SEX DIFFERENCES IN VERBAL ABILITY OF PRIMARY SCHOOL CHILDREN IN NEW PROVIDENCE

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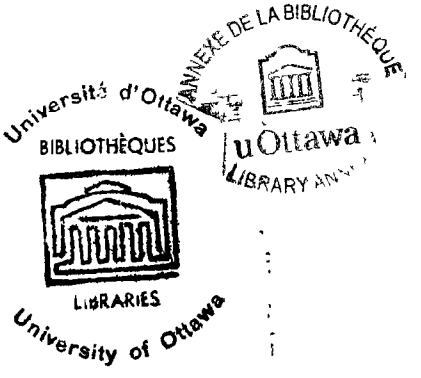

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CURRICULUM STUDIORUM

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INTRODUCTION

From the creation of man to the present it seems that all 'men' have been aware of the differences between the sexes. The role of one sex may vary from one cultural group to another but within any single group there is invariably a difference in role between the sexes. The fact of difference in role implies an assumption of difference in abilities.

One ability which has received much attention from many educators, psychologists and other social scientists is verbal ability. This is not surprising as language is a very important means of communication, self expression, dissemination of culture, as well as the prime medium of formal education in a society. Consequently, with a more individualized approach to education, it is necessary for educators to know whether those to be educated differ in verbal and other abilities. In this respect, psychologists and other social science researchers can play a very important part.

Since the turn of the century a great deal of research has been done on verbal ability. Some of the studies did not include sex differences, but at any point in time they shared the same kind of methodology. The early studies were concerned with articulation and the acquisition of

vocabulary. Some of these studies were single cases of genius, or the other extreme of retardation, while others consisted of unreliable reports of parents; none of these early studies could be called scientific.

It was not until the thirties that a more objective and scientific approach to the problem was taken with the introduction of better standardized aptitude tests. The later development of the factor analytic technique also permitted more accurate measurement of abilities. Steady progress has been made since and research aimed at the refinement of tests and statistical methods has continued unabated. These factors led to more scientific studies of sex differences in many aspects of verbal ability.

Most of the research on this topic has been done in the United States of America. A prominent personality in this field is Dorothea McCarthy who has reviewed many studies and conducted a great deal of research, including considerable discussions on the subject of language development in children, in which sex differences form an important part. The majority of researchers including McCarthy have found a female superiority in verbal ability in all well controlled studies. This difference in favour of the female is not always statistically significant but McCarthy and others point out that such consistent experimental trends cannot be ignored and should be considered a real difference.

Sex differences in verbal ability in favour of one sex or another cannot be fully understood unless studies are made in different cultures. It was McCarthy's realization of this fact that led her to suggest that a greater insight might be gained into sex differences in verbal ability if studies were conducted in a culture in contrast to the American culture in which the other studies were done. This is the prime reason that led this writer to conduct a study in New Providence, a culture in which the male child appears to be preferred. Moreover, it is felt that such a study would provide some experimental evidence of individual differences in this island. The study might also serve a practical purpose in providing local norms on the tests used.

This thesis concerns the testing of a null hypothesis: Primary school boys and girls in New Providence do not differ significantly in verbal ability as measured by the Verbal Meaning (V) and Perceptual Speed (P) factors of the SRA Primary Mental Abilities Test.

The first chapter consists of a review of the literature which contains a discussion of various contributions to the theory of sex differences in verbal ability. A sample of the major studies is presented and the origin of this study is explained.

In the next chapter, the experimental design is discussed. The null hypothesis is formulated and the sample, tools and procedure of the experiment are described in detail.

In chapter three the results are presented quantitatively and discussed qualitatively. The results emphasize reliability, significance of the difference between means and variability statistics.

A summary and conclusions follow. In this, the whole project is summarized and recommendations are made for future research.

The final section, the appendices, contains the raw data of this study and tables of frequency distributions of scores of the sexes on the tests used.

CHAPTER I

REVIEW OF THE LITERATURE

The question of whether males and females differ in verbal ability has received a great deal of attention from many social scientists. In this context, verbal ability refers to any linguistic function, vocalized or written.

One of the most prominent writers in this field is Dorothea McCarthy[1] who wrote several papers on language development in children; and in these papers she explored the problems of sex differences. She has also made an extensive review of the literature as well as having done some experimental work.

