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ABSTRACT

The purpose of this study was to investigate and compare the patterns of psycholinguistic abilities of lower and middle class Negro and white children. The subjects for the study were 160 second grade children in the 90 to 110 IQ range from Northeast Louisiana. They were subgrouped by race and social class (lower-lower, upper-lower, lower-middle, and upper-middle) and were given the Illinois Test of Psycholinguistic Abilities (ITPA), Revised Edition. Analysis of data resulting from this test indicates that: (a) Race and social class were significant factors in the pattern of psycholinguistic abilities. (b) Significant differences existed between the subsets of the test for the total sample, for races, for social classes, and for races by social classes. (c) The interaction of race and social class was significant in the general test and by subtest. (d) The interaction of social class and subtests was not significant. (d) The interaction of race, social class, and the ITPA subtests was not significant. Based on the findings of the study, teachers should examine their teaching methods and materials to determine if they are appropriate to the patterns of psycholinguistic abilities of children in the classroom. (Author/JD)

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PREFACE

This study is an outgrowth of earlier research concerning the psycholinguistic abilities of lower socioeconomic status children. In that research it was found that lower socioeconomic status children were visually-motor oriented, had significant difficulty with the syntax of the language, and performed exceptionally well on Auditory Sequential Memory. The present study was undertaken to determine if this pattern is typical of lower socioeconomic status, and if there are significant changes in these abilities with changes in socio-economic status.

Thanks are due many people who have contributed to the development and administration of this project: Dr. Lewis F. Blackwell who was chairman of my doctor committee when the original study was conducted, Mr. James O. Lancaster, Superintendent of Ouachita Parish Schools, Dr. J. Harvey Walthall, Superintendent of Monroe Public Schools, Mr. O. L. Harper, Superintendent of Morehouse Parish Schools, Mrs. Alma Brown, Principal Grambling Laboratory School, the principals, teachers, and children that were involved in the study.

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SUMMARY

The purpose of this study was to investigate the patterns of psycholinguistic abilities of Negro and white children from the Lower-lower, Upper-lower, Lower-middle, and Upper-middle socioeconomic status levels.

The problem consisted of the identification and testing of 160 children who were: (a) between 83 and 89 months old, (b) in the 90 to 110 IQ range, (c) were from one of the two racial groups and one of the four social class levels as determined by the Index of Socio-economic Status.

Subjects for the study were second grade children from several school systems of Northeast Louisiana. The population from which the sample was selected consisted of approximately 3,500 children.

To identify these children, chronological age was determined first, then the mental ability was determined. After the children met these criteria, socioeconomic status was computed and the child's name was placed in one of the eight subgroups. Then names were selected from these groups and the children were administered the Illinois Test of Psycholinguistic Abilities (ITPA) Revised Edition.

The ITPA raw scores were converted to months by the use of published norms and subjected to a two by four by ten analysis of variance. The research design used in this study is referred to by Lindquist (1953) as a Type III Analysis of Variance or random replication of two factor experiment. The F ratios were computed and when the P was significant (.05), t ratios were computed to identify the source of variation.

The objectives of the study were: (a) to determine if the heavy reliance on the visual and motor channels is a characteristic limited to the lower social class, (b) to determine if social class is a significant factor affecting the psycholinguistic abilities of children, (c) to determine if children from the middle class use the auditory and vocal channels more than the visual and motor channels, and (d) to determine if there is a pattern of psycholinguistic abilities associated with race.

Analysis of data indicated that:

1. Race was a significant factor in the pattern of psycho-linguistic abilities. White children surpassed Negro

children in combined performance and on all subtests except Auditory Sequential Memory and Visual Sequential Memory. There were no significant race differences on these subtests, but Negro children performed better on Auditory Sequential Memory than did white children.

2. Social class was a significant factor in the pattern of psycholinguistic abilities. Differences were noted between Lower-lower and Lower-middle, Lower-lower and Upper-middle, Upper-lower and Upper-middle, and Lower-middle and Upper-middle. Social class was a significant factor affecting the performance on Auditory Reception, Visual Reception, Grammatic Closure, and Visual Closure. In general, visual skills dominate the pattern of abilities of the lower social class and auditory skills, though not significantly higher than visual skills, become more pronounced with the middle classes. One factor contributing to the relative strength in visual skills was the amount of variability between psycholinguistic abilities of the lower social classes. The performance of the middle classes tends to show less variability and thus fewer differences between abilities, but a higher level of performance.

3. Significant differences existed between the subtests of the ITPA for the total sample, for races, for social classes, and for races by social classes. In general, deficiencies in Verbal Expression were noted in all groups, Manual Expression was relatively high, Auditory Sequential Memory and Visual Sequential Memory were strengths, and Grammatic Closure was a deficiency for lower-class children, especially Negro children.

4. The interaction of race and social class was significant. Social class has little effect on the performance of Negro children. Differences for Negro children were noted between Lower-lower and Upper-middle, and Upper-lower and Upper-middle social classes. Social class had a pronounced effect on the performance of white children on the ITPA. Significant differences were noted between all social class combinations except Upper-lower and Lower-middle.

5. The interaction of race by subtest was significant. This finding indicates characteristic patterns for Negro and white children. Figure 1 and Tables 31 and 32 indicate the degree of difference between races on the various subtests.

6. The interaction of social class and subtests was not significant.

7. The interaction of race, social class, and ITPA subtests was not significant.

Based on the findings of the study teachers should examine their teaching method and materials to determine if they are appropriate to the patterns of psycholinguistic abilities of children in the classroom. This study found that Auditory Reception was a disability for Negro children and children from the lower social class. Considerable emphasis should be placed on developing listening skills for these children.

Verbal Expression was a disability found in all groups in this study. Associated with listening skills there should be time devoted to oral expression. In terms of psycholinguistic abilities the major instructional technique used in public schools (lecture-recite) uses Auditory Reception and Verbal Expression exclusively. The results of this study indicate that visual presentation would facilitate learning and that motor expression may be the most effective means of communicating that learning has occurred.

Grammatic Closure, the automatic speech patterns that one acquires by hearing syntatically correct speech, was a disability for children from the lower social class. It appears that they look at factors other than the content of speech for the meaning that they derive from communication. Associated with the teaching of listening skills, emphasis should be placed on inflections, changes of person, tense, and number, which should facilitate the acquisition of the basic language patterns.

INTRODUCTION

Orientation to the Problem

The impact of social class on one's life has been documented exceptionally well by Warner (1941), Hollingshead (1949), Havighurst (1962), Stendler (1949), and many other writers. These studies have been concerned usually with global factors such as dating patterns, shopping areas, living quarters, etc.

Recently, with tremendous emphasis on equality of opportunity for all, studies have indicated that children from the lower socioeconomic status levels have different attitudes toward life, usually perform lower on academic subjects and measures of achievement, and have different levels of aspiration from middle-class children. These studies have stimulated researchers to try to identify the factors affecting low academic performance, low aspiration level, a value system oriented towards the present, and many other characteristics associated with the lower class.

These researchers are investigating now such factors as learning patterns, channel utilization in receiving and responding to stimuli, quality and quantity of adult-child interaction, information processing, categorization modes, disciplining procedures, and other specific skills to determine what the specific patterns are and what factors may have resulted in these patterns.

A study concerning the pattern of psycholinguistic abilities of lower socioeconomic status children was conducted by the principal investigator (Stephenson, 1968). The present investigation is an extension of that study.

In Stephenson (1968) the Experimental Edition of the Illinois Test of Psycholinguistic Abilities (ITPA) was administered to 40 randomly selected lower socioeconomic status first grade children. The children in this study were between 81 and 87 months old and on the Peabody Picture Vocabulary Test scored between 85 and 105.

A three-way analysis of variance (race, sex, and subtests) was computed for the scores on the subtests. The results of the analysis indicated that: (1) race was a significant factor in psycholinguistic abilities, (2) sex was not a significant factor, (3) the interaction of race and sex was significant, (4) significant differences exist between subtests for lower socioeconomic status children, (5) subtests by race interaction was significant, and (6) subtests by sex interaction

was significant. From the analysis it was concluded that race and subtests were contributing the major portion of the variance.

To identify where significant differences between races and between subtests existed, t ratios were computed. The t ratios for differences between races were significant for (1) subtest seven--Auditory Vocal Automatic (white), (2) subtest five--Vocal Encoding (white), (3) Auditory Vocal Sequencing (Negro), and (4) Composite Language Age (white).

A t ratio matrix was calculated for the total sample--all lower socioeconomic status children. The differences between abilities of this group led to the questions to be answered in the present study. Significant differences were found in 15 of the 36 possible t ratios. The rank order of performance on the ITPA of lower socioeconomic status children was:

1. Auditory Vocal Sequencing
2. Visual Decoding
3. Visual Motor Association
4. Motor Encoding
5. Auditory Vocal Association
6. Auditory Decoding
7. Auditory Vocal Automatic
8. Visual Motor Sequencing
9. Vocal Encoding

The general picture that emerged concerning the psycholinguistic abilities of lower socioeconomic status children was:

1. They rely heavily on the visual channel in receiving stimuli.
2. They rely heavily on the motor channel in responding to stimuli.
3. Their command of the basic English language patterns is poor.
4. Their immediate auditory memory--one to four seconds--is very good relative to other psycholinguistic abilities.
5. Their ability to express ideas vocally is very limited.
6. Expressive skills are significantly below receptive skills.
7. Language age was significantly below mental age.

The results of this study and the research with culturally disadvantaged children pertaining to these abilities were generally in agreement. Other research regarding channel preference could explain the visual orientation of children from the lower social class and would suggest that all children, regardless of social class, are visually oriented. It has been estimated that of human experiences one percent is received through the sense of taste, one and one-half percent

through the sense of touch, three and one-half percent through the sense of smell, eleven percent through the sense of hearing, and eighty-three percent through the sense of vision. The purpose of the present study was to extend the original study to three other social class levels to determine if social class affects the level of performance as well as specific psycholinguistic abilities.

The general hypothesis regarding the particular pattern of abilities states that children from lower social classes experience as much if not more visual stimulation than do middle-class children, but the quantity of verbal behavior in lower-class homes is limited. In lower-class homes, vocal stimulation by an adult who can provide correction for immature or inaccurate speech is not available, because child rearing is usually the function of siblings not very much older than the imitator.

The reliance on visual cues and the emphasis placed on compliance with the status leader results in much emphasis being placed on visual motor skills and demands on the auditory vocal skills. The disuse of the auditory vocal channels results in delayed language development, which in turn limits mediation and results in the comparatively lower level of performance on intelligence tests, achievement tests, and academic skills.

If this hypothesis is tenable, then the level of performance on the various subtests should increase as we move up levels of social class, and there should be dramatic differences in the psycholinguistic abilities of children of the Lower-lower and Upper-middle social class levels.

Review of the Literature

Bernstein (1967) suggests the existence of two types of language codes. "Public" language is the language of the working class (British terminology for lower class) and is defined as "a form of language use which can be marked off from other forms by the rigidity of its syntax and the restricted use of formal possibilities for verbal organization (p. 232)."

"Formal" language is "one in which the formal possibilities and syntax are much less predictable for any one individual and the formal possibilities for sentence organization are used to clarify meaning and make it explicit (p. 235)."

Bernstein (1967) states of the lower social class or working class:

> Their society is limited to a form of spoken language in which complex verbal procedures are made irrelevant by the systems of non-verbal, closely shared, identifications which serve as a backcloth to their speech. The form of social relationship acts selectively on language potential.

> Verbilization is limited and organized by means of a narrow range of formal possibilities. These restricted formal strategies for the sustained organization of verbal meaning are capable of solving a comparatively small number of linguistic problems (p. 231).

Hess and Shipman (1965) state in regard to the culturally deprived that:

> . . . the meaning of deprivation is a deprivation of meaning--a cognitive environment in which behavior is controlled by status rules, rather than by attention to the individual characteristics of a specific situation and one in which behavior is not mediated by verbal cues or by teaching which relates events to one another and the present to the future. This environment produces a child who relates to authority rather than to rationale; who, although often compliant, is not reflective in his behavior; and for whom the consequences of an act are largely considered in terms of immediate punishment or reward rather than future effects and long range goods (p. 194).

Cary (1966) investigated social class socialization patterns and their relationship to learning. He states that the middle-class home is more "symbolic expressive" where as the lower-class home is "action expressive." He indicates that the major difference between these is that symbolic expressive behavior is brought about by the acquisition of a language through dialogues with adults, and these dialogues do not exist in the families of the lower social class.

Deutsch (1967) states that "being lower class, Negro or white, makes for lower language scores, but being both Negro and lower class does not disproportionally make for lower language scores (p. 223).

John and Goldstein (1967) state in regard to the learning of a language that:

> The middle-class child learns by feedback; by being heard, corrected, and modified--by gaining "operant control" over his social environment by using words that he hears. The child learns by interacting with an adult teacher who plays an active role in simplifying the various components of word-referent relationships (p. 462).
>
> The child from a lower socioeconomic background may experience a deficient amount of verbal interaction. He learns most of his language by means of receptive exposure--by hearing rather than by correction of his own active speech. Words acquired with little corrective feedback in a stable learning environment will be of minimum use as mediators, at a later stage of development. In contrast, the child whose language acquisition is characterized by active participation with a

> more verbally mature individual not only develops greater verbal proficiency--as a result of being listened to and corrected--but also is likely to rely on, and use effectively, words as mediators (p. 466).

Weaver and Weaver (1967) used the ITPA with three groups of culturally disadvantaged Negro children. They concluded that scores obtained through the auditory and vocal channels were significantly lower than those obtained through the visual and motor channels. Scores on the subtests showed a decrease in the following order: association, sequencing, decoding, encoding, and automatic. The rank order of channel utilization was visual, motor, vocal, and auditory.

Lesser, Fifer, and Clark (1965) investigated the learning patterns of the disadvantaged. They compared lower- and middle-class six- and seven-year-old Chinese, Jewish, Negro, and Puerto Rican children on verbal ability, reasoning, number facility, and space conceptualization. They concluded that ethology is a highly significant factor acting upon the level, as well as the pattern, of mental abilities. Social class is a highly significant factor influencing the level of mental ability, but it is not influential on patterns of mental ability. Social class and ethology interact to produce significant effects on the level of mental ability, but not on the pattern of ability. The effect of social class on mental ability is more pronounced in Negro children than in other ethnic groups. There was greater similarity of scores of middle-class children than of scores of lower-class children which indicates that middle-class children as a group are more consistent.

Questions under Investigation

In the present study the major questions were: (a) Is the pattern identified by research of utilization of the visual and motor channels by the lower socioeconomic status levels limited to the lower social class? (b) Is social class a significant factor affecting the pattern of psycholinguistic abilities of children? (c) Do children from the middle class use the auditory and vocal channels more than the visual and motor channels? (d) Is there a pattern of psycholinguistic abilities associated with race?

The preceding questions subsume not only the differences between subtests, but also the interaction of the variables race, social class, and subtests.

Delimitations of the Study

The study was limited to schools in Northeast Louisiana with the majority of the sample coming from the Monroe, Louisiana, area.

Participants in the study were selected from four socioeconomic status levels as measured by the McGuire-White Index of Socioeconomic

Status (1955) Whisenton (1968) and Drake and Cayton (1945), in the Bronzeville study pointed out that criteria for determining social class do not apply equally to white and Negro populations. The criteria for determing social class for Negroes is much more subjective and these criteria are much finer than those used by the McGuire-White Index. For these reasons, and because of the unavailability of information needed to calculate social class using Drake and Cayton's criteria, the McGuire-White Index was used with both populations. The use of the McGuire-White Index with Negroes may have been unjustified, as the comparisons of varying social classes indicate few social class differences between Negroes. This finding could be due to the inability of the McGuire-White to discriminate among social classes for Negroes or due to the fact that the performance of Negroes is not affected by social class.

The study was limited to those second grade children who were between 83 and 89 months old on the day of testing. It was expected that these children had become familiar with general academic tasks, and had been in school long enough to limit the effects of test and stranger anxiety. The majority of the children were tested by white examiners, however, which may have adversely affected the performance of Negro children.

The study was limited to children in average range of intelligence (90-110). This range was chosen because it includes the majority of the children in the public schools. The results of a study involving children of average ability would have the greatest implications for public school teachers in all geographical areas. Using the average range resulted in difficulties finding lower socioeconomic status children with ability in the average range, for their performance tends to fall below the mean. Upper-middle-class children were difficult to find also for they tend to be above the upper limits of the average range on many measures of ability.

The study was limited to a sample size of 160. Twenty children of each race (Negro-white) and each socioeconomic status level (Lower-lower, Upper-lower, Lower-middle and Upper-middle) were selected.

Statistical Design

In the analysis of data the major statistical technique was a two by four by ten analysis of variance. The design identifies the source of variance due to the main effects of social class, race, and subtests, as well as the interaction of race and social class, race and subtests, social class and subtests, and race, social class and subtests.

F ratios were computed for the factors in the analysis of variance design. When the F ratio exceeded a P of .05, t ratios were computed to isolate the source of variance. The .05 level of significance was chosen as the confidence interval by which to

accept as significantly different from chance the differences between factors.

The t ratios were placed when appropriate in matrix form with corresponding graphic representations of the performance of the particular group under discussion.

Analysis of data was handled by means of prepared programs for the IBM 1130 computer.

Instruments Used in the Study

The major instrument used in the study was the Illinois Test of Psycholinguistic Abilities (ITPA) Revised Edition. The ITPA consists of three dimensions of cognitive abilities:

I. Channels of Communication

   A. Sensory input--auditory and visual

   B. Expressive output--vocal and motor

II. Psycholinguistic Processes

   A. Receptive process

   B. Expressive process

   C. Organizing process

III. Levels of Organization

   A. Automatic level

   B. Representational level

From these three dimensions ten major subtests and two supplemental subtests have been developed. The ten subtests and the abilities measured are:

1. Auditory Reception. This is a test to assess the ability of a child to derive meaning from verbally presented material.

