CHAPTER II

REVIEW OF LITERATURE
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This section presents a selective review of the research, inferences, and implications related to the cognitive consequences of bilingualism. In discussing the relationship between linguistic status and cognition, evidence mostly from cross-cultural literature and dealing with such cognitive factors as intelligence, memory, linguistic and metalinguistic skills, reasoning and academic skills are cited.

The review is mainly focused on the developmental consequences of becoming a bilingual and the processes and strategies in bilingual children as distinct from their unilingual counterparts. Following the traditions of developmental literature and the theoretical vigour of Piaget's stage-invariant theory of intelligence, the likely influence of bilingualism on cognitive development is also reviewed with reference to piagetian and experimental research. The citations predominantly emphasize cross-cultural studies and their implications with a view to providing a theoretical background for the present research.

Bilingualism and Cognition

The history of studies on bilingualism does not fall into a neat continuous line. During the early years, the
bilingualism literature witnessed periodic surges of research activity mostly confined to trying standard psychological tests on populations of varying linguistic status rather than being guided by any sound theoretical framework. Most of the early studies could be characterized by pitfalls in methodology, inadequacies in sample size and testing devices and above all by a lack of scientific concern. These problems, however, were recognized and to a great extent redressed in the later phases of bilingual research. The shift of emphasis in the issues addressed and the style of investigation adopted from the early to the later phase of research was noticeable. While during the beginning years, the issue mostly addressed was whether or not bilingualism is intellectually desirable, the later years of research attempted to explicate besides the traditional issues, many new and diverse aspects of bilingualism.

Literature on the consequences of bilingualism can be traced back to the turn of the century. The span of these eight decades may be reviewed in three phases: the earlier phase of general pessimism, the period of optimism, and the period in which research concentrated on exploring many new and diverse aspects of bilingualism. A large proportion of the investigations during the early period concluded that bilingualism had a detrimental
effect on the intellectual functioning of the children. In the subsequent period of optimism, results of many studies indicated that bilinguals exercise good deal of cognitive superiority over their unilingual counterparts. However, at present, a period of indecision continues to prevail in the bilingual research as rightly pointed out by McLaughlin (1977) that the findings in regard to the effect of bilingualism can, at best be described as inconclusive.

**Early Pessimism**

A systematic investigation of the question of whether the bilingual is cognitively different from unilingual was first reported by Ronjat (1913) which suggested that bilingual children relative to unilingual controls were behind in schools, retarded in measured intelligence and socially adrift. On the basis of their studies on Spanish-English bilinguals, Manuel and Wright (1929) reported that bilinguals most often think in one language and speak in another as a result of which their memory processes become uncertain and confused, thinking is interfered and intellectual pursuits decline. Rigg (1928) considered bilingualism as a mental burden causing intellectual fatigue in the learner. On the basis of his experimental investigations, he reported that bilingualism reduces the ability of the learner to comprehend and
conceptualize his experiences.

Saer (1923) and Smith (1923) reported that a bilingual child is handicapped on intelligence tests especially those demanding linguistic ability. They explained the deficit in terms of having to learn and having learned two languages instead of one. Using Welsh-English bilinguals as his subjects, Smith (1939) concluded that intelligence is negatively affected in the presence of bilingualism. Seidl's (1937) study on Spanish-English bilinguals reported that bilinguals' thinking process is clumsy and confused as a result of interference between the competing responses from the two languages.

Weisgerber (1935) reported that bilingualism is even capable of impairing the intelligence of a whole ethnic group and crippling its creative ability for generations. This position was also shared by many German authors of the time who claimed it to be their patriotic duty to find scientific evidences for the negative effects of bilingualism (Porchi, 1975). Darcy (1953) observed that bilinguals suffer from a language handicap when measured on verbal tests of intelligence but with nonverbal tests of intelligence, no such handicap was reported. Mitchell (1937) employed paper-pencil tests to measure the differences in the intellectual functioning of unilingual and bilingual subjects. He
reported that bilinguals performed poorly on these tests because their potentiality is divided among the two languages resulting in a low concentration and initiative on their part.

The foregoing citations reveal that by the middle of the 20th century, bilingualism was considered as intellectually undesirable. Investigators in German, USA, Canada and in many different parts of the world were almost unanimous in their opinion. Arsenian (1937) noted that 60 percent of the research findings in the world reported bilingualism as an intellectual handicap, 30 percent reported that this handicap did exist in a minor form and only 10 percent found no ill effects of bilingualism. However, in reviewing the earlier studies, he argued that an adequate study should be methodologically more careful and must consist of a larger sample size. Arsenian's study on the relationship of bilingualism with mental ability, age-grade status and socio-economic background reported no significant difference in the intellectual functioning of unilingual and bilingual subjects.

Some classic studies on the relationship between bilingualism and intelligence were carried out in Wales with children having competence in both the Welsh and English language. Like American research, these studies at first suggested that bilingualism had a negative effect on intelligence (Saer, 1923). But subsequent research
with unilingual and bilingual children in Wales (Barke, 1933; Jones, 1952, 1966) found that bilingual's inferiority was a function of the type of materials used. No difference was observed between unilingual and bilingual subjects on the nonverbal measures excepting that the unilinguals scored a little higher on the verbal measures. They found that bilingual children tested in their second language were at a definite disadvantage in intelligence tests with a verbal factor because of their inadequate reading ability and conceptual inadequacy in the second language. A few other studies in the early literature also pointed out that bilingual and unilingual children were equal on measures of IQ, especially when they were compared on nonverbal measures (Anastasi & de Jesus, 1953; Arsenian, 1937; Carrow, 1957; Samchez, 1934; Stark, 1940).

Reviewing the literature, Darcy (1953, 1963) reported that the apparently contradictory results arose largely from methodological differences between various investigations and from the absence of an accepted definition of bilingualism. Moreover, researchers have often failed to separate the bilingual factors from the environmental factors by not being able to match the unilingual and bilingual groups with respect to their socioeconomic status.

The early literature, thus consistently reported
negative effects of bilingualism. However, these studies did not take enough care to check out the essentials before comparing unilingual and bilingual subjects; such factors as social class background and educational opportunities were not controlled and little attention was paid to determine whether or not the bilingual and unilingual groups were really comparable. But despite the diverse nature of the early studies, the findings were relatively clear and fairly consistent in that bilingualism had a detrimental effect on cognitive functioning.

The Optimistic Trend

Evidence concerning the favourable effects of bilingualism on cognitive functioning was not totally absent in the early literature, it was very scarce in that only 10 percent of the early studies argued for the positive effects of bilingualism. The real optimistic trend in bilingual research emerged in the early sixties with the investigation of Peal and Lambert (1962) on Canadian bilingual children. Following the traditions of early research they expected a bilingual deficit. Their major research contention was to examine the intellectual components of such deficits so as to plan appropriate compensatory training programs for the bilingual children. They tried to overcome most of the shortcomings noted in the earlier research.
Peal and Lambert (1962) got surprising results in that French-English bilingual children in the Montreal setting scored significantly ahead of carefully matched unilinguals on both verbal and nonverbal measures of intelligence. Furthermore, the pattern of test results suggested that the bilinguals had a more diversified structure of intelligence and were more flexible in thought. Anisfield (1964) confirmed the results of this investigation by a subsequent follow-up study.

The findings of this study set a new motion in bilingual research. It caught the imagination of researchers in different parts of the world; they set out to investigate the issues in different cultural settings. Research evidence in confirmation of the findings of Peal and Lambert (1962) started flowing from different corners of the world, from Singapore (Torrance, Gowan, Wu, & Alliotti, 1970), Switzerland (Balkan, 1970), South Africa (Tanco-Worrall, 1972), Israel (Ben-Zeev, 1972), New York (Ben-Zeev, 1972); and Western Canada (Cummins & Gulutsan, 1974). Each of these studies in its unique ways investigated the phenomenon and reported that bilinguals were superior to their unilingual counterparts on measures of cognitive flexibility, creativity and divergent thought.

Tanco-Worrall (1972) studied middle class Afrikaan-English bilinguals in South Africa. His bilingual and unilingual subjects were equated for age, sex, social
class and intelligence. Ethnicity was also the same for both the groups. All the 30 subjects were in the age range of 7 to 9 years. The bilingual children came from families where father and mother consistently spoke a different language to the child. Selection was determined by the ability to pass a test of basic verbal skills in both languages. The results indicated that bilinguals were capable of separating the meaning of a word from its sound at a relatively earlier age compared to unilingual children. This ability was supposed to be the result of learning the words of two languages which were characterized by different sound representation for a given idea. In other words a bilingual child understands that a sound representation is not the same as the idea which it represents. This distinction is conveniently available to the bilingual child and helps him at a later stage for representations of more abstract ideas.

