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RELATIONSHIPS BETWEEN FREQUENTLY USED MEASURES OF
VERBAL INTELLIGENCE AND A MEASURE OF
PERSONAL LANGUAGE DEVELOPMENT

By

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A DISSERTATION

Submitted in partial fulfillment of the requirements
for the degree of Doctor of Philosophy in the
Program in Educational Psychology in the
Area of Behavioral Studies in the
Graduate School of the
University of Alabama

UNIVERSITY, ALABAMA

1974

ACKNOWLEDGEMENTS

The writer expresses his deep appreciation to the following members of his doctoral committee for their high professional competence, understanding, and tireless patience.

Dr. Carl Cecil, Chairman

Dr. Beverly Holaday

Dr. Robert Comas

Dr. Lewis Blackwell

Dr. Tommy Russell

Grateful appreciation is also extended to my parents, Robert W. and Penny V. Gunn, to Hobart O. and Estelle Coats Pardue, Sr., and to Hobart O. and Loretta B. Pardue, Jr. for consistent help, encouragement and confidence.

Finally, this effort is dedicated with love to three people whose love and long term self-sacrifice made my education possible,

Jane Pardue Gunn

Danielle Dawn Gunn

Robin Lynn Gunn

C. D. G.

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CHAPTER I

INTRODUCTION

In recent years the widespread use of intelligence tests in the school age population has been strongly criticized. The most prevalent criticism of these tests is that the resulting IQ scores are verbally based. Those who criticize these tests say that the verbal portion may not be fair to members of subcultural groups because of differences in language experiences in their backgrounds. While most of the complaints about the inequalities of intelligence testing revolve around this idea, the fact that our society is a highly verbal one is recognized and accepted. Many investigators say that people with different cultural backgrounds may have some peculiar condition of perceptual or learning set that causes their understanding of verbal behavior to be different from that of the norming groups, and not related to intellectual deficits.

During three years of administering IQ tests to children in Alabama schools, the investigator observed that many children in minority or subcultural groups did not perform as well on tests as the norming group for the test or the majority of the school population. The most often mentioned reason given by teachers and administrators alike for this difference in performance was language difference. It seems to be popular

opinion that children who belong to minority groups, lower socioeconomic groups, or who have different cultural backgrounds will perform at a lower than average level on verbal tests because their language background is different.

Research indicates that children whose native (or "at home") language is not English, including those children who speak an English dialect, must translate questions presented in standard English into their "at home" language, work out an answer in their "at home" language, and then translate the answer back into standard English. This translating requirement causes these children to appear to be slow to respond and in testing situations where time is a factor their score may be depressed as a result (Hall, 1973). It appears that many black children in the South speak a dialect or non-standard English. If this is true then they may be forced into a translating situation on many IQ tests and their resulting IQ score could be depressed as a result.

Classroom teachers and school administrators are quick to recognize that poor verbal IQ test performance by children who belong to recognizable minority or subcultural groups can be explained (or excused) on the basis of some conclusions about language differences that they feel are known to be associated with these groups. One aspect of this feeling is that low verbal scores accompanied by high performance scores on the Wechsler Intelligence Scale for Children has come to represent a profile of "cultural deprivation" at least in the South. The term "cultural deprivation" appears

to generate feelings that the individual has been placed at a language disadvantage as a result of being deprived of some learning opportunity. Most school officials tend to view this depressed verbal ability as an indication of language difference rather than intellectual deficit, as long as the individual belongs to some easily recognized minority or sub-cultural group.

It appears obvious also that children with noticeable language differences might not perform on verbal intelligence measures in the same manner as a standard English norming group. What is not obvious, but could nonetheless be true, is that some children might belong to minority or subcultural groups that are not easily recognized or have language differences that are not commonly noticed and who perform poorly on verbal IQ tests as a result of either or both of these conditions. The ever present danger for these children might be that since they appear to be "average" children, their low verbal IQ performance could be misinterpreted as an intellectual deficit and not a language difference. This error could produce damaging results for such a child.

The present study was concerned with the detection and measurement of individual language differences (the individual level of paradigmatic shift) in a population of children readily identified as suffering from some cultural deprivation. In terms of socioeconomic status, lack of exposure to standard English in the home, and general performance on tests of scholastic aptitude and achievement, the

children in this school appear to qualify as being representative of that syndrome of characteristics discussed earlier and likely not to perform in a manner similar to normative performance.

Specifically the study was designed to measure the presence of the paradigmatic shift to three commonly used measures of verbal intelligence. The investigator felt that the individual nature of language development would necessitate the use of a test of personal language development (the paradigmatic shift) that did not depend upon a comparison of individual performance with a norming or standardization group for significance. The commonly held assumption that verbal behavior should be assessed in a standardized condition may merely reflect a strong empirical tradition. Sroufe (1970) has said that a standardized condition simply biases performance in favor of those individuals who identify with the condition. He stated that age, sex, familiarity of participants, ethnic affiliation, and socioeconomic background affect the amount and variety of verbal production. He concluded that situational variations significantly alter (bias) verbal behavior.

Those who criticize standardized aptitude tests are not saying that verbal behavior should not be measured, and they are not saying that verbal measures should not be a logical part of the information used to compute an individual's IQ score. The point that they have been making is that current methods of verbal intelligence measurement leave a great

deal to be desired when the person being measured may have a language difference that is not taken into consideration in the computation of a verbal IQ score.

There appears to be another question that has not been addressed in this area. If we accept as fact the assumption that many factors (currently called socioeconomic or cultural) can modify an individual's verbal behavior so that the person appears to be more or less intelligent than he really is, and that these factors are usually associated with some other visible difference, are we also to assume that if the visible cultural differences are not present then the modifying characteristics are also not present? Are there some characteristics of the individual other than those associated with visible cultural differences that might cause an individual to be just as different in his understanding of expected verbal behavior? One usually assumes that if a child is similar in most demographic categories to the norming group and the client's verbal behavior is deviant, then intellect and not language characteristics are assumed to be the causative factors. Or is it possible that methods to measure personal language development apart from verbal intelligence have not been utilized?

Piaget (1926) stated that the individual's understanding of language proceeds from the concrete to the general. Ervin-Tripp (1961) and others (e.g., Woodrow & Lowell, 1916; Brown and Berko, 1960) have hypothesized that the types of responses to stimulus words change as a function of age from sequential

associations (child-like language) to paradigmatic associations (adult-like language). These two observations might have a great deal to suggest about the method by which one proceeds to measure an individual's personal language development. It might be possible for an investigator to determine the degree to which an individual has progressed toward general language understanding and usage by the use of a procedure that allows him to obtain a sample of verbal behavior that could be analyzed individually without the biases imposed by a standardization process. In this regard the earliest investigators of word association noted that adult associations were usually in the same grammatical class as the stimulus words. These findings challenge a commonly held view that word associations are learned through simple contiguity in overt speech (Ervin-Tripp, 1961). If associations were learned on this basis, then the most frequent response to transitive verbs would be the. Some authors (Brown & Berko, 1960) have shown that the determinants of word association change predictably with age. The tendency to give paradigmatic responses (responses in the same grammatical class as the stimulus) increases with age until the nature of responding "shifts" almost entirely to paradigmatic. That is to say, individuals progressively change with age their verbal response tendencies from responses that are "child-language" to responses that are "adult-language." Although this change appears to occur in all children, the rate of change is not necessarily the same for all children. Further, this progressive paradigmatic change readily lends itself to

measurement. Piaget (1926) said that there is a stage in the development of the child (7 to 11 years) when the child is egocentric (concrete) in his representation of objects. That is to say, a stimulus word may elicit responses that are more meaningful in terms of personal past history of the child than in terms of general language knowledge. Since the personal history of each child is different, and the meanings of words used by the child during the egocentric stage are entirely dependent upon that child's personal past history, it is easy to conclude that the same words may produce different responses in different children. The words may look the same, sound the same, and through the process of mimicry the child may use words in the same context as he hears others use them; still the child's language understanding and behavior may be different from those of children to whom he appears to be similar. In short, it may be possible for any child to vary in language development just as much as individuals differ in visible subcultures even though the child belongs to no easily recognized subcultural group and is of normal intelligence. However, if such a child is given a test of intelligence that measures the ability of the child to use words in the same framework of meaning as the children in the norming group for that test, then this child's responses will correspond to those in the norming group only insofar as the aspects of personal language history of the child being tested and the children in the norming group, then the tested child may be adjudged to be more or less intelligent even though the verbal difference is really a difference in personal language background

and may have no relation to the child's ability to learn. Piaget labeled the change that occurs in the child's usage and understanding of language, between 7 and 11 years of age, the "egocentric shift." The "egocentric shift" represents a change in the child's language that moves from concrete (egocentric) to a general (social) understanding of language.

Statement of the Problem

The purpose of this study is to examine the possible relationship between three frequently used measures of verbal intelligence (Verbal subtest of the Wechsler Intelligence Scale for Children, the Grammatic Closure Subtest of the Illinois Test of Psycholinguistic Abilities, and the Peabody Picture Vocabulary Test) and a free-response word association measure of personal language development, specifically, the paradigmatic shift.