2. Visual Reception. This is a measure of the child's ability to gain meaning from visual symbols.

3. Auditory Vocal Association. This test taps the child's ability to relate concepts presented orally.

4. Visual Motor Association. The organizing process in this channel is tapped by a picture association test with which

is assessed the child's ability to relate concepts presented visually.

5. Verbal Expression. The purpose of this test is to assess the ability of the child to express his own concepts vocally.

6. Manual Expression. This taps the child's ability to express ideas manually.

7. Grammatic Closure. This test assesses the child's ability to make use of the redundances of oral language in acquiring automatic habits for handling syntax and grammatic inflections.

8. Visual Closure. This test assesses the child's ability to identify a common object from an incomplete visual presentation.

9. Auditory Sequential Memory. This test assesses the child's ability to reproduce from memory sequences of digits increasing in length from two to eight digits.

10. Visual Sequential Memory. This test assesses the child's ability to reproduce sequences of nonmeaningful figures from memory (Kirk, McCarthy, and Kirk, 1968, pp. 9-13).

Raw scores on the subtests are converted to language ages and standard scores. Scores from the ten subtests are summed to determine Composite Psycholinguistic Age. The definition of language age and Composite Psycholinguistic Age, a function of chronological age, has been determined statistically from the standardization sample.

The McGuire-White (1955) Index of Socioeconomic Status was used as the measure of social class in the study. The Index of Socioeconomic Status uses three of Warner's (1941) six criteria for determining socioeconomic status. To ascertain the socioeconomic status level, occupation, source of income, and educational attainment of the status parent are rated from one to seven. These ratings are then multiplied by five, four, and three respectively. The products are summed, and socioeconomic status is determined by entering a table and finding the sum of the three products. In the Index the higher the sum of the products, the lower the socioeconomic status level.

Objectives and Significance

The objectives of this investigation were to: (1) determine if there are characteristic patterns of psycholinguistic abilities associated with the Lower-lower, Upper-lower, Lower-middle and Upper-middle socioeconomic status levels, (2) determine if there are characteristic patterns of psycholinguistic abilities for Negro and white children, (3) to determine if there are characteristic patterns of

psycholinguistic abilities of Negro and white children from various socioeconomic status levels.

The availability of data concerning the learning patterns of children from various races and social classes can be very useful to the classroom teacher. The profiles of these groups and of individuals suggest disabilities to which instructors should be directed and abilities through which instruction should be directed. Two important contributions of the results of this investigation are: (1) it encourages the teacher to examine methods and materials in terms of psycholinguistic abilities to determine the channel, level and process required of the student, and (2) the ITPA is a diagnostic instrument, as such assessment with the ITPA has led to the development of several curriculum guides and remediational procedures for identified disabilities.

Methods and Procedures

The factors under investigation in this study were race, social class, and psycholinguistic abilities. Basically the two racial groups and the four socioeconomic status levels were the independent variables and psycholinguistic abilities were the dependent variables.

Selection of Subjects

The criteria for selection of children for the study were highly discriminating. The records of approximately 3,500 children were examined to identify the sample of 160.

Chronological Age

Chronological age affects language development; therefore, it was necessary to control chronological age, and this was accomplished by limiting the age span to six months. A child is required to be 72 months (6 years) old by January 1 to enroll in the public schools in Louisiana. The present study was conducted after the children had received approximately one year of public school instruction; therefore the youngest child in the second grade was approximately 77 months old. The average child was approximately 6 months older than the youngest child; therefore, children who met the chronological age requirement were between the ages of 83 and 89 months old on the day of testing.

Mental Age

Mental ability is known to have a significant affect on language development. To study language patterns and development it is necessary to restrict these factors. The 90 to 110 IQ range was selected because (1) this range includes 68 percent of the population, this allowing for a sounder base for generalization to the regular classroom, and (2) it is less difficult to find lower socioeconomic status children whose mental ability is in the average range, than it is to find Upper-middle-class children whose mental ability is below average and who have

not suffered some form of genetic or physical defect.

Social Class

In order to have a standard measure of social class the McGuire-White Index of Socioeconomic Status was used. In most cases data on permanent records of the children provided the information needed to determine social class. From the data on record cards, ratings (1-7) were made on occupation, source of income, and education of the status parent. These ratings were then multiplied by five, four, and three respectively. These products were summed and by using conversion tables the social class level for each child was determined.

The names of those children who met the chronological age and mental age requirements were placed in one of eight pools according to social class scores. Names were selected from these pools and these children were administered the ITPA by qualified examiners.

PRESENTATION AND ANALYSIS OF DATA

The purpose of this study was to investigate differences among psycholinguistic abilities of Negro and white children from the Lower-lower, Upper-lower, Lower-middle, and Upper-middle socioeconomic status levels.

In the Introduction the questions to be investigated were stated. These questions, regarding patterns of performance on the ITPA subtests by various racial and social class groups, were investigated by computing a three-way analysis of variance. Where significant F ratios were obtained, t ratios were computed to identify the source of variance. (With the sample size of 160 and 1,600 observations on this sample, the .05 level of significance was chosen as the confidence interval for rejecting chance as the factor responsible for differences.) In many cases differences were significant beyond the .05 and .01 level. The ratios and degrees of freedom are reported in the tables for anyone interested in the level of significance beyond those chosen by this researcher.

Racial Differences in Psycholinguistic Abilities

Table 1 presents the results of analysis of variance for race by social class by ITPA subtests. Table 1 indicates that race was a significant factor affecting the performance of children on psycholinguistic abilities. To investigate the difference between races, ratio was computed between the mean for Negro children and the mean for white children. The mean for Negro children was 77.1 with a standard deviation of 18.3 months and the mean for white children was 88.1 with a standard deviation of 20.7 months. The t ratio was 11.11 which was significant beyond the .05 level of confidence.

Social Class and Psycholinguistic Abilities

Table 1 indicates that social class was a significant factor affecting the performance of children on the ITPA. Results of t ratios computed for differences between means of the various social classes for the total sample indicated significant differences between (1) Lower-lower and Lower-middle, (2) Lower-lower and Upper-middle, (3) Upper-lower and Upper-middle, and (4) Lower-middle and Upper-middle.

Table 2 presents the results of computation of t ratios for differences between social classes.

TABLE 1

Analysis of Variance for Scores on the ITPA

Source of Variance	Sum of Squares	df	Mean Squares	F	P
Race	48336.00	1	48336.00	144.60	.01
Social Class	15922.00	3	5307.33	15.87	.01
Subtests	63410.00	9	7045.55	21.07	.01
Race by Social Class	3264.00	3	1088.00	3.25	.05
Race by Subtest	20406.00	9	2267.33	6.78	.01
Social Class by Subtests	7572.00	27	280.44	.83	NS
Race by Social Class by Subtests	6874.00	27	254.59	.76	NS
Within Cell	508066.06	1520	334.25		
Total	673850.12	1599			

TABLE 2

t Ratios for Differences between Social Class Levels of the Total Sample on the ITPA

	t
Lower-lower by Upper-lower	1.67
Lower-lower by Lower-middle	3.03**
Lower-lower by Upper-middle	6.02**
Upper-lower by Lower-middle	1.34
Upper-lower by Upper-middle	4.27**
Lower-middle by Upper-middle	2.88**

798 df * = .05 = 1.96 ** = .01 = 2.586

Table 3 presents the means and standard deviations of each subtest by social class. Inspection of these means reveals an increase in the level of performance as social class level increases. Table 3 also indicates that the two lower social classes score higher on Visual Reception than on Auditory Reception, but the two middle social classes score higher on Auditory Reception than on Visual Reception.

All social classes score higher on Manual Expression than on Verbal Expression and the difference between these modes of expression remain relatively consistent regardless of social class.

Psycholinguistic Abilities (Subtests)

Table 1 indicates that significant differences exist among psycholinguistic abilities of the total sample. To determine where significant differences were, t ratios were computed. Table 4 presents the t ratio matrix for the total sample on the ten subtests. Inspection of Table 4 indicates that 29 of the 45 possible t ratios were significant. No difference was noted between channels of reception, but Manual Expression was significantly above Verbal Expression.

Race by Social Class Interaction

Table 1 indicates that the race by social class interaction was significant. Figure 1 presents a graphic representation of the

TABLE 3

Means and Standard Deviations of the Total Sample
on the ITPA Subtests by Social Class Expressed in Months

Subtest	Lower-lower	Upper-lower	Lower-middle	Upper-middle
1	76.87 17.20	72.75 17.12	83.52 21.44	89.12 20.47
2	81.40 20.28	82.37 19.24	83.25 17.07	87.57 16.86
3	73.17 10.60	76.37 12.74	80.45 14.20	87.47 19.55
4	78.37 12.47	86.57 15.40	85.90 19.59	85.47 19.96
5	64.75 12.26	67.97 13.67	66.80 16.92	69.00 13.69
6	86.80 24.23	88.97 25.40	88.72 25.41	93.02 22.65
7	77.75 16.77	77.67 13.89	85.75 18.13	87.47 20.52
8	79.32 13.65	85.87 17.91	83.67 21.51	90.90 21.42
9	89.12 22 45	90.05 22.46	90.15 22.20	98.45 21.52
10	81.00 18.81	82.67 26.44	82.62 23.51	85.87 27.67

1 Auditory Reception
2 Visual Reception
3 Auditory Vocal Association
4 Visual Motor Association
5 Verbal Expression
6 Manual Expression
7 Grammatic Closure
8 Visual Closure
9 Auditory Sequential Memory
10 Visual Sequential Memory

TABLE 4

t Ratio Matrix for Mean Performance of the Sample for All Ten ITPA Subtests

	1	2	3	4	5	6	7	8	9
2	-1.71								
3	.81	2.80**							
4	-2.16*	-.31	-3.79**						
5	8.45**	11.25**	10.14**	12.29**					
6	-4.18**	-2.80**	-5.08**	-2.69**	-11.97**				
7	-1.00	.86	-2.38*	1.32	-10.65**	3.47**			
8	-2.27*	-.73	-3.82**	-.54	-12.07**	2.08*	-1.59		
9	-4.99**	-3.55**	-6.45**	-3.64**	-12.23**	-1.04	-4.57**	-3.04**	
10	-1.05	.26	-1.62	.45	-7.56**	2.37*	-.37	.80	3.31**

1 Auditory Reception
2 Visual Reception
3 Auditory Vocal Association
4 Visual Motor Association
5 Verbal Expression
6 Manual Expression
7 Grammatic Closure
8 Visual Closure
9 Auditory Sequential Memory
10 Visual Sequential Memory

159 df

* = .05 = 1.976

** = .01 = 2.609

performance of Negro and white children on the various subtests. Table 5 presents the results of the computation of t ratios for Negro children by social class.

TABLE 5

t Ratios for Differences between Social Class Levels of Negro Children on the ITPA

	t
Lower-lower by Upper-lower	-.22
Lower-lower by Lower-middle	-1.23
Lower-lower by Upper-middle	-2.43*
Upper-lower by Lower-middle	-.96
Upper-lower by Upper-middle	-2.12*
Lower-middle by Upper-middle	-1.18

198 df * = .05 = 1.974 ** = .01 = 2.605

Inspection of Table 5 indicates that social class has limited effect on the performance of Negro children. Either the instrument used to determine social class can not clearly discriminate among members of various social classes of Negro children, or social class is not very important in its effect on the psycholinguistic abilities of Negro children. The performance of white children suggests the latter.

Table 6 presents the results of computation of t ratios for white children by social class.

Inspection of Table 6 indicates that the McGuire-White Index of Socioeconomic Status can be considered a valid indicator of social class, and that social class has tremendous influence on the performance of white children.

TABLE 6

t Ratios for Differences between Social Class Levels of White Children

	t
Lower-lower by Upper-lower	-2.13*
Lower-lower by Lower-middle	-3.07**
Lower-lower by Upper-middle	-6.35**
Upper-lower by Lower-middle	-1.01
Upper-lower by Upper-middle	-4.19**
Lower-middle by Upper-middle	-3.04**

198 df * = .05 = 1.914 ** = .01 = 2.605

Race by Subtest Interaction

Table 1 indicates that the interaction of race by subtest was significant. To identify the differences among subtests, t ratio matrices were computed for both white and Negro children.

Table 7 is a t ratio matrix for Negro children on the ITPA subtests. Inspection of Table 7 and Figure 1, which is a graphic representation of the means for Negro children, indicates considerable variability among psycholinguistic abilities. Thirty-two of the possible forty-five t ratios were significant. Significant differences exist between Auditory Reception and Visual Reception with Visual Reception being higher. Differences between Motor Expression and Manual Expression were noted with Manual Expression being higher. The most outstanding features of the t ratio matrix is the significant disability in Verbal Expression. Scores on this subtest were significantly below scores on all other subtests.

Table 8 is a t ratio matrix for white children on the ITPA subtests. Inspection of Table 8 and Figure 1 which presents a graphic representation of the mean performance of white children indicates less variability than was noted with Negro children.

There is no difference between modes of reception of white children, but white children scored significantly higher on measures of motor expression than vocal expression. Significant differences were noted

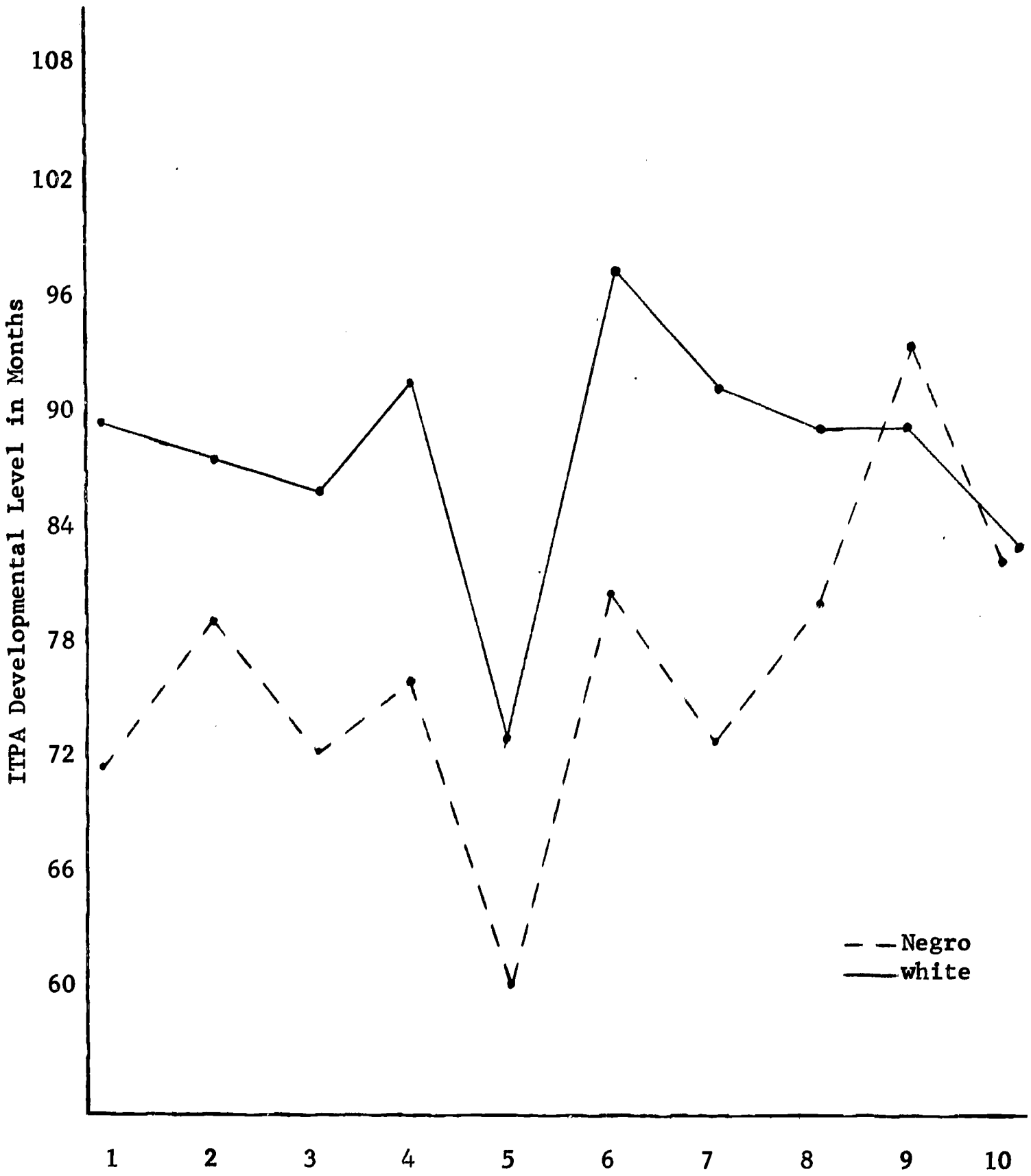

Figure 1. Comparison of ITPA Subtests Developmental Ages for Negro and White Children

1	Auditory Reception	6	Manual Expression
2	Visual Reception	7	Grammatic Closure
3	Auditory Vocal Association	8	Visual Closure
4	Visual Motor Association	9	Auditory Sequential Memory
5	Verbal Expression	10	Visual Sequential Memory

TABLE 7

t Ratio Matrix for Blacks by ITPA Subtests

	1	2	3	4	5	6	7	8	9
2	-3.27**								
3	-.60	3.32**							
4	-2.31*	1.37	-2.96**						
5	4.62**	9.41**	8.10**	9.23**					
6	-3.27**	-.67	-3.18**	-1.74	-7.07**				
7	-.87	2.65**	-.51	1.94	-7.18**	2.73**			
8	-3.27**	-.48	-4.07**	-1.91	-8.90**	.25	-3.19**		
9	-7.40**	-4.73**	-9.61**	-6.71**	-12.13**	-3.88**	-7.75**	-4.59**	
10	-4.02**	-1.19	-3.55**	-2.22*	-8.04**	-.53	-3.17**	-.78	3.03**

1 Auditory Reception
2 Visual Reception
3 Auditory Vocal Association
4 Visual Motor Association
5 Verbal Expression
6 Manual Expression
7 Grammatic Closure
8 Visual Closure
9 Auditory Sequential Memory
10 Visual Sequential Memory

79 df

* = .05 = 1.992

** = .01 = 2.643

TABLE 8

t Ratio Matrix for Whites by ITPA Subtests

	1	2	3	4	5	6	7	8	9
2	.65								
3	1.68	.83							
4	-.79	-1.91	-2.61*						
5	7.44**	6.73**	6.60**	8.41**					
6	-2.62*	-3.31**	-3.97**	-2.04*	-10.21**				
7	-.54	-1.15	-2.64**	.27	-8.02**	2.18*			
8	.09	-.55	-1.54	.87	-8.16**	2.83**	.55		
9	-.03	-.53	-1.28	.58	-6.08**	2.38*	.40	-.09	
10	1.92	1.55	.92	2.60*	-3.21**	3.64**	2.39	1.92	1.70

1 Auditory Reception
2 Visual Reception
3 Auditory Vocal Association
4 Visual Motor Association
5 Verbal Expression
6 Manual Expression
7 Grammatic Closure
8 Visual Closure
9 Auditory Sequential Memory
10 Visual Sequential Memory

79 df * = .05 = 1.992 ** = .01 = 2.643

in 20 of the 45 possible t ratio combinations. As with Negro children Verbal Expression was significantly below all other psycholinguistic abilities.