It was also observed by Ianco-Worrall (1972) that bilingual children not only excelled in active analysis of representations but also in the ability to state the principle that names are arbitrarily assigned to things. Using Hebrew-English bilinguals in New York and Israel, Ben-zeev (1972) reported greater cognitive flexibility for the bilinguals as compared to unilinguals. The bilinguals were found to have skills in auditory reorganization of verbal materials, a much more flexible
manipulation of linguistic code and more advanced perfor-
mances on tests of concrete operational thinking. The
Hebrew-English bilinguals were superior to their
comparison groups in their ability to play with words,
which may possibly be regarded as emerging from increased
analysis of language on the part of the bilinguals.

Ben-zeev's study included items to tap subjects
awareness of language structure and functions. For example,
one of the items consisted of showing the subject a toy
aeroplane and telling him that this is called an aeroplane.
The subject was then prompted to play a game of words with
the experimenter renaming the aeroplane as turtle. The
subject was then asked two questions- "Can the turtle fly?"
and "How does the turtle fly?". Both the questions aimed
at examining subject's competence in using the words in a
relatively arbitrary way by appreciating that objects do
not change their property and characteristic ways of
functioning inspite of changes in their assigned names.
The bilinguals were found to outperform the unilinguals on
tests of this type designed to study competence in
arbitrariness of language use.

The indications for bilingual superiority on
intellectual tasks appeared to be progressively clearer.
Cummins and Gulutsan (1974) found that French-English
bilinguals performed at a higher level both on verbal and
nonverbal measures of intelligence. In their study
sixty-one sixth grade bilingual children drawn from a French-English bilingual program were found to perform at a significantly higher level than the sixty-one age, sex, and SES matched unilinguals on several measures of reasoning and divergent thinking. The performance characteristics of children in the bilingual programs from French speaking houses, English speaking houses and houses where both French and English were spoken were also examined. The French group performed at a significantly lower level than the other two bilingual groups but not from unilinguals on a measure of verbal reasoning.

One of the most persuasive studies in bilingual research was conducted by Scott (1973) on French-English bilinguals in Montreal. It involved a comparison of young children some of whom were given the opportunity to become bilingual over a period of years. One group which became functionally bilingual in French by attending experimental classes with instructions imparted in French was contrasted with the unilingual group attending conventional English language education programs. At the grade 1 level the two groups were equated for measured intelligence, socio-economic background and parental attitude towards French people. In fact, had the opportunity been presented to them, it was likely that most of the parents in the control group would have enrolled their children in the experimental French programs.
Scott was interested in the possible effects of becoming bilingual on cognitive abilities like divergent thinking and convergent thinking. Measures of divergent thinking provided the subjects with a starting point for thought (Think of a paper clip and tell me all the things that one could do with it) which the subjects were required to analyse for giving a correct answer. For convergent thinking measures, subjects were required to synthesize a number of pieces of information to arrive at a correct solution. The results based on a multivariate analysis showed that the group who had become functionally bilingual through immersion schooling scored substantially higher than the unilingual groups on measures of divergent thinking. Although the sample size in each group was small, the study provided strong support for the causal link between bilingualism and cognitive flexibility, the former apparently enhancing the later.

Diverse Nature of Bilingual Research

During the last decade, there has been a gradual shift of emphasis in bilingual research. The early explanations for the negative consequences of bilingualism and the later ones propagating its positive effects were both considered inadequate for explicating the many different and diverse conditions of the bilingual environment. Instead of viewing bilingualism as a global variable, recent researchers tended to differentiate
between additive and substractive forms of bilingualism (Lambert, 1975) and brought in threshold hypothesis (Cummins, 1979) to explain either the positive or the negative consequences of bilingual education.

Within the present research tradition, bilingualism no more exists as a unitary and global concept. Most of the studies conducted since 1960's and reporting positive effects of bilingual education dealt with samples acquiring a second language at no cost to the development of their first language. This is what has been termed by Lambert (1975) as additive form of bilingualism. Obviously children coming from such bilingual environment were in the process of attaining a relatively high level of fluency and literacy in their two languages. The threshold level of proficiency attained by these children in the two languages was high enough to secure the intellectual benefits of bilingual programs. On the other hand, when the process of second language acquisition replaces subject's skill in his first language, a substrative form of bilingualism is said to develop in which case because of low level of proficiency in both the languages, the bilingual children are likely to suffer language handicaps and therefore, cognitive confusion. Most of the early studies in bilingual research may be characterized as dealing with what could possibly be called substrative forms of bilingualism.
It seems clear that the bilingual child having more than certain specified levels of mastery in two languages had a definite cognitive advantage over the unilingual child. But this advantage is either lost or reversed if the children do not reach a certain threshold level of proficiency in their two languages. Furthermore, the socio-cultural forces play a major role in determining the cognitive consequences of bilingualism and biliteracy. Where the social reinforcement systems are such as to promote the second language acquisition faster, still putting considerable premium on the retention of the first language, bilingualism is likely to generate positive intellectual effects. Bilingual children from minority groups lacking in this social and educational support for literacy development are likely to suffer from the ill effects of substractive form of bilingualism. It thus seems clear that bilingualism of all forms and across all socio-cultural contexts is not intellectually desirable. This perspective was seen to be lacking in the early phase of research. Unlike the early findings in regard to either positive or negative consequences of bilingual education; the current proposition argues in favour of examining effects of bilingualism with reference to the conditions of the bilingual environment.

However, the mechanism by which bilingualism brings about cognitive changes are not apparently clear. It is
speculated that the bilingual child uses two distinct ways of saying the same thing, and thus apparently gains control over the structure and functions of language. With considerable practice in analysing meanings in two languages, he becomes more adept in certain aspects of linguistic processing. His sensitivity to word meanings and formal aspects of language possibly generalize to cognitive functioning.

Hakuta and Diaz (1985) and Diaz (1986) have recently reported that bilingualism may positively influence general cognitive functioning in addition to the meta-linguistic skills. Within the framework of a longitudinal within-group design, Hakuta and Diaz studied the relationship between cognitive abilities and second language (English) skills of Hispanic primary school children matched with respect to their abilities on the first language, socio-economic status and educational experience. The relationship was found to be substantial, particularly for Raven's progressive matrices, a nonverbal measure of intelligence.

Their analysis further suggested that when bilingualism and intellectual functioning are related, the former is most likely the causal factor. However, McLaughlin's (1984) review of literature suggests that the possible causal link between bilingualism and intellectual functioning can at best he described as inconclusive.
mainly because of the difficulties in applying the necessary controls in research. Even the threshold hypothesis proposed by Cummins was questioned by Diaz (1986) who found that even low level of second language proficiency had strong positive effects on the cognitive abilities of Hispanic primary school children. Cummins (1985) defended the threshold hypothesis on the grounds that for the positive effects of bilingualism to emerge, children must be in the process of developing high levels of bilingual skill and that this was probably true for the Hispanic school children.

True to any discipline of knowledge, recent bilingual research is full of debates, arguments and contradictions as researchers are becoming increasingly aware of the multifaceted processes underlying bilingual programs. The entire base of bilingual research has been broadened and subdivided. Researchers are moving away from a same-different conceptualization of the bilingual-unilingual distinction to looking for distinctions within the bilingual population itself. New dimensions of inquiry reflecting social, psychological, sociolinguistic, and educational theories are being gradually incorporated into the realm of bilingual research, each one pointing to the diversified nature of bilingualism.

Inspite of disagreements among researchers in building a unified theory for interpreting bilingual
effects, the possibility of integrating the research findings within a coherent theoretical system cannot altogether be ruled out. In fact Cummins (1985) proposes that:

The development of additive bilingual and biliteracy skills entails no negative consequences for children's academic, linguistic and intellectual development. On the contrary, although not conclusive, the evidence points in the direction of subtle metalinguistic, academic and intellectual benefits for bilingual children. (p.10)

Information Coding and Linguistic Processes

Piaget once remarked "To explain a psychological reaction or a cognitive mechanism ... is not simply to describe it, but to comprehend the processes by which it is formed. Failing that one can but note results without grasping their meaning" (Piaget, 1976; p.VI).

Recently there has been a shift from the study of abilities to enquiry into processes (Das, Kirby & Jarman, 1975, 1979). In the present study the information processing model developed by Das, Kirby and Jarman (1979) has been used to understand the information-integration modes of the bilinguals as compared to their unilingual counterparts.
Simultaneous and Successive Syntheses

Das et al. (1979) proposed that individual differences on a variety of reasoning, memory, and linguistic tasks can be parsimoniously interpreted in terms of simultaneous and successive syntheses. These two modes of information integration were originally suggested by Luria (1966) on the basis of his observations of different types of cortical lesions and their behavioural correlates.

Simultaneous synthesis involves the formation of a code which is quasi-spatial in nature having the characteristics that all parts of it are immediately surveyable. Successive synthesis, on the other hand, integrates individual stimuli into temporally organized successive series with the characteristics that all the elements are accessible only in a linear way.