Justification of the Problem

Many studies have shown that language varies around a norm in the general population. For example, Stewart (1968) indicated that dialect speakers are most reticent in foreign situations, i.e., school, tests, and other situations. However, children in school are subjected to measurement by standardized test instruments with little regard to possible biasing background conditions. Sroufe (1970) indicated that typical test conditions greatly constrained the performance of disadvantaged children. Palmer (1969) hypothesized that intelligence test performance of disadvantaged children probably does not assess intelligence, but the constraining biases of the test situation.

Some children, although not classified as disadvantaged, may speak a dialect. The most commonly used measures of verbal intelligence do not consider the differences in measurement that dialect usage may cause. Gerber and Hertel (1969) concluded that dialect speakers' language is both quantitatively and qualitatively inadequate on the basis of performance on the Illinois Test of Psycholinguistic Abilities (ITPA) and the Peabody Picture Vocabulary Test (PPVT), and may represent an abridgment of some underlying assumptions for these people, although these three instruments are commonly used to measure verbal intelligence.

Bloom (1970) showed quite convincingly that individuals have prerogatives to employ individual language strategies, probably superimposed on developmental universals. Nelson (1970, 1971) also demonstrated that individuals adopt alternative strategies of language learning.

Many investigators assume that any given language performance can be taken as an index of one's language knowledge, and language knowledge is considered a good indicator of general intelligence. Certainly, language knowledge and usage are always confounded, and neither may be analyzed independently of the other. However, research indicates that when an individual is functioning in an optimal or near optimal way, the assumption that language knowledge is more prominent than language usage can reasonably be held (Clumer, 1970; Sroufe, 1970). Several investigators have stated that a child may not be able to function optimally in a standardized testing situation. If a child is required to function

in a fashion other than personally optimal, the conditions may yield results that are strongly influenced by usage, performance, and "other" variables (Stewart, 1968). In short, investigators may be in error when they assume that an obtained sample of verbal behavior is an adequate index of the subject's language knowledge. Language usage may represent a type of knowledge that is somewhat separate from grammatical knowledge. It might be called situational knowledge. Thus, the knowledge-usage distinction might be viewed as knowledge of a grammatical system and knowledge of how to use the system. Certain language assessment procedures reflect language usage more than knowledge. Even though the ITPA is offered as a test of psycholinguistic abilities, it is probably a measure of language usage (between modalities) rather than language knowledge (Sevenson & Guest, 1970; Weener, Barritt, & Semmell, 1967). Similarly, the mean length of utterance (MLU) or response (MLR) reflects situational variation more than language competence, especially when computed for children over four years of age. Assessment procedures of this type are popular but derive their significance in a clinical setting through normative comparison (Shriner, 1969).

Consequently, children who differ from the norming group again face the possibility of being misidentified as deficient rather than different.

A series of studies by Bellugi (1965), Brown, Cazden, and Bellugi-Klima (1969) provided descriptive evidence concerning the development of interrogative systems of language

assessment. These procedures describe what an individual knows about his grammatical system and provide relatively more information about personal language knowledge. These and other works have demonstrated that an open alternative structure procedure provides a very potent descriptive assessment of one's personal language knowledge (Ervin-Tripp, 1961).

Woodrow and Lowell (1916) and others subsequently stated that an individual's tendency to give paradigmatic responses increased with age and the tendency to give syntagmatic responses decreased with age and that these changing response tendencies can be measured. Ervin-Tripp (1961) indicated the same results, and in addition, her results showed that the "paradigmatic shift" roughly corresponds (in terms of chronological age) to the "egocentric shift."

The foregoing studies suggest that the measurement of the verbal or language component of IQ by conventional IQ tests may ignore or confound personal aspects of language development that may have an important role in the development and expression of verbal intellectual ability. Further, these data suggest that methods do exist which consider these aspects of the personal language developmental position (degree of paradigmatic shift) of the child. The present study examined the relationship between three frequently used measures of verbal intelligence and a measure of personal language development, in order to determine if the difference in personal language development reflected by a procedure that measures the degree to which an individual has made the

paradigmatic shift is related to the level of success for that individual on the three measures of verbal intelligence used in the present study.

Assumptions

1. This study assumed that the "egocentric shift" and the "paradigmatic shift" do occur systematically.
2. This study assumed that the "egocentric shift" and the "paradigmatic shift" accurately reflect the normal personal language development among children.
3. This study assumed that the development of the paradigmatic shift follows the normal pattern of probability that underlies the development of other human traits.
4. This study assumed that the free response word association test of personal language development accurately reflected the level of paradigmatic shift for each subject.

Hypotheses Tested

- I. There is no statistically significant deviation from a normal distribution of the paradigmatic shift in the population under study.
- II. There is no statistically significant difference between high and low verbal IQ groups of fifth- and sixth-graders (as measured by the verbal scales of the WISC, the Grammatic Closure subtest of the ITPA, and the PPVT) on personal language development as measured by a free response word association test of personal language development, specifically the level of paradigmatic shift.

Statistical Treatment of the Data

The statistical procedures discriminant analysis and chi-square were employed to analyze the data obtained from this study. The statistical procedures predicted criterion group membership (number of paradigmatic responses) by virtue of examination of the predictor variables (conventional verbal IQ measures), and examined the statistical relationship between the number of subjects expected to make the paradigmatic shift and the number of subjects who actually made the shift.

Definition of Terms. For purposes of this study, the following definitions of terms were used:

Paradigmatic. A response to a stimulus word that is in the same grammatical class.

Syntagmatic. A response to a stimulus word that is a sequential associate in normal speech.

Clang response. A response to a stimulus word that is based upon the sound of the stimulus rather than the meaning of the stimulus.

High IQ Group. This term refers to those individuals whose sum of scores on the Wechsler Intelligence Scale for Children (verbal subtests), the Illinois Test of Psycholinguistic Ability (Grammatical Closure Subtest), and the Peabody Picture Vocabulary test were above the score used as a criterion for group division.

Low IQ Group. This term refers to those individuals whose sum of scores on the Wechsler Intelligence Scale for

Children (verbal subtests), the Illinois Test of Psycholinguistic Ability (Grammatical Closure Subtest), and the Peabody Picture Vocabulary test were below the score used as a criterion for group division.

High Personal Language Development Group. This term refers to those individuals whose scores on the free response word association test of personal language development (paradigmatic shift) were above the score used as a criterion for group division.

Low Personal Language Development Group. This term refers to those individuals whose scores on the free response word association test of personal language development (paradigmatic shift) were below the score used as a criterion for group division.

Limitations of the Study

This study was limited to 60 children from low to low average socioeconomic background enrolled in Maxwell Elementary School, Tuscaloosa County Schools System, Alabama during the school year, 1972-1973. The children were in the fifth- and sixth-grades. The findings of the study were further limited by the ability of the various test instruments to reflect accurately the actual capacities of the students. It was assumed that these instruments did accurately measure verbal ability and the extent of the paradigmatic shift and personal language development.

The measure of paradigmatic shift used was a word association test of a free response nature (Ervin-Tripp, 1961).

This test was constructed from a collection of vocabulary words (Rinsland, 1954) that were judged to be well within the vocabulary range of fifth- and sixth-grade children.

The standardized measures of verbal ability that were used were the following:

(a) The verbal subtests of the Wechsler Intelligence Scale for Children (WISC).

(b) The Peabody Picture Vocabulary Test (PPVT).

(c) The Grammatic Closure subtest of the Illinois Test of Psycholinguistic Ability (ITPA). These tests were chosen because of their relatively high rate of use, and because the responses of the subject are compared with the responses of the respective norming group. These tests were administered and scored in the standardized fashion dictated by their respective manuals. A more complete description of these instruments will be given in Chapter III.

Organization of the Study

Chapter I explained the general nature of the study; the purposes, the theory behind the study, the hypothesis, definition of terms, and delimitations were included.

Chapter II presents a selected review of relevant literature and research pertinent to the present study.

Chapter III deals with the procedures and methods of sampling and testing, a brief description of instruments and tasks employed, and the statistical processes involved in determining results.

Chapter IV presents analyses of the data.

Chapter V consists of the summary, conclusions, and recommendations based on the statistical results.

CHAPTER II

REVIEW OF THE RELATED LITERATURE

The purpose of this investigation was to examine the possible relationships between frequently used standardized measures of verbal intelligence and a measure of personal language development (the paradigmatic shift).

General Theories of Language Development

In recent years professionals in the areas of linguistics, education, psychology, philosophy, sociology, and anthropology have shown an increasing interest in the process of language development in the individual. Investigators agree that children do not learn adult language directly. They move through a series of stages in progressive approximation of adult grammatical knowledge. Even though the grammar of a language may be so complex that linguists are not able to describe fully its complexity, children are able to master it. This characteristic of human language development has contributed to the rise of several theories of human language development. Only two of these theories are of interest to the present study.

The first theory to be considered is the behaviorist or empiricist theory. Foremost among the proponents of this theory are B. F. Skinner, O. Hobart Mower, and Charles E. Osgood.