McCarthy reviewed fourteen major studies,[2] in which the criterion was the mean number of words used by the children in responding to different objects presented to them. Sixty-four comparisons of the two sexes were made of children of the same age groups between ages one and a half and 9½ years. The results showed that the girls excelled in forty-three comparisons. Three comparisons were the same for both sexes, one a study of twins, and in another study,

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1 Dorothea McCarthy, "Language Development in Children", in Manual of Child Psychology, Leonard Carmichael, (ed.), New York, Wiley, 1946, p. 476-581; and 1954, p. 492-630.

2 Ibid., 1954, p. 546-549.

four out of nine conditions favoured the boys. Eighteen comparisons favoured the boys; ten of these were said to be explainable in terms of age, socioeconomic, twinship or racial factors.

Two types of studies were noted by McCarthy: 1) those dealing with infant vocalization and using the genetic approach; and 2) clinical studies dealing with language disorders. This latter type of study belongs to the abnormal field and is thus a negative approach to gaining knowledge of sex differences in verbal ability. For this reason it was not included in this review.

This writer decided to review the literature under two headings: preschool and school age.

1. Preschool Age.

Preschool age here applies to any age from birth to six years. As a rule, objective tests were not used in studies involving preschool age children. Criteria such as mean length of sentence, number of comprehensible responses and other responses which depended on the establishment of good rapport between the experimenter and the subject. Hence, the validity and reliability of the results may be generally questionable.

It appears that girls begin to talk earlier than boys and articulate better at an early age. McCarthy[3] made a study of the percentage of comprehensible verbal responses of eighteen and 24 month old boys and girls. At eighteen months, girls averaged 38 per cent comprehensible responses and boys averaged 14%. Twenty-four month old girls averaged 78% while boys of the same age averaged only 49%.

Girls have been found to have a larger vocabulary than boys. In Irwin and Chen's[4] study the phonema of ninety-five middle class infants were recorded from birth to age two and a half years. Boys and girls averaged approximately the same number of phonema from birth to ten months of age. From ten months on, girls continuously surpassed the boys, although not to a significant extent. According to the authors the most continuous sample was used as several infants dropped out because of illness, change of address and the like. This led to a smaller and more select sample, which factors could minimize existing differences.[5]

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3 McCarthy, Op. Cit., p. 553.

4 Orvis C. Irwin and Han Piao Chen, "Development of Speech During Infancy: Curve of Phonemic Types", in the Journal of Experimental Psychology, Vol. 36, No. 5, issue of October 1946, p. 431-436.

5 Anne Anastasi, Differential Psychology, Individual and Group Differences in Behaviour, New York, Macmillan, 1958, p. 456.

In a study of the length of sentence used by seventy-four nursery school children, ages 30 to 65 months, Young[6] observed the subjects in different settings and under different conditions, indoors and outdoors. This study extended over four years, observations being made during one or more quarters each year. It was found that, on the average, girls used more words than boys at all ages and under all conditions to a significant degree.

Another contribution to knowledge in this area is an investigation made by Anastasi and D'Angelo.[7] They took a sample of one hundred five-year old negro and white children and compared them for I.Q., mean sentence length and complexity of sentence structure. Unlike other similar studies the groups were balanced in terms of uni-racial and inter-racial contacts, age, and socioeconomic status. The differences between the two racial groups were negligible. White girls excelled white boys, but negro boys exceeded negro girls. The authors suggested that this superiority of negro boys in verbal ability could be due to special racial attitudes resulting in social pressure on the boys to achieve.

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6 Florence M. Young, "An Analysis of Certain Variables in Developmental Study of Language", in the Genetic Psychological Monograph, Vol. 23, No. 1, issue of 1941, p. 3-141.

7 Anne Anastasi and Rita Y. D'Angelo, "A Comparison of Negro and White Preschool Children in Language Development and Goodenough Draw-a-Man I.Q.", in the Journal of Genetic Psychology, Vol. 81, First Half, issue of September 1952, p. 147-165.

They also found that children of higher socioeconomic status surpassed those of lower status.

Among American children of preschool age the majority of studies have shown that girls are superior to boys in verbal ability. Girls begin to talk earlier, articulate better, have a larger vocabulary and use longer sentences than boys.