Interaction of Social Class by Subtests and Race by Social Class by Subtests

Table 1 indicates that the interaction of social class and subtests was not significant nor was the interaction of race by social class by subtests significant.

With the finding of no difference for the interaction of social class by ITPA subtests and for the interaction of race by social class by subtests, computation of t ratios were not necessary. In an effort to determine if these variables were interacting in such a way as to negate any systematic variance, ten separate two-way analysis of variance designs were computed. The results of these computations are included in the appendix.

Psycholinguistic Abilities and Social Class

Table 9 is a t ratio matrix of differences among the performances of children from the Lower-lower social class. Inspection of Table 9 and Figure 2, which is a graphic representation of the performance of Lower-lower social class children, indicates no difference between mode of reception. This finding is in disagreement with previous research for most research has indicated that lower social class children are visually oriented. Mode of expression--motor higher than vocal--is as previous research has indicated. Basic understanding of the syntatical organization of grammar continues to be a disability. The ability to remember digits requiring short term--one to four seconds--auditory memory continues to be very high. Significant differences were noted between Visual Reception and Auditory Vocal Association abilities. Children from the lower class tend to score higher on visual tasks than on auditory tasks and tend to score higher on receptive tasks than on association tasks. The difference between Auditory Vocal and Visual Motor Association was significant. Again the difference was in favor of visual motor tasks.

Scores on Verbal Expression were significantly below all other psycholinguistic abilities. Manual Expression was significantly above Auditory Reception, Auditory Vocal Association, Visual Motor Association, and Grammatic Closure. The performance of lower social class children on Manual Expression was the second highest among the psycholinguistic abilities, ranking behind Auditory Sequential Memory. Visual Closure was significantly higher than Auditory Vocal Association. Again the use of visual skills appears to be paramount for lower social class children. Auditory Sequential Memory was the psycholinguistic ability on which lower social class children performed best. Significant differences were noted between this ability and Auditory Reception, Auditory Vocal

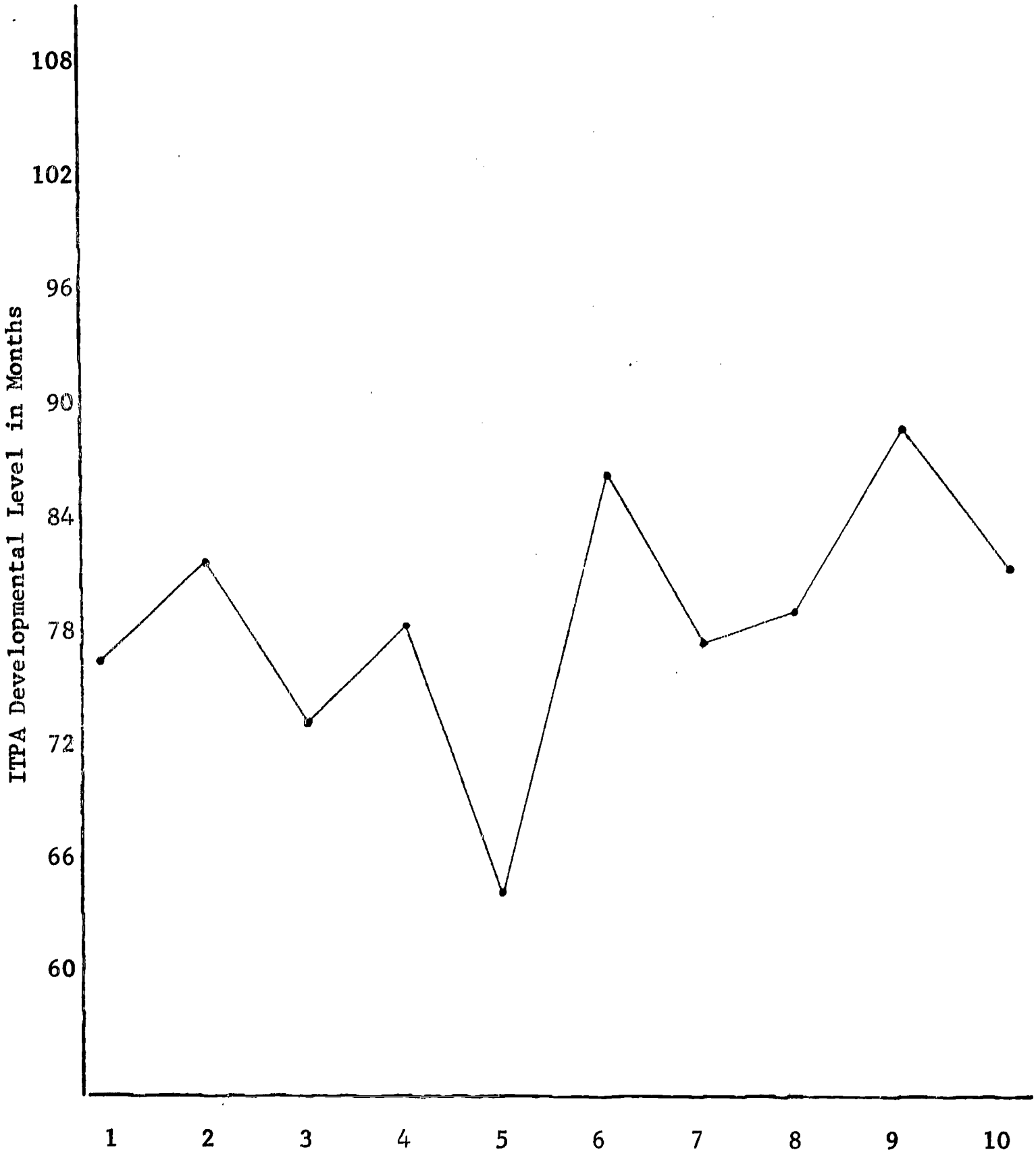

Figure 2. Comparison of ITPA Subtests
Developmental Age for Social Class 1 (combined)

1	Auditory Reception	6	Manual Expression
2	Visual Reception	7	Grammatic Closure
3	Auditory Vocal Association	8	Visual Closure
4	Visual Motor Association	9	Auditory Sequential Memory
5	Verbal Expression	10	Visual Sequential Memory

TABLE 9

t Ratio Matrix for Social Class 1 (Lower-Lower) by ITPA Subtests

	1	2	3	4	5	6	7	8	9
2	-1.38								
3	1.34	2.67*							
4	-.53	1.28	-2.66*						
5	4.56**	5.39**	4.75**	5.82**					
6	-2.75**	-1.33	-3.59**	-2.28*	-5.92**				
7	-.30	1.02	-1.88	.23	-5.22**	2.25*			
8	-.77	.63	-2.59*	-.34	-6.06**	1.90	-.47		
9	-2.70*	-1.56	-4.54**	-2.47*	-6.63**	-.44	-2.54*	-2.63*	
10	-1.07	.10	-2.37*	-.75	-4.92**	1.27	-.87	-.46	1.91

1 Auditory Reception
2 Visual Reception
3 Auditory Vocal Association
4 Visual Motor Association
5 Verbal Expression
6 Manual Expression
7 Grammatic Closure
8 Visual Closure
9 Auditory Sequential Memory
10 Visual Sequential Memory

39 df * = .05 = 2.025 ** = .01 = 2.711

Association, Visual Motor Association, Grammatic Closure, and Visual Closure. Short term--one to four seconds--memory seems to be a strength for lower-class children. Some writers consider this to be a disability in that it is compulsive nonreflective behavior and is believed to cause difficulties in reading. Visual Motor Sequencing was significantly above Auditory Vocal Association. The strength in the sequencing abilities over association abilities is again noted.

Table 10 is a t ratio matrix for the Upper-lower social class. Inspection of Table 10 and Figure 3, which is a graphic representation of the performance of the Upper-lower social class, indicates much variation among subtests.

Significant differences exist between mode of reception, with children from the Upper-lower social class scoring higher on Visual Reception. Visual Motor Association was significantly higher than Auditory Reception and Auditory Vocal Association. As with social class one (Lower-lower), performances on visual tasks are higher than performances on auditory tasks. Visual Closure was significantly higher than Auditory Reception, Auditory Vocal Association, and Grammatic Closure. Auditory Sequential Memory was significantly higher than Auditory Reception, Auditory Vocal Association, and Grammatic Closure. Auditory Sequential Memory was significantly higher than Auditory Reception, Auditory Vocal Association and Grammatic Closure. The high level of performance on this subtest was observed in social class two, as well as social class one.

Visual Sequential Memory was significantly above Auditory Reception. This finding and others in which Auditory Reception was compared showed Auditory Reception to be in the majority of the cases a serious disability. This finding is especially important in light of research comparing blind and deaf children on academic achievement, because in most cases deaf children were significantly lower than blind children. Even though most of our sensory experiences are through the visual channel, impaired or reduced utilization of the auditory channel can have profound effects on the performance of children.

The performance of children from social class two (Upper-lower) on Verbal Expression was significantly below all subtests except Auditory Reception. Motor Expression was significantly above Auditory Reception, Auditory Vocal Association, and Grammatic Closure. Motor Expression was the second highest score attained by social class two, surpassed only by Auditory Sequential Memory.

Table 11 is a t ratio matrix for Lower-middle-class children on the ITPA subtests. Inspection of Table 11 and Figure 4, which is a graphic representation of the performance of Lower-middle-class children, shows significantly fewer differences among subtests than social classes one and two.

The major differences noted in social class three is that Verbal Expression is significantly below all other psycholinguistic abilities. The performance of children on this subtest was one to two years below

TABLE 10

t Ratio Matrix for Social Class 2 (Upper-Lower) by ITPA Subtests

	1	2	3	4	5	6	7	8	9
2	-2.63*								
3	-1.49	1.97							
4	-5.08**	-1.55	-4.30**						
5	1.66	5.28**	3.53**	7.63**					
6	-3.95**	-1.58	-3.26**	-.63	-5.52**				
7	-1.87	1.53	-.66	3.65**	-3.94**	3.12**			
8	-4.59**	-.96	-3.52**	.27	-5.85**	.75	-3.07**		
9	-4.07**	-1.61	-3.67**	-.89	-5.77**	-.20	-2.96**	-.87	
10	-2.16*	-.05	-1.41	.85	-2.98**	1.07	-1.08	.64	1.23

1 Auditory Reception
2 Visual Reception
3 Auditory Vocal Association
4 Visual Motor Association
5 Verbal Expression
6 Manual Expression
7 Grammatic Closure
8 Visual Closure
9 Auditory Sequential Memory
10 Visual Sequential Memory

39 df * = .05 = 2.025 ** = .01 = 2.711

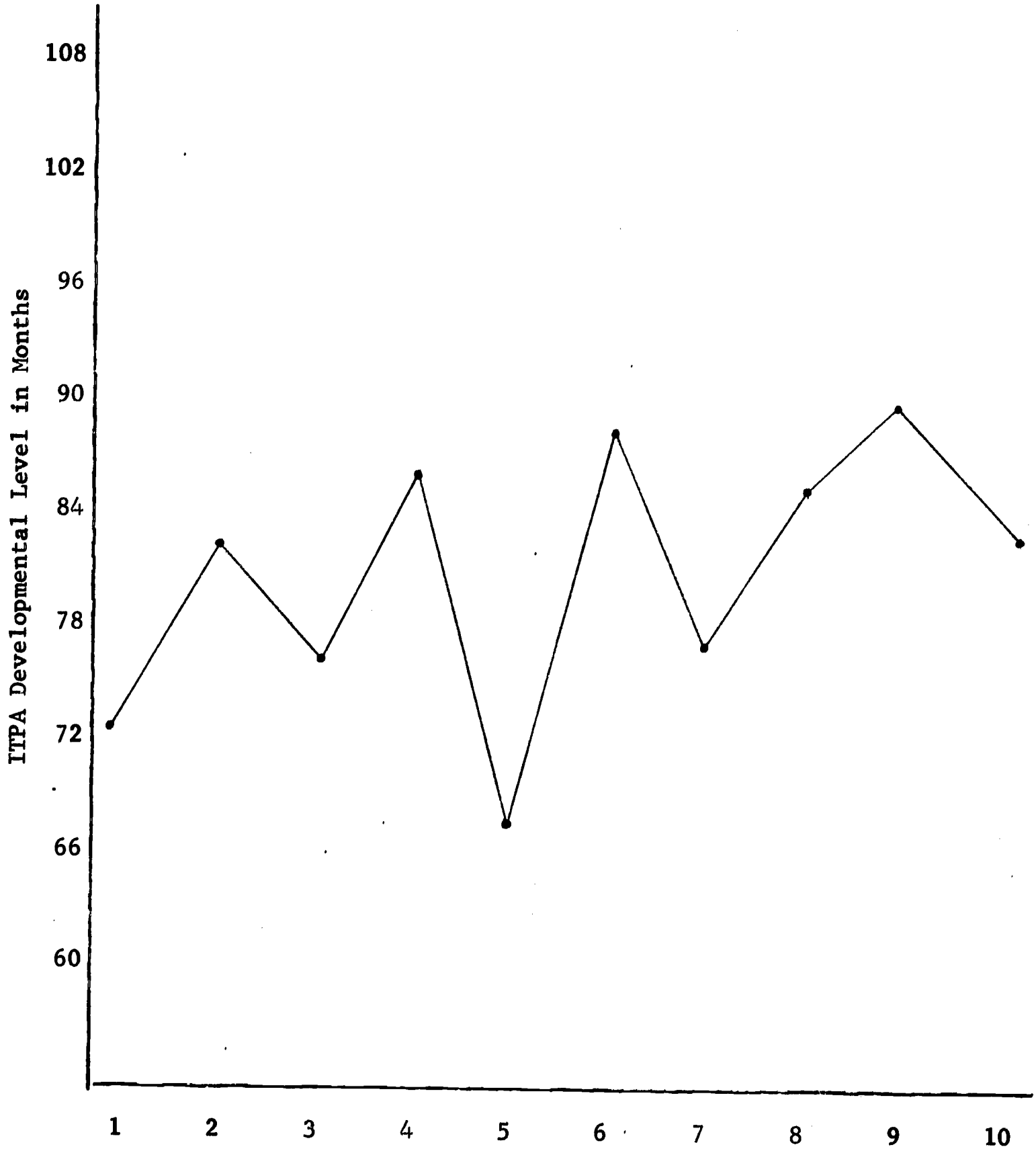

Figure 3. Comparison of ITPA Subtests
Developmental Age for Social Class 2 (combined)

1 Auditory Reception
2 Visual Reception
3 Auditory Vocal Association
4 Visual Motor Association
5 Verbal Expression
6 Manual Expression
7 Grammatic Closure
8 Visual Closure
9 Auditory Sequential Memory
10 Visual Sequential Memory

TABLE 11

t Ratio Matrix for Social Class 3 (Lower-Middle) by ITPA Subtests

	1	2	3	4	5	6	7	8	9
2	.07								
3	.90	.95							
4	-.63	-.83	-1.87						
5	4.39**	4.75**	5.25**	6.16**					
6	-1.12	-1.26	-2.00	-.66	-5.56**				
7	-.54	-.67	-2.14*	.04	-5.63**	.62			
8	-.03	-.10	-.89	.56	-4.98**	1.09	.48		
9	-1.40	-1.77	-2.47*	-1.00	-5.25**	-.31	-1.15	-1.36	
10	.18	.15	-.52	.77	-4.05**	1.07	.65	.23	1.32

1 Auditory Reception
2 Visual Reception
3 Auditory Vocal Association
4 Visual Motor Association
5 Verbal Expression
6 Manual Expression
7 Grammatic Closure
8 Visual Closure
9 Auditory Sequential Memory
10 Visual Sequential Memory