Since 1972, a battery of tests is consistently used to tap the two modes of processing. This battery includes several measures of simultaneous processing (Raven's Progressive Matrices, Figure Copying and Memory for Designs), successive processing (Serial Recall, Digit Span and Visual Short-Term Memory) and processing speed (Word Reading and Colour Naming). Factors identifiable as simultaneous and successive processing have emerged in a number of studies dealing with various ability, age, socio-economic class, cultural and diagnostic groups.
More recent studies have examined the relationships of these cognitive processes with traditional models of abilities (Kirby & Das, 1978), intelligence (Jarman & Das, 1977) and language processes (Cummins & Das, 1977, 1978; Kirby & Das, 1977). Attempts have also been made to extend the model to investigate the cognitive processing of reading disabled children (Leong, 1976) and to explore its usefulness as a basis for remediating reading difficulties (Krywaniuk & Das, 1976). The relationship of the two coding processes with linguistic processing carries a great deal of significance for the present research.

Luria (1975) has argued that all grammatical constructions can be divided into two different groups. The first type, termed as 'contextual grammatical structures' represent "those forms that link together the elements of a statement into a single concrete whole" (1975, p.68). Successive processing is said to underly the processing of contextual grammatical structures. For example, those having deficits in successive processing would find it difficult to say which of the two statements is correct, "I am writing along the papers" or "I am writing on the paper". Underlying this type of dysfunction is the impairment of inner speech. While successive synthesis is important for contextual grammatical structures, simultaneous synthesis is
involved in processing the second type of logical-grammatical structures that Luria terms, "communication of relationships". Those having difficulties in simultaneous processing experience problems in understanding comparative constructions (e.g., taller than), spatial prepositional constructions (e.g., above, below etc.) and logical grammatical relationships involved in distinguishing "father's brother" from "brother's father". The essential characteristic of such a deficit is the impairment of the "ability to turn information received sequentially into synchronic quasi-spatial arrangements" (Luria, 1975, p.71). The contention that simultaneous processing is involved in comprehension of logical grammatical constructions is supported in a study carried out by Caramazza, Gordon, Zurif and Deluca (1976).

In summary, successive processing is significantly related to performance on linguistic tasks which require analysis of the sequential linear structure of a sentence. Simultaneous processing, on the other hand is involved in linguistic tasks which require the grasping of quasi-spatial conceptual relationships. It thus appears that while successive synthesis would be involved in linguistic analysis, a component of metalinguistic awareness simultaneous synthesis would underly general metalinguistic competence.
Empirical Evidence

The relationships of both these modes of processing with various cognitive and linguistic tasks (e.g., story recall, ambiguities, word association, class inclusion, syllogisms, spelling, verbal IQ, oral reading, comprehension etc.) have been investigated in a number of studies (Cummins & Das, 1977, 1978; Das, Cummins, Kirby & Jarman, 1979; Jarman, 1978; Kirby & Das, 1978). The pattern of findings suggest that different forms of cognitive processing are involved in different types of linguistic processing.

Cummins & Das (1978) using 60 grade 3 children as their subjects found that whereas simultaneous processing is clearly involved in understanding lexical ambiguities, successive processing assumes a relatively more important role in understanding surface structure and deep structure ambiguities. This is because analysis of the sequential pattern of the entire sentence is involved in surface and deep structure ambiguities while lexical ambiguity seems to involve what Luria (1975) calls the nominative or paradigmatic function of speech.

A subsequent study reported by Das, Kirby and Jarman (1979) examined the role of simultaneous and successive processing in narrative speech. The prediction that successive processing would be related to syntactic organization was supported in that the two indices of
syntactic maturity and complexity (number of words per T-unit and number of clauses per T-unit) loaded on the successive factor.

Cummins (1979) reported that simultaneous processing is important for grasping the relationship between subordinate and superordinate classes in the class inclusion task, and also for paradigmatic responding on the word association task. It was also found by Cummins (1973) that a syllogistic reasoning task involving comparative constructions and a task involving the discovery of semantic relationship between words both loaded on a simultaneous factor in high school students. The pattern of findings noted above are consistent with Luria's contention that simultaneous and successive processing are differentially important for different aspects of linguistic functioning.

These two modes of processing have also been related to more global measures of reading achievement, another form of linguistic functioning. Kirby & Das (1977) found that measures of reading vocabulary and reading comprehension were related to simultaneous and successive factor scores of a group of 99 grade four children. This suggests that for these children both forms of processing were important for their level of reading achievement. Further studies have elaborated upon these conclusions by introducing a developmental factor. Using 52 Educable
Mentally Retarded (EMR) adolescents Cummins and Das (1978) found that successive processing correlated significantly with the WRAT oral reading and spelling subtests while simultaneous processing was significantly related to WRAT arithmetic. The finding that for EMRs, both forms of processing are important for reading achievement has also been supported by Jarman (1978).

Although the importance of successive processing for reading achievement of the EMR children appears to be well substantiated, the picture appears to be different for the high achieving children. McLeod (1978) reported that simultaneous but not successive processing was highly related to reading performance in a group of grade 4 advanced readers; similar findings were also obtained by Cummins and Das (1977).

Thus the role of simultaneous and successive processing in linguistic functioning may vary between groups and at different developmental levels. The findings from studies involving EMR, normal and high achieving children suggest that successive processing may be a prerequisite for deeper levels of semantic analysis involving simultaneous processes. In other words successive processing may be important for the mastery of initial decoding skills but higher levels of fluent reading may depend more on simultaneous processing. The involvement of the two coding processes in conceptual-linguistic operations,
thus depends upon the characteristic of the group.

Implications for Bilingual Research

The preceding discussion should not, however, suggest that simultaneous and successive processing are hierarchical in nature. Each is an independent mode of processing and different subgroups use one or the other while solving a variety of memory, reasoning and linguistic tasks. It has been shown that bilinguals, compared to unilinguals are more adept in certain aspects of linguistic processing and show greater awareness about the structures and functions of language. Bilingualism, thus, fosters metalinguistic competence in children by orienting them to more objective aspects of language. As a result of this, one would expect a certain degree of difference between the bilinguals and unilinguals in the use of one or the other modes of processing while working on cognitive and linguistic problems. With the acquisition of an advanced level of bilingual and biliteracy skills, simultaneous processing would play an increasingly important role for understanding conceptual-linguistic operations of both the languages. One would, therefore, expect that bilinguals having certain threshold level of competence in both the languages would differ significantly from the unilinguals on measures of simultaneous than successive processing. In the recent
literature bilingual superiority in linguistic awareness has been conceptualized in terms of two underlying dimensions: children's analyzed knowledge of language and their control over language (Bialystok, 1984; Bialystok & Ryan, 1985). Bilingualism has been found to enhance child's control over language but not his analyzed knowledge of language. Considering that successive processing maintains high degree of relationship with analyses of the sequential linear structure of a sentence, it would be difficult to speculate whether or not bilingual-unilingual distinction would be obtained on the successive processing measures, especially at the earlier grades. The present study seeks to examine bilingual competence within the frame work of the simultaneous-successive information processing model. Besides group differences it would be worthwhile to explore the changing nature of relationships between the two processing modes, and a variety of cognitive, linguistic and achievement measures as a function of group characteristic and increasing bilingual experience.

Bilingualism and Metalinguistic-Skills

Most of the studies on bilingualism have investigated aspects of children's metalinguistic development. These skills refer to children's explicit knowledge about the structure and functions of language itself. Since
bilingualism is a phenomenon related to linguistic competence, it is not surprising that maximum research attention has been devoted to examining its role on linguistic processing and consequently on metalinguistic awareness. It would be in order to mention that in no area other than 'metalinguistic development' has the role of bilingual programs been so intensively and extensively examined.

**Historical Perspective**

Indeed it is argued that the relationship that bilingualism has with intellectual functioning is possibly mediated by children's sensitivity to formal aspects, structure and functions of language (Ben-zeev, 1972; Bialystok, 1984; Bialystok & Ryan, 1985; Cummins, 1979, 1985; Ianco-Worrall, 1972; McLaughlin, 1984). The evidence, however, was not always very clear cut. While the early studies on the bilinguals' linguistic skills reported negative effects of bilingualism, the more recent ones supported the notion of positive bilingual effects on metalinguistic awareness. In other words, from the earlier to the later phase of research, the evidence continued to change in the same manner as it was observed with studies on bilingualism and cognitive development. The only exception was that, during the early phase of research, relatively very few studies were conducted in the area of metalinguistic development.
Smith's (1939) study on preschool Chinese children was the first systematic investigation of bilingual's linguistic skills. He observed that the bilingual child tends to use fewer different words and develops a confused and mixed vocabulary because of lexical borrowings and the tendency to hyphenate words. Darcy (1946) in a similar vein reported that bilingual children use shorter and incomplete sentences, fewer compound and complex sentences and fewer interrogative and more exclamatory sentences. He indicated that confused structural patterns, unusual word orders, errors in agreement and dependency characterize bilingual speech, and consequently bilinguals make many errors in the use of verbs, tense, connectives, propositions, nouns, pronouns, and articles (Smith, 1939).