2. School Age.

School age is defined here as any age which lies between six years and the maximum age of a child in high school. In experiments using this age group of children the researcher is aided in doing more scientific work because of the availability of subjects leading to a more representative sample of a general population; and these children are more objectively testable.

In the thirties, educators and psychologists already subscribed to the view that:

> (...) a large part of any individual's total adjustment and life efficiency depends upon an adequate understanding of the possibilities and limitations which his sex brings with it.[8]

With this outlook and the appearance of aptitude or ability tests on the market, interest in sex differences in verbal

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8 Lewis M. Terman and Leona E. Tyler, "Psychological Sex Differences", in Manual of Child Psychology, Leonard Carmichael (ed.), New York, Wiley, 1954, p. 1104.

and other abilities increased. Now the abilities could be analyzed more specifically, and norms could be established for guidance purposes as well as curriculum planning.

One of the early studies of school age children was made by Heilman.[9] His sample was very large, consisting of more than eight hundred ten-year old subjects. He controlled for training, life age, educational age, mental age and socioeconomic level. The children were compared in various school subjects and it was found that the difference in spelling in favour of the girls was significant at the .05 level of confidence. The girls also excelled in language usage but not to a significant degree.

Within one year of the last mentioned study, LaBrant[10] investigated the verbal ability of some one thousand children in grades four to twelve. The boys and girls were required to write a composition on a prescribed topic of interest to both sexes. In the same period of time the boys produced themes eighty-six per cent and 83% as long as the girls at the elementary and high school levels respectively.

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9 J.D. Heilman, "Sex Differences in Intellectual Abilities", in the Journal of Educational Psychology, Vol. 24, No. 1, issue of January 1933, p. 47-62.

10 Lou L. LaBrant, "A Study of Certain Language Developments of Children in Grades Four to Twelve Inclusive", in the Genetic Psychological Monograph, Vol. 14, No. 5, issue of November 1933, p. 387-491.

Ferrell[11] made a comparative study of the school achievement of six hundred negro and white children of ages nine years and two months to fifteen years and three months. The Stanford Achievement Test, Form H was used as criterion. Differences in language usage significant at .01 level of confidence were found in favour of the girls in both racial groups. This result is the reverse of Anastasi and D'Angelo's[12] findings of negro boys being superior to negro girls in mean sentence length used. An explanation for this difference may lie in the fact that the negroes in Ferrell's study were southern negroes who lived in a racially segregated environment unlike the northern negroes who mixed with other racial groups.

Stroud and Lindquist[13] administered the Iowa Every-Pupil Test to a random sample of more than four hundred children. The researchers found girls higher on reading comprehension, work study skills, and basic language skills in grade school. In the high school group boys surpassed

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11 Guy V. Ferrell, "Comparative Study of Sex Differences in School Achievement of White and Negro Children", in the Journal of Educational Research, Vol. 43, No. 2, issue of October 1949, p. 116-121.

12 Anastasi and D'Angelo, Op. Cit., p. 147-165.

13 J.B. Stroud and E.F. Lindquist, "Sex Differences in Achievement in the Elementary and Secondary Schools", in the Journal of Educational Psychology, Vol. 33, No. 9, issue of December 1942, p. 657-667.

girls on everything except reading and comprehension. This may be explainable in terms of high school boys being a select group.[14]

A study done by Havighurst and Breese[15] explored the relationship between social status and ability using the Primary Mental Abilities Test. Their sample consisted of ninety-one students from grades four to nine, who came from the three lower social levels of their community. The girls exceeded the boys on all verbal and other factors except the space factor, but the differences were not significant. A significant relationship was found between numerical, verbal comprehension, word fluency, and social status.

Hobson[16] studied sex differences on the Primary Mental Abilities Test. His sample consisted of five hundred students from grade nine one year and grade eight the following year; their average ages were fourteen years and four months and thirteen years four months respectively. Testing was repeated annually about three times prior to publication

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14 Anastasi, Op. Cit., p. 456.

15 Robert J. Havighurst and Fay H. Breese, "Relation between Ability and Social Status in a Midwestern Community. III Primary Mental Abilities", in The Journal of Educational Psychology, Vol. 38, No. 4, issue of April 1947, p. 241-247.