This point of view stresses traditional studies of verbal learning and the principles of conditioning and association. However, Miller (1964) cautioned all psycholinguistic investigators to examine carefully the facts accumulated within the traditional area of psychology known as verbal learning. Miller stated his belief that verbal learning should not be confused with an understanding of human language development. Miller said that there exist many theoretical bases for the analysis of verbal learning (e.g., Osgood, 1953, Gibson, 1940; Underwood & Schulz, 1961; Goss & Nodine, 1965), but these theories contain many extensions of principles applicable to laboratory exercises and should not be accepted as adequate explanations for analysis of language development. Miller insisted that the learning of an isolated orthographic combination of finite dimensions (as done in the laboratory) is not very revealing for an explanation of a novel connected utterance. Lefevre (1970) supported the behaviorist view and stated:

Linguistics, narrowly defined, can describe language as a hierarchical structured system of interrelated parts, or constituents-- language as a code. Psychology, via learning theory, can describe language as a system of habits relating symbols to behavior; and via information theory and communication models, can describe language as a means of transmitting "information" by both speech and writing (p. 60).

For Skinner, and other behaviorists, the principles of learning, notably those involving conditioning, with slight extensions, are as applicable in the explanation of language development as they are in the development of limb flexion in the dog. Skinner (1957) has stated that verbal

behavior is "behavior reinforced through the mediation of other persons (p. 14)" and that it should not be considered as having an independent existence apart from other behavior of the speaker. He said:

A child acquires verbal behavior when relatively unpatterned vocalizations, selectively reinforced, gradually assume forms which produce appropriate consequences in a given verbal community (p. 31).

Clearly, from the behavioral point of view, the implication is that children learn all aspects of language usage within a context of social reinforcement. This is likely, through intermittent schedules of reinforcement, to produce language patterns that are highly resistant to change and consequently, maintained over long periods of time. It is also evident that the selective nature of reinforcement might well result in highly idiosyncratic cue and meaning associations of the type of interest to the present study.

Chomsky (1965) presented the view of the rationalists (the second theory of significance to the present study) which explicitly questions the givens in the behaviorist's approach. He continually argues that the sheer complexity of language makes it inevitable that some assumptions about specific innate language capacity must be made. He stated that the human must have some mechanism particularly suited for language learning other than the behaviorists' general principle of learning adaptability. He further stated that,

In short, then, man has a species specific capacity, a unique type of intellectual organization which can not be attributed to peripheral organs or related to general intelligence and which manifests itself in

what we may refer to as the "creative aspect" of ordinary language use--its property being both unbounded in scope and stimulus-free (p. 4).

Lenneberg (1967) supported Chomsky's view when he wrote concerning the possible biological predispositions that humans may have for the learning of a language; he said:

Thus, no features that are characteristic of only certain natural languages, either particulars of syntax, or phonology, or semantics, are assumed here to lie innate. However, there are many reasons to believe that the processes by which the realized, outer structure of a natural language comes about are deeply-rooted, species specific, innate properties of man's biological nature (p. 394).

Skinner (1957) along with other behavioristic learning theorists has minimized the importance of hereditary biological endowments in the development and use of language. He has maintained that behavioristic theorists generally agree that while the physiological functions of the individual form the basis for language behavior, the function of the nervous system in performing language tasks is of basic interest to psychologists studying the development of language.

Menyuk (1969), in an attempt to bring together some of the more divergent views, said:

...all of the aspects of language acquisition and development, linguistic, psychological, and neurophysiological, are logically interdependent... (p. 2).

She reported that psychologists were concerned with the way a child acquired and used his knowledge. She stated:

Various learning theories have been proposed to account for the acquisition and use of linguistic competence. These theories have been made about the utterances of children from experiments which may or may not have

been concerned with language per se. In addition, attempts have been made to determine the characteristics of the mechanisms which underlie (SIC) the acquisition and use of language, such as perception, discrimination, memory, and hypothesis formation. These mechanisms are linked, in some manner, to the structures and functions of the nervous system... (p. 2).

Regardless of the differences between the behaviorists and the rationalists over the basic causal factors of language development, neither view denies the significance of social experience as an instrumental factor. It is of minor importance to practitioners whether language ability is innate or learned. What is of significance to one charged with recognizing and dealing with differences in language is whether or not change is necessary, desirable, and difficult, and the extent to which stages in language development lend themselves to intervention where necessary. Of prime interest to the present study was the idea that regardless of the nature of the basic explanation of language development, there remains an area of development that is entirely personal, whether the basis for this personal difference is innate or environmentally produced is not important. What is important is that if this personal factor does exist, its effect upon the measurement of verbal IQ must be accounted for.

Relationship of Language and Intelligence

Most teachers and school administrators encountered by the investigator over a three-year period of time felt that certain aspects of language ability were highly representative of intellectual ability. Wechsler (1958) stated

that this assumption has considerable support in research. McCarthy (1954) reported the fact that differences in intellectual status paralleled those in linguistic development. She noted that there was a slight superiority of girls over boys, of singletons over twins, and of children from upper socioeconomic levels over those from lower socioeconomic levels. These relationships have been often reported in the literature. Whether the measured greater language maturity of some subjects was due to greater intellectual abilities or whether the higher scores on the chiefly verbal intelligence tests were due to the greater language ability of some subjects is a question left unanswered. Studies that have attempted to clarify the issues involved in this question have not produced a clear or final answer (McCarthy, 1954).

Loban (1963) pointed out that the highest correlation in his entire study was between vocabulary and intelligence. He secured language samples from male and female subjects by controlled interviews. He then divided his subjects into high and low language proficiency groups based on an equally weighted combination of scores from a vocabulary test and the average of all of the teachers' ratings on language obtained during kindergarten. The high group consistently rated higher than the low group on fluency with language, effectiveness and control, wider use of the elements within the structural patterns, sensitivity to conventional usage and grammar, use of language to express tentative thinking, reading and writing ability, coherency through subordination, and greater variety

of movables such as adverbial constructions. Strickland (1962) found that the use of movables (such as adverbial constructions) increased with age and advances in school grade. She found statistically significant interaction between the use of movables and the variables of verbal intelligence, mental age, and parent's education. Templin (1957) also found substantial correlation between IQ scores and vocabulary measures.

Loban (1963) concluded his study by saying, "Vocabulary, success with group tests of intelligence, and proficiency with language constitute a cluster of traits (or possibly, they are different manifestations of the same trait) (p. 87)." It appears to be clear that intelligence tests that are dependent upon verbal communication between examiner and examinee or that take the form of written responses to material that is read should inevitably result in high correlations between measured language ability and derived intelligence scores. To deny that language usage capability should make any contribution to determining one's capability of dealing with everyday problems in a technological society is to deny the obvious.

Nevertheless, the possibility remains that due to innate predispositions or circumstances in a child's environment, one may learn language skills at a different rate or even learn language skills that are different from those taken for granted in the broader culture. Depending upon the nature of the test and/or the testing conditions, the

resulting IQ score deficit could play a considerable role in causing a misevaluation of such a child's real capacities.

Changes in Language Ability with Increasing Age

Many researchers believe that only a basic mastery of the language may be achieved by the age of four to six. During this time the individual may master the fundamental structure (syntax) of his language as well as many of the details. However, this achievement is based upon the child's environment, and the child may have to modify his language when he enters school so that the language he uses at school (and is tested through the use of) may be another translation situation where he cannot perform in an optimal fashion, and thereby be misjudged as language deficient rather than language different (Ervin & Miller, 1963). John Carroll (1960) stated,

After the age of six there is relatively little in the grammar or syntax of the language that the average child needs to learn, except to achieve a school-imposed standard of speech or writing to which he may not be accustomed in his home environment. (p. 748).

Lefevre (1970) expressed a different view of a child's language development,

The acquisition of language is a life long task, beginning with the birth cry and continuing steadily during the slow maturing of the whole personality (p. 43).

Here again disagreement exists between researchers in the field of language development. Carroll's (1960) statement seems positive enough, yet the meaning of "the average

child" was not established and therefore does not preclude the language different child from being placed in the "non-average" group.

Measurement of Language Development

The ideas, feelings and conclusions that many teachers and test administrators have about the development of language and its relation to verbal intelligence appear to be founded in the methods that have been used to measure language development.

The earliest attempts to study the process of the individual's language development centered around classifying language usage into "correct" and "incorrect" usage through the measurement of accepted classifications of formal grammar. Traditionally, the study of the developing speech of very young children was the only accepted method of scientific investigation. Studies of the language of older children were not popular before the 1960's. The early studies were extremely complex in that the method used was one of complete classification. The researcher would find it necessary to classify sentence length; length of total response; distribution of simple, complex, compound, and incomplete sentences; frequencies of declarative, interrogative, imperative, and exclamatory sentences; various kinds of subordinate clauses and their ratios to main clauses; comparisons involving the different parts of speech; and cataloging what was considered to be errors in morphology and syntax (O'Donnell, 1967, p. 3).