With increasing research concentration in the area, the evidence continued to change. Possibly because of adequate research controls and genuine scientific concern, the earlier conclusions were reversed in that bilingual children were found to be more adept at certain aspects of linguistic processing. Anastasi and de Jesus (1953) found that a group of bilingual Puerto Rican preschool children in New York city excelled a comparable group of unilingual in mean sentence length, and in maturity of sentence structure in English. Hymes (1967) reported that bilingual children demonstrated increased vocabulary in
a carefully controlled experiment. Spoerl (1944) pointed out that at the college level, bilingual children had no language handicap and even possessed some advantages.

It was contended that initial disadvantages, if any, of a bilingual child were largely overcome in higher grade levels with increasing competence in the two languages. In the early literature, indications were clear that language handicap was greater at early grades and diminished afterwards, the rate being determined by the individual's level of intelligence and the opportunity to interact with others in the community setting where the second language was used (Pinter, 1932). Among the later and more carefully controlled studies, the two significant ones were those of Carrow (1957) with Spanish-English bilinguals and Macnamara (1966) with Irish-English bilinguals. Carrow (1957) reported significant differences in favour of bilinguals on tests of oral reading, accuracy in comprehension and hearing vocabulary. No difference was observed on such linguistic skills as spelling, total verbal output, clause length, degree of subordination and complexity of sentence structure.

**Recent Metalinguistic Research**

Metalinguistic development refers to both the development of children's awareness of certain properties of language and their ability to analyse linguistic input;
that is to make language forms themselves the object of focal attention and to look at language rather than through it to the intended meaning. Although a pessimistic outlook prevailed the early research literature, a few investigators of the early period have speculated that access to two languages in early childhood might promote an awareness of linguistic operations and a more analytical orientation to linguistic input (Leopold, 1949; Vygotsky, 1962). Vygotsky (1962) argued that being able to express the same thought in different languages would enable the child to see his language as one particular system among many, and to view its phenomenon under more general categories. In the paper directly concerned with multilingualism, Vygotsky (1962) suggested that when the application of sound pedagogical principles ensured that each language had an independent sphere of influence, bilingualism could orient the child towards more abstract thought processes freed from the prison of concrete language form and phenomenon.

Leopold (1949) and Imedadze (1960) have both argued on the basis of observational studies of children's simultaneous acquisition of two languages, that bilingualism can accelerate the separation of name and object and can focus the child's attention on certain aspects of language. Lambert and Tucker (1972) found that the experimental group in the St. Lambert's bilingual
education project had learned to engage in a form of constructive linguistics. Ben-zeev (1977) hypothesized that bilinguals develop this analytic strategy towards language as a means of overcoming interlingual interference.

Evidence that bilinguals may analyse language more intensively than unilinguals comes from three major studies on Hebrew-English bilinguals (Ben-zeev, 1972), Spanish-English bilinguals (Ben-zeev, 1975), and Afrikaans-English bilinguals (Tanco-Worrall, 1972). In all these studies, the bilingual and unilingual groups were as far as possible equated for age, sex, social class, and intelligence and even ethnicity. The age of the subjects ranged from 4 to 9 years. While Ben-zeev used 98 and 188 subjects respectively for the two of her studies Worrall had a relatively small sample size of 30 mainly because of the reasons that she dealt with bilinguals whose parents each consistently spoke a different language to the child and who were selected on the basis of their ability to pass a test of basic verbal skills in both languages. The selection criterion used by Ben-zeev was subject's performance on a translation test in which they were required to translate sentences in each language into the other.

In two of these studies mentioned above, bilinguals were found to be capable of separating the meaning of a
word from its sound at an earlier age (Ben-zeev, 1972; Ianco-Woranall, 1972). This ability was considered to be the result of learning that the words of two languages are characterized by different sound representations for a given idea. The Afrikaan-English and the Hebrew-English bilinguals were more capable of playing with words and could state the principle that names are arbitrarily assigned to things which may possibly have been the result of increased analysis of language (Ben-zeev, 1972; Ianco-Worral, 1972). The Spanish-English bilinguals did not show evidence of any such superiority partly because of the reason that they came from low socio-economic stratum of the society, had less opportunity for language experience and had less pride in acquiring a second language. The one-language one-parent home situation of the Afrikaan-English bilinguals was probably a self-conscious plan by the parents to foster bilingualism in the children. Similarly, conscious planning by parents to foster bilingualism in children was evident in Hebrew-English bilingual homes. For the Spanish-English bilingual children, the planning was less evident. When asked which language they spoke better, they usually said "Spanish", but when asked which language they liked better, they usually said "English".

In the Hebrew-English study there was more direct evidence for better ability to analyze language on the
part of the bilinguals. In the symbol substitution test which required much more than simple substitution, they performed much better than the unilingual control. For example, the following item requires violation of the rule that a mass noun takes a singular verb. For this game, the way we say "they" is to say "Spaghetti". How do we say? They are good children (Correct answer: Spaghetti are good children). The Hebrew-English bilinguals were significantly superior on these tasks to their unilingual control groups from equally well educated families. For the Spanish-English bilinguals there was no group trend on such test items. However, when types of errors were analysed, it was found that in comparison to their unilingual group, the Spanish-English bilinguals made significantly fewer errors of a global type. The child is said to commit this type of error when he simply utters the substitute word in place of the entire sentence. For example, instead of saying "Spaghetti are good children", the child merely says "Spaghetti". The Spanish-English bilinguals had less of these type of errors. In other words, they were relatively competent to treat sentences in an analytical fashion.

Ability to treat sentence analytically and with playful flexibility, as in the symbol substitution task, does not imply superiority in ordinary grammar rule usage
as much as it speaks of children's metalinguistic competence. In neither of the studies were the bilinguals superior in tests of understanding of ordinary grammar. The Hebrew-English study included a test of ability to generalize ordinary phrase structure rules, adapted from Berko (1953). An example item is as follows:

"This is a Lord. He is another Lord. What are these?"
(Correct answer: These are Lords). The test in Hebrew-English study covered a broader range of structures than Berko's to correspond to the greater age range of the subjects.

For the Spanish-English study, samples of children's story telling were taken and analysed for grammatical mistakes. Surprisingly, the bilinguals made significantly more mistakes on all measures; their sentences were, however, as complex as those of the unilinguals as measured by percentage of clausal sentences.

The superiority of the bilinguals on the symbol substitution task can also be contrasted with their vocabulary performance. Both the Hebrew-English and Spanish-English bilinguals were not as good in performance on the Peabody Picture Vocabulary Test as to their respective unilingual control groups. This in itself is not surprising. Having to share their language experience between two languages, the bilinguals have less opportunity for experience with the vocabulary of either. Presumably
with increasing age and experience, the deficit becomes less marked. The relative lack of experience with each language probably has some limiting effect on the knowledge of standard grammatical rules within each language as well as on vocabulary although the grammar limitation should be less serious because repetitiveness and redundancy in grammar compensate a great deal for experience.

Symbol substitution on the other hand, depends not only on the mastery of particular words or particular production rules but on a grasp of the basic idea that the structure of a language is different from the phonological representations and meaningful words in which it is embodied, and that it is arbitrary and subject to change, rather than immutable. The experience that bilinguals have in learning two different language structures apparently fosters this kind of consciousness, which is evidently metalinguistic in nature.

Generalized Competence

Besides tests of linguistic and metalinguistic competence, Ben-Zeev (1972, 1975) also used nonverbal measures intended to test structural understanding. It was presumed that bilinguals would perform differently compared to unilinguals on these tests as a result of generalization from system analysis skills developed in
language learning efforts. The Spanish-English sample was given two somewhat different tests of ability to classify and reclassify following Inhelder and Piaget (1964). Each required the subject to classify items consistently, to switch to another type of classification of the same items, and then to switch to still a third type of classification. One of the tests involved reversal shift and required subjects to resist fitting together the stimuli into a global whole. The bilinguals performed better on both the tests.

On a test of matrix transposition (Bruner & Kenney 1966) the Hebrew-English bilinguals were better able to name the underlying dimensions in the task. The same trend was also shown for the Spanish-English bilinguals. The bilinguals were especially good on an item which required the child to demonstrate or describe how two items in the matrix which differ in one basic dimension are the same.

Subjects in the Hebrew-English study were also given the Raven's Progressive Matrices Test. There was no group differences in the total score. However, the bilinguals were better able to resist the error of simply choosing the response item closest to the choice point by scanning the whole field of possible responses; they appeared to be approaching the task with a more analytical strategy.