16 James R. Hobson, "Sex Differences in Primary Mental Abilities", in the Journal of Educational Research, Vol. 41, No. 2, issue of October 1947, p. 126-132.

of these results. The girls surpassed the boys to a significant extent at .01 level of confidence in word fluency, inductive reasoning, and memory; boys exceeded girls significantly at .01 level of confidence in verbal comprehension at the grade eight level and by a doubtful margin in grade nine. The author suggested a definite need for sex age norms for verbal meaning and word fluency factors as well as other factors if the results were to be used for guidance purposes.

The Differential Aptitude Tests[17] provide sex norms. In the standardising population girls are consistently higher than boys in language usage while verbal reasoning showed very slight differences in favour of the boys.

Studies done on children of school age indicate that girls generally tend to be superior to boys in language usage, length of sentences used, spelling, and word fluency; but not so in verbal comprehension in which high school boys occasionally excel.

3. Summary and Hypothesis.

The majority of the studies examined showed female superiority in many different aspects of verbal ability.

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17 George K. Bennet et al., Differential Aptitude Tests, Manual, (3rd Edition), New York, Psychological Corporation, 1959, p. 1v-94.

Although this difference is not always significant yet experimental trends seem to show quite conclusively that the difference is real. This view is supported by McCarthy who states:

> The vast accumulation of evidence in the same direction from a variety of investigators working in different parts of the country, employing different situations and methods of observation, and employing different analyses and linquistic indices, certainly is convincing proof that a real sex difference in language development exists in favor of the girls. (...) In the array of data cited above we have presented experimental, rather than statistical, evidence of the reality of the differences, small though they may be and when experimental trends check in study after study there appears to be little need for the reassurances of the statistical significance of critical ratios.[18]

Two types of explanation have been offered for this female superiority. Biologically, girls tend to be more accelerated than boys in physical development, and this probably accounts for their earlier maturation in articulation. This, in turn, may create in favour of girls an initial difference in verbal ability which boys are unable to eliminate in later life.[19]

The second explanation is based on the amount and quality of contact which the child has with the mother who is the chief source of early language training. McCarthy suggests:

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18 McCarthy, Op. Cit., p. 554.

19 Anastasi, Op. Cit., p. 473.

> If the same sex preference is present among true parents, that seems evident in instances in which prospective parents have their choice, it is reasonable to assume that girl babies are more often welcomed, and hence are given greater warmth, affection and security from the very beginning than are boys in our present day society.[20]

Added to this is the fact that on the average boys play outdoors more than girls and consequently spend less time with the mother. McCarthy further suggested that when children start school, the very fact that girls are superior to boys in verbal ability may lead the teacher to reject the boys which, in turn, could lead to further retardation of the boys. If the aforementioned contentions are correct, then ceteris paribus, it is not surprising to find girls surpassing boys in verbal ability.

The question now arises, whether there is any difference in verbal ability between boys and girls in other cultures.[21] For example, McCarthy herself suggested that findings might be different in a culture where the male child is preferred.[22] However, very few studies have been

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20 Dorothea McCarthy, "Some Possible Explanations of Sex Differences in Language Development and Disorders", in the Journal of Psychology, Vol. 35, First Half, issue of January 1953, p. 157.

21 Culture here refers to the sume of the conditions such as traditions, mores and the like under which the individual is reared.

22 McCarthy, "Some Possible Explanations of Sex Differences in Language Development and Disorders", Op. Cit., p. 157.

conducted outside North America. It is this apparent gap in this body of knowledge that led the writer to extend the field of enquiry to the island of New Providence;[23] this culture will be dealt with in more detail in the next chapter on experimental design.

The null hypothesis was formulated that there is no significant difference in verbal ability (as measured by the V and P factors of the SRA Primary Mental Abilities Test)[24] between primary school boys and girls in New Providence.

The design for testing this hypothesis will be discussed in the following chapter.

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23 One of the islands of the Bahamas, British West Indies.

24 Thelma Gwinn Thurstone and L.L. Thurstone, Examiner Manual for the SRA Primary Mental Abilities for Ages 5 to 7, Chicago, Science Research Associates, 1953, 27 p.

