussion an attempt has been made not to be confined to an either/or perspective but to consider the consequences of both 'competencies' in an osmotic relationship.

Iconic patterns of discourse would not be inconsistent with the predominance of primary school levels of attainment in the majority of the community, a finding reflected in cross-cultural studies where large numbers of adults were non-schooled (Bruner 1971).

Clark (1985) also noted the greater proportion of aversive techniques in Zulu childrearing than proportions of praising or reinforcing behaviours. It is also suggestive that in the perceptions of role fulfillment in the homes, that of 'rewards' was markedly varied in attribution. This category was thus uncertainly perceived either because of its low priority or because it is flexibly perceived. 'Rewards' do, however, tend to be one of the grandparent's functions as well as that of fathers'. Not all households have the benefit of both, or either, of these members. Vilikazi (1982) and de Haas (1984) have commented on the minimal role attributed to fathers except as providing role models for their sons.

Though intragroup variation can be expected on this reward category, the authoritarian trend is also reflected in the mediational operators (Kok 1986) mothers allegedly practice. Blau (1981) has emphasised through

empirical evidence that aversive maternal techniques in childrearing are adversely related to achievements. In a study of middle and upper class blacks, different modes of interaction were noted: a higher verbal input, greater number of explanations and questions and little reliance of aversive strategies. Feshbach (1973) has also commented on variation in reinforcement style, cross-culturally, according to social class.

The mothers in these households were not all gainfully employed and very few if any had access to a white social milieu (i.e. other than as domestic employees). Cock (1984) found in her sample of black mothers that 66% had pre-school children. A quarter of the working mothers returned to work before the child was two months old, and half by the time the child was six months old. There had been a 51% increase in black female labour in the decade 1971 - 1981. Cock's findings remind one of the other side of Blau's contention about working mothers referred to earlier (p130). The context of the work setting, or the mesosystem, must be significant in relation to which mothers, where, and when, would benefit their children by returning to work? The question of daycare and its advantages and disadvantages remain controversial. Recent research emphasises the value of quality daycare in promoting cognitive growth (Tizard 1985). Crèches and preschools, per se, may not always be to the child's advantage as adult-child interactional opportunities could become completely diffused by large numbers of peers (Bronfenbrenner 1979).

Aversive strategies in childrearing and a low priority on autonomy are also consistent with the literature on impoverished working class communities (Feshbach 1973, Rutter 1985). Most Zulu parents do have a high investment in education (Craig 1985) but the type of education available has generally remained a subtle negative factor in the promoting of cognitive growth. Township parents tend to believe that the schools will provide all that is necessary for learning (Clark 1985) which is also suggested by the framework of rigid role divisions (Kok 1986). The main medium for learning is believed to be observation and imitation as reflected both in the teaching interaction and in the interview comments. In many ways, the 'match' between learning styles at home and at school does not appear very discrepant. The dilemma appears to lie in the curriculum of apartheid education which reinforces authoritarian principles, and thus reduces the accessibility of Western competencies while purporting to make them more available.

# 7.    CONCLUSION

The intention of the present study was:

a)   to contribute to the debate on cognitive development in a multi-cultural context through a consideration of the sibling role in tutoring situations

b)   to explore the contribution of the wider community to caretaking tasks hypothesising that therein lay part of the experiential nexus of learning styles

c)   to consider the pragmatic implications of such findings within the broader learning situation, including formal education.

Elements of ecological and phenomenological models were used to investigate how township children taught each other. What interventions can be proposed to foster children's cognitive development? The following recommendations focus firstly on the tutoring perspective, secondly on the caretaking perspective, and, finally, on the research perspective.

## 7.1.    The Tutoring Perspective

The township children were found to teach each other in a manner similar to the local adults but with decreasing skills as the age level of the tutor drops. Certain conventions of interaction were apparent: a value on compliance, restricted autonomy, minimal verbal cues and an emphasis on 'doing' rather than 'knowing'. 'Pseudo-competence' was observed particularly in the younger tutors which suggests an 'overmimicry' of perceived adult style. Tutors were mostly found to be conscious of role division, exhibited trial-and-error strategies and a low rate of positive feedback behaviours. Again such tendencies were more pronounced for younger tutors.