Piaget (1926) in The Language and Thought of the Child introduced a functional approach to the study of language development in children. He stated that the traditional method of classifying and analyzing the speech of children was cumbersome and ineffective. Piaget said that his new functional or clinical method would permit the investigation of the relationship between the child's language and his thought process. E. Claparede, who wrote the preface of Piaget's 1926 work, (The Language and Thought of the Child) described Piaget's new method enthusiastically by saying:

The method which in M. Piaget's hands has proved to be so prolific is also one of great originality. Its author has christened it "the clinical method." It is, in fact, that method of observation, which consists in letting the child talk and in noticing the manner in which his thought unfolds itself. The novelty consists in not being content simply to record the answers given by the child to the questions which have been put to him, but letting him talk of his own accord. "If we follow up each of the child's answers, and then allowing him to take the lead, induce him to talk more and more freely, we shall gradually establish for every department of intelligence a method of clinical analysis analogous to that which has been adopted by psychiatrists as a means of diagnosis."

This clinical method, therefore, which is also an art, the art of questioning, does not confine itself to superficial observations, but aims at capturing what is hidden behind the immediate appearance of things. It analyses down to its ultimate constituents the least little remark made by the young subjects. It does not give up the struggle when the child gives incomprehensible or contradictory answers, but only follows closer in chase of the ever-receding thought, drives it from cover, pursues and tracks it down till it can seize it, dissect it and lay bare the secret of its composition (p. xiii).

Piaget spoke of the intent of his method when he wrote:

It may therefore be of interest to state the functional problem in connection with older children, and this is what we intend to do as an introduction to the study of child logic, since logic and language are obviously interdependent (p. 4).

Piaget elaborated on the basic method with the following detailed account:

The method we have adopted is as follows. Two of us followed each a child (a boy) for about a month at the morning class at the Maison des Petits de l' Institut Rousseau, taking down in minute detail and in its context everything that was said by the child. In the class where our two subjects were observed the scholars draw or make whatever they like; they model and play at games of arithmetic and reading, etc. These activities take place in complete freedom; no check is put upon any desire that may manifest itself to talk or play together; no intervention takes place unless it is asked for. The children work individually or in groups, as they choose; the groups are formed and then break up again without any interference on the part of the adult; the children go from one room to another (modeling room, drawing room, etc.) just as they please without being asked to do any continuous work so long as they do not themselves feel any desire for it. In short, these school-rooms supply a first-class field of observation for everything connected with the study of the social life and of the language of childhood.

We must anticipate at once any objection that may be advanced on the plea that since these children were used as subjects they were not observed in natural conditions. In the first place, the children, when they are in the play-room with their friends talk just as much as they would at home, since they are allowed to talk all day long at school, and do not feel censured or constrained in any way whatsoever. In the second place, they do not talk any more at school than they would at home, since observation shows that up to a certain age, varying between 5 and 7 1/2, children generally prefer to work individually rather than in groups even of two. Moreover, as we have taken down in its entirety the context of our two subjects' conversations, especially when it was addressed to an adult, it will be quite spontaneous talk on the

part of the children, i.e., all that may have been said in answer to questions that were put to them.

Once the material was collected, we utilized it as follows. We began by numbering all the subjects' sentences. As a rule the child speaks in short sentences interspersed with long silences or with the talk of other children. Each sentence is numbered separately. Where the talk is a little prolonged, the reader must not be afraid of reckoning several consecutive sentences to one number, so long as to each sentence containing a definite idea only one number is affixed. In such cases, which are rare enough, the division is necessarily arbitrary, but this is of no importance for statistics dealing with hundreds of sentences.

Once the talk has been portioned out into numbered sentences, we endeavour to classify these into elementary functional categories (p. 6).

He identified two major types of language used by children as egocentric (concrete) and general (socialized). He hypothesized that in the source of growth and development, the child's language would shift from the former to the latter usually between 7 and 11 years of age. Piaget thus provided the first break with tradition in concepts of early language development. This break with tradition stimulated new research and the development of new research methods that continues to this day.

The present study was stimulated by the concept in Piaget's work that states that children develop language abilities at different rates and that examination of such development must be done on an individual, personal basis. Further, he says that the change from a child-like language usage to an adult-like usage of language (egocentric shift)

will occur over an extremely wide time span, i.e. between 7 and 11 years of age. It appears that if children are not at the same stage in language development (according to Piaget's standards) then their responses to verbal IQ test items could differ, primarily as a result of differences in language "shift" levels, and not necessarily differences in intelligence.

The Paradigmatic Shift

Another shift in personal language usage and understanding is the "paradigmatic shift." Many researchers report that this change in the child's language is age related and highly similar to the "egocentric shift." Moreover, the paradigmatic shift lends itself to direct measurement.

Ervin-Tripp (1961) using 183 children in kindergarten, the first-, third-, and sixth-grades conducted an investigation relating to the paradigmatic shift in children. The children were given a free response word association test containing a collection of words that were judged to be within the vocabulary of the children. It was found that there was a significant increase with age in the proportion of responses in the same grammatical class as the stimulus word (paradigmatic responses). That is to say, language usage increases with increases in age. There was, in addition, a decrease with age in clang responses, another indicator of increased language maturity. Ervin-Tripp stated that the significant change to paradigmatic responses with age did not appear to be caused by formal educational practices, but merely hastened by such experiences.

Woodrow and Lowell (1916) conducted early studies of children and adult responses to similar word lists. They found that even poorly educated adults preferred paradigmatic responses. One such group of subjects, non-literate Navaho adults, very markedly preferred paradigmatic responses. The children in Woodrow and Lowell's studies ranged from 9- to 12-years of age and the gradual shift from syntagmatic to paradigmatic responses were quite similar to the Ervin-Tripp study.

Brown and Berko (1960) have shown that there is even a tendency for children to define nonsense syllables differentially with paradigmatic responding increasing with age. Younger children offer sentences as definitions and older children offer synonyms. The older children who offer synonyms as definitions also give significantly more paradigmatic responses to stimulus words. The investigators did not interpret this change to be one brought about by educational experiences, but by some interaction of maturation and environment. These studies tend to suggest that in addition to often quoted cultural, socioeconomic, and environmental deprivation reasons for different language development and performance, there are some similar factors that are seemingly independent of these causes but produce highly similar language results. Further, these changes and differences appear to have been reflected in a measure sensitive to the degree of paradigmatic shift present in the individual's personal language development.

The change in the tendency to respond to a stimulus word with a response word in the same class is not limited to the English language. Rosenzweig (1961) reported that essentially the same change occurs in children who speak French, German, and Italian as native languages.

Wreschner (1907) using German words, found that age and education were both related to paradigmatic dominance. He stated that the children speaking German preferred concrete nouns as responses, regardless of the class of the stimulus word. However, inflectional affixes in German con- found paradigmatic responses.

All of the foregoing research seems to indicate that the tendency to go through the paradigmatic shift is an almost universal aspect of personal language development. This developmental predisposition appears to transcend the differences imposed by language, country, cultural background, and other factors as long as the language used allows the individual to respond to the test instrument in a manner that can be related to a paradigmatic quantity.

The most frequently used method for measuring the degree of paradigmatic shift is a free response word association test. A test of this sort allows the subject to freely respond to a language stimulus, with great freedom from restraint and response limitations.

In this regard the free response word association test of paradigmatic shift is similar to Piaget's functional method. There are many other methods for measuring personal

language development, but most of them center their attention upon standardized, traditional school grammar.

Perhaps one of the first major changes in the use of traditional school grammar in the study of children's language development came when researchers adopted Fries' (1952) form classes for the classification of words on the basis of their grammatical functions. Fries' classification is still used often and many researchers have developed techniques that are extensions of Fries' work. Most of Fries' work was done in an area now called structural linguistics. Findings by Fries (1952) and by Trager and Smith (1951) form a basis from which modern structural linguistics investigates language development. Structural linguists usually divide their analyses into three levels. Herndon (1970) described these levels as:

Phonology, the sound system; morphology, the system of meaningful grammatical units or combinations of sound; and syntax, the system of combining morphological units into larger structures (p. 210).

Phonology, the first level, consists of a relatively small number of meaningless sound units which are called phonemes. Phonemes are the smallest sound units of a language or dialect and do not occur singly but combine into patterns which are called morphemes. Morphemes are the smallest structural units of English which carry meaning and include word bases, grammatical inflections and derivational prefixes and suffixes. The way in which morphemes and larger units are arranged in sentences is known as syntax. These patterns of syntax are recognized as units in oral language through the use of stress,

pitch, and juncture (Lefevre, 1970). The present study was concerned with only one of the three levels of analysis used by the structural linguists, namely, syntax. The underlying assumption in this study is that syntax is learned in highly individual situations which will have a carry-over effect to more generalized syntax situations.

Factors that Affect Language Development

Language is one of the most important aspects of the development of a child. No other developing ability can make changes in the child's environment that the increasing use of the language does. The change in the child's ability to use the language may be positively or negatively influenced by many factors. The range within which these factors might fall is great; from lack of or abundance of innate ability to quality of language models in the environment.

The present study was prompted by a concern that unknown or unrecognized cultural and/or other factors might exist that could alter the language development rate of an individual and that this difference in language development rate could be misinterpreted as an above or below normal intelligence level.

The present study was most concerned with the possibility that life long damage could be done to children who were misidentified as having a low verbal IQ when in actuality, they were not as far into the egocentric or paradigmatic shift as the test norming group. Some research shows many factors as having an influence on language ability although

the basic interest in this study had to do with problems of measurement of personal language development level.