CHAPTER II

EXPERIMENTAL DESIGN

This experiment was designed to determine whether the sexes differ in verbal ability in New Providence. A null hypothesis was formulated that primary school boys and girls do not differ significantly in verbal ability as measured by the Verbal Meaning (V) and Perceptual Speed (P) factors of the SRA Primary Mental Abilities Test.

To test this hypothesis there are three basic requirements: a sample, tools and procedure. It is under these headings that the experimental design will be discussed.

1. The Sample.

In the preceding chapter it was mentioned that this research project was extended to the population of New Providence to explore sex differences in verbal ability in a non-American culture, where the male in his society is the preferred sex.[1] Following are several conditions which support this observation.

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1 In the last chapter the writer referred to Dorothea McCarthy's suggestion that studies of verbal ability on groups which preferred the male might be revealing.

In the island of New Providence the male appears to be singularly the most important member of the family and, indeed, of the community at large. Although he may often be absent from the home, yet he is the paterfamilias and as such has the last word on the most important family matters. He occupies an exclusive position in political life and plays a leading role in the social life of the island. Until mid-1962, the franchise as well as eligibility for election to the House of Assembly (the elected governing body) was limited to the male sex. Women, on the other hand, play a passive role in the community, and are largely confined to the rearing of children and domestic tasks.

Another factor contributing to a male preference in this island may be the fact that among the massive lower classes the male is almost the exclusive wage earner in his family. He invariably remains with his family and contributes to its maintenance until he is married and at times even afterwards. This situation is further encouraged by the monotonous nature of the economy, based predominantly on tourism, and the smallness of the island;[2] both of

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2 The island of New Providence is seven miles wide by twenty-one miles long and the most recent estimates available place the population at fifty thousand.

which limit the individual's mobility thus tying the wage earner to the home.

The high rate of illegitimacy also contributes to a male preference in this society. Unlike North America where child welfare and adoption agencies abound, New Providence has no such agencies to take care of children born out-of-wedlock. These children, therefore, usually remain in the family with their mothers; so that the female child is often regarded as a potential economic burden to the family.

Under the aforementioned conditions, human nature being what it is, the male will almost certainly be the preferred sex and be given more attention and affection than the female.

The selected sample consisted of a hundred girls and 104 boys[3] in class I, the first year of formal education. The sample was taken at this level to obtain a representative group that could be objectively tested with a standardized test at an early age; and to reduce, to as great an extent as possible, the effects of education and other variables which may influence verbal ability as the child grows older. The sample was taken from three schools[4] in

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3 In one school two entire classes were used and there were four more boys than girls in the group.

4 For this purpose the Board of Education in New Providence recommended the following schools: Sandilands, a rural school, Eastern Preparatory III, weighted with children from homes of higher income level, and Western Preparatory III, cross-section of population.

order to obtain the most representative sample. A random sample was chosen in an attempt to balance the groups for age, intellectual ability, educational level and socio-economic status, all of which have been found to affect verbal ability. Randomization was accomplished by taking every fourth name from the class register of the boys in two schools and the entire male population of two classes in the third school; the sample of girls was chosen at random in the same way.

2. The Tools.

From the literature it seems that verbal ability may be placed into two classes, one involving mechanical language skills and the other skills of comprehension. So, in this study, the experimenter wished to choose tools that would sample these two types of verbal ability. Moreover, the children in this experiment were very young and were taking a standardized test for the first time; hence, it was felt that the selected tests should be particularly appealing to the subjects to get the best performance from them. The writer felt that the latter could be accomplished if the tests had visual appeal, simple tasks, short duration and did not favour either sex. The aforementioned plus the reliability of the tests led to the V and P factors of the SRA Primary Mental Abilities Test being chosen as measures

of verbal ability in this study. The Spearman-Brown split-half reliability of V and P are .770 and.959 respectively.[5]

According to the authors,[6] the V (verbal-meaning) factor is a measure of the ability to understand ideas expressed in words, and is measured by vocabulary, sentence completion, paragraph comprehension and auditory discrimination type items. The test is made up of a number of practice items and forty-nine scored items, all in pictorial form. The subject answers a question by marking one picture in a row of four pictures.

The P (perceptual-speed) factor, one of the factors related to reading readiness measures the ability to recognize similarities and differences between figures in a given period of time. The subject is required to mark a picture in a box by itself, then he has to look at four pictures in a box and mark the one which is the same as the one which he marked in the box by itself. This test also has some practice items and thirty items which are scored.