39 df

* = .05 = 2.025

** = .01 = 2.711

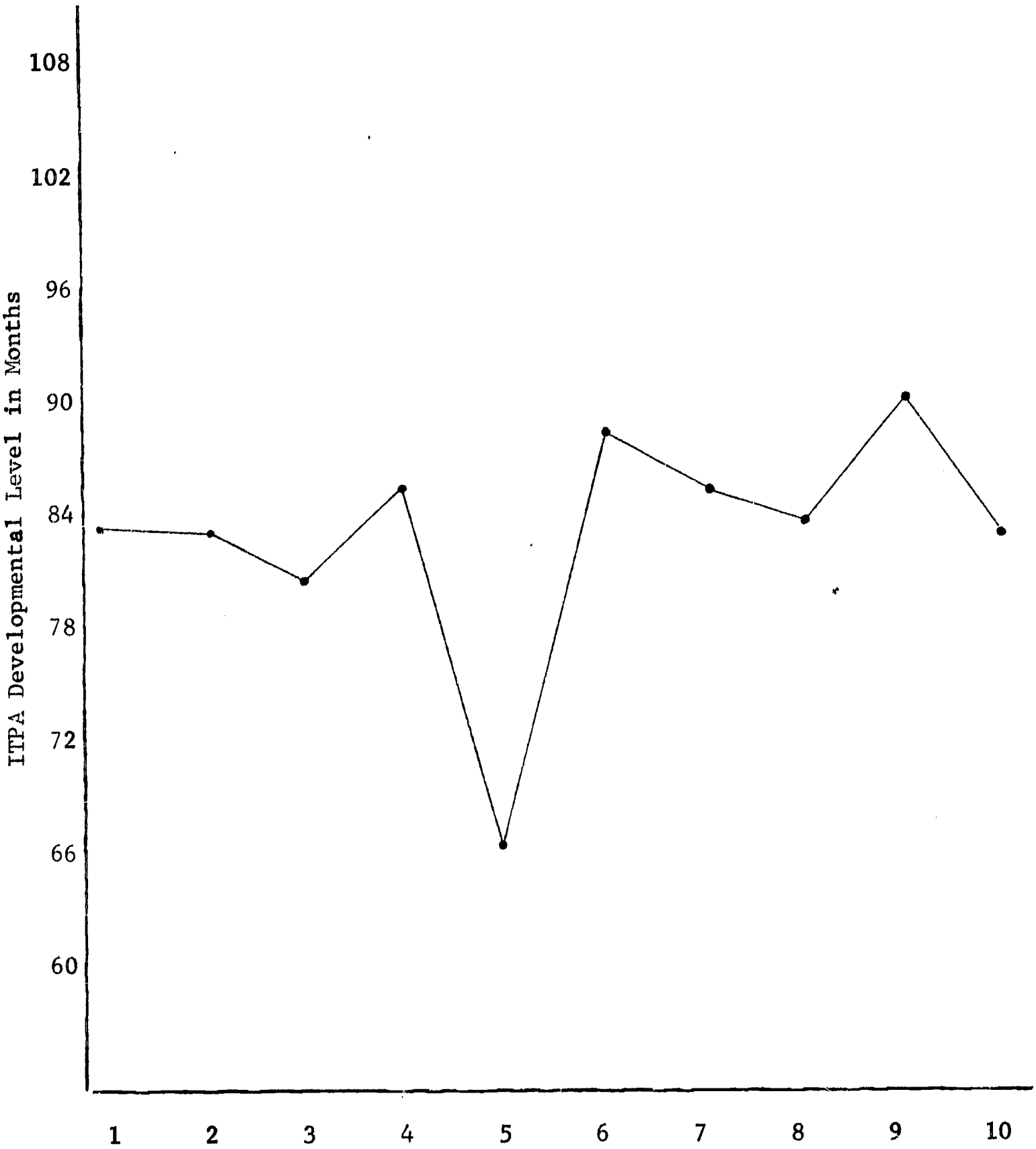

Figure 4. Comparison of ITPA Subtests Developmental Age for Social Class 3 (combined)

1 Auditory Reception
2 Visual Reception
3 Auditory Vocal Association
4 Visual Motor Association
5 Verbal Expression
6 Manual Expression
7 Grammatic Closure
8 Visual Closure
9 Auditory Sequential Memory
10 Visual Sequential Memory

the performance on all other psycholinguistic abilities. Grammatic Closure was significantly higher than Auditory Vocal Association. Basic understanding of the syntax of the language increased with social class. Auditory Sequential Memory was significantly higher than Auditory Vocal Association. In general the sequential level of organization was superior to the representational level. The difference between Auditory Reception and Visual Reception was not significant, but it is important that Auditory Reception was slightly above Visual Reception. With an increase in social class there is a trend toward higher scores on Auditory Reception than on Visual Reception.

Table 12 is a t ratio matrix for social class four (Upper-middle). The trend toward reduced variability with the higher the social class is maintained. Figure 5, which is a graphic representation of the performance of Upper-middle-class children, reflects this trend. Even though the performance on Verbal Expression is higher in the Upper-middle class, this ability remains significantly below all other psycholinguistic abilities. Auditory Sequential Memory was significantly higher than Visual Reception, Auditory Vocal Association, Visual Motor Association, Grammatic Closure, and Visual Sequential Memory. This ability shows an increase as social class increases. The two subtests, Verbal Expression and Auditory Sequential Memory, were the two outstanding features of the performance of Upper-middle-class children. Verbal Expression was lower than all other subtests and Auditory Sequential Memory was significantly higher than the majority of the subtests. The difference between Visual and Auditory Reception is becoming larger, but there was no significant difference between these abilities at this social class level.

Patterns of Psycholinguistic Abilities for Race by Social Class

Table 13 is a t ratio matrix for white children of social class one (Lower-lower) on the ITPA subtests. Inspection of the table and Figure 6, which is a graphic representation of the performance of white Lower-lower-class children, suggests considerable variability.

Auditory Vocal Association was significantly below Auditory Reception, Visual Motor Association, Manual Expression, Grammatic Closure, and Auditory Sequential Memory, but significantly above Verbal Expression. Association skills requiring auditory and vocal channels appear to be a significant disability for white children of social class one. Verbal Expression was observed to be a pronounced disability for these children. All other psycholinguistic abilities were significantly above Verbal Expression. Manual Expression appears to be the favored channel of expression for social class one, as significant differences were noted between Manual Expression, Visual Closure, Visual Sequential Memory, as well as those noted previously. Grammatic Closure was significantly above Visual Sequential Memory, which indicates that white children of social class one score better on measures of the syntatical structure of the language than on measures of memory of sequence of figures, which are important in the printed structure of the language. The differences

TABLE 12

t Ratio Matrix for Social Class 4 (Upper-Middle) by ITPA Subtests

	1	2	3	4	5	6	7	8	9
2	.44								
3	.52	.03							
4	1.16	.76	.86						
5	7.06**	7.57**	7.28**	5.34**					
6	-.89	-1.36	-1.39	-1.85	-6.83**				
7	.56	.02	.00	-.63	-6.81**	1.32			
8	-.46	-1.18	-1.20	-1.63	-7.66**	.46	-.97		
9	-1.96	-2.11*	-2.46*	-2.74**	-6.86**	-1.11	-2.35*	-1.45	
10	.61	.34	.27	-.07	-3.63**	1.32	.29	.87	2.24*

1 Auditory Reception
2 Visual Reception
3 Auditory Vocal Association
4 Visual Motor Association
5 Verbal Expression
6 Manual Expression
7 Grammatic Closure
8 Visual Closure
9 Auditory Sequential Memory
10 Visual Sequential Memory

39 df * = .05 = 2.025 ** = .01 = 2.711

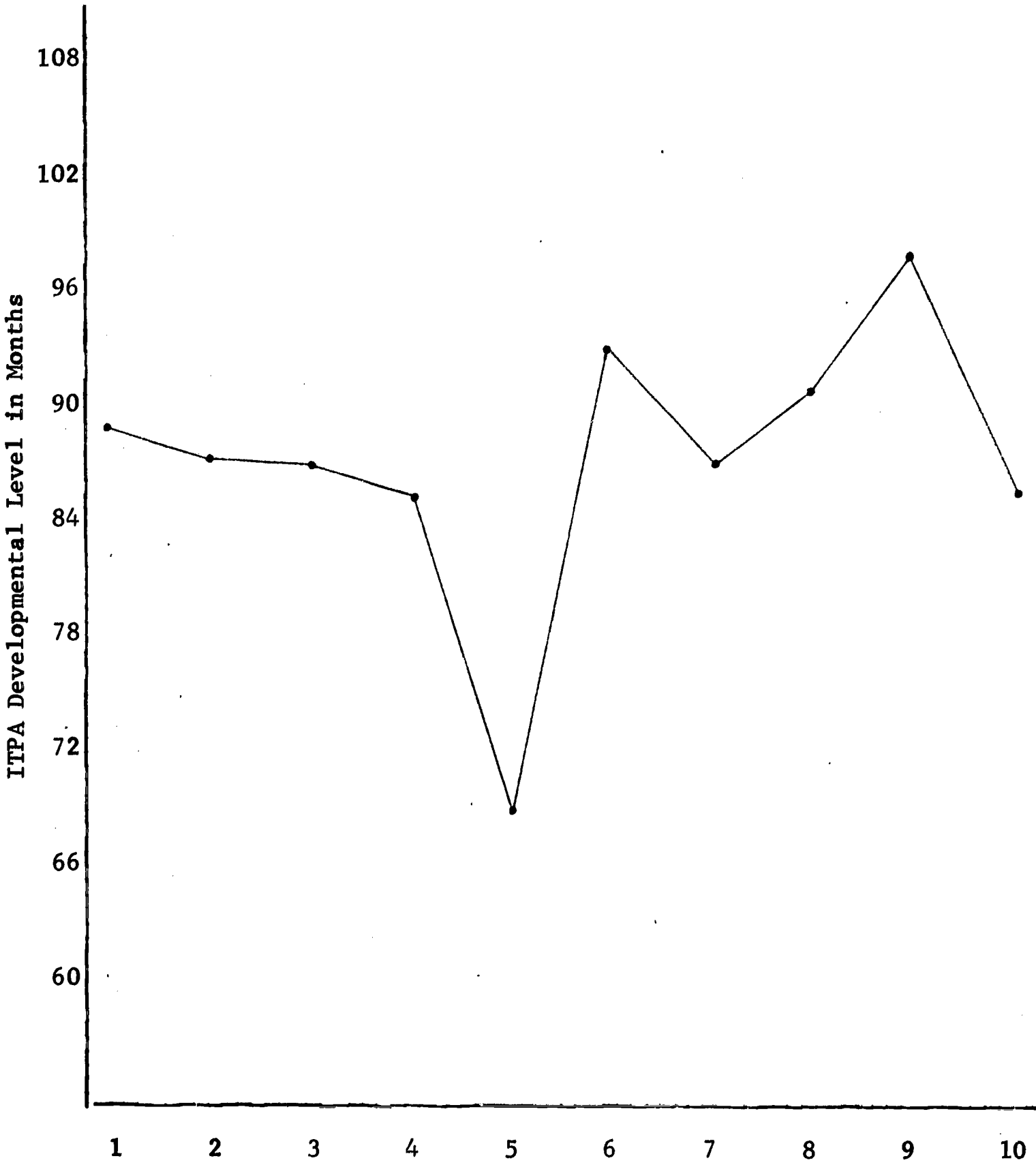

Figure 5. Comparison of ITPA Subtests Developmental Age for Social Class 4 (combined)

1	Auditory Reception	6	Manual Expression
2	Visual Reception	7	Grammatic Closure
3	Auditory Vocal Association	8	Visual Closure
4	Visual Motor Association	9	Auditory Sequential Memory
5	Verbal Expression	10	Visual Sequential Memory

TABLE 13

t Ratio Matrix for Whites of Social Class 1 (Lower-Lower) by ITPA Subtests

	1	2	3	4	5	6	7	8	9
2	-.30								
3	2.90**	2.03							
4	.35	.75	-2.25*						
5	4.14**	3.28**	3.35**	4.19**					
6	-1.65	-1.39	-3.27**	-1.93	-4.48**				
7	-.67	-.30	-3.59**	-1.00	-5.42**	.92			
8	.81	.86	-1.63	.47	-4.67**	2.11*	1.31		
9	-.50	-.22	-2.22*	-.70	-3.89**	.85	.01	-1.21	
10	1.07	1.28	-.79	1.09	-2.47*	2.20*	2.26*	.42	1.38

1 Auditory Reception
2 Visual Reception
3 Auditory Vocal Association
4 Visual Motor Association
5 Verbal Expression
6 Manual Expression
7 Grammatic Closure
8 Visual Closure
9 Auditory Sequential Memory
10 Visual Sequential Memory

19 df * = .05 = 2.093 ** = .01 = 2.861

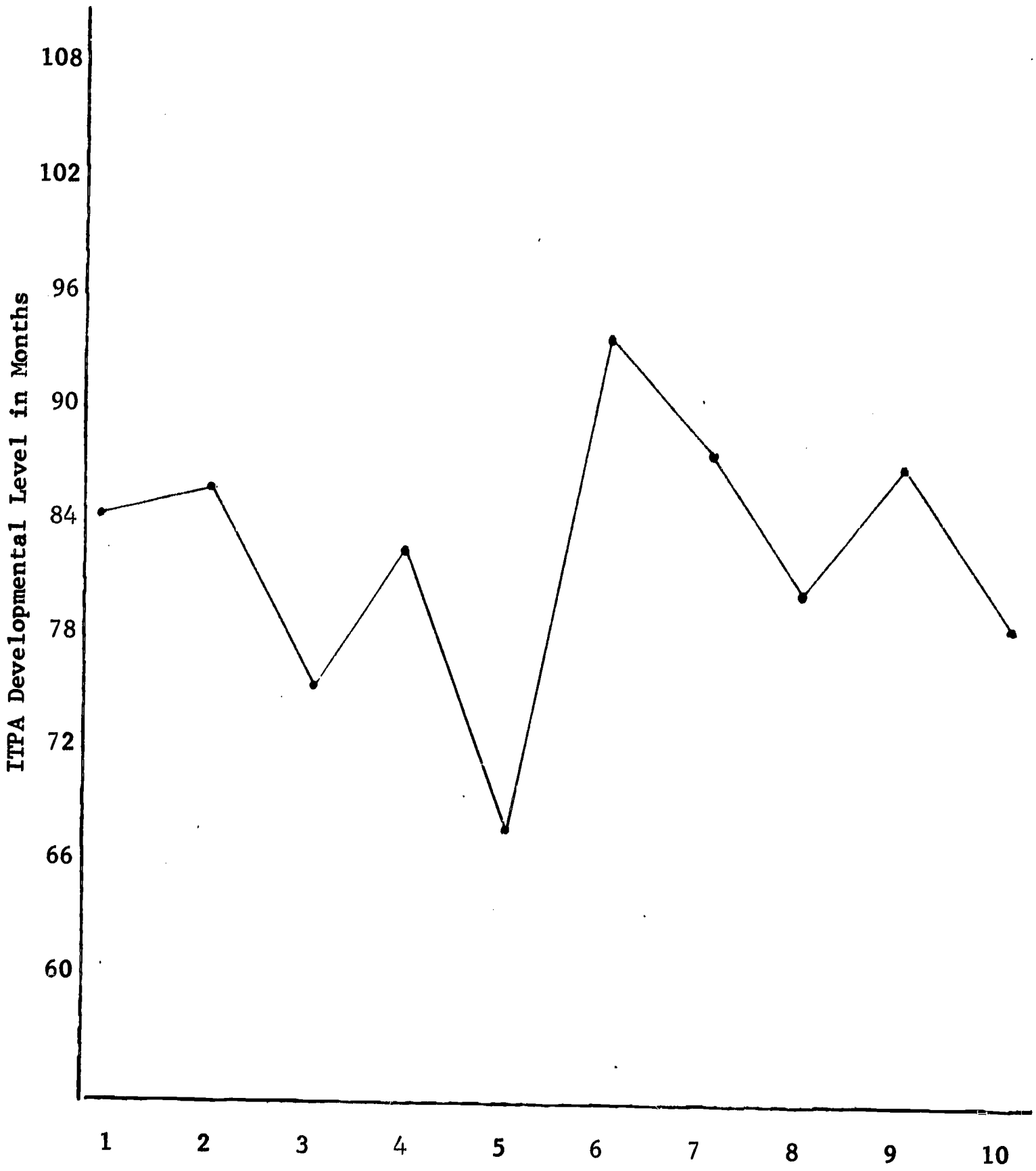

Figure 6. Comparison of ITPA Subtests
Developmental Age for Social Class 1 (white)

1 Auditory Reception
2 Visual Reception
3 Auditory Vocal Association
4 Visual Motor Association
5 Verbal Expression
6 Manual Expression
7 Grammatic Closure
8 Visual Closure
9 Auditory Sequential Memory
10 Visual Sequential Memory

between mode of reception was not significant, but Visual Reception was slightly above Auditory Reception.

Table 14 is a t ratio matrix of the differences between subtests of the ITPA for white children from social class two (Upper-lower). Figure 7 is a graphic presentation of the performance of these children on the ITPA.

Inspection of the Table 14 and Figure 7 indicates two major patterns: (1) a weakness in Verbal Expression, and (2) strength in Motor Expression. Verbal Expression was significantly below all subtests except Auditory Reception and Visual Sequential Memory. Manual Expression was significantly above Auditory Reception, Visual Reception, Auditory Vocal Association, and Grammatic Closure. Auditory Reception was significantly below Visual Motor Association and Visual Closure. These findings and the significant difference between Visual Motor Association and Auditory Vocal Association, and Auditory Vocal Association and Visual Closure indicate a visual orientation of white children from social class two. The difference between Auditory Reception was in the direction of visual superiority, but was not significant.

Table 15 is a t ratio matrix for white children from the Lower-middle class. Figure 8 is a graphic representation of the performance of these children on the ITPA. Inspection of Table 15 indicates very little variability between the psycholinguistic abilities. It appears that white children of social class three are very homogeneous in their performance on the ITPA.

The significant differences noted in this group involved Verbal Expression in all cases. Verbal Expression was significantly below all other psycholinguistic abilities except Visual Reception, Auditory Sequential Memory, and Visual Sequential Memory. White children of the Lower-middle class performed better on measures of Auditory Reception than Visual Reception. This difference is not significant, but it is a reversal of mode of reception noted with social class one and two. Another change noted in this social class level is that the performances on measures of expression favored the motor channel, but Motor Expression was not significantly higher than the other psycholinguistic abilities.

Table 16 is a t ratio matrix of the performance of white children from the Upper-middle social class. Figure 9 is a graphic representation of the performance of this group on the ITPA subtests. Inspection of Table 16 and Figure 9 shows a relatively consistant performance with one major weakness. This weakness is in the area of Verbal Expression. Verbal Expression was significantly below all subtests except Visual Sequential Memory. The performance of white children on Verbal Expression has increased with social class, but never reaches the lower chronological age limit (83-89 months) of children in the study. Performance on Visual Sequential Memory was significantly below performance on Auditory Reception and Auditory Vocal Association. This finding and the higher performance of these children on Auditory Reception than on Visual Reception, though not significant, suggest a trend away from visual and toward auditory skills with the higher social classes.