Loban (1963) followed the language development of a group of 338 children in a longitudinal study, from kindergarten to the sixth grade. He found that "Studies of children's language have identified socioeconomic status, sex, race, and intelligence as factors influencing language proficiency (p. 3)."

Hall (1973) has pointed out that many children in this country speak "non-standard" English. "Non-standard" English he defined as any consistent deviation from the English language as used by the majority of children in public schools. Hall's research showed that black students usually speak a "non-standard" English dialect that he believes contributes to low classroom performance and poor performance on standardized intelligence tests. One non-black subject, whose family spoke only Portuguese, did not perform well on intelligence tests if kept within the normal time restraints but did exceptionally well if allowed additional time. Hall hypothesized that the subject "thought" in Portuguese and had to translate questions into his native language to come up with an answer and then translate that answer back to English. Hall also hypothesized that other cultural influences might produce a similar "translation" problem for children of other cultural and subcultural groups.

Using a group of 180 white and 180 black subjects, Hall found that children comprehend information or "encode"

it in their memory in their most familiar dialect. Hall's research evidence further indicated that subjects tended to retrieve information from memory in the same form in which they encoded it. Hall found that while white children do better than black children in "standard" English testing situations, black children outperform white children in non-standard English testing situations.

Currently in this country researchers have shown great interest in the relationships between language development and socioeconomic status. Observers generally report that language development proceeds more rapidly for children in the upper socioeconomic levels. One common belief expressed frequently is that standardized IQ tests are biased against minority groups and people in lower socioeconomic classes, because differences in language development exist. It is possible that factors that influence the rate of language development and performance on verbal IQ tests are related to some aspect of life that is strongly influenced by the socioeconomic level of the individual.

In this regard, McCarthy (1954) reported:

There is considerable evidence in the literature to indicate that there exists a marked relationship between socioeconomic status of the family and the child's linguistic development (p. 586).

Templin (1957) reported that she found consistent differences in the performance of the upper and lower socioeconomic groups. The performance of the upper socioeconomic groups was consistently higher than of the lower group.

Loban (1963) reporting on his long term study of a group of 338 children from kindergarten through the sixth grade stated:

The persistently parallel variation of language proficiency and socioeconomic status should not be over-looked. It appears entirely possible that language proficiency may be culturally as well as individually determined (p. 89).

Bernstein (1960) studied language forms as they developed within the youth of British middle class and lower working class. He found that distinct forms of spoken language are associated with the organization of particular social groups. He said:

It is proposed that the two distinct forms of language use arise because the organization of the two social statuses is such that different emphases are placed on language potential. Once this emphasis or stress is placed, then the resulting forms of language used progressively orient the speakers to distinct and different types of relationships to objects and persons, irrespective of the level of measured intelligence (p. 271).

McCarthy (1954) reported that several studies give evidence that;

Occupational group differences are consistent and strikingly in favor of the upper socioeconomic levels in all types of analysis. The children from the upper social levels not only use longer sentences but also use more mature sentence forms at earlier ages (p. 586).

In addition to the foregoing factors that appear to influence language usage, many researchers have come to believe that the same forces and factors that bear the responsibility for the development of the personality, the adjustment or maladjustment to social life, and human thought strongly influence or are reflected in language usage.

These aspects of human life are highly personal and individual, their close relationship to language usage could indicate that language is an extremely personal attribute and may perform many different functions in the life of the individual.

It is reported frequently that parents chide their school-age children when they use school-type language at home considered to be "above their raising." This pattern of selective reinforcement and punishment apparently extends to many other aspects of an individual's life conditioning him to think and speak in a culturally determined manner. The extent to which this selective program of reinforcement mitigates against standard language development may determine, in part, the individual's capacity to emit a language performance judged acceptable in an academic setting.

Carroll (1960) felt that many psychologists were becoming increasingly aware that some of the fundamental problems of behavior may be understood better through a study of the child's personality adjustment and the contents of his mental life through the study of his language. The research does not provide enough evidence to separate factors that influence language from those that influence other behavior. Some theorists believe that language cannot be considered as separate and apart from other behaviors of the individual. They maintain that language is influenced by all the factors that impinge on any other activity of the individual. Many firmly state that communication between different humans is not the only language function.

Carroll (1964) asserted his belief that language represents not only the means by which relations are accomplished between individuals, but also is the means by which the individual communicates (thinks) with himself. He declared:

We can think of language as serving two major functions: (1) as a system of responses by which individuals communicate with each other (inter-individual communications); and (2) as a system of responses that facilitates thinking and action for the individual (intra-individual communication) (p. 4).

Vendryes (1925) agreed and added:

Language is a symbolic sign system. By signs, we understand all those symbols capable of serving as a means of communication between men (p. 7).

He further stated that these symbols enable men to think and communicate with others of different times and places.

Pilsbury and Meader (1928), in The Psychology of Language, emphasized that the communication of thought is the primary function of language: "We may begin with the statement that language is a means or instrument for the communication of thought, including ideas and emotions (p. 4)."

Vygotsky (1934) believed that distinctions existed between vocalized speech, inner speech, and thought. He stated his belief that there was a special relationship between words and thought:

The relationship between thought and word is a living process, thought is born through words, a word devoid of thought is a dead thing, and a thought unembodied in words remains a shadow (p. 153).

Language is seen by the preceding investigators as something more than a skill learned over time to enhance communication between people. It must be considered as more than a socially acquired, standardized system of symbols and codes that each person has an equal opportunity, predisposition, and motivation to identically incorporate into their lives. It must be viewed as an entity that can be modified and changed by forces and factors that can be quite different for each individual.

Summary

The present study had a central interest in the possible relationship between a measure of paradigmatic shift and personal language development in the individual and three standardized measures of verbal intelligence. The foregoing presentation of research findings indicates that there has been considerable interest over the years in the development of language in the individual. There are two major theories of language development that were of interest to the present study. The empiricist believes that association and generalization can readily explain how language develops in humans. The rationalist believes a child has species-specific, genetically endowed predispositions of speech.

The research also indicates that some investigators believed that language is an expression of intelligence and that through the analysis of language the level of intellectual functioning for the individual can be determined. Still other investigators maintained that language usage is somewhat

separate from intelligence and may vary independently. Many factors have been shown to influence language usage.

The literature also reflects support for the phenomena of egocentric shift and paradigmatic shift. Although limited, there is also evidence that the egocentric shift and the paradigmatic shift occur at approximately the same chronological age. Research shows that the paradigmatic shift may be detected and measured by a free responding word association procedure. In the present study the level of the paradigmatic shift was assumed to be a measure of personal language development.

CHAPTER III

METHODS AND PROCEDURES

The purpose of this study was to examine the relationships between frequently used standardized intelligence tests and a measure of personal language development. The procedures used to test the hypotheses formulated in the study were: (a) selection of sample, (b) administration of selected tests, (c) processing of the data, and (d) statistical treatment of the data.

Selection of Sample

The population included in this study was restricted to 60 fifth- and sixth-grade students from low to average socioeconomic backgrounds from Maxwell Elementary School, Tuscaloosa County School System, Alabama, during the 1972-1973 school year. This school is racially integrated by students and teachers. Both black and white, male and female students were selected on a random basis from a pool of eligible children from grades five and six. All subjects were approximately at the upper age limit for the egocentric and paradigmatic shift to occur. A sample of 60 children was selected to allow for adequate degrees of freedom for statistical analysis. All 60 children selected were tested.

Administration of Selected Tests

The tests were administered over a five-day period in December, 1973, to all children involved. The word association test was given at the same time the first day to all 60 children. The standardized intelligence tests were given on an individual basis using recommended standardized procedures to each of the children by the investigator and a qualified female examiner in two small, quiet, well-ventilated rooms at the school. The tests were given in the same order to each child, i.e., the verbal subtests of the WISC, the PPVT, and the Grammatic Closure subtest of the ITPA. The raw scores for each of the tests were used in the statistical analysis since each child received the same tests. The investigator assigned a code number to each subject and all scoring, compilation, and statistical treatment of the scores was done by code number identification to insure confidentiality.

Brief Description of the Tests Used

A complete description of the tests used including standardization procedures, item purpose and description, and scoring and scaling procedures would go far beyond the scope of this study. Such information about the WISC may be found in the WISC Manual (Wechsler, 1949), similar information about the ITPA may be found in the Examiners Manual, Illinois Test of Psycholinguistic Abilities, Revised Edition (Kirk, McCarthy & Kirk, 1968). The same type information about the PPVT may be found in the Expanded Manual for the Peabody Picture Vocabulary Test (Lloyd M. Dunn, 1965). A brief description of each instrument will suffice here.

Wechsler Intelligence Scale for Children

This test is published by the Psychological Corporation. In assessing the effectiveness of intellectual ability, one is primarily interested in how the individual compares with his age peers. The techniques used in the WISC were chosen to facilitate such comparisons. The 12 subtests are divided into two subgroups identified as Verbal and Performance. In this study only the Verbal subtests were used. These subtests are:

Information: This is a test of old learning and is thought to reflect cultural background. At the upper levels it may also represent knowledge that an alert individual could acquire for himself. This knowledge is accessible even after a disturbance has affected some of the other mental functions; it is generally not affected by age.