Ben-zeev's studies on Hebrew-English and Spanish-
English bilinguals also included Word Association Test in order to examine whether or not the child responds to a meaningful stimulus word with a response word which could follow the former in a sentence sequence. Responses of the same form class, called pragmatic responses, have been found to increase in frequency with age. An early explanation for this was that with increasing age, there is increased opportunity for experiencing each word in many different verbal contexts. Thus, the older children are more likely to abstract word aspect which is constant across all its various contexts of usage, and to respond on the basis of form class membership (Ervin, 1961a, 1963; Jenkins & Palermo, 1964). It has been suggested (Clifton, 1967; McNeill, 1971) that so called paradigmatic responses are based on concept relationships of the stimulus word and represent placement of the word within a semantic feature system in memory storage. If this interpretation is correct, one would expect bilinguals to give fewer responses of the paradigmatic type compared to others because they must devote their time between languages and thus would have less experience with particular words. The lower vocabulary scores found for bilinguals bear out this experimental deficit.

The results of both the bilingual studies of Ben-zeev (1972, 1975) were quite similar although the implications
were not very clear. No significant difference was observed between the bilingual and unilingual groups; the latency of the paradigmatic responses was however higher for the bilinguals. The task appeared to be more difficult for the bilinguals who gave more unrelated and clang sound responses. Since vocabulary performance was found to be highly and positively related in these studies, it was not surprising that bilinguals found to be poor in vocabulary knowledge, showed higher latency for paradigmatic responses.

In summary, the three bilingual studies reported above provided considerable evidence for the existence of an analytic strategy towards language on the part of the bilinguals and some evidence for the generalization of this strategy to other kinds of structures, which is apparently metalinguistic and metacognitive in nature.

It has been reported in several studies that besides developing an analytical strategy towards language, the bilinguals are more sensitive to language feedback cues (Ben-zeev, 1977). Utilization of feedback cues refer to a strategy presumed to involve active scanning efforts to spot cues indicating the correctness or incorrectness of present language orientation which then triggers reorganization efforts. The cues may come from aspects of language structure, or from the details of the environmental situation. Many kinds of cues are relevant
including syntactic, phonetic, linguistic and details of the environmental setting such as types of interlocutor, place, topic and so on.

The motivation for utilizing feedback cues is conceived to be both cognitive and emotional. Penfield and Roberts (1959) proposed that the neurological systems underlying the two languages of the bilinguals are functionally separate in such a way that when one is on, the other must be off. This theory implies that linguistic interference does not occur. However, Preston (1965) negated Penfield and Roberts' theory by using Stroop Colour Word Test and remarked that the ability to keep languages apart cannot be completely accomplished by a simple on off switching mechanism.

In reviewing Preston's study, Macnamara (1967a) highlighted the need for a two switch model; one at the output system and the other at the input system. However, his formulation of an automatic two switch model is still too simple. Koleers (1966) has shown that switching takes time and therefore special processing is required. He observed that since switching is difficult, the child develops special monitoring processes which pick up cues to warn him when switching will be required. And since the child must not only be ready to switch when required but also be able to resist interference and to remain within the structure of one language, the bilingual child
may be especially sensitive both to cues indicating the need to reorganize and switch to the other language structure, and to cues indicating successful preservation of a given framework.

Irrespective of the conditions of bilingual language learning, it seems to be cognitively more difficult to become bilingual than to become unilingual. Bilingual children are required to exercise extra effort in language learning. They may thus have acquired disposition for attending to feedback cues as the most immediate way of accommodating to the immediate language requirements.

Evidence for the cue selection strategy comes from the Ben-zeev's (1975) Spanish-English Study, which included several different measures to test sensitivity to cues. In the test of classification and reclassification, whenever a subject perseverated by giving the same classification principle twice instead of switching to another, the experimenter provided special hints in the next trial pointing the need to reclassify. The bilinguals were better able to use these hints as cues to successful restructuring.

The bilinguals were also found to score significantly higher on the Picture Completion subtest of the WISC presumably because they were more prone to scan the details of the pictures to check how those deviated from their internal model of what such a picture ought to
include. Sensitivity to cues on the part of the bilinguals was also evident for the classification tasks mentioned earlier. Besides classifying the objects into two consistent classes, as directed, the bilinguals tended to make gratuitous subclassifications within the two major classes, which of course had no effect on the correctness of their responses. From the viewpoint of classification test, a slight tendency to disorientation was marked with the bilinguals as they occasionally lost track of the levels involved and described their classification in terms of the subclasses instead of the major class. But attention to the analytical and structural details was an important characteristic of the bilingual children, and more so of the older bilinguals. A similar tendency towards the elaboration of structural details was also marked with bilinguals in a study conducted by Torrance et al. (1970). The tendency to attend to the structural details was also marked for a Picture Arrangement Test where subjects had to tell stories using sets of cartoon pictures. The bilinguals more often noticed and included in their stories, a necessary detail which led to better integration of the parts of the picture sequence (Torrance et al., 1970). These findings provide additional support to bilingual superiority in the use of analytic strategy mentioned earlier.
It is speculated that one of the mechanisms used by bilinguals to keep their language free from mutual interference is to maximize the differences between the two by overgeneralizing the regularity and super-paradigmatic consistency of rules within each language to cases governed by exceptionality.

Selinker, Swain and Dumas (1975) list a number of strategies found in children learning a second language in a school immersion program. One of these strategies is overgeneralization of rules within the second language especially when these rules are in contrast to those of the first language. For example in French the child speaks "une maison nouvelle" for which the correct order should be une nouvelle maison. The correct order for this exceptional case is the same as that of English. What the child did in this case was to base the order on the usual rule in French that the adjective follows the noun it modifies, even though it does not apply in this particular case. The child was attempting to maximize the contrast between the typical French and typical English forms.

Selinker et al. (1975) also described transfer as another strategy used by second language learners. If we define 'strategy' as an operating perceptual or production set used by the child, then it seems as though transfer is more a matter of lack of differentiation
between languages associated with a low level of bilingualism than an actual strategy for language learning. Learning to become bilingual involves learning to recognize one's tendencies to naive transfer because this is one of the kinds of interference which the child must overcome.

The child cannot understand his two languages as distinct systems until he has grasped a number of basic structural rules. Initially the child learning both languages simultaneously applies a given rule in all contexts, indicating that the systems have not yet been differentiated (Swain, 1972a, 1972b). Once the child has sufficient data to grasp that he has two separate systems, he makes active efforts to distinguish the two contexts and to find translation equivalents (Burling, 1959). Before this the stage of naive rule generalization prevails in which the two languages have not yet been differentiated. This comes in the wake of the earliest language-learning period in which the bilingual finds it usually difficult to make any rule generalizations because of the overwhelming variation of forms corresponding to any rule. At that point the child has no means yet to separate the way a given rule is contrastingly formulated in each language.

It may be that the very difficulty which the bilingual child experiences in formulating the earliest
rules creates in him greater pressure towards generalization. Once he has begun to understand that he has two different language systems, he may apply this readiness to generalize by using it to extend and integrate the various rules within each language as a way of distinguishing between languages. In some cases this may lead to unwarranted overgeneralization within each language making the language seem more consistent than it is. In other respects, it may contribute to an usually deep understanding of language structure which in turn would lead to metalinguistic awareness.

Greenfield (1971) found that perceptual notions such as squaredness are learned better by young children if the children are made to perform many actions in relation to objects exhibiting that trait. However, once the child has learned a term describing a related attribute, e.g., "round", then whether or not the child was subjected to different physical encounters with objects exhibiting that trait no longer mattered. At that point in learning, exposure to the contrasting labels 'round' and 'square' become more effective in learning to understand squaredness than associating the word square with a variety of activities. It is thus possible that the need for variation which is essential for discrimination of meaning at some point becomes shifted from the perceptual to the verbal plane, so that after the child has reached a certain
basic comprehension of vocabulary and structure, then more varied the verbal activity and verbal contexts in which the item appears, the deeper and more complex is the understanding of the item which again facilitate his metalinguistic competence.

For the bilingual child the fact that a given concept may be associated with two different universes of discourse in the different languages may create in him a deeper understanding of that concept. He may come to see also that a given aspect of the referent situation is represented in two different ways in the structure of his languages and that each of these forms of representations is consistent with other rules within each of the respective language systems. This may suggest to the child a way to keep his languages from interfering with each other. If he can learn how the various rules within one language are consistent with each other, he can understand how each language constitute a system of rules. He can then make use of the rule redundancies within a language system as cues to maintaining his own speech within one system and as a means for preventing interlingual interference. The strategy of over generalization of rules within one language, as described by Selinker et al. (1975), can be taken as an indication that the child is trying to view each of his languages as a consistent system and to maximize the differences between
his two language systems.

The hypothesis here is that bilinguals become aware of their languages as internally consistent systems more than unilingual children because this kind of understanding provides a way of separating their languages from each other. Attention to the analytical details of each language, and attempts at understanding the deeper level structures and functions of the language develops in the bilingual child an increased sense of metalinguistic awareness.