TABLE 14

t Ratio Matrix for Whites of Social Class 2 (Upper-Lower) by ITPA Subtests

	1	2	3	4	5	6	7	8	9
2	-1.21								
3	-.29	1.44							
4	-2.84*	-1.48	-2.99**						
5	1.77	4.03**	2.34*	5.97**					
6	-3.25**	-2.23*	-3.10**	-1.13	-5.53**				
7	-.95	.68	-.96	1.87	-3.00**	2.72*			
8	-2.50*	-.68	-2.51*	.31	-3.92**	1.39	-1.79		
9	-1.27	.11	-.99	1.11	-3.20**	1.91	-.44	.67	
10	-1.02	.12	-.91	.92	-2.02	1.33	-.38	.70	.03

1 Auditory Reception
2 Visual Reception
3 Auditory Vocal Association
4 Visual Motor Association
5 Verbal Expression
6 Manual Expression
7 Grammatic Closure
8 Visual Closure
9 Auditory Sequential Memory
10 Visual Sequential Memory

159 df

* = .05 = 1.976

** = .01 = 2.609

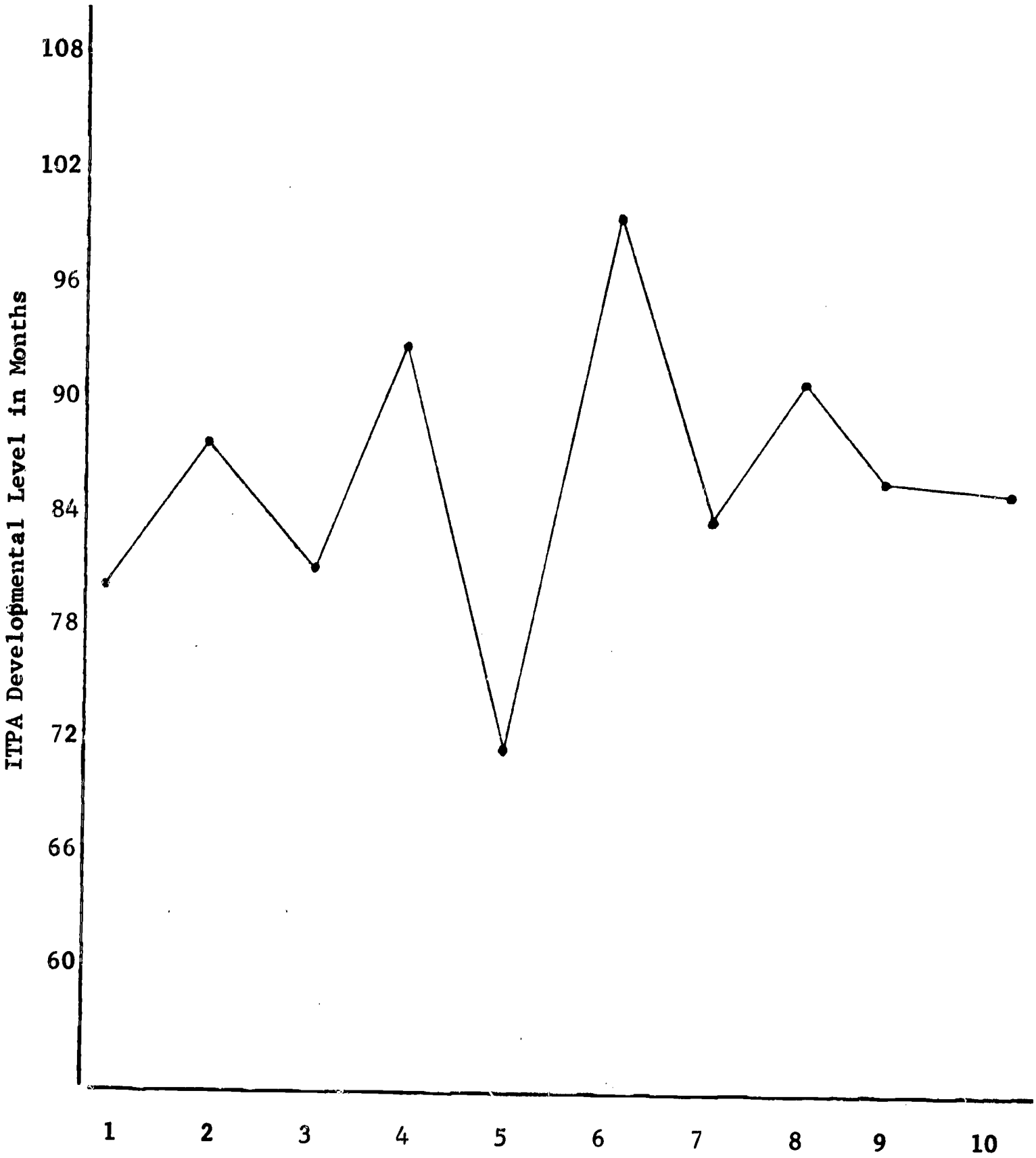

Figure 7. Comparison of ITPA Subtests Developmental Age for Social Class 2 (white)

1 Auditory Reception
2 Visual Reception
3 Auditory Vocal Association
4 Visual Motor Association
5 Verbal Expression
6 Manual Expression
7 Grammatic Closure
8 Visual Closure
9 Auditory Sequential Memory
10 Visual Sequential Memory

TABLE 15

t Ratio Matrix for White of Social Class 3 (Lower-Middle) by ITPA Subtests

	1	2	3	4	5	6	7	8	9
2	1.59								
3	1.38	-.31							
4	-.08	-2.00	-1.37						
5	3.36**	2.00	2.39*	3.53**					
6	-.66	-1.84	-1.83	-.59	-5.56**				
7	.12	-1.44	-1.58	.20	-2.81*	.71			
8	1.22	-.14	.07	1.24	-2.77*	2.01	.99		
9	.95	-.36	-.18	.94	-1.71	1.54	.91	-.20	
10	1.23	.31	.44	1.55	-1.23	1.71	1.14	.38	.42

1 Auditory Reception
2 Visual Reception
3 Auditory Vocal Association
4 Visual Motor Association
5 Verbal Expression
6 Manual Expression
7 Grammatic Closure
8 Visual Closure
9 Auditory Sequential Memory
10 Visual Sequential Memory

19 df * = .05 = 2.093 ** = .01 = 2.861

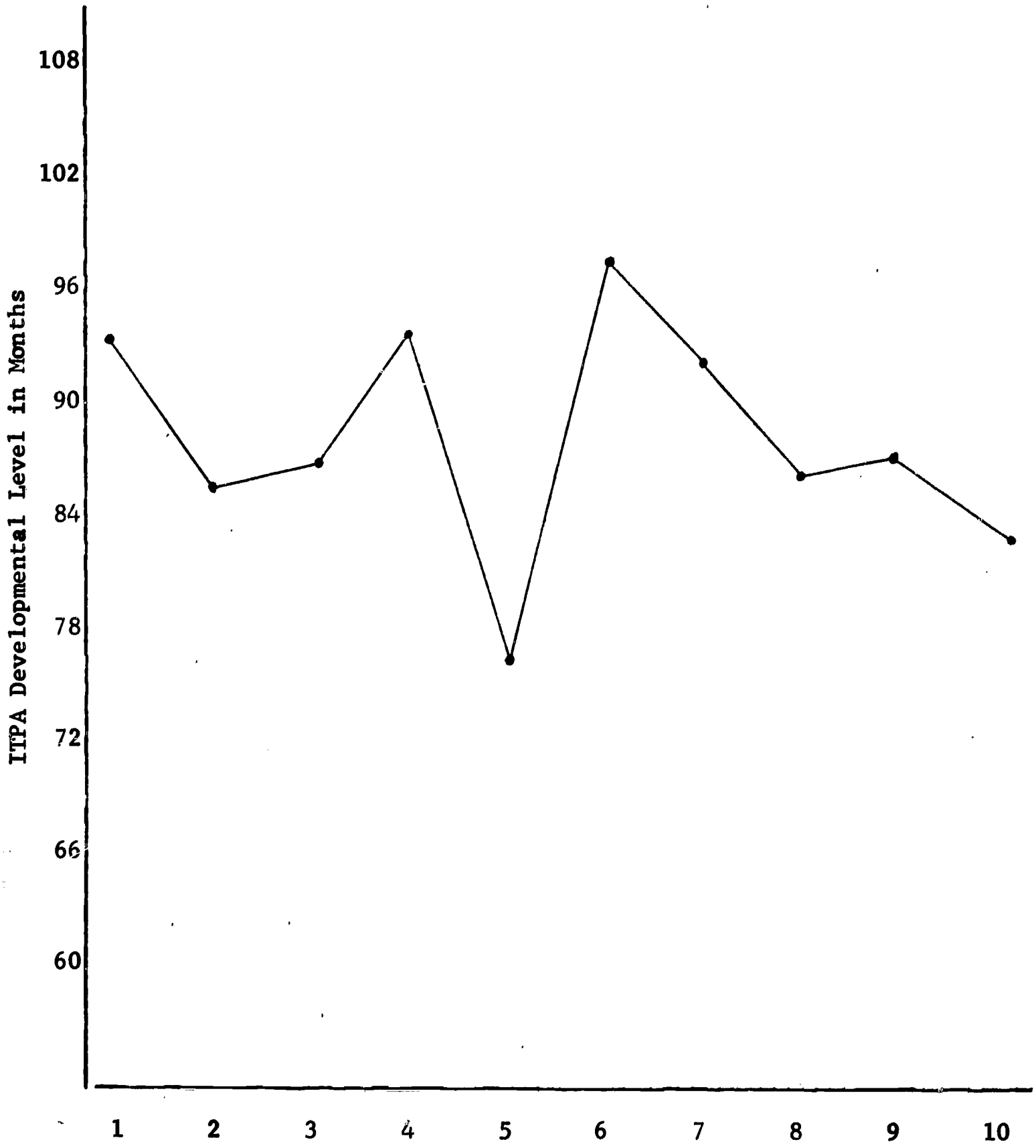

Figure 8. Comparison of ITPA Subtests
Developmental Age for Social Class 3 (white)

1	Auditory Reception	6	Manual Expression
2	Visual Reception	7	Grammatic Closure
3	Auditory Vocal Association	8	Visual Closure
4	Visual Motor Association	9	Auditory Sequential Memory
5	Verbal Expression	10	Visual Sequential Memory

TABLE 16

t Ratio Matrix for Whites of Social Class 4 (Upper-Middle) by ITPA Subtests

	1	2	3	4	5	6	7	8	9
2	1.94								
3	.03	-1.98							
4	.83	-1.10	1.06						
5	6.70**	4.63**	6.35**	3.78**					
6	.43	-1.21	.44	-.36	-5.08**				
7	.48	-1.60	.45	-.52	-5.99**	-.06			
8	.36	-1.73	.45	-.45	-5.69**	-.03	.02		
9	.80	-.60	.81	.01	-3.84**	.39	.42	.34	
10	2.47*	1.37	2.19*	1.58	-.95	2.12	2.23	2.04	1.80

1 Auditory Reception
2 Visual Reception
3 Auditory Vocal Association
4 Visual Motor Association
5 Verbal Expression
6 Manual Expression
7 Grammatic Closure
8 Visual Closure
9 Auditory Sequential Memory
10 Visual Sequential Memory

19 df * = .05 = 2.093 ** = .01 = 2.861

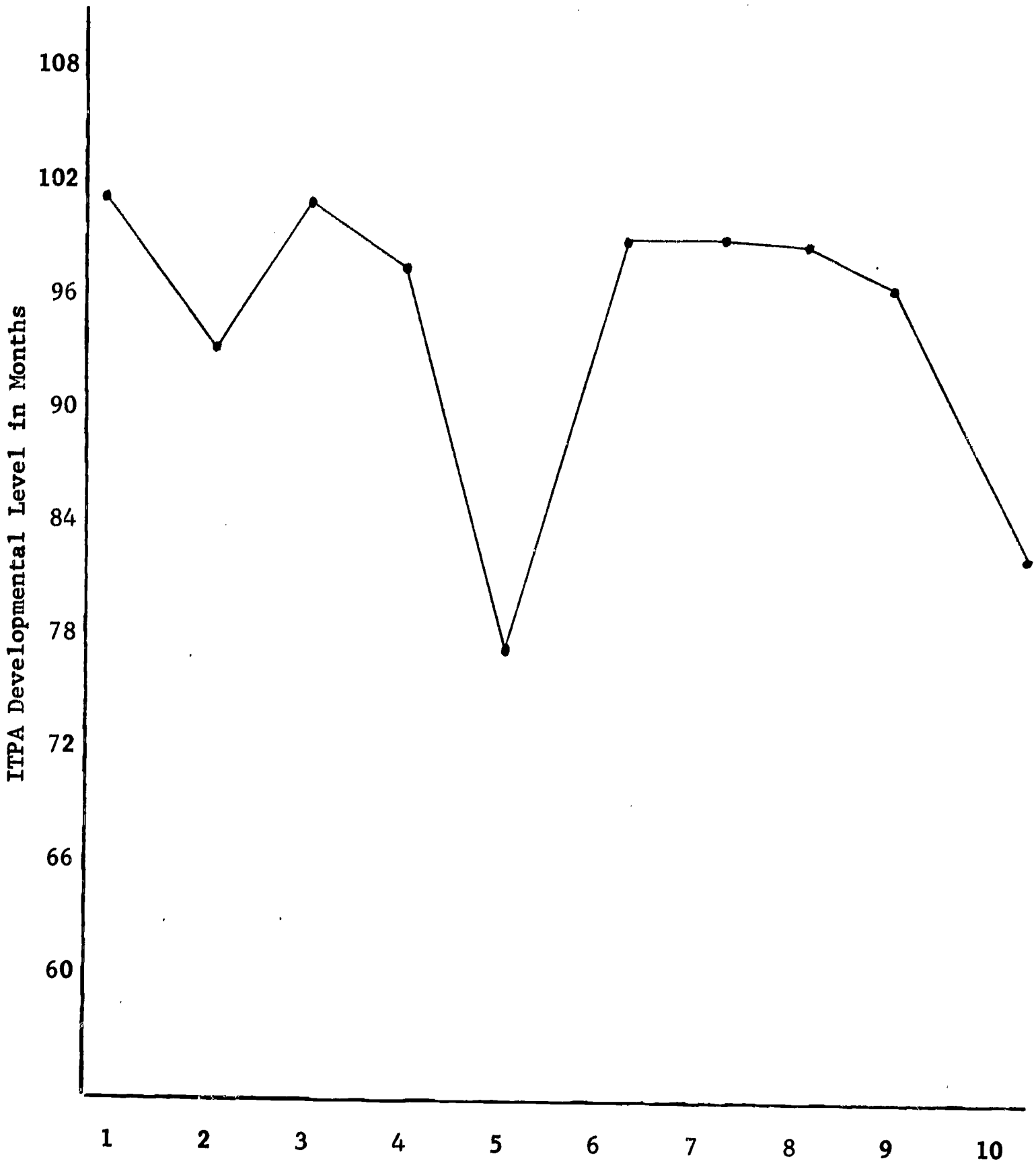

Figure 9. Comparison of ITPA Subtests
Developmental Age for Social Class 4 (white)

1	Auditory Reception	6	Manual Expression
2	Visual Reception	7	Grammatic Closure
3	Auditory Vocal Association	8	Visual Closure
4	Visual Motor Association	9	Auditory Sequential Memory
5	Verbal Expression	10	Visual Sequential Memory

Table 17 is a t ratio matrix for blacks of social class one (Lower-lower) on the ITPA subtests. Figure 10 is a graphic representation of the performance of these children on the subtests. Inspection of Table 17 and Figure 10 indicates much variability and four distinct features: (1) Verbal Expression was significantly below all other psycholinguistic abilities. (2) Grammatic Closure which involves basic understanding of the syntactical organization of language was a deficiency of black children from the Lower-lower social class. Only Auditory Reception, Auditory Vocal Association, and Verbal Expression were not significantly above Grammatic Closure, and Verbal Expression, as has been pointed out, was significantly below Grammatic Closure. (3) Auditory Sequential Memory appears to be a strength for this group of children for scores on this subtest were significantly higher than all other subtest scores, except Manual Expression and Visual Sequential Memory. (4) Visual Sequential Memory appears to be a strength also. Performance on this subtest was significantly higher than Auditory Reception, Auditory Vocal Association, Verbal Expression and Grammatic Closure. No significant differences were noted between mode of reception, though the score on Visual Reception was higher than the score on Auditory Reception. Motor Expression was significantly higher than Auditory Reception, as well as Verbal Expression, for Negro children of social class one.

Table 18 is a t ratio matrix for black children of social class two (Upper-lower) on the ITPA subtests. Figure 11 is a graphic representation of the performance of this group on the subtests. Inspection of Table 18 and Figure 11 indicates much variability.

Auditory Reception was a pronounced disability. Performance on this subtest was significantly below all psycholinguistic abilities except Verbal Expression, Grammatic Closure, and Visual Sequential Memory. Visual Reception was approximately one year above Auditory Reception. Verbal Expression was significantly below all psycholinguistic abilities except Auditory Reception. Auditory Sequential Memory was a significant strength with scores above all psycholinguistic abilites except Visual Sequential Memory. Grammatic Closure was significantly below Visual Motor Association and Visual Closure. The difficulty with language syntax continues, but was not so pronounced in this group. Auditory Vocal Association was significantly below Visual Motor Association and Visual Closure. Again the relative strength in visual skills tends to be associated with the lower social class.