Comprehension: Comprehension is a test mainly of social judgement. This requires conceptual manipulation of information obtained in the subject's cultural and educational background. In addition to his social judgement, comprehension necessitates the ability to make generalizations based on the knowledge acquired by the individual in his social milieu. The earlier items require little or no abstractive reasoning, whereas the later items are largely dependent on abstract thinking.

Similarities: The ability to recognize relationships between objects or ideas depends largely on concept information. This ability requires logical abstractive thinking. The early items of the test may be answered easily because they evoke previously made associations and are therefore similar to the information items. They do not necessarily call for judgement. The later items; however, do necessitate judgement as well as the use of the associative processes in the evaluation of essential likenesses. This is one of the most sensitive tests of intellectual impairment. Perceiving similarities is closely related to general verbal intelligence.

Arithmetic: This test requires concentration, attention, and mental effort. The arithmetic items are not identical in the mental processes involved. The earlier problems are similar and depend more on school learning. The later items are more difficult and necessitate an analysis of the problem including logical reasoning and abstraction. This test may reflect reality contact and alertness.

Vocabulary: This test is considered one of the best measures of verbal intelligence and learning ability; vocabulary score is a rough measure of the subjects optimal intellectual efficiency. It is related largely to the educational background of the subject. It may reflect the range of ideas, experiences, or interests which a subject has acquired (Blackburn, 1970; pp. 3-4).

Illinois Test of Psycholinguistic Ability

The edition of the ITPA used is a revision of the Experimental Edition, which was published in 1961 (McCarthy & Kirk). A summary of research studies on the Illinois Test of Psycholinguistic Abilities, Experimental Edition, was conducted by Bateman in 1965 and an increasing number of studies have been made since that time. The ITPA is an instrument devised to measure one's lack of precision in the use of language. It deals with the psychological functions of the individual which operate in communication activities. The ITPA contains 12 subtests divided into three dimensions of measurement: (a) channels of communication; (b) levels of organization; and (c) psycholinguistic processes. Of the 12 subtests of the ITPA, only the subtest Grammatical Closure was administered. The Grammatical Closure subtest measures the subject's ability to predict future linguistic events from linguistic structure or inflection. The Grammatical Closure subtest is in the psycholinguistic processes dimension of

measurement. The ITPA Manual (1968) states that as a result of having overlearned grammatical structure one should be automatically led to correct grammatical responses (e.g., the examiner says, "Father is opening the can. Now the can has been _____.") (p. 9).

Peabody Picture Vocabulary Test

This test was published in 1965 by the American Guidance Service, Incorporated. The test is designed to provide an estimate of a subject's verbal intelligence through measuring his hearing vocabulary. The test does not require the subject to read, only to respond to oral instructions and pictures. Subjects are presented with four pictures on a page. The examiner orally gives the subject a stimulus word and the subject responds by pointing to the picture that best tells the meaning of that word. The PPVT yields a mental age and an IQ. The PPVT mental age is more accurately described as a vocabulary age and according to Wechsler (1958), vocabulary is the best predictor of intelligence (Dunn, 1965).

Word Association Test

The test used to measure personal language development was a free response word association test of the type used by Ervin-Tripp (1961). This test consisted of 50 words selected from a list of vocabulary words that were considered to be within the vocabulary range of fifth- and sixth-grade children (Rinsland, 1954). The form classes were alternated

within the list and through the method of group presentation the order of presentation was the same for all subjects. There were no problems in administration. The lists of words used may be found in appendix A.

The word association test was given to all subjects at the same time. This assured that the conditions of testing were as close to the same for all subjects as possible. This procedure did help keep speed uniform and aid slow readers. The words for the test were printed on the pages of a large flip chart. The investigator designed and gave the following instructions after distribution of the answer sheets:

When you hear a word sometimes it makes you think of another word. For example, when you hear 'cat' you might think of milk or purr or dog or black, almost anything. What does 'cat' make you think of? I would like to find out what certain words make you think of. You have been given a sheet of paper with 50 blanks on it. If you will look carefully, you will see that the first four blanks have a letter in front of them and all of the rest of the blanks have numbers in front of them. Notice that the numbers begin with one and end with 46. The first four blanks are for practice words. After we do the first four words, I will answer any questions you might have and then we will do words one through 46. I will show you a word on the flip chart along with the number of the blank that goes with the word. I will say the word for you aloud; you repeat the word silently to yourself; and write the first word that it makes you think of. When you have written the word that you have thought of then look up at me and I will know that you are ready to go to the next word. Be sure that the word you write down is in the blank with the same number as the word on the flip chart.

Classification of Responses

A list of the stimulus words and every different response word given to each stimulus word was compiled and copies made for three judges. The practice stimulus words (the first four on the list) and the responses to them were used by the investigator and the judges in a group to discuss and agree upon the process of classifying the response words into grammatical classes. After the group session, each judge was given an identical list, i.e., all stimulus words and the different response words obtained. Each judge independently classified all responses into grammatical groups, and determined if each response was in the same grammatical class as the stimulus. Responses were then classed as paradigmatic if they occurred in the same grammatical class as the stimulus word and then only if they did not occur in immediate sequence in ordinary continuous speech. Thus, although all may be nouns, front-door and table-spoon, for example, were not tallied as paradigmatic because they normally occur in immediate sequence in ordinary continuous speech.

The lists compiled by the judges were returned to the investigator and an examination for inter-judge variance was performed. Any difference of opinion between judges was resolved by a discussion between all judges and the investigator. After all of the various responses had been classified, the investigator then used this list to classify the response group for each subject. Any extremely deviant responses, such

as neologisms, were taken up with the subject later the same day when non-directive sentences such as "can you tell me more about that" were used in attempt to gather enough information to assign the word to a grammatical class. The number of paradigmatic responses given on the test by an individual was his or her score on the word association test.

Processing of the Data

All of the tests were administered to each child, and a master sheet was prepared for each child listing his score on each of the tests. The score for each test was defined as follows:

1. The raw score for the WISC was the sum of raw scores for each subtest of the verbal portion of the WISC.
2. The raw score for the ITPA was the number of correct responses for the Grammatical Closure subtest.
3. The raw score for the PPVT was the number of correct responses on the test.
4. The raw scores for the word association test was the total number of paradigmatic responses given on the test.

Statistical Methods

The statistical method used in the study was discriminant analysis. This statistical procedure predicted criterion group membership (number of paradigmatic responses) by virtue of examination of the predictor variable profile (scores from the three standardized tests used). The experimental hypothesis was either supported or rejected on

the basis of the accuracy of predicted inclusion in the criterion group. A level of confidence of .05 was chosen as necessary to reject the null hypotheses.

CHAPTER IV

ANALYSIS OF DATA

This study investigated the possible relationships between frequently used standardized measures of verbal intelligence and language development. The standardized measures of verbal intelligence were obtained by the administration of the verbal subtests of the WISC; the Grammatic Closure Subtest of the ITPA; and the PPVT. The measure of personal language development was obtained through the administration of a word association test derived from a similar test used by Ervin-Tripp (1961) and a list of words from Rinsland (1954).

This study examined the performance of 60 fifth- and sixth-grade children on all of the above measures. Scores on the measures of verbal intelligence were used to predict the level (high or low) of performance on the word association test of personal language development.

Chapter IV describes the analyses of the data as they relate to the hypotheses tested. The statistical analyses used to test the hypotheses were performed on an IBM 360 Model 50 Computer. The program discriminant analysis (CORRO6) was employed and is part of the Behavioral Sciences Statistics Program Library (1973).

Description of Statistical Techniques Employed

Discriminant analysis considers several measurements obtained on individuals in groups, interprets them simultaneously, and yields a statistic which indicates the measurable differences between groups. Discriminant analysis, in addition, considers all of the data on each individual simultaneously and classifies each individual according to the group which his own particular set of data suggests he is most like (Cronbach & Gleser, 1950). This classification is of primary interest in this study as the profile obtained from an individual's scores on the verbal intelligence tests was used to predict membership in high or low level paradigmatic shift groups.

Discriminant analysis involves computing the squared difference between profiles in the correlated measurement space. This squared difference is called the Generalized Mahalanobis D^2 . The greater the numerical value of D^2 , the smaller the amount of overlap between measurements, so D^2 may be regarded as the difference between high and low paradigmatic shift groups (Tatsuoka & Tiedeman, 1954). The distribution of the Mahalanobis D^2 closely approximates the chi-square distribution and can be interpreted using standard chi-square tables (Tiedeman, 1951).

Profiles may differ in both shape and elevation, and discriminant analysis is sensitive to both types of differences. Helmstadter (1957) reviewed 15 statistical techniques for estimating profile and concluded that discriminant analysis is the most statistically sophisticated procedure for the

analysis of profiles. In the present study, discriminant analysis was used to determine how useful the verbal IQ measures were in predicting performance on the measure of paradigmatic shift.

Application of Results to Hypotheses

Hypothesis I. There is no statistically significant deviation from a normal distribution of the paradigmatic shift in the present study.