In summary, metalinguistic development refers both to the development of children's awareness of certain properties of language and also their ability to analyse linguistic input by making the language forms the object of focal attention and looking at language rather than through it to the intended meaning. The findings of the above cited studies suggest that bilingualism may foster metalinguistic competence in children by orienting them to the analytical and objective aspects of language. Related studies in the areas of metalinguistics and metacognition, further suggest bilingual superiority with respect to concept formation and general mental flexibility (Cazden, 1972; Flavell, Botkin, Fry, Wright, & Jarvis ,1968; Markham, 1973). A considerable number of studies have also reported that bilingual children exhibit greater sensitivity to linguistic meanings and
appear to be more flexible in their thinking than are unilinguals (Cummins, 1984a).

In recent literature attempts are made to clarify the notion of metalinguistic development in terms of two underlying dimensions: namely, children's analysed knowledge of language and their control over language (Bialystok, 1984; Bialystok & Ryan, 1985). A further differentiation to the global concept of 'metalinguistic development' was thus made and it was shown in a number of studies that bilingualism enhanced children's control over and ability to manipulate language but not their analysed knowledge of language (Bialystok, 1984). Keeping in view the cross-cultural nonreplicability of the findings, the present study includes a series of metalinguistic tests to examine whether or not bilinguals in a tribal culture maintain their superiority over the unilinguals equated as far as possible on the major socio-demographic variables.

**Bilingualism and Educational Achievement**

Early studies on bilingualism reported that bilingual children from minority backgrounds experienced difficulties in school and performed worse compared to unilinguals on verbal IQ tests and measures of literacy development (Manuel & Wright, 1929; Ronjat, 1913; Saer, 1923; Smith, 1923). These findings during the period between 1920 and
1960 led researchers to believe that bilingualism was an intellectual burden and caused language handicaps and cognitive confusion among children. As a result of this bilingual children suffered emotional conflicts in the school set up more frequently than unilingual children. Thus, before 1960 bilingualism acquired a doubtful reputation among educators. Many schools redoubled their efforts to dispense with the first language of the children coming from minority groups on the grounds that the first language was the major source of children's academic difficulties.

As mentioned earlier majority of the early research efforts were characterized by inadequate research controls and testing devices and by a lack of scientific concern. Evidence soon continued to emerge that bilinguals were operating at a relatively more advanced level than the unilinguals on cognitive metalinguistic and achievement measures. Bilingualism was thus shown to positively affect both intellectual and linguistic processes, which are regarded as the two most essential components of school-related achievement (Ben-zeev, 1972, 1975; Bialystok, 1984; Bialystok & Ryan, 1985; Cummins, 1984a; Cummins & Gulutsan, 1973; Tanco-Worrall, 1972).

The pattern of findings suggested that bilinguals were two to three years advanced than unilinguals in intellectual functioning, analytical thought and general
mental flexibility. Bilinguals were shown to attend to the structural details of a language, use language feedback cues, carry on context independent form of thinking in relatively more abstract domains. Having been exposed to more than one language, they could view each as one particular system in many, thus fostering in them higher level competence for generalization, discrimination and abstraction. The bilingual skills, thus appeared more compatible with the intellectual skills necessary for scholastic achievement.

Issues such as the effects of bilingual education on achievement, the appropriate age to begin teaching the second language and the consequences of different patterns of bilingual language use on student's achievement received major research concentration (Cummins, 1981). Research in this area did not intend so much to examine how bilinguals and unilinguals differ in their academic achievement as to conceptualizing the issue of how language proficiency is related to academic achievement.

Disagreements continues to prevail in relating language proficiency to educational achievement, especially on the question of what constitutes language proficiency. Clinical reports of under-achieving children from bilingual homes occasionally report negative consequences of bilingual home environment especially in the verbal than nonverbal domain of achievement (Cummins, 1981). These
reports are governed by the implicit assumption that superficial fluency in oral skills in the second language constitutes what may be termed as 'language proficiency'.

According to Oller and Perkins (1980) language is seen as playing a central role in all aspects of learning processes in schools. Thus, there are close relationships between language proficiency, intelligence and academic achievement. In discussing about language proficiency Bruner (1975) distinguishes between 'communicative competence' and 'analytic competence'. While the former refers to the ability to make and comprehend utterances in the light of an appropriate context, analytic competence invokes prolonged operation of thought processes exclusively on linguistic representations, and is promoted largely through formal schooling. Bilinguals being accustomed to two ways of saying the same thing, learn to decontextualize their knowledge from concrete referents and thereby develop analytic competence characteristic of school success.

Following Olson's (1977) distinction between utterance and text, bilinguals with a desired level of language proficiency can be seen to appreciate utterances and more so the text in a context-free manner compatible with the educational processes operating in schools. Hence, theoretically bilinguals compared to unilinguals would be better able to reap the benefits of formal schooling.
experience. It has been stated by Cummins (1985) that "although not conclusive, the evidence points in the direction of subtle metalinguistic, academic and intellectual benefits for bilingual children" (p.10).

Language, Cognition and School Achievement

A significant proportion of scientific attempts to understand cross-cultural differences in psychological functions has been devoted to the study of relationship between language and thought. Such studies have been most influenced by the early works of Whorf (1956) who claimed that individual's cognitive organization is primarily determined by the structure of their language and that the speakers of different languages possess cognitive structures relative to their language. Subsequent analysis of the Whorfian position (Carroll, 1963; Fishman, 1960; Miller & McNeil, 1969) have, however, reduced the strength of the claim. Some studies using cross-linguistic and intralinguistic samples (Brown & Lenneberg, 1954; Carroll & Casagrande, 1968; Lantz & Steffire, 1964; McClay, 1958) have provided only partial support for a weak Whorfian hypothesis. One of the problems with the concept of bilingual relativism is in its inherent conception that certain languages and dialects are not as good as others in promoting cognitive development. On the theoretical as well as empirical grounds qualitative ordering of languages is impossible
to establish and can lead to endless debates (Labov, 1970).

Another way of looking at the language thought relationship is to examine the language difference issue from a purely quantitative point of view. Such an approach, generally ignored in discussions of this relationship, comes from studies on bilingualism and multilingualism which essentially revolve around one central question: "How does competence in two or more languages relative to one affect the thought process of individuals?" A large number of studies inspired by such an approach attempted to examine the consequences of a second language acquisition on various aspects of cognition, such as verbal and nonverbal intelligence, creativity and divergent thinking, cognitive flexibility and cognitive style. These studies have been discussed earlier.

One of the more plausible hypotheses explaining bilingual's advantage can be stated within the framework of at least a weak Whorfian position. The lexical items and linguistic structures of two different languages influences the thought processes of bilinguals by enriching their cognitive system and thus making it easier for them to encode their experiences in diverse ways. Vygotsky's (1962) view on the relationship between language and thought is less extreme than those of Whorf,
on one hand, and Piaget on the other, he also claimed that bilingual children capable of expressing the same thought in different languages develop a greater sophistication in their thought processes by their insight into arbitrary properties of language. It is obvious that various aspects of school-related achievement are to a large extent mediated by linguistic, cognitive and metacognitive skills that the bilinguals are shown to possess to a greater degree than unilinguals. It would, therefore, be reasonable to expect superior academic achievement as a function of bilingualism provided that a threshold level of language proficiency are accompanied by the bilinguals.

Over the past 20 years, many of the most contentious debates in psycholinguistics and educational psychology have revolved around the issue of how 'language proficiency is related to academic achievement. The frame of reference adapted in these debates does not center so much on characterizing language proficiency as a mere quantitative addition of languages to individuals repertoire as on the level of proficiency attained by the bilinguals on their respective languages.

A large body of research considers the issue of how oral language abilities (after characterized by vocabulary tests), deep structure language skills (operationalized by metalinguistic tests), cognitive skills and school
achievement are related. All clearly involve language proficiency but the precise ways in which it is involved in these types of performances is not very clear. The situation can be illustrated by examining the views which have emphasized very different aspects of language proficiency.

According to Oller and Perkins (1980), a single factor of global language proficiency seems to account for a large percentage of variance in a wide variety of educational tests, achievement batteries and even personality inventories and affective measures. The evidence to date are preponderantly in favour of the assumption that a global language proficiency pervades every area of school curriculum. For all of four general language skills, like listening, speaking, reading, and writing, there is evidence of strong relationships between language proficiency and academic and cognitive variables. The pedagogical implications of Oller's theory is based on the fact that language is seen as playing a central role in all aspects of learning process in schools.

Labov (1973) while admitting a close relationship between conceptual abilities and language proficiency goes on to argue that the tasks used for assessing linguistic competence of low SES children tap proficiency outside of a naturally occurring communicative context and are, therefore, invalid measures. None of the two positions,
respectively by Oller and Labov, provide an adequate theoretical basis for conceptualizing the relationship between language proficiencies, cognition and academic achievement (Cummins, 1985).