Tutees were compliant and passive except where younger tutors were unable to involve their charges in 'doing' the tasks. Initiative was frequently rejected. Some interesting exceptions were noted where ludic engagement,

verbal cues and participatory modes were encouraged. Such examples were found in the younger as well as the older groups, males as well as females. Some sex differences were observed, female children appearing more constrained by role division whereas males showed greater spontaneity. Mediational operators (Kok 1986, p184) provide one perspective for assessing role divisions and 'a different kind of competence'. It would appear that the uniquely relevant ecological factors within the South African setting might require a more elaborate explanation.

It would seem from reviewing these findings in conjunction with the literature that the following recommendations could be considered for educational purposes.

i)   A greater emphasis on the value of 'bicognitive functioning' (Schofield & Anderson, 1987, p280) i.e. fostering the ability to use field dependent and field independent styles as appropriate. This would involve actively recognising the strengths of characteristics assumed to be Western (competitive, individualistic, autonomous) as well as those assumed to be of Third World societies (co-operative, community-based, interdependent).

ii)  In a pluralistic society optimising development for all children is highly problematic. Placing value on mutual interdependence and co-operative learning would increase cross-ethnic understanding if joint goals were assigned to such groups. Same-age cohorts could be 'scrambled' into more 'natural' multi-age groups to work on joint assignments. The 'jig-saw method' (Aronson & Bridgeman quoted in Phinney & Rotheram, 1987) for example, advocates individuals learning sections of work and then all contributing by teaching others. Thus social skills and social responsibility and trust are developed without sacrificing individual motivation and achievement.

iii) The benefits of child tutoring are not unequivocally viewed by researchers or educationalists but many agree that the tutor benefits from role rehearsal and perspective taking. The benefits to the tutee have not been assessed over time nor qualitatively investigated. This study suggests that siblings do contribute

important interactional dimensions to learning situations and thus hold a definite potential role in furthering cognitive development. By greater exposure to different models of task planning and strategy devising, tutees could themselves be extended beyond their own existing developmental level to a more advanced one.

For example, future recommendations would necessitate re-thinking:

a) the potential role of siblings as tutors to pre-school siblings through specific guidance at primary schools and high schools,

b) the possibility of peripatetic tutors to small groups of children within specific areas for specific periods (e.g. mobile pre-primary 'workshops' for children in a rotating block system for set periods, say 4 weeks at a time,

c) training the unemployed youth, or siblings, who have left school, either as home-tutors or as assistants in the existing crèches or primary schools to provide a better child-tutor ratio.

iv) Teacher training programmes: cultural differences, economic variables and different social values need to be acknowledged when planning tasks and goals (Phinney & Rotheram, 1987). Alternative education has already postulated some directions for change.

v) Co-operative workshops: between teachers, parents and the youth on joint community goals. Emphasis on discourse skills, communication patterns, negotiating and conflict-resolution skills, would encourage the development of self-regulation and promote cognitive flexibility.

vi) Using Gardner's (1985) exposition of multiple intelligences, all possible forms of learning opportunities should be included in educational experiences: kinaesthetic, visual, spatial, musical, logical-mathematical and interpersonal. In this way the gap between formal/informal learning styles could begin to be bridged. Miller and Bizzell's (1984) study has indicated the positive long-term gains of multi-experiential learning.

vii) The re-evaluation of the role and status of primary school education appears of fundamental importance. The largest proportion of black school-going children is in primary school. What is essential, is the upgrading or re-formation of such schools: improved teacher/pupil ratios and qualified teachers. The transitional phase from concrete operational thinking to formal thinking surely constitutes the most important part of formal education. This is the primary school age-group, to which these tutors belong. Pre-school education and adequate daycare are certainly very important (Bronfenbrenner 1979, van den Berg & Verganni, 1986). Due to the gravity of educational standards and the decline in the black matriculation pass rate, it is contended here that the primary schools are an equally, if not more important, educational priority.

## 7.2.   The Caretaking Perspective

The microsystem for the township child consists of 'patterns of activities, roles and interpersonal relations' (Bronfenbrenner, 1979, p22) that this study has only glimpsed in fragmented form. There is, it seems, need for an Octavio Sanchez to document these children's experiences from a deeply experiential base to provide a phenomenological perspective to the developmental 'relief' of the inter-psychological and intra-psychological processes appearing within the ecology of the individual child.