Hypothesis II. There are no statistically significant differences between high and low IQ groups of fifth- and sixth-graders (as measured by the verbal scales of the WISC, the Grammatic Closure Subtest of the ITPA, and the PPVT) on level of paradigmatic shift.

The results of the discriminant analysis of the data of the present study are presented in Table 1 and Table 2. The CORRO6 computer program computes the Generalized Mahalanobis D^2 , coefficients for all three verbal tests for both discriminant functions (high paradigmatic shift groups and low paradigmatic shift groups), and the probability associated with the largest discriminant function.

The Generalized Mahalanobis D^2 computed by the discriminate analysis indicates that there is a significant difference between the high and low paradigmatic shift groups in this study and that the difference is significant beyond the .001 level of confidence. The null hypothesis I is therefore rejected.

One possible explanation for deviation from a normal distribution of the paradigmatic shift in the present study could be that those factors which influence the development of other human traits may also work to affect the rate of development of the paradigmatic shift. It may be that some conditions that coexist with life as experienced by children in lower socioeconomic groups depress the rate at which the paradigmatic shift occurs. More research should be done in a population where there is a normal spread of socioeconomic groups to determine if the development of the paradigmatic shift actually follows the same statistically predictable pattern that many other human traits do.

Table 2 indicates that of the three verbal IQ tests administered, the verbal subtests of the WISC did a better job of predicting performance on the test of level of paradigmatic shift than either the ITPA or the PPVT. The profile of all three verbal measures was more accurate in predicting membership in the high paradigmatic group, although the WISC was more accurate separately in predicting membership in the low paradigmatic group. The probabilities associated with the largest discriminant function for each subject (the probability that the profile used by the program to predict group membership would not occur by chance) were high.

The chi-square values in Table 1 and contingency coefficients in Table 2 refer to the group frequencies predicted by the measure of paradigmatic shift and the three measures of verbal IQ. The chi-square values in Table 1

TABLE 1

CHI-SQUARE CLASSIFICATION OF SUBJECTS INTO OBSERVED AND EXPECTED HIGH AND LOW PARADIGMATIC SHIFT GROUPS AND ACCURACY OF PREDICTION OF GROUP MEMBERSHIP BY A PROFILE OF SCORES FROM STANDARDIZED MEASURES OF VERBAL INTELLIGENCE

GROUP	OBSERVED FREQUENCY	EXPECTED FREQUENCY	PREDICTION ACCURACY	(GENERALIZED MAHALANOBIS D ²)
HIGH	35	24	68.5%	
LOW	20	12	60.0%	10.37*

*Significant beyond the .001 level.

TABLE 2

RELATIONSHIP OF THE VERBAL SUBTESTS OF THE WISC, THE
GRAMMATICAL CLOSURE SUBTEST OF THE ITPA, AND THE PPVT
TO THE LEVEL OF THE PARADIGMATIC SHIFT

GROUP	TEST	CONTINGENCY COEFFICIENTS
HIGH IQ PARADIGMATIC	WISC	.60896
	PPVT	-.01146
	ITPA	.25104
LOW IQ PARADIGMATIC	WISC	.64002
	PPVT	-.16392
	ITPA	.24187

indicate that the predicted frequencies are significantly different from what would be expected by chance. The contingency coefficients indicate the strength of the relationship or predictability of frequencies. The contingency coefficients in Table 2 indicate a poor and statistically significant beyond the .001 level of significance relationship between verbal IQ test scores and paradigmatic shift group membership. That is to say, using the results of the discriminant analysis, group membership (i.e., high or low paradigmatic shift) can be predicted only poorly by the combined scores of the selected measures of verbal IQ, thus the null hypothesis II is therefore rejected.

Discussion of the Findings

Of the many questions of interest to this study, perhaps the most basic one, was related to the possibility that many tests of verbal intelligence might not be appropriate intelligence measures for members of some sub-cultural groups. A reason for the possible inappropriateness of some tests of verbal intelligence could be language differences between the norming groups and later subjects. These language differences might be interpreted as intellectual deficiencies if they did indeed depress an individual's score on a test of verbal intelligence. This study did not presume to argue that the ability to use language is unrelated to intelligence, only that some language users may not be able to demonstrate their actual intellectual ability in the face of a testing situation where the language required is

in any degree foreign to the individual. In this country there are many children in public school systems whose native language is not English. It appears obvious that a language handicap could exist for many of these children.

Sufficient evidence seems to exist to show that individuals in highly visible or noticeably different sub-cultural groups differ in language usage. All of the reasons for inadequate or different IQ test performances accrue to members of these groups primarily because it is easy to enumerate well known physical and social differences that set them apart from the mainstream of American culture. The present study was conceived to be more concerned with the possibility that some of the language differences that admittedly exist for members of recognized subcultural groups might also exist for individuals who cannot (as it were) seek refuge from the finalty of poor IQ test performance in the socially acceptable excuse of cultural difference or deprivation. The investigator felt that if language differences that can misrepresent intellectual ability do exist for some individuals then the differences could be related to some universal aspect of language development that could be reasonably held to exist for many children. Two possibilities seemed to offer some clue as to the nature of a possible universal, namely differences in the unique personal past history of the child and language changes that appear to occur as a result of age increases.

Hall found that both black and white children significantly increased the rate of correct responding to

both standard and non-standard English test items from age 8 to age 10, Piaget found that between the ages of 7 to 14 children responded to language situations with adult language more and more frequently until the nature of responding becomes almost completely adult (the egocentric shift). Ervin-Tripp found that children respond to language stimulus situations with more and more paradigmatic associations until the major portion of the responses that are given are paradigmatic (the paradigmatic shift). How and if these changes are related to verbal intelligence is not clear. What is clear, however, is that some rather dramatic language changes do occur for most children during a period of time that roughly corresponds to 6- to 12-years of age. The possibility does certainly exist that these changes occur systematically for most children and also that the individual rate of change might be influenced by any number of personal factors (i.e., social, cultural, economic, etc.). The possibility also exists that some factors that might modify this process of change do not lend themselves to ready identification. If, however, they do exist their presence might be suggested if a measure of personal language development and a measure of verbal IQ do not correlate highly.

The present study presented subjects with a measure of personal language development that has been shown to be sensitive to the paradigmatic shift. Previously quoted research also indicated that the paradigmatic shift and the egocentric shift are closely related in time for each individual. It was felt that the level of success on this

test accurately reflected the language ability of the subject. The subjects were also given three accepted measures of verbal intelligence and it was felt by the investigator that these measures were sensitive to what is commonly referred to as verbal intelligence. It was felt that any discrepancy between the individual's performance in the two areas would be indicative of the disruptive operation of some unknown language or verbal intelligence factor since language ability is generally assumed to be a good indicator of intellectual ability. The method used was to predict the level of personal language development by examination and analysis of the individual's performance on the three measures of verbal intelligence.

The resulting analysis showed that, for more than half of the subjects, the profile of the measures of verbal intelligence could accurately predict the level of performance on the paradigmatic shift test. This would tend to support the idea that language ability and success on the verbal portion of IQ tests are positively related. However for a significant group of subjects (N=36) the profile of the measures of verbal intelligence did not correctly predict the level of language performance of the individual. The statistical probability associated with membership in high or low paradigmatic shift groups was quite high for all subjects and the likelihood of being incorrectly grouped was quite remote.

These results show that for some reason or reasons some subjects do not perform on verbal IQ tests and

paradigmatic shift tests in a predictable fashion. The present study did not include an interest in the identification of the various reasons for disparity, only in the possibility that these conditions did exist. Both high and low (paradigmatic shift) groups were inaccurately identified by the profile of verbal IQ measures as much as 40% of the time. Although the high paradigmatic shift group was correctly identified more often than the low (paradigmatic shift) group, the verbal IQ profile still correctly identified group members 60% of the time. The 40% misidentification was statistically significant beyond the .001 level.

The three measures of verbal intelligence used differed considerably in their ability to separately predict the level of success on the measure of paradigmatic shift. The WISC was considerably more accurate in identifying membership in both high and low paradigmatic shift groups than either the PPVT or the ITPA. This could be the result of the larger variety of language usage required by the verbal portion of the WISC as compared to the ITPA and the PPVT. Further, the WISC may share some aspects of the measure of paradigmatic shift used in the present study in that the cultural deprivation syndrome (low verbal score, high performance score) on the WISC might also be interpreted as evidence for a late or slow developing paradigmatic or egocentric shift. If this were the case one would expect increases in language ability to occur with increasing age, irrespective of educational experiences. Hall (1973),

Woodrow and Lowell (1916), Ervin-Tripp (1961), and others have stated that this process does indeed occur. Although one cannot deny the fact that the language ability necessary to express intellectual ability is difficult to separate from the degree or level of intellectual functioning, it appears clear that, for many children, the language ability is age dependent. The finality and life shaping effect of an IQ score (i.e., through a process such as the self-fulfilling prophecy) seems to be a high price for some children to pay for what may be the inability of tests and investigators to separate and measure personal language development and verbal intellectual ability. Another possible relationship between the WISC and the measure of paradigmatic shift could be the degree to which both measures are influenced by language "overlaps" or commonalities that are shared by children in both high and low paradigmatic shift groups.