In characterizing language as an instrument of thought, Bruner (1975) suggests that a mere possession of "Species minimum" competence (mastery of basic syntactic structures and semantic categories) has relatively little effect on thought process. Bruner distinguishes between communicative and analytic competence and suggests that analytic competence is made possible by the possession of communicative competence and is promoted largely through formal schooling.

Olson's (1977) distinction between "utterance" and "text" attributes the development of "analytic" modes of thinking specifically to the acquisition of literacy skills in schools. He suggests that acquisition of text processing skills in a particular language may contribute profoundly to a specialized and distinctive mode of thought we usually associate with formal education.

Donaldson (1978) distinguishes between embedded and disembodied cognitive processes from a developmental perspective, and is especially concerned with the implications for children's adjustment to formal schooling. She considers that linguistic processing of the bilinguals can be considered efficient only when it
is characterized by disembedded cognitive processes. Her distinction carries a lot of relevance for the assessment of bilingual's language proficiency.

In summary, all the theoretical frameworks concerned with developmental relationships between thought and language argue in favour of a distinction between the processing of language in informal everyday situations and the language processing required in most academic situations. It is essentially argued that reading a difficult text or writing essays make fundamentally different information processing demands on the individual compared to engaging in a causal conversation with a friend.

Cummin's (1981) theoretical framework incorporates elements of distinctions discussed earlier and proposes that language proficiency can be conceptualized along two continua. First one relates to the range of contextual support available for expressing or receiving meaning with its extremes being described in terms of "context embedded versus context reduced communication." In context embedded communication, the participant can actively negotiate meaning and the language is supported by a wide range of meaningful paralinguistic and situational cues while context reduced communication relies primarily on linguistic cues to meaning and may in some cases involve suspending knowledge of the real
world in order to interpret the logic of the communication appropriately. The second continuum refers to the degree of active cognitive involvement in the task of activity, that is the amount of information which must be processed simultaneously or in close succession by the individual in order to carry out the activity. The two continuums proposed by Cummins tend to merge to some extent in the distinctions proposed by other theorists. The potential application of Cummin's two dimensional model for studying the relationships between language proficiency, socio-economic status and achievement makes an important practical contribution in the field of bilingual research.

Some Major Issues in Bilingual Research

Degree of bilingual Proficiency

One of the major reasons for disagreement in interpreting the cognitive consequences of bilingualism in the period between 1920 to 1960 pertained to criterion of sample selection. Studies were not very clear with respect to degrees of language proficiency possessed by the bilinguals. Even minimal exposure to second language whereby bilinguals acquired simple oral communicative skills was regarded as the defining criterion of the bilingual sample. The criterion of sample selection was so inconsistent that negative as well as positive effects
of bilingualism were reported in the early literature. The bilingual groups were thus heterogeneous in their characteristics, some having the required level of competence in both languages and the rest possibly in one and not the other. In general, therefore, it was not surprising that while some studies reported positive cognitive effects associated with bilingualism, others suggested that bilingualism was an intellectual liability and resulted in cognitive confusion.

Lambert, Havelka and Gardner (1959) used the term balanced bilinguals to refer to individuals fully competent in both languages. Non balanced bilinguals, on the other hand, refer to individuals who speak one of the languages haltingly, or with accent or with nonnative errors of grammar. The balanced bilinguals are characterized by a desired level of proficiency in both languages, determined on the basis of their ability to translate texts of one language into another with a relatively very few errors. Nonbalanced bilinguals fail to perform adequately on this task. Numerous studies have compared the performance of the balanced bilinguals with that of the nonbalanced or dominant bilinguals. Some of these studies suggest that the balanced bilinguals simply have more of some skills that the dominant bilinguals are yet to fully master (Champagnol, 1973; Mackay, 1970; Macnamara, 1970; Nott & Lambert, 1968; Palmer, 1972). Further studies suggest
that the balanced bilinguals have different processing strategies from those that the dominant bilinguals have for the nonfluent language (Mackay, 1970 & Treisman, 1965).

Several studies suggest that the nonfluent speaker of a language has control over fewer processing strategies than a truly proficient speaker partly because of the reason that verbal memory seems to be worse in the non-dominant language. On list recall tests, Nott and Lambert (1968), Palmer (1972), and Champagnol (1973) showed that increasing bilingual experience increased the number of items recalled. Another type of evidence that processing strategies are imperfect in the nonfluent bilinguals comes from Macnamara (1970) where English dominant College students asked to judge whether or not a word flashed simultaneously with a picture was the correct label for the picture, showed longer latency for French (nondominant) than it was for English. Macnamara (1970) provided evidence that the speed of reading aloud was slower in the less fluent language than in the fluent language for the Irish-English bilingual subjects.

Two studies suggest that concomitant with the imperfect processing skills, the dominant bilingual has the inability to take advantage of the full range of natural redundancy in a language. Mackay (1970) reported that dominant bilinguals experienced relatively greater
difficulty in processing distorted speech in their non-fluent language than when the same degree of distortion was applied to their fluent language.

Macnamara (1970) reported that English dominant bilinguals in French-English colleges evidenced less difference on reading speed between scrambled and unscrambled French passages than between scrambled and unscrambled English passages. Thus, it would appear that for English, knowledge of linear syntactic probabilities facilitated rapid reading, whereas for French, reading went on word by word. The sentence completion study of Forster and Clyne (1968) showed that dominant English bilinguals had not mastered the sentence reconstruction strategies of monolingual German speakers, but the balanced bilinguals had. Champagnol (1973) further demonstrated that the tendency to cluster words by semantic categories in both languages increased with proficiency in the second language.

Thus, it is evident from the above discussion that the fluent speakers control a wider range of processing strategies in his dominant language, and that these strategies permit optimal appreciation of the redundancies of a language. Riegel (1968) theorized that all bilinguals develop from a compound to a coordinate state when and if they are truly fluent in a language. Goggin and Wickens (1971) showed that balanced Spanish-English bilinguals
benefited more from a change of language than did the
dominant group in test of release from proactive inter-
ference. This supports Riegel's hypothesis, suggesting
that the balanced bilinguals had greater language
independence than did the nonbalanced bilinguals. Ervin
(1961b), however, indicated the opposite, that dominant
bilinguals have less compounding between the two
languages than do balanced bilinguals. Her dominant
subjects recalled individual words best in the language
in which they had been best able to label them. Conside-
ring the above evidence, Riegel's compound-coordinate
developmental hypothesis can at best be described as
inconclusive.

It may be concluded from the above discussion that
the balanced bilingual has control over the processing
strategies that a unilingual has for respective languages.
The nonfluent bilingual does not have control over all
these strategies and as a result would perform with
decreased efficiency on a number of tasks in the second
language.

**Compound - Coordinate Dichotomy**

Many of the effects commonly associated with
bilingualism may actually reflect the result of what has
been termed as compound-coordinate bilingualism (Ervin &
Osgood, 1954a; Weinreich, 1953). While this distinction
has proven to be somewhat slippery, it has generally provided a reasonable, if partial, explanation for groupings of different performance patterns among the bilinguals (Albert & Obler, 1978).

Coordinate bilinguals are considered to have separate semantic systems while compound bilinguals have two distinct modes of expression for a single underlying semantic network. Following the water-tank metaphor of Kolers (1968), compound bilingual system is like a water-tank with different taps meant to release the same information through different rules while the coordinate system resembles two tanks, one each for receiving and dispensing information from each language. Thus, two sets of linguistic signs come to be associated with a single set of representational process in case of compound bilingualism, but in the coordinate, two separate meaning level processors are maintained.

The compound coordinate dichotomy rests on slippery grounds. Diller (1970) was particularly so much distressed with the unclear nature of this distinction and the inconclusiveness of the tests used that he deemed the terms empty. Taylor (1976) also concluded that "The distinction between coordinate and compound bilingualism... is neither clear-cut nor useful" (p.261). Today few would assert that individual bilinguals are either compounds or coordinates. On the other hand, individuals
lie along a continuum between the two poles represented by compound and coordinate bilingualism respectively. The fact that many parameters have been proposed as exercising an influence on compound-coordinate status implies that the phenomenon may be multidimensional in nature.

Inspite of its lack of clarity and usefulness, the compound-coordinate distinction has contributed significantly to the understanding of literature on bilingualism. This variable has provided some degree of understanding in bilingual research pertaining to acquisitional context, acquisitional manner and usage of a second language. Lambert (1969) summarized the development of his understanding of the compound-coordinate dichotomy by stating that the acquisitional context was thought to induce a different state depending on whether the subjects learned the two languages in the same or different cultures. The manner of acquisition was also suspected to influence the bilingual's state. A translation method or a direct teaching method in which words are defined only with respect to objects or words in the second language would result in a co-ordinate system whereas daily mixing of the two languages in the bilingual community would result in a compound system.