Table 19 is a t ratio matrix of the performance on the ITPA subtests of black children from social class three. Figure 12 is a graphic representation of the performance of this group. Inspection of Table 19 and Figure 12 reveals less variability than the other three social class levels. This same phenomenon was observed with social class three of white children. Black children of this level show more variability than do white children. Two major patterns can be observed: (1) Verbal Expression was significantly below all other psycholinguistic abilities, and (2) Auditory Sequential Memory was a pronounced strength. The performance on Auditory Sequential Memory

TABLE 17

t Ratio Matrix for Blacks of Social Class 1 (Lower-Lower) by ITPA Subtests

	1	2	3	4	5	6	7	8	9
2	-1.69								
3	-.32	1.71							
4	-1.09	1.11	-1.43						
5	2.32	5.10**	3.31**	3.98**					
6	-2.40	-.48	-1.76	-1.21	-3.95**				
7	.54	3.02**	1.14	3.26**	-2.31*	2.99**			
8	-1.89	-.22	-1.97	-1.19	-4.06**	.35	-2.98**		
9	-3.63**	-2.51*	-4.49**	-3.09**	-5.53**	-1.77	-4.12**	-2.55*	
10	-2.86**	-1.18	-2.44*	-1.71	-4.57**	-.78	-3.09**	-1.07	1.28

1 Auditory Reception
2 Visual Reception
3 Auditory Vocal Association
4 Visual Motor Association
5 Verbal Expression
6 Manual Expression
7 Grammatic Closure
8 Visual Closure
9 Auditory Sequential Memory
10 Visual Sequential Memory

19 df * = .05 = 2.093 ** = .01 = 2.861

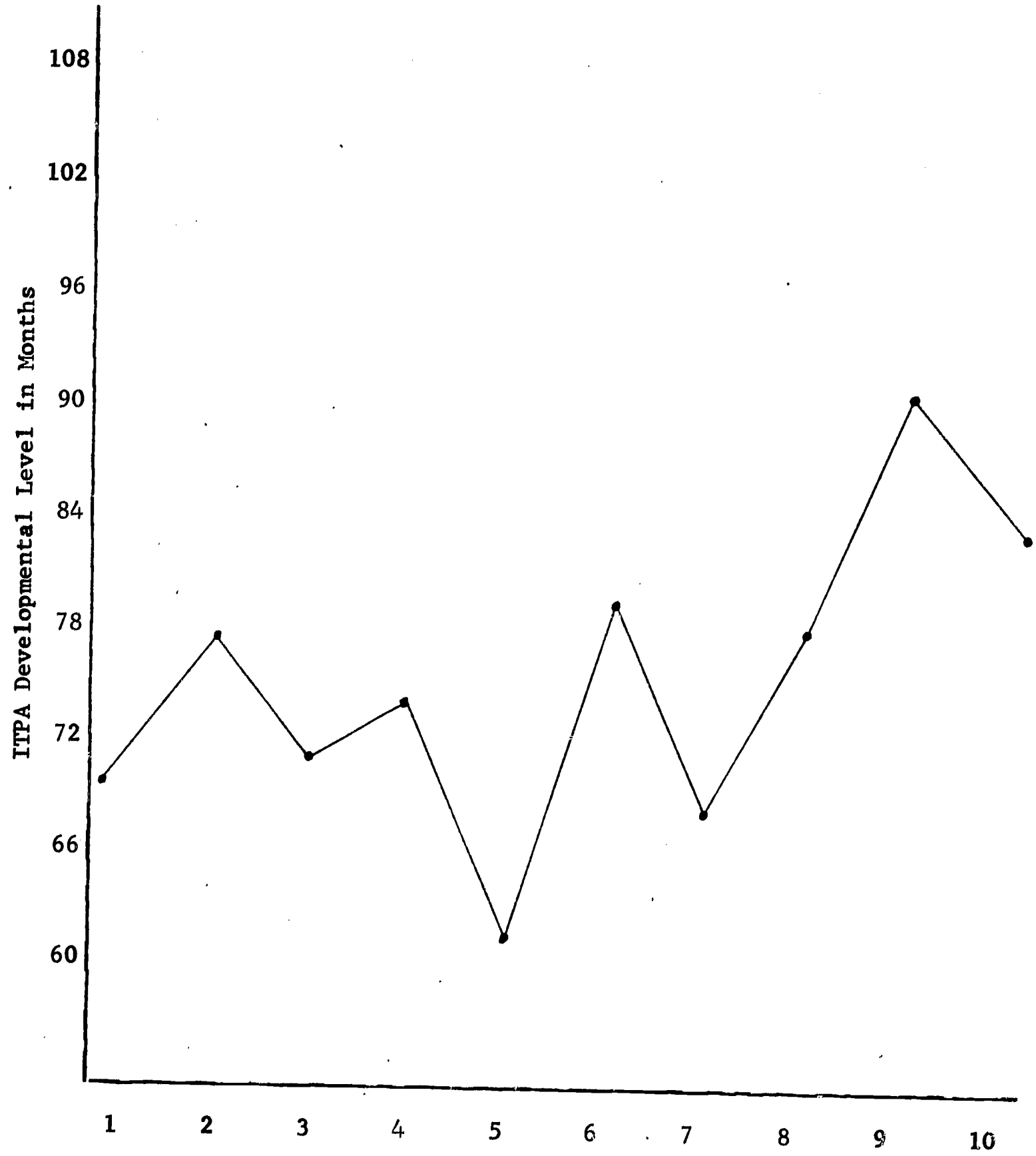

Figure 10. Compariosn of ITPA Subt sts
Developmental Age for Social Class 1 (Negro)

1	Auditory Reception	6	Manual Expression
2	Visual Reception	7	Grammatic Closure
3	Auditory Vocal Association	8	Visual Closure
4	Visual Motor Association	9	Auditory Sequential Memory
5	Verbal Expression	10	Visual Sequential Memory

TABLE 18

t Ratio Matrix for Blacks of Social Class 2 (Upper-Lower) by ITPA Subtests

	1	2	3	4	5	6	7	8	9
2	-2.95*								
3	-2.17*	1.31							
4	-4.70**	-.75	-3.16**						
5	.49	3.33**	2.66*	4.77**					
6	-2.29*	-.19	-1.42	.41	-2.65*				
7	-1.86	1.64	.17	5.38**	-2.54*	1.61			
8	-4.24**	-.66	-2.42*	.03	-4.41**	-.31	-2.59*		
9	-4.79**	-2.30*	-5.25**	-2.59*	-5.10**	-2.19*	-4.46**	-2.14*	
10	-2.02	-.20	-1.05	.25	-2.13*	-.04	-1.13	.20	1.62

1 Auditory Reception
2 Visual Reception
3 Auditory Vocal Association
4 Visual Motor Association
5 Verbal Expression
6 Manual Expression
7 Grammatic Closure
8 Visual Closure
9 Auditory Sequential Memory
10 Visual Sequential Memory

19 df * = .05 = 2.093 ** = .01 = 2.861

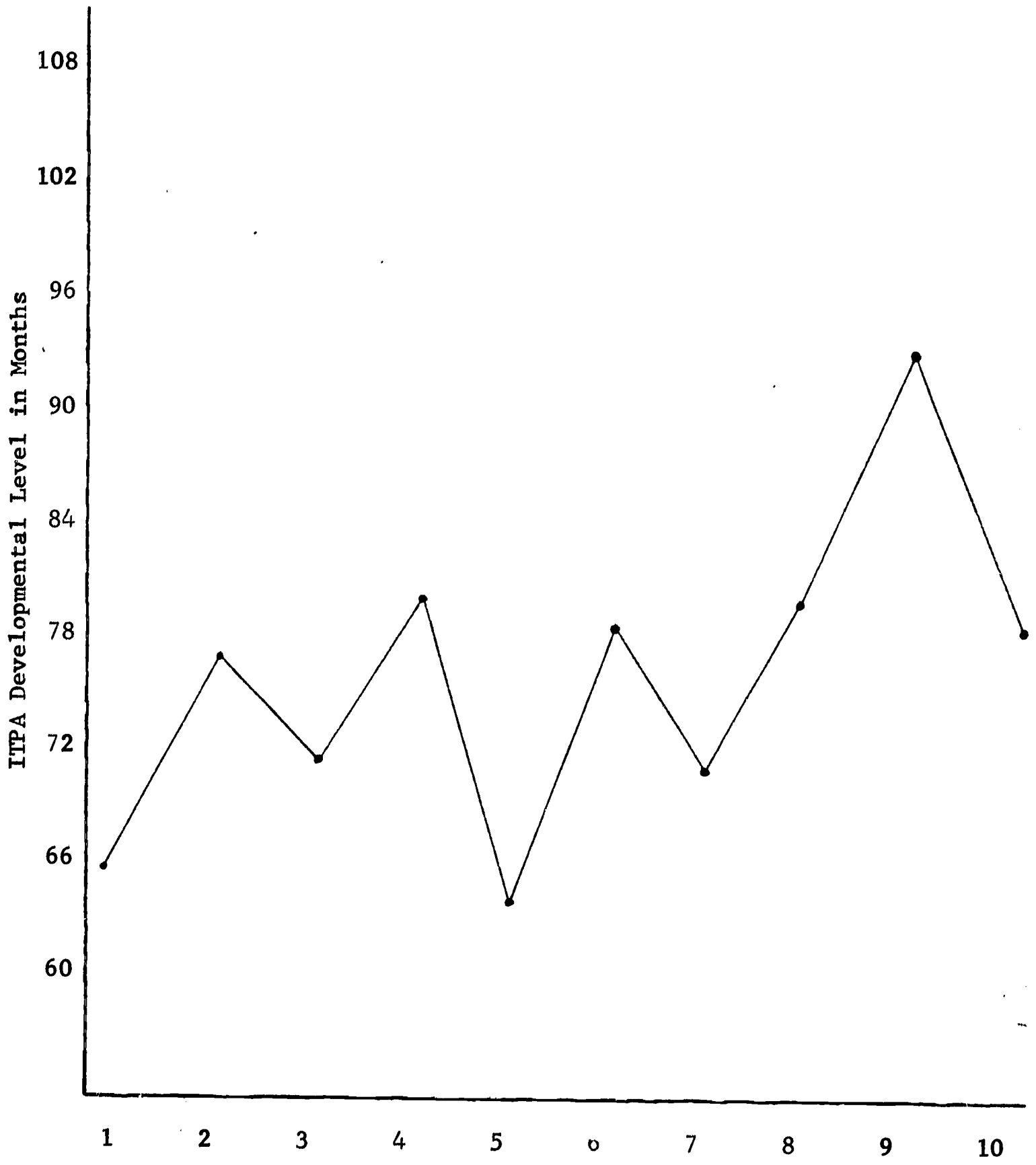

Figure 11. Comparison of ITPA Subtests Developmental Age for Social Class 2 (Negro)

1	Auditory Reception	6	Manual Expression
2	Visual Reception	7	Grammatic Closure
3	Auditory Vocal Association	8	Visual Closure
4	Visual Motor Association	9	Auditory Sequential Memory
5	Verbal Expression	10	Visual Sequential Memory

TABLE 19

t Ratio Matrix for Blacks of Social Class 3 (Lower-Middle) by ITPA Subtests

	1	2	3	4	5	6	7	8	9
2	-1.33								
3	-.10	1.63							
4	-.75	.65	-1.34						
5	2.81*	5.00**	6.20**	5.41**					
6	-.88	.18	-.98	-.32	-3.22**				
7	-.78	.41	-1.40	-.20	-6.32**	.17			
8	-.92	.00	-1.47	-.60	-4.38**	-.13	-.40		
9	-2.86**	-2.87**	-4.88**	-2.93**	-7.75**	-2.11*	-2.82*	-2.07	
10	-1.36	-.06	-1.44	-.63	-5.73**	-.17	-.47	-.06	1.82

1 Auditory Reception
2 Visual Reception
3 Auditory Vocal Association
4 Visual Motor Association
5 Verbal Expression
6 Manual Expression
7 Grammatic Closure
8 Visual Closure
9 Auditory Sequential Memory
10 Visual Sequential Memory

19 df * = .05 = 2.093 ** = .01 = 2.861

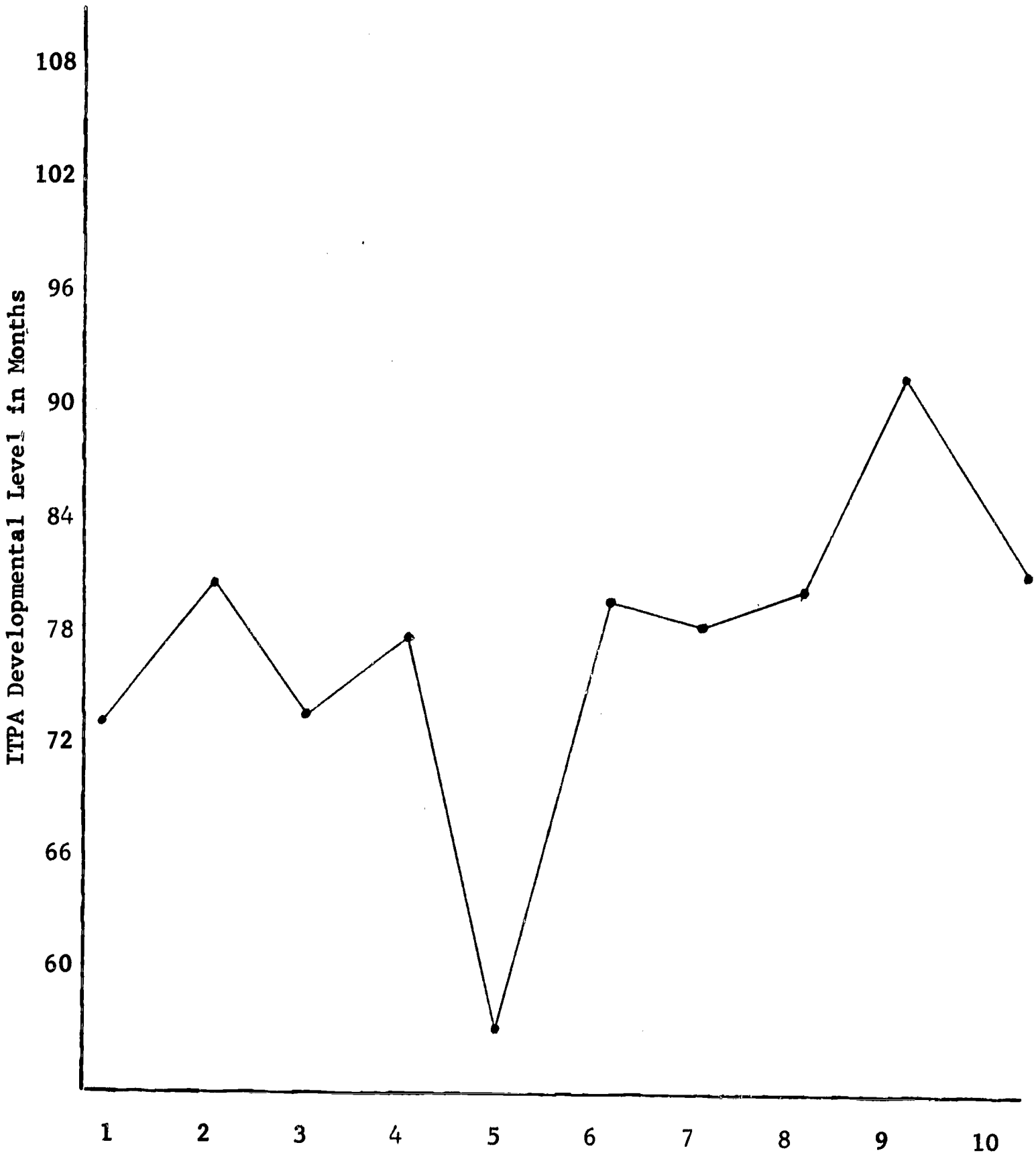

Figure 12. Comparison of ITPA Subtests Developmental Age for Social Class 3 (Negro)

1	Auditory Reception	6	Manual Expression
2	Visual Reception	7	Grammatic Closure
3	Auditory Vocal Reception	8	Visual Closure
4	Visual Motor Association	9	Auditory Sequential Memory
5	Verbal Expression	10	Visual Sequential Memory

was significantly above all other psycholinguistic abilities except Visual Closure and Visual Sequential Memory. Verbal Expression has been observed to be a significant disability with both white and Negro children at all social class levels. The high performance on Auditory Sequential Memory appears most frequently as a significant strength for black children than for white children. The performance of Negro children surpassed white children at all social class levels, and for Negro children, the performance on this test was higher than all other subtests al all social class levels. Visual Reception was higher than Auditory Reception, but the difference between these become less the higher the social class.

Table 20 is a t ratio matrix for Negro children from the Upper-middle social class on the ITPA subtests. Figure 13 is a graphic representation of the performance of this group of children on the subtests. Inspection of Table 20 and Figure 13 shows slightly more variability for social class four than for social class three, and approximately twice as much variability for white children at this social class level. The major factor in the pattern of Negro children from social class four is the disability in Verbal Expression. Scores on this subtest were significantly below all other subtest scores. Verbal Expression has been observed to be a significant disability of white and Negro children al all social class levels. Auditory Sequential Memory continues to be a strength for Negro children. The performance on this psycholinguistic ability was significantly higher than all others except Manual Expression and Visual Sequential Memory. Auditory Sequential Memory was the only psycholinguistic ability in which black children at all social class levels performed above the upper chronological age limit (83 to 89 months) of children in the scudy. Auditory Vocal Association was significantly below Visual Closure and Visual Sequential Memory. Visual Motor Association was significantly below Manual Expression and Visual Sequential Memory. The pronounced difference between visual and auditory skills still persist for Negro children of the Upper-middle class, but there is a general trend away from visual to auditory which appears to be related to social class. This trend was more evident with white children, but can be observed in the performance of black children. Evidence for this trend includes the finding of no difference between mode of reception for the Lower- and Upper-middle social class levels of both white and Negro children.

The Interaction of Race, Social Class, and Psycholinguistic Abilities

Table 21 is a t ratio matrix of Negro and white children from the four social class levels on Auditory Reception. Inspection of Table 21 indicates that Auditory Reception was significantly affected by race and by social class, but the interaction of race and social class was not significant. Race appears to be the major contributor of variance.