In recalling the initial image of the holograph from the Introduction (Chapter 1) , the constraints of the mesosystem (value conflicts between neighbours, parents, teachers and peers), the exosystem (education boycotts, township unrest, police, military and vigilante presence), and the macrosystem (Group areas, apartheid education policies, economic discrimination in State expenditure), to name a few, present a negative 'setting' for optimal cognitive development from a Western analyst's perspective. Though Bronfenbrenner (1979) is partially optimistic about the possible positive effects of conflict and confrontation on the developing individual (eg. the Great Depression of 1929), and no doubt the resourcefulness and resilience of human beings should never be underestimated, it must be acknowledged that the 'way of looking' in this

discussion has tended to be pessimistic rather than optimistic.
It is not, however, without hope that the prospects for change and
evolution within these systems are seen, and that the contribution of
siblings themselves to such transformations will be more than
theoretically possible, particularly in a community where youth is seizing
the initiative. Hope may transform the sub-culture of despair.

In overview, the caretaking and demographic survey of siblings'
contribution to household tasks yield the following impressions:

i)   A context of extended family systems with households averaging eleven
     people, as well as community networks of shared responsibility.
     Patterns of sibling caretaking are pronounced. There appears an
     authoritarian caretaking framework and reinforcement style.

ii)  Households tend to have high proportions of grandmothers active in
     caretaking roles, and together with aunts and mothers, there is a
     prevalent female influence. Father presence, though limited, appears
     to be associated with cognitive gains. Adult interaction tends to be
     limited to physically or socially nurturant tasks. Siblings,
     especially younger ones, perceive themselves as almost jointly
     responsible with adults in caretaking tasks.

iii) Recreational, social and intellectual stimulation is limited.
     Cognitive experiences - learning new words, songs, games - are
     predominantly the siblings' roles. Caretaking tasks in general are
     usually shared by an adult and sibling.

iv)  School grades and pupil ages present very different profiles for peer
     relationships compared to conventional White school norms. The
     community reflects low levels of schooling and high levels of
     unskilled and unemployed persons, and the likelihood of a large body
     of frustrated youth. Optimism must be linked then to future changes
     in the macrosystem because it 'encompasses the blueprint of the
     ecological environment not only as it is but also as it might become
     if the present social order were altered' (Bronfenbrenner, 1979,
     p289).

7.3.     The Research Perspective

Some of the problems encountered by this particular research study have
been described earlier (3.1.5.) therefore the conclusions that can be
drawn from these results are necessarily tentative. An attempt has been
made to combine the paradigms of positivism and modern humanism, and
although this heuristic endeavour at methodological rapprochement
represents a fledgling stage, the advantages are:

i)   In relation to the statistical perspective, an opportunity to
     consider quantitative empirical data: frequency of behaviours, age,
     sex, education, socio-economic needs and status.

ii)  In relation to the subjective perspective: descriptions of the
     individuality of interpersonal behaviours which complement numerical
     data.   The transcript commentaries reveal variables of interaction
     not available statistically, such as compliance, fear, humour or
     play. However, in this study the two approaches could have been more
     actively correlated.   A major limitation was the fact that the
     caretaking interviews did not include qualitative subjective
     phenomena, in particular the way siblings viewed their caretaking
     roles. Frequency of interaction could not yield the information that
     would promote reconciling the two sets of data.   Educational
     variables and father's presence appeared relevant to mediating
     skills.

iii) Videotaped naturalistic observations of the children playing a game
     or engaged in problem solving in a home setting would greatly
     increase the density of 'text' with which a 'reading' of sibling
     contribution could be attempted.

iv)  A sample of rural children could provide a comparison of caretaking
     styles and differences in relation to formal educational approaches.

v) Longitudinal studies, or even a follow-up study, would allow a clearer view of the effects of the zone of proximal development over time. Wertsch (1985) believes pre-task and post-tests are risky procedures and prefers a single dyad-in-action session as a suitable unit of analysis. He offers an important insight which is particularly relevant to the township sample. 'It is generally assumed that one must understand a task before one can carry it out. Our suggestion is that in many cases one must carry it out before one can understand it' (p 289). I see this as particularly relevant for this study. The S.A. ecological context is one of transition. Multiculturally we will have to evolve even before we have understood how to do so. Though the aim of this study was to be 'pragmatic', the difficulties surrounding the topic prove immense. Increasingly, the specialised nature of alternative educational perspectives became clearer. Consequently, this discussion only hints at the complexities.