According to Kirstein and de vincenz (1974) the extreme coordinate bilinguals control two grammers which
are unrelated except at the deepest level of universal language processes and thought. But for the compound bilinguals, relations between the two languages exist at both the level of surface structure and the level of language specific processes for the second language. Kirstein and de Vincenz also suggested that in the coordinate bilinguals, spontaneous translation from one language to the other must be routed through universal processes of thought whereas in case of compound bilinguals this goes back only as far as the necessary first language level and then proceeds to the corresponding second language level.

While Diller (1970) shows his disrespect for the compound coordinate dichotomy, others have suggested refining it by taking into account the multiple factors thought to be involved. Thus, Genesee, Hamers, Lambert, Mononen, Seitz, and Starck (1978) defined their compound bilingual as subjects brought up in a thoroughly bilingual home from the earliest childhood whereas the coordinates were those who learned one language after the other usually after age 10 and also outside of the family. Bearedsmore (1974) suggested that compounds might be considered those who acquired both languages "during vital formative years and coordinate those who learned their second language after this period." Riegel's (1968) developmental model suggests that when a second language
is introduced after the first language has been mastered to some degree a weak compounding interrelationship of the vocabulary items between the two languages may be obtained. The bilinguals achieving this stage of special language learning are essentially coordinate. Through appropriate wage conditions, a final compound stage may be reached where all items in the two languages are interrelated.

From a psycholinguistic point of view the notion of partially compounded and partially coordinate systems is most attractive because it is compatible with the multidimensional nature of the bilingual language process. Diller completely ruled out the possibility of a compound system on the grounds that the vocabulary and the grammatical rules of no two languages are similar enough to be compoundable. Albert and Obler (1978) however contend that learning a language after a native one, at whatever age, can not demand a repetition of all the same steps and that there would be considerable overlap in the elements of knowledge between and across languages. In their opinion, the two language systems of the bilingual can only be considered to be compound.

The contention of Albert and Obler (1978) carries a sense of truth when it is realised that the ability to intuit correspondences between lexical items, grammatical and phonological rules of the two languages is part of
the creative language acquisitional talent a human is 
born with contrary to predictions by Diller (1970) that 
the compound bilingualism accounts for anything but 
interference errors, it has been shown in some instances 
that a compound system may be most efficient (Caramazza, 
Yeni-Komshian & Zurif, 1974).

The compound-coordinate division is however not a 
hierarchical classification, each group exhibits its 
unique way of responding to cognitive tasks. Lambert, 
Havelka and Crosby (1958) found bicultural coordinate 
bilinguals evidence semantic differential than either 
compounds or monocultural coordinates. Jakobovits and 
Lambert (1961) showed that compound bilinguals manifested 
semantic satiation for words whereas coordinates 
evidenced less satiation altogether. Lambert and Rawling 
(1969) found that before the age of six, compound 
bilinguals are better able than coordinates to deal with 
the task of abstracting core concepts. Stafford (1968) 
saw that his coordinate subjects performed faster than 
compounds on a nonverbal problem solving task while 
Gekoski (1970) found compound subjects able to give more 
translation equivalents than coordinates in a restricted 
association task.

In three different studies no differences were 
observed between compound and coordinate bilinguals 
despite the fact that the authors expected them. Two of
these studies (Gekoski, 1968; Lambert, 1969) involved a translation task while the third one by Segalowitz & Lambert (1969) dealt with a task of abstraction and generalization of core concepts from mixed lists.

In spite of some explanatory power that the compound-coordinate dichotomy had for interpreting the multidimensional nature of bilingual language process, the distinction has gradually fallen in disrepute partly because of its overlapping nature with the concept of biculturalism.

In the present study, however, the Kond tribal society in Orissa provides an ideal setting for investigation, since the bilingual and unilingual Konds share a common culture. The bilingual Konds speak both Kui and Oriya language the latter being the medium of instruction in schools, whereas the unilingual Konds speak only Oriya having lost their traditional Kui language. Following the distinction of compound and coordinate bilingualism, the bilinguals in the present study can be said to possess a coordinate system. The distinction however, is not directly important for the present study except that it is used as a means for describing the characteristic of the present sample for the purpose of maintaining communicability with fellow researchers.
Bilingualism and Biculturalism

Bilingualism is not the only characteristic of the bilingual for he may also be bicultural. This topic has been surrounded by considerable controversy over the years with many theoreticians and researchers claiming that to be bilingual engenders feelings of anomie (Lamy, 1974), Marginality (Meisel, in Lamy, 1974), and even Schizophrenia (Christophersen, 1948). It has been argued that in learning two languages the bilingual must also internalize two systems of Shared meanings of world views (Lamy, 1974) one from each of the ethno-linguistic groups involved. It is further argued that identity problems arise either because these meaning systems are inherently irreconcilable and therefore, create a type of Schizophrenia or because they are reconcilable but yield a hybrid reality system which is not completely similar to the systems of either of the groups whose languages he speaks.

Lambert cites a study (Gardener & Lambert, 1972) on the ethnic identity of people with a dual cultural heritage which demonstrates that individuals may indeed react in different ways to bicultural backgrounds. This study which was carried out in French-American communities in New England and Louisiana found evidence for atleast three types of relations. There were subgroups of
individuals who oriented themselves exclusively towards one of their two ethnolinguistic reference groups and ignored the others; subgroups who tried not to think of themselves in ethnic terms; and interestingly, subgroups who identified positively with both of their ethnolinguistic reference groups. Thus, to talk about bilingualism as if it had unconditionally negative or positive socio-cultural consequences would be a gross oversimplification of the issues.

The opposing contentions concerning the positive and negative consequences of bilingualism on personality development or identity formation may be equally valid but require qualifications which clearly define the subgroup and sociocultural circumstances involved. Much valuable research needs to be carried out to investigate those circumstances in which individuals have difficulty adjusting to their bicultural heritage.

The issue of bilingualism versus biculturalism makes one conscious of examining the consequences of bilingualism keeping in view its interactive relationship with the bicultural forces. Although both may frequently occur together, they can also occur separately as is true in present study. The issue was only brought in with a purpose to highlight the fact that many of the commonly observed effects of bilingualism may actually reflect the result of such concommitant biculturalism, thereby seriously
restricting the generalizability of even clearest research results. Considering the special difficulties of doing research in naturalistic settings, this phenomenon should not be considered as a serious impediment in bilingual research; rather it can be viewed as a candid representation of reality. On the other hand, the diverse processes underlying bilingualism should be discovered by accumulating evidences from different naturalistic settings, from those where bilingualism and biculturalism share an interactive relationship and those where they do not as is true in case of the present study. Since the sample in the present study consists of bilingual and unilingual Kond tribals sharing a common culture, the findings, it is hoped, would make an important practical contribution in bilingual research.

Major Findings from the Literature

The major findings emerging from literature on bilingualism are as follows:

1. Although in the early literature, during the period from 1920 to 1960, bilingualism was considered to be an intellectual burden resulting in cognitive confusion; many recent studies suggested that bilingualism can positively affect both intellectual and linguistic processes. Bilinguals were reported
to be superior to unilinguals on measures of general mental flexibility, creativity and divergent thought.

2. Related studies in the area of metalinguistics and metacognition revealed that bilingualism promotes metalinguistic awareness, that is, children's explicit knowledge about the structure and functions of language itself. Bilinguals relative to unilinguals were better able to analyse languages more extensively, to attend to the analytical details of each language, and to gain control over manipulating language.

3. The mastery of two languages was shown to develop in the bilinguals' higher level competence for generalization, discrimination and abstraction, all compatible with intellectual skills necessary for academic achievement. Bilinguals were thus superior to unilinguals in metalinguistic, intellectual and academic achievement measures.

4. Bilingualism was considered not to be a static phenomenon. Researchers moved away from a same-different conceptualization of the bilingual unilingual distinction to looking for distinctions within the bilingual population itself. The issue of bilingual competence was thus examined with reference to the degree of competence in two
languages (balanced versus dominant), the linguistic relationship between two speech varieties (distinct languages versus stylistic variations). The degree of overlap in the shared meanings of two languages (compound versus coordinate), and the extent of cultural duality involved (bilingualism versus biculturalism). The bilingual research assumed a multidisciplinary character.

5. It was shown in a large number of studies that balanced bilinguals compared to the dominant ones, experienced all the cognitive benefits associated with bilingualism, that compared to compound bilinguals, the coordinate bilinguals perform on cognitive tasks in uniquely different ways and that separate perspectives be maintained for interpreting the performance characteristics of bicultural and monocultural bilinguals.

6. The entire base of bilingual research has been broadened and subdivided. It has been realized that several other factors which covary with but are extrinsic to bilingualism should be taken into account in interpreting bilingual effects. These factors include socio-political structure of the bilingual society, cultural values and norms, relationships between the first and the second language, acquisitional age, manner and contexts of the second language,
social prestige attached to both languages, type of language emphasis in the school curriculum etc. considering the diverse ways in which bilingualism can manifest its effects, the isolated pieces of research from bilingual literature remains yet to be neatly woven into a coherent theoretical system.