The PPVT was least effective in predicting paradigmatic shift group membership. The PPVT uses pictures more than words and it was felt that this arrangement would allow the subject an opportunity to respond in such a fashion that the more apparent biasing factors (cultural, social, etc.) would not be an influence. One possible explanation for the negative relationship between the PPVT results and the prediction of high or low paradigmatic shift group membership could be the very reason it was felt that this relationship would not occur; namely the response freedom that picture stimuli would allow. It is possible that

the same factors that influence individual language development to make it idiosyncratic might also produce responses to the PPVT stimulus pictures that would not be judged correct by the application of the standards for that test.

The ITPA Grammatical Closure subtest purports to measure the level of grammatical development in the individual. Initially the investigator felt that this measure would allow the subject to express that type of language development that would closely approximate the level of development indicated by the word association measure of paradigmatic shift development. Although the ITPA did a better job of predicting paradigmatic shift group membership than did the PPVT, it did a much poorer job than the WISC. One explanation for the poor predictive ability of the ITPA (in this study) could be that it is more influenced by factors that appear also to influence language development than the WISC but less than is the PPVT.

Administrators of many Alabama school systems directly indicated to the investigator (over a three-year period) that they and fellow school system administrators in other states found the WISC to be the IQ test of choice. They indicated that the reason for this choice was that this test had both a verbal and performance scale. They stated that they believed that many cultural differences observed in school children in their charge were reflected in language differences and directly related to low verbal performance on IQ tests. They indicated that the performance scale on

the WISC offered some children (usually minority group members) with cultural differences, an opportunity to demonstrate intellectual abilities separate and apart from language.

The results of the present study show that the verbal portion of the WISC predicted the level of personal language development (the paradigmatic shift) significantly better than the PPVT or the Grammatic Closure subtest of the ITPA. This finding appears to be in conflict with the view that the verbal portion of the WISC is principally responsible for the "cultural bias" of that test.

Summary

This study was basically concerned with the possibility that the effect of some factors that influence language development might be misinterpreted as deficits in verbal intelligence. A procedure was employed where the profile of three measures of verbal IQ was used to predict the level of success on a measure of personal language development (the paradigmatic shift). It was found that the profile of verbal IQ only poorly predicted the level of success on the measure of paradigmatic shift. Of the three measures of verbal IQ used (the verbal subtests of the WISC, the PPVT, and the Grammatic Closure subtest of the ITPA), the WISC did a significantly better job of predicting the level of success on the measure of paradigmatic shift than did the other two.

CHAPTER V

SUMMARY, CONCLUSION AND RECOMMENDATIONS

The purpose of this study was to examine the possible relationships between frequently used standardized measures of verbal intelligence and a measure of personal language development. The standardized measures of verbal intelligence selected for use in the present study were the verbal subtests of the WISC, the Grammatic Closure subtest of the ITPA, and the PPVT. The measure of personal language development used was a free response word association test of paradigmatic shift similar to one used by Ervin-Tripp (1961).

The subjects for the present study were 60 children in the fifth and sixth grades at Maxwell Elementary School, Tuscaloosa County School System, Alabama in the school year 1972-73. Subjects were randomly chosen from a pool of black and white, male and female students. The hypotheses were stated in null form and dealt with the expected distribution of the paradigmatic shift in the present population and the relationship between performance on the measures of verbal intelligence and performance on the measure of paradigmatic shift.

On the first day of testing all 60 children in a group were given the free response word association test of

personal language development. Each child was then given individually and in the same order the measures of verbal intelligence. The sequence of administration was the verbal subtests of the WISC, the PPVT, and the Grammatic Closure subtest of the ITPA. A code number was assigned to each child and all scores were compiled on individual master sheets.

The statistical procedures discriminant analysis and chi-square were used to analyze the data. The statistical procedure chi-square represented in the computer program by the Mahalanobis D^2 computed the expected frequencies for both high and low paradigmatic shift groups, compared the predicted group membership to observed membership and indicated the probability that this result would occur by chance. The results showed that the statistical dispersion of paradigmatic test scores differed significantly from a statistically normal distribution, and that this difference was statistically significant at the .001 level of confidence. The discriminant analysis procedure used a profile of scores from the three measures of verbal intelligence to predict the level of performance on the free response word association test of paradigmatic shift. The results showed that this profile was only 68.5% accurate in predicting the level of the paradigmatic shift of those subjects whose scores on the measure of paradigmatic shift placed them in the "high" scoring group, and only 60.0% accurate in predicting the level of paradigmatic shift for those subjects whose scores placed in the "low" scoring group.

The statistical procedure also indicated how effective each of the three measures of verbal intelligence was in predicting performance on the measure of paradigmatic shift.

Least effective of the three was the PPVT, next in effectiveness was the Grammatic Closure subtest of the ITPA, and significantly more effective was the verbal subtests of the WISC. The difference between actual paradigmatic shift group placement and predicted placement was significant beyond the .001 level of significance.

Conclusions

In the population used in the present study, the paradigmatic shift is not statistically distributed as one might expect it to be if it does indeed follow the same pattern of development as do other human traits. However, it may be that if the pattern of paradigmatic shift seen in the present study is clearly deviant from that pattern of development found in a normal socioeconomic population, one might be led to conclude that some factors of life associated with the development of the paradigmatic shift are most strongly influenced by low socioeconomic level. This conclusion could be made more viable if future research shows that in a normal socioeconomic population the paradigmatic shift does follow the same development patterns as many other human traits. The relationships that may exist between the measures of verbal intelligence and the measure of paradigmatic shift selected for this study appear as follows:

PPVT. The PPVT score was negatively correlated with performance on the measure of paradigmatic shift. It may be that the use of stimulus pictures rather than words taps a faculty in the subject that is considerably different than that elicited by the ITPA and the WISC on the measure of paradigmatic shift.

ITPA. The Grammatical Closure subtest of the ITPA was more positively correlated with performance on the measure of paradigmatic shift than the PPVT but less so than the WISC. Both the PPVT and the ITPA were very poor predictors of performance on the measure of paradigmatic shift. It may be that both the PPVT and the ITPA are strongly influenced by factors that caused the idiosyncratic language of many children to be viewed as deficient rather than different.

WISC. It has been the experience of the investigator that the verbal scale of the WISC is sharply criticized for being sensitive to cultural differences and misrepresenting language differences as intellectual deficits. However, the results of this study indicate that the verbal scale of the WISC correctly predicted the level of performance on the measure of paradigmatic shift for the majority of subjects. The difference between predictive ability of the WISC and that of the PPVT and the ITPA was statistically significant.

The findings appear to indicate that while the PPVT and the Grammatical Closure subtest of the ITPA do not measure the same abilities in an individual that the measure of

paradigmatic shift does, the verbal subtests of the WISC do measure some of the same abilities to an appreciable degree. The positive correlation between performance on the WISC and performance on the measure of paradigmatic shift seems to indicate that some overlap of measurement or "pluralistic qualities" exist between those factors measured by the WISC and those factors measured by the free response word association measure of paradigmatic shift.

Recommendations

The results of the present study indicate related investigations which might provide needed information about the relationship of paradigmatic shift development and methods of measurement of verbal intelligence.

Several studies which appear to be logical extensions of the present study are:

1. A similar study could investigate the characteristics of the verbal scale of the WISC and a measure of paradigmatic shift development to determine in what ways these two measures are culturally pluralistic or equivalent.
2. A similar study could investigate the relationships that might exist between specific age related language changes and verbal intelligence as measured by the WISC.
3. A study could be conducted which would be concerned with the specific performance differences that various cultural and socioeconomic backgrounds produce on both language development and verbal intelligence measures.

4. A study could be designed to investigate verbal intelligence and personal language development that would emphasize the evaluation of the idiosyncratic abilities of the individual rather than a comparison of language or intellectual differences.

5. A study could investigate the relationship between performance on the measure of paradigmatic shift development used in the present study and individual level of academic success.

6. A study could investigate the statistical distribution of the paradigmatic shift in a population of normal socioeconomic status construction.

7. A study could investigate the relationship between performance on the WISC performance scale and the measure of paradigmatic shift used in the present study.

APPENDIX

APPENDIX A

FREE RESPONSE WORD ASSOCIATION TEST
OF PERSONAL LANGUAGE DEVELOPMENT

- | | |
|-------------|---------------|
| A. Cat | 22. There |
| B. Dog | 23. Yesterday |
| C. Mouse | 24. Him |
| D. Apple | 25. These |
| 1. Table | 26. When |
| 2. Moon | 27. Softer |
| 3. Boy | 28. Hotter |
| 4. Front | 29. Slower |
| 5. Night | 30. Worse |
| 6. Winter | 31. Fire |
| 7. Hand | 32. Hard |
| 8. Game | 33. Lie |
| 9. Build | 34. Black |
| 10. Give | 35. Trees |
| 11. Float | 36. Ball |
| 12. Worked | 37. Supper |
| 13. Come | 38. Write |
| 14. Walking | 39. Pillow |
| 15. From | 40. Sad |
| 16. Across | 41. Dark |
| 17. Over | 42. Fast |
| 18. Up | 43. Go |
| 19. Out | 44. Behind |
| 20. Before | 45. Light |
| 21. Always | 46. Played |

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