Table 22 is a t ratio matrix of Negro and white children from the four social class levels on Visual Reception. Inspection of Table 22

TABLE 20

t Ratio Matrix for Blacks of Social Class 4 (Upper-Middle) by ITPA Subtests

	1	2	3	4	5	6	7	8	9
2	-.91								
3	.81	1.88							
4	.82	1.95	-.03						
5	3.71**	6.08**	4.48**	4.34**					
6	-1.44	-.78	-2.14*	-2.23*	-4.59**				
7	.31	1.15	-.55	-.36	-3.81**	1.63			
8	-1.03	-.15	-2.33*	-1.91	-5.02**	.58	-1.38		
9	-3.48**	-2.20*	-4.72**	-4.79**	-6.20**	-1.65	-4.02**	-2.36*	
10	-1.86	-1.11	-2.24*	-2.50*	-4.92**	-.21	-1.86	-.77	1.35

1 Auditory Reception
2 Visual Reception
3 Auditory Vocal Association
4 Visual Motor Association
5 Verbal Expression
6 Manual Expression
7 Grammatic Closure
8 Visual Closure
9 Auditory Sequential Memory
10 Visual Sequential Memory

19 df * = .05 = 2.093 ** = .01 = 2.861

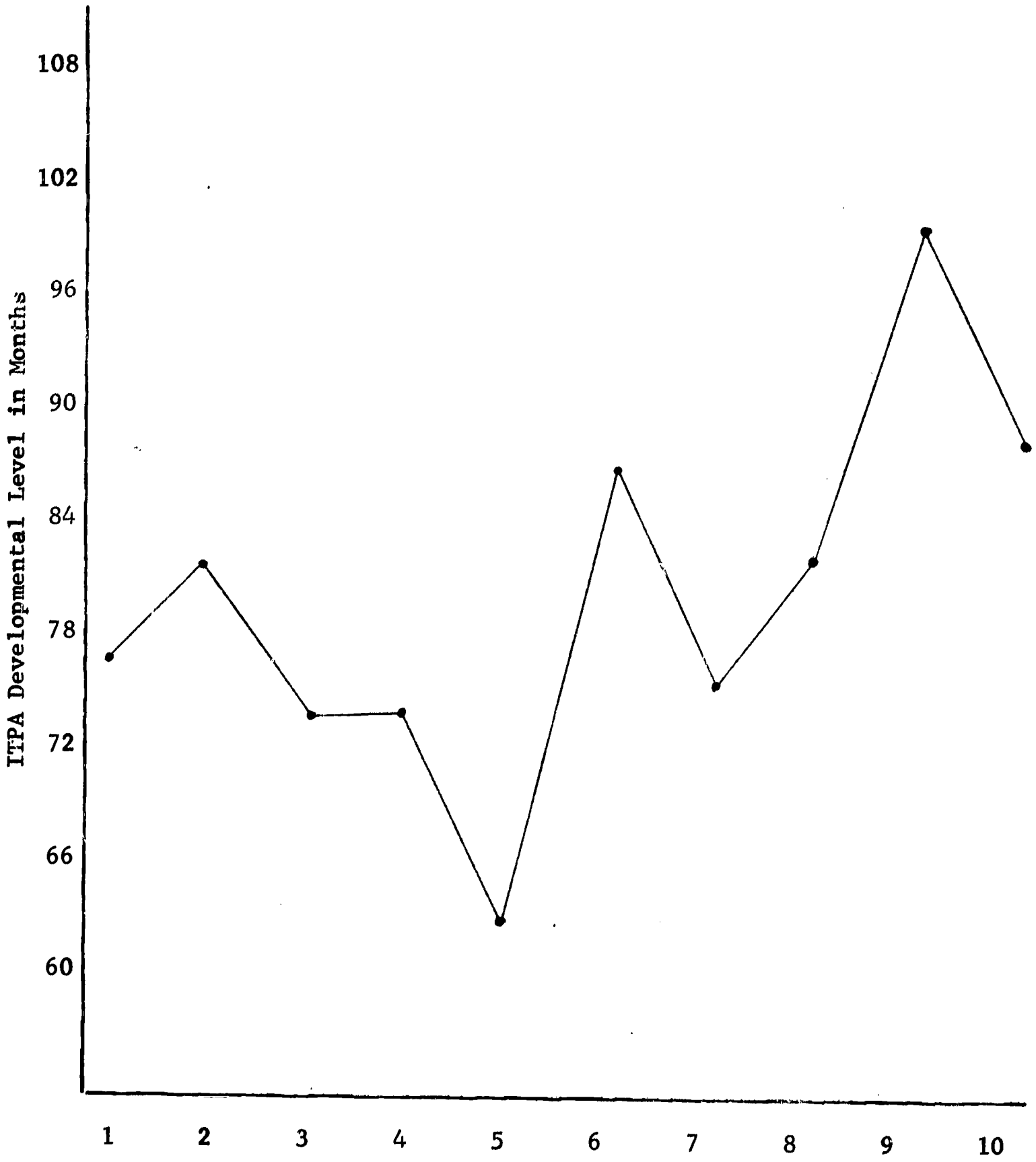

Figure 13. Comparison of ITPA Subtests Developmental Age for Social Class 4 (Negro)

1	Auditory Reception	6	Manual Expression
2	Visual Reception	7	Grammatic Closure
3	Auditory Vocal Association	8	Visual Closure
4	Visual Motor Association	9	Auditory Sequential Memory
5	Verbal Expression	10	Visual Sequential Memory

TABLE 21

t Ratio Matrix for Race by Social Class for Subtest 1
Auditory Reception

	1	2	3	4	5	6	7
2	.74						
3	-1.80	-2.46*					
4	-3.42**	-4.05**	-1.49				
5	2.92**	2.06	4.61**	6.34**			
6	3.99**	3.05**	5.70**	7.57**	.92		
7	1.82	1.13	3.33**	4.76**	-.66	-1.46	
8	1.45	.67	3.16**	4.80**	-1.39	-2.37*	-.54

1 Lower-lower white
2 Upper-lower white
3 Lower-middle white
4 Upper-middle white
5 Lower-lower black
6 Upper-lower black
7 Lower-middle black
8 Upper-middle black

19 df

* = .05 = 2.093

** = .01 = 2.861

TABLE 22

t Ratio Matrix for Race by Social Class for Subtest 2
Visual Reception

	1	2	3	4	5	6	7
2	-.32						
3	-.01	.35					
4	-1.23	-1.03	-1.45				
5	1.32	1.96	1.61	3.42**			
6	1.28	1.85	1.52	3.12**	.05		
7	.74	1.27	.90	2.59*	-.75	-.73	
8	.61	1.11	.75	2.39*	-.89	-.86	-.14

1 Lower-lower white
2 Upper-lower white
3 Lower-middle white
4 Upper-middle white

5 Lower-lower black
6 Upper-lower black
7 Lower-middle black
8 Upper-middle black

19 df * = .05 = 2.093 ** = .01 = 2.861

indicates that race, social class and the interaction of race and social class were significant. The major contributor of variance was again race.

Table 23 is a t ratio matrix of Negro and white children from the four social class levels on Auditory Vocal Association. Inspection of Table 23 indicates that the major source of variation was race, and that social class and the interaction of race and social class was not significant.

Table 24 is a t ratio matrix of Negro and white children from the four social classes on Visual Motor Association. Inspection of Table 24 indicates that the major source of variation was race.

Table 25 is a t ratio matrix for Negro and white children from the four social classes on Verbal Expression. Inspection of Table 25 indicates the major source of variance was race.

Table 26 is a t ratio matrix for Negro and white children of the four social class levels on Manual Expression. Inspection of Table 26 indicates that the major source of variance was race.

Table 27 is a t ratio matrix for Negro and white children of the four social class levels on Grammatic Closure. Inspection of Table 27 indicates that both race and social class were contributing to the variance, but race was the major contributor.

Table 28 is a t ratio matrix of Negro and white children from the four social class levels on Visual Closure. Inspection of Table 28 indicates that race and social class were contributing significantly to the variance, but race was the major contributor.

Table 29 is a t ratio matrix of Negro and white children from the four social class levels on Auditory Sequential Memory. Inspection of Table 29 indicates that there were no significant differences between race, social class, nor interaction of race and social classes.

Table 30 is a t ratio matrix for Negro and white children from the four social classes on Visual Sequential Memory. Inspection of Table 30 indicates that there were no significant differences between race, social class, nor interaction of race and social class.

TABLE 23

t Ratio Matrix for Race by Social Class for Subtest 3
Auditory-Vocal Association

	1	2	3	4	5	6	7
2	-1.58						
3	-2.62*	-1.23					
4	-5.93**	-4.47**	-2.89**				
5	1.30	3.03**	3.91**	7.52**			
6	1.09	2.68*	3.58**	6.95**	-.10		
7	.42	2.21*	3.22**	6.86**	-1.06	-.82	
8	.48	2.08	3.06**	6.41**	-.78	-.61	.12

1 Lower-lower white
2 Upper-lower white
3 Lower-middle white
4 Upper-middle white
5 Lower-lower black
6 Upper-lower black
7 Lower-middle black
8 Upper-middle black

19 df * = .05 = 2.093 ** = .01 = 2.861

TABLE 24

t Ratio Matrix for Race by Social Class for Subtest 4
Visual-Motor Association

	1	2	3	4	5	6	7
2	-2.06						
3	-1.92	-.14					
4	-2.50*	-.67	-.48				
5	2.34*	4.44**	3.81**	4.48**			
6	.68	2.92**	2.59*	3.23**	-2.06		
7	1.13	3.14**	2.84*	3.43**	-1.08	.60	
8	2.51*	4.63**	3.94**	4.62**	.13	2.29*	1.22

1 Lower-lower white
2 Upper-lower white
3 Lower-middle white
4 Upper-middle white

5 Lower-lower black
6 Upper-lower black
7 Lower-middle black
8 Upper-middle black

19 df * = .05 = 2.093 ** = .01 = 2.861

TABLE 25

t Ratio Matrix for Race by Social Class for Subtest 5
Verbal Expression

	1	2	3	4	5	6	7
2	-1.23						
3	-1.91	-.91					
4	-2.21*	-1.14	-.10				
5	1.52	3.14**	3.54**	4.12**			
6	.95	2.22*	2.76*	3.12**	-.39		
7	2.53*	4.07**	4.35**	4.94**	1.30	1.45	
8	1.75	3.45**	3.79**	4.43**	.24	.59	-1.12

1 Lower-lower white
2 Upper-lower white
3 Lower-middle white
4 Upper-middle white
5 Lower-lower black
6 Upper-lower black
7 Lower-middle black
8 Upper-middle black

19 df * = .05 = 2.093 ** = .01 = 2.861

TABLE 26

t Ratio Matrix for Race by Social Class for Subtest 6
Manual Expression

	1	2	3	4	5	6	7
2	-.69						
3	-.45	.28					
4	-.70	.06	-.25				
5	1.97	2.86**	2.73*	3.21**			
6	2.09*	2.94**	2.82*	3.28**	.20		
7	1.72	2.49*	2.34*	2.71*	-.04	-.22	
8	.91	1.68	1.48	1.81	-1.03	-1.18	-.87

1 Lower-lower white
2 Upper-lower white
3 Lower-middle white
4 Upper-middle white
5 Lower-lower black
6 Upper-lower black
7 Lower-middle black
8 Upper-middle black

19 df * = .05 = 2.093 ** = .01 = 2.861

TABLE 27

t Ratio Matrix for Race by Social Class for Subtest 7
Grammatic Closure

	1	2	3	4	5	6	7
2	.60						
3	-.95	-1.61					
4	-2.38*	-3.29**	-1.27				
5	4.49**	4.32**	5.50**	8.52**			
6	3.74**	3.46**	4.77**	7.54**	-1.08		
7	1.73	1.24	2.70*	4.54**	-2.76*	-1.94	
8	2.13*	1.71	3.01**	4.63**	-1.60	-.94	.61

1 Lower-lower white
2 Upper-lower white
3 Lower-middle white
4 Upper-middle white
5 Lower-lower black
6 Upper-lower black
7 Lower-middle black
8 Upper-middle black

19 df * = .05 = 2.093 ** = .01 = 2.861

TABLE 28

t Ratio Matrix for Race by Social Class for Subtest 8
Visual Closure

	1	2	3	4	5	6	7
2	-2.11*						
3	-1.04	.81					
4	-3.33**	-1.19	-1.91				
5	.63	2.56*	1.49	3.72**			
6	.17	2.19	1.14	3.37**	-.44		
7	-.01	1.68	.84	2.72**	-.48	-.14	
8	-.31	1.61	.69	2.76*	-.84	-.44	-.22

1 Lower-lower white
2 Upper-lower white
3 Lower-middle white
4 Upper-middle white
5 Lower-lower black
6 Upper-lower black
7 Lower-middle black
8 Upper-middle black

19 df * = .05 = 2.093 ** = .01 = 2.861

TABLE 29

t Ratio Matrix for Race by Social Class for Subtest 9
Auditory Sequential Memory

	1	2	3	4	5	6	7
2	.03						
3	-.09	-.12*					
4	-1.46	-1.50	-1.20				
5	-.48	-.51	-.34	.93			
6	-.77	-.81	-.60	.62	-.29		
7	-.76	-.80	-.56	.86	-.20	.12	
8	-1.69	-1.73	-1.44	-.36	-1.20	-.92	-1.17

1 Lower-lower white
2 Upper-lower white
3 Lower-middle white
4 Upper-middle white
5 Lower-lower black
6 Upper-lower black
7 Lower-middle black
8 Upper-middle black

19 df * = .05 = 2.093 ** = .01 = 2.861

TABLE 30

t Ratio Matrix for Race by Social Class for Subtest 10
Visual Sequential Memory

	1	2	3	4	5	6	7
2	-1.31						
3	-.77	.34					
4	-.64	.39	.06				
5	-.82	.47	.07	.00			
6	.01	1.01	.62	.53	.61		
7	-.49	.83	.37	.27	.34	-.35	
8	-1.50	-.18	-.51	-.54	-.65	-1.16	-1.02

1 Lower-lower white
2 Upper-lower white
3 Lower-middle white
4 Upper-middle white
5 Lower-lower black
6 Upper-lower black
7 Lower-middle black
8 Upper-middle black

19 df * = .05 = 2.093 ** = .01 = 2.861

TABLE 31

Means and Standard Deviations of Blacks
on the ITPA by Social Class Expressed in Months

Subtest	Lower-lower	Upper-lower	Lower-middle	Upper-middle
1	69.60 15.59	65.25 13.96	73.45 20.77	76.70 16.48
2	77.20 14.54	76.90 17.98	80.80 15.50	81.55 16.12
3	71.00 9.00	71.35 11.28	73.95 8.58	73.55 11.44
4	74.00 8.50	80.05 9.98	77.80 13.20	73.65 7.42
5	61.85 10.17	63.40 14.52	57.15 12.51	61.10 9.52
6	79.50 19.45	78.15 21.20	79.80 25.59	86.70 24.22
7	68.00 8.23	70.95 9.01	78.55 14.94	75.30 18.55
8	77.95 14.32	79.95 14.38	80.80 21.89	82.25 17.84
9	90.85 23.01	92.95 22.76	92.15 16.61	99.70 23.43
10	83.45 22.09	78.45 28.57	81.20 18.86	88.30 24.76

1 Auditory Reception
2 Visual Reception
3 Auditory Vocal Association
4 Visual Motor Association
5 Verbal Expression
6 Manual Expression
7 Grammatic Closure
8 Visual Closure
9 Auditory Sequential Memory
10 Visual Sequential Memory

TABLE 32

Means and Standard Deviations of Whites
on the ITPA by Social Class Expressed in Months

Subtest	Lower-lower	Upper-lower	Lower-middle	Upper-middle
1	84.15 15.89	80.25 16.98	93.60 17.27	101.55 16.24
2	85.60 24.41	87.85 19.32	85.70 18.59	93.60 15.72
3	75.35 11.83	81.40 12.37	86.95 15.86	101.40 15.67
4	82.75 14.37	93.10 17.25	94.00 21.81	97.30 21.64
5	67.65 13.69	72.55 11.33	76.45 15.35	76.90 12.75
6	94.10 26.72	99.80 25.06	97.65 22.43	99.35 19.55
7	87.50 17.58	84.40 14.82	92.95 18.50	99.65 14.41
8	80.70 13.16	91.80 19.43	86.55 21.28	99.55 21.60
9	87.40 22.32	87.15 22.35	88.15 26.96	97.20 19.95
10	78.55 15.02	86.90 24.10	84.05 27.84	83.45 30.75

1 Auditory Reception
2 Visual Reception
3 Auditory Vocal Association
4 Visual Motor Association
5 Verbal Expression
6 Manual Expression
7 Grammatic Closure
8 Visual Closure
9 Auditory Sequential Memory
10 Visual Sequential Memory

CONCLUSIONS AND RECOMMENDATIONS

The following conclusions were drawn from the analysis of variance and t ratio computed for differences between groups.

Auditory Reception

Subtest One--The Ability to Derive Meaning from Verbally Presented Materials

1. Race: White children surpassed Negro children.

2. Social class: Significant differences exist between social classes. Scores tend to increase with increase in social class.

3. Interaction of race and social class: No differences were noted.

4. Interaction with other subtests: The ability to derive meaning from verbally presented materials appears to be a significant psycholinguistic disability for Negro children. Performance on this subtest was significantly below Visual Reception, Visual Motor Association, Manual Expression, Visual Closure, Auditory Sequential Memory, and Visual Sequential Memory, but significantly above Verbal Expression. Auditory Reception was significantly below Manual Expression, but above Verbal Expression for white children.

Children from the Lower-lower social class performed significantly better on Auditory Sequential Memory and Manual Expression than on Auditory Reception, and Auditory Reception was significantly higher than Verbal Expression.

Children from the Upper-lower social class had significantly more problems with Auditory Reception than any other social class level. This ability was significantly below Visual Reception, Visual Motor Association, Motor Expression, Visual Closure, Auditory Sequential Memory, and Visual Sequential Memory. This is the only social class in which differences between Auditory Reception and Verbal Expression were significant.

Children from the Lower-middle social class and the Upper-middle social class showed no differences between the subtests except between Auditory Reception and Verbal Expression.

Visual Reception

Subtest Two--The Ability to Gain Meaning from Visual Symbols

1. Race: White children surpassed Negro children.

2. Social class: Significant differences were noted between social classes. The means for the Lower-lower, Upper-lower, and Lower-middle were very similar, but the mean for the Upper-middle class on the ability to gain meaning from visual symbols was approximately one-half year above the performances of the other social classes.