Finally, the value of extended observations over time would be that while both child tutor and tutee continue their individual child maturation processes, so their engagement in mediated learning experiences will undergo changes and transformations. In this way the challenges of cognitive growth could be monitored. 'Rather than seeking a mountain top where we can climb above the jungle to see the whole of reality, we must acknowledge the constraints on our vision, seeking smaller hillocks, each of which may give us a different perspective on the part of the whole' (Hinde et al, p332).

May this hillock contribute, in some way, to the viewfinders.

8.   REFERENCES

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8.                    **A P P E N D I X**

<u>Instructions</u>

We have  asked you  to come here today because we want to see how you play
together with your brother/sister.

The game that you will play looks like this one (demonstration task).

We will give you two games at a time and when playing  you must  copy from
the  one  game.   We  will  bring  two  complete games to you, then we'll
dismantle one and you will have to  reassemble  it.   As  you  finish one
puzzle we will bring you another.

Remember that we are not testing you.  We are not finding out whether your
brother/sister is bright or not.  The big thing is that we want to see how
you  do  things  together,  with  you telling him/her how to do something.
Your brother/sister will not be able  to do  the puzzle  without your help
because  it  will  be  too  difficult  for  him/her.   However, it is your
brother/sister who must play and not you.  All the puzzles must be done by
him/her and you must help and guide him/her in any way you wish.

We will start with this one (demonstration task).  This is just an example
so that you can see how to do the real puzzle.

Now you see that these two  puzzles are  the same/identical  - the shapes,
the positions  and the colours are the same.  A green four-cornered one is
in a similar position in the task puzzle and in the model  puzzle, and the
round yellow  one is  in a  similar corner as this one.  When you play you
must look  how the  pieces are  on the  model so  that you  can make yours
identical.

Task  1

As you can see, these two trucks are the same in all respects (point to each individual piece in the truck puzzle, comparing it with the model). Do you see that the shapes, colours and positions are all identical? Look especially at the cargo of the truck. The coloured squares making up the cargo are arranged so that they look identical to the model. When you make up this truck puzzle, it must look identical to the model (empty the one puzzle). I am going to place the model in between you (the tutor) and your sister/brother so that you can both see it clearly (the pieces of the puzzle are also placed between the tutor and tutee). The empty task is placed directly in front of the tutee (sibling).

Task  2

As you can see these two trucks are exactly the same. The colour, shape and position of the pieces are identical to the model (pointing out, specifically, the cargo). The cargo pieces in the model truck and your truck are exactly the same. The shapes and colours are the same as in the model and the different coloured shapes are positioned in the same way in your puzzle as in the model puzzle. As you did in the previous game you must make this puzzle by copying from the model, so that, when you are finished, your truck and the model look exactly the same.

(Empty out the puzzle.) The empty puzzle is placed in front of the tutee (sibling) and pieces being placed in between tutor and tutee (sibling). It is again emphasized to the tutor that she/he must help their brother/sister and not do the task for him/her.

Task 3

We are now going to play another <u>kind</u> of game. It's a block puzzle game. As you can see, both block puzzles are exactly the same (pointing to colour, shape and size of the blocks). Then one by one, the sticks with the 3 blocks are taken out. The shape of this stick is a triangle / square / rectangle and the inside hole of the blocks on this stick match the shape of the stick so that when you make this block puzzle, you must make sure the inner hole of the block matches the shape of the stick. The block must also be the same shape and colour as that on the model, and must be arranged in the same order as they are arranged on the model. Also, the stick must be placed in the same holes as they are in the model. The empty board is placed in front of the tutee (sibling) and the blocks, sticks and model are placed in front of the tutee (sibling) and the blocks, sticks and model are placed in between the tutor and tutee (sibling). It is again stressed that the tutor must aid his/her sibling and not do the task for him/her.

When you play there will be pieces that are unlike the ones you must use. I want to see if you can see them and leave them and not use them because they are the wrong pieces. You should choose the right pieces because you are copying from here as you make up your puzzle.