3. Interaction of race and social class: Upper-middle-class white children surpassed Negro children from the four social class levels.

4. Interaction with other subtests: Negro children showed more variability on the ability to gain meaning from visual symbols than did white children. Significant differences were noted between this ability and Auditory Vocal Association, Verbal Expression, Grammatic Closure, Auditory Reception, and Auditory Sequential Memory. Of these differences Auditory Sequential Memory was the only ability above Visual Reception. The differences noted for white children on this subtest were between Verbal Expression and Manual Expression with Manual Expression being significantly above Visual Reception and Verbal Expression being significantly below Visual Reception.

Social class had very little influence on the differences between Visual Reception and other psycholinguistic abilities. Verbal Expression was significantly below Visual Reception at all social class levels. Auditory Vocal Association was significantly below Visual Reception at the Lower-lower social class, and the Upper-lower social class performed better on Visual Reception than Auditory Reception.

Audito Vocal Association

Subtest Three--The Ability to Relate Concepts Presented Orally

1. Race: White children surpassed Negro children.

2. Social class: No differences were noted.

3. Interaction of race and social class: The interaction of race and social class on the ability to relate concepts presented orally was not significant.

4. Interaction with other subtests: The performance of Negro children on the subtest indicated significant differences exist between this subtest and many other psycholinguistic abilities. The performance

of Negro children was significantly below Visual Reception, Visual Motor Association, Manual Expression, Sequential Memory, but above Verbal Expression.

White children showed less variability on this subtest with Visual Motor Association, Manual Expression, and Grammatic Closure above Auditory Vocal Association, but Verbal Expression below Auditory Vocal Association.

Children from the lower social classes showed more variability than children from the upper social classes. In the Lower-lower social class differences were noted between Auditory Vocal Association and Visual Reception, Visual Motor Association, Verbal Expression, Manual Expression, Visual Closure, Auditory Sequential Memory, and Visual Sequential Memory. All of these were above Auditory Vocal Association except Verbal Expression. The patterns of the Lower-lower social class and the patterns for Negro children are very similar. The pattern for children from the Upper-lower social class was very similar to that of Negro children and Lower-lower social class children. The differences between Auditory Vocal Association and Visual Reception, and Auditory Vocal Association and Visual Sequential Memory were not significant.

Lower-middle-class children showed fewer significant differences than the lower social classes, with the differences between Verbal Expression, Grammatic Closure, and Auditory Sequential Memory being significant.

Visual Motor Association

Subtest Four--The Ability to Relate Concepts Presented Visually

1. Race: White children surpassed Negro children on the ability to relate concepts presented visually.

2. Social class: No significant differences were noted.

3. Interaction of race and social class: The interaction of race and social class was not significant.

4. Interaction with other subtests: The performance of Negro children on Visual Motor Association showed slightly more variability between other psycholinguistic abilities than did the performance of white children. Visual Motor Association was significantly higher than Auditory Reception, Auditory Vocal Association, Verbal Expression, but below Auditory Sequential Memory and Visual Sequential Memory. The strength of Negro children in visual skills was demonstrated.

   White children performed significantly higher on Visual Motor Association than on Auditory Vocal Association, Verbal Expression, and Visual Motor Sequencing, but significantly lower than on Manual Expression.

Negro children performed better on Visual Sequential Memory than on Visual Motor Association, where as the performance for white children on these subtests were reversed. Negro children tend to perform significantly better on sequential skills than any of the other psycholinguistic abilities.

The performance of children from the Lower-lower social class on Visual Motor Association was significantly higher than on Auditory Vocal Association and Verbal Expression. Manual Expression and Auditory Sequential Memory were above Visual Motor Association.

Children from the Upper-lower class showed a different pattern in regard to Visual Motor Association. Their performance on this subtest was significantly above Auditory Reception, Auditory Vocal Association, Verbal Expression, Grammatic Closure. No other differences were noted for this social class level.

The performance of Lower-middle-class children on Visual Motor Association showed the least interpsycholinguistic variation. The only difference noted for this social class on this subtest was between Verbal Expression which was significantly below Visual Motor Association.

The performance of children from the Upper-middle social class on Visual Motor Association was significantly higher than Verbal Expression, but lower than Auditory Sequential Memory.

Verbal Expression

Subtest Five--The Ability to Express Concepts Vocally

1. Race: White children surpassed Negro children on the ability to express ideas vocally.

2. Social class: No differences were noted.

3. Interaction of race and social class: The interaction of race and social class was not significant.

4. Interaction with other subtests: The performance of Negro and white children of the four social classes on Verbal Expression was very similar. Verbal Expression was significantly below all other psycholinguistic abilities at all social class levels for both races.

   The ability to express ideas vocally was a significant disability for those children that participated in this study. Other studies have not identified this pronounced disability. This disability could be related to the fact that the majority of the children in this study were drawn from a population basically rural.

Manual Expression

Subtest Six--The Ability to Express Ideas Manually

1. Race: White children surpassed Negro children on the ability to express ideas manually.

2. Social class: No significant differences were noted.

3. Interaction of race and social class: The interaction of race and social class on the ability to express ideas manually was not significant.

4. Interaction with other subtests: White children showed more variation between Manual Expression and the other psycholinguistic abilities than did Negro children. Scores on this subtest tended to be relatively high for both groups.

   Negro children performed significantly higher on this ability than on Auditory Reception, Auditory Vocal Association, Verbal Expression, and Grammatic Closure, but below Auditory Sequential Memory. White children performed higher on this subtest than on all other psycholinguistic skills.

   The children of social class one performed significantly higher on Manual Expression than on Auditory Reception, Auditory Vocal Association, Visual Motor Association, Verbal Expression, and Grammatic Closure.

   Children from social class two performed better on Manual Expression than on Auditory Reception, Auditory Vocal Association, Verbal Expression and Grammatic Closure.

   Children of social class three and four performed better on Manual Expression than on Verbal Expression.

Grammatic Closure

Subtest Seven--The Ability to Handle Grammatic Inflection and Syntax

1. Race: White children surpassed Negro children in the ability to handle syntax and inflections of language that are basically automatic.

2. Social class: Social class was a significant factor affecting performance on this subtest. Inspection of the performance of children from the four social classes indicates significant differences between the two lower levels and the two upper levels. Children from the two lower social classes exhibited more variability between Grammatic Closure and other psycholinguistic abilities than did children from the two upper social classes.

3. Interaction of race and social class: The interaction of race and social class was not significant.

4. Interaction with other subtests: The performance of Negro children on the Grammatic Closure subtest indicates that these children have a definite disability in dealing with the basic automatic language patterns. Performance on this ability was significantly below Visual Reception, Manual Expression, Visual Closure, Auditory Sequential Memory, and Visual Sequential Memory, but above Verbal Expression.

White children had little difficulty with this ability. Their performance on Grammatic Closure was above Auditory Vocal Association and Verbal Expression, but below Manual Expression. White children have little difficulty forming plurals and past tenses of words, but as analysis of the performance of Negro children indicates, they frequently do not pronounce the last syllables of words and tend to leave off "s" and "z" sounds of words when forming plurals.

Children from the Lower-lower social class level performed better on Manual Expression and Auditory Sequential Memory than on Grammatic Closure, but Verbal Expression was significantly below Grammatic Closure.

Children from the Upper-lower social class showed more variability between this subtest and other psycholinguistic abilites than Lower-lower-class children. Visual Motor Association, Manual Expression, Visual Closure, and Auditory Sequential Memory were significantly higher than Grammatic Closure, but Verbal Expression was significantly lower than Grammatic Closure.

The performance of children from the Lower-middle social class on Grammatic Closure was very consistent with the scores on all other subtests. The difference between Verbal Expression and Grammatic Closure was significant, with Verbal Expression continuing to be a disability for the sample in this study.

Children from the Upper-middle class performed higher on Grammatic Closure than on Verbal Expression, but lower on Grammatic Closure than on Auditory Sequential Memory.

Visual Closure

Subtest Eight--The Ability to Identify Common Objects from Incomplete Visual Presentation

1. Race: White children surpassed Negro children on the ability to identify common objects from an incomplete visual presentation.

2. Social class: Social class was a significant factor affecting performance of children on this subtest. In general the higher the social class the fewer the differences between psycholinguistic skills.

3. Interaction of race and social class: The interaction of race and social class was not significant.

4. Interaction with other subtests: The performance of Negro children on this subtest indicates a relative strength in visually related psycholinguistic skills. Performance on Visual Closure was significantly higher than on Auditory Reception, Auditory Vocal Association, Verbal Expression, Grammatic Closure, but lower than on Auditory Sequential Memory. White children showed fewer differences, with Verbal Expression being significantly lower and Manual Expression being significantly higher than Visual Closure.

   Children from social class one performed better on this subtest than on Auditory Vocal Association and Verbal Expression, but lower than on Auditory Sequential Memory.

   Children from social class two showed more variability than the other social classes. Their performance on Visual Closure was significantly higher than their performance on Auditory Reception, Auditory Vocal Association, Verbal Expression, and Grammatic Closure.

   Children from social class three and four performed better on Visual Closure than on Verbal Expression. No other differences were noted for this subtest.

Auditory Sequential Memory

Subtest Nine--The Ability to Reproduce from Memory Sequences of Digits Previously Heard

1. Race: The differences between races on the ability to reproduce from memory sequences of digits previously heard was not significant.

2. Social class: The differences between social classes was not significant.

3. Interaction of race and social class: The interaction of race and social class was not significant.

4. Interaction with other subtests: The performance of Negro children on this subtest indicates that Auditory Sequential Memory was a significant psycholinguistic ability. The performance on this subtest, which measures memory from one-half second to four seconds by repeating digits presented two per second, was significantly higher than the performances on all other subtests. The performance of white children on this subtest was significantly above Verbal Expression and significantly below Manual Expression.

   Children from the Lower-lower social class performed significantly higher on Auditory Sequential Memory than on all other subtests except Visual Reception, Manual Expression, and Visual Sequential Memory.

Children from social class two performed better on this subtest than on Auditory Reception, Auditory Vocal Association, Verbal Expression and Grammatic Closure.

Children from the Lower-middle social class showed the least amount of variability between Auditory Sequential Memory and the other psycholinguistic skills. Only Verbal Expression was significantly below Auditory Sequential Memory.

Children from social class four showed an eight-month increase over the other social classes in Auditory Sequential Memory. This increase resulted in Auditory Sequential Memory being significantly above Visual Reception, Auditory Vocal Association, Visual Motor Association, Verbal Expression, Grammatic Closure, and Visual Sequential Memory.

Visual Sequential Memory

Subtest Ten--The Ability to Reproduce Sequences of Nonmeaningful Figures from Memory

1. Race: No significant differences between races were noted for the ability to reproduce sequences of nonmeaningful figures from memory.

2. Social class: No significant differences were noted.

3. Interaction of race and social class: The interaction of race and social class on Visual Sequential Memory was not significant.

4. Interaction with other subtests: Negro children performed relatively well on Visual Sequential Memory. Their performance on this subtest was significantly above Auditory Reception, Auditory Vocal Association, Visual Motor Association, Verbal Expression, and Grammatic Closure, but was significantly lower than Auditory Sequential Memory. White children showed fewer differences on this subtest. Visual Motor Association and Manual Expression were significantly higher and Verbal Expression was significantly lower than Visual Sequential Memory.

   Children from the Lower-lower social class performed better on Visual Sequential Memory than on Auditory Vocal Association and on Verbal Expression.

   Children from the Lower-middle class performed significantly higher on this subtest than on Verbal Expression.

   Children from the Upper-middle social class performed significantly better on Visual Sequential Memory than on Verbal Expression, but Auditory Sequential Memory was significantly higher than Visual Sequential Memory.

Recommendations

Based on the findings of this study the following studies and teaching procedures are recommended.

1. Children from the lower social classes and Negro children have significant difficulties with auditory receptive skills. Public schools dealing with these children should institute training procedures in listening skills.

2. Children in this study from the Upper-lower social class performed significantly better on Visual Reception than on Auditory Reception, but this difference was not noted for the Lower-lower social class. Studies should be conducted to determine if this is due to the instrument used to calculate social class or is due to variation within the lower social class.

3. Negro children in the study usually performed better on subtests requiring visual skills. Research should be conducted to determine if there are cultural factors that predispose one group to develop visual skills and another group to rely less heavily on visual skills. This finding should be helpful for teachers even though the question concerning whether to teach to the ability or the disability has not been resolved. Research should be conducted to provide information on which is best and for what types of materials.

4. Auditory Sequential Memory is a strength for Negro children and Upper-middle class children. Kagan (1965) reports that children that respond rapidly to materials as required by this subtest show significant difficulties with reading. He refers to this behavior as impulsive-nonreflective. This finding is not in agreement for Upper-middle-class children are usually the best readers. Further study of this skill is needed.

5. The performance of the sample in this study showed significant disabilities in Verbal Expression. The level of performance was below the norms in the standardization sample. This disability is believed to be related to the fact that the sample was drawn from a basically rural population. Research needs to be conducted to determine if this pattern is characteristic of rural children. If this is valid, teachers of these types of children should provide extended periods in which expression by children is required rather than teacher talk.

6. Negro children and children from the lower social classes had significant problems with the automatic language patterns. Examination of their performance indicated that they tend to omit the last syllables and sounds of words. In so doing, tense of verbs and number tends to be present and singular, when past and plural are needed. Drill on expression in which the omission of sounds is not permitted is recommended. Many of the facets of the language program developed by Bereiter and Englemann (1966) should be used with these children.

7. It is recommended that teachers evaluate their materials and methods in terms of the specific psycholinguistic abilities involved. This evaluation should lead to instruction based on the pattern of psycholinguistic abilities of the majority of children in the room if all children cannot be tested.

8. The ITPA is a diagnostic instrument. As such it leads to programs of instruction based on the pattern of abilities and disabilities. Individuals using the ITPA should refer to McCarthy (1966), Kirk (1966), Rainey (1968), and Bush (1969) for instructional materials and methods that are psycholinguistically based.

9. Future studies involving social class should attempt to include ways of comparing social class levels between studies. The results obtained with Upper-lower social class in this study tends to be consistent with studies regarding the lower social class in other studies.

APPENDIX

TABLE A

Analysis of Variance for Scores on Auditory Reception

Source of Variance	Sum of Squares	df	Mean Squares	F	P
Social Class	6269.10	3	2089.70	7.44	.01
Race	13894.50	1	13894.50	49.51	.01
Race by Social Class	707.90	3	235.96	.84	NS
Sampling Error	42655.35	152	280.62		
Total	63526.85	159	399.53		

TABLE B

Analysis of Variance for Scores on Visual Reception

Source of Variance	Sum of Squares	df	Mean Squares	F	P
Social Class	4568.29	3	1522.76	10.12	.01
Race	7631.50	1	7631.50	50.72	.01
Race by Social Class	3013.90	3	1004.63	6.67	.01
Sampling Error	22867.26	152	150.44		
Total	38080.96	159	239.50		

TABLE C

Analysis of Variance for Scores on Auditory Vocal Association

Source of Variance	Sum of Squares	df	Mean Squares	F	P
Social Class	890.09	3	296.69	.91	NS
Race	3294.29	1	3294.29	10.14	.01
Race by Social Class	302.50	3	100.83	.31	NS
Sampling Error	49357.14	152	324.71		
Total	53844.04	159	338.64		

TABLE D

Analysis of Variance for Scores on Visual Motor Association

Source of Variance	Sum of Squares	df	Mean Squares	F	P
Social Class	1761.19	3	587.06	2.53	NS
Race	9501.80	1	9501.80	41.07	.01
Race by Social Class	1184.40	3	394.80	1.70	NS
Sampling Error	35160.24	152	231.31		
Total	47607.64	159	299.41		

TABLE E

Analysis of Variance for Scores on Verbal Expression

Source of Variance	Sum of Squares	df	Mean Squares	F	P
Social Class	399.47	3	133.15	.83	NS
Race	6262.57	1	6262.57	39.25	.01
Race by Social Class	1132.22	3	377.40	2.36	NS
Sampling Error	24251.73	152	159.55		
Total	32046.01	159	201.54		

TABLE F

Analysis of Variance for Scores on Manual Expression

Source of Variance	Sum of Squares	df	Mean Squares	F	P
Social Class	821.59	3	273.86	.50	NS
Race	11139.00	1	11139.00	20.73	.01
Race by Social Class	466.19	3	155.39	.28	NS
Sampling Error	81666.39	152	537.27		
Total	94093.20	159	591.78		

TABLE G

Analysis of Variance for Scores on Grammatic Closure

Source of Variance	Sum of Squares	df	Mean Squares	F	P
Social Class	3228.19	3	1076.06	4.79	.01
Race	12852.40	1	12852.40	57.24	.01
Race by Social Class	761.80	3	253.93	1.13	NS
Sampling Error	34127.02	152	224.51		
Total	50969.42	159	320.56		

TABLE H

Analysis of Variance for Scores on Visual Closure

Source of Variance	Sum of Squares	df	Mean Squares	F	P
Social Class	2781.14	3	927.04	2.76	.01
Race	3543.94	1	3543.94	10.57	.01
Race by Social Class	1259.25	3	419.75	1.25	NS
Sampling Error	50931.74	152	335.07		
Total	58516.09	159	368.02		

TABLE I

Analysis of Variance for Scores on Auditory Sequential Memory

Source of Variance	Sum of Squares	df	Mean Squares	F	P
Social Class	2283.35	3	761.11	1.52	NS
Race	620.34	1	620.34	1.24	NS
Race by Social Class	57.44	3	19.14	.03	NS
Sampling Error	75946.64	152	499.64		
Total	78907.79	159	496.27		

TABLE J

Analysis of Variance for Scores on Visual Sequential Memory

Source of Variance	Sum of Squares	df	Mean Squares	F	P
Social Class	500.39	3	166.79	.27	NS
Race	6.19	1	6.19	.01	NS
Race by Social Class	1264.20	3	421.40	.70	NS
Sampling Error	91229.07	152	600.19		
Total	92999.89	159	584.90		

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