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5 L.L. Thurstone and Thelma Gwinn Thurstone, Technical Supplement for the SRA Primary Mental Abilities for Ages 5 to 7, Chicago, Science Research Associates, 1953, p. 2.

6 Thelma Gwinn Thurstone and L.L. Thurstone, Examiner Manual for the SRA Primary Mental Abilities for Ages 5 to 7, Chicago, Science Research Associates, 1954, p. 3.

3. Procedure.

The testing was done at the end of the first term of the children's first year at school. Rapport was readily established with the help of the teacher. Ten was the maximum number of children tested at one time; they were tested in their classroom while the remainder of the class was taken away by the teacher. The examiner had an assistant who helped supervise each testing session thus minimizing opportunities for copying and also helped subjects do practice items when necessary. The testing conditions were generally good with ample working space for the child. The tests were administered and scored according to the instructions given in the manual.

A number of statistical evaluations were made. Two types of reliability of the tests used were calculated, split-half and test-retest. In connection with the latter, one hundred children (fifty boys and fifty girls) were retested on V and P tests after a one week interval. Age means for boys and girls were compared for differences and significance of the difference. The mean scores for boys and girls on V were compared for difference and statistical significance was computed; the mean scores for boys and girls on P were treated in the same manner. In addition, boys and girls were compared for variability and overlap in verbal ability. All of these results will be discussed in the next chapter.

CHAPTER III

PRESENTATION AND DISCUSSION OF RESULTS

In this chapter the results of the experiment will be presented and analysed in terms of the null hypothesis. The chapter will be discussed under five headings: 1. reliability, 2. age, 3. Verbal-Meaning, 4. Perceptual-Speed, and 5. general discussion.

1. Reliability.

The results of an experiment are as reliable as its tools of measurement. It is therefore important that appropriate measures of reliability be computed.

In the technical supplement[1] of the tests the reliability of the V, Verbal-Meaning Test and P, Perceptual-Speed Test (generally referred to as V and P) is given as .77 and .96 respectively, which was calculated by the Spearman-Brown split-half method. Using a correlation of odd and even items of the test the writer calculated the same type of reliability on V and P in this study in order to compare the results with those of the normative sample. In this case the reliability of V was found to be .81 and of

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1 L.L. Thurstone and Thelma Gwinn Thurstone, Technical Supplement for the SRA Primary Mental Abilities for Ages 5 to 7, Chicago, Science Research Associates, 1953, p. 2.

P .93, which values closely parallel those of the normative sample.

Although the split-half reliability is appropriate for V it is not so for P. When one considers that the P test is a speed test, its high reliability .96 on the normative sample and .93 in this study becomes very suspect. This doubt about such a reliability is aroused by the fact that if no examinee completed the test and if no wrong answers were given a perfect correlation would be obtained by correlating the two halves of the test.[2] This type of reliability, therefore, was not considered the best by this writer, so a test-retest reliability using the same test was done.

As shown in Table I, the test-retest reliability for V and P was found to be .78 and .77 respectively. The raw data from which this reliability was computed will be found in Tables IX and X in Appendix 1. With a standard error of .04 in both cases the coefficients of correlation .78 and .77 are considered sufficiently reliable by the writer.

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2 J.P. Guilford, Fundamental Statistics in Psychology and Education, New York, McGraw-Hill, 1956, p. 447.

Table 1.-

Test-Retest Reliability of V and P Factors of SRA PMA Test on 100 Primary School Children.

Test	Reliability, r	S.E.
V	.78	± .04
P	.77	± .04

2. Age.

Boys and girls are compared for differences in age in Table II. When rounded to the nearest whole number the mean age for boys is seventy-five months and for girls seventy-six months. This difference, with a t value of .30 is not statistically significant. Moreover, there is no significant age difference between the boys and the girls in any of the subgroups.

The girls are more variable in age than the boys, the standard deviation for girls being 9.6 months and for boys 8.4 months. This greater variability of girls is found throughout the subgroups and is greatest in the rural school where the dispersion of boys is six months and that of the girls is 12.4 months. The latter deviation is due mainly to two very extreme ages of 103 months and 117 months found among the girls, the smaller of which exceeds the higest boy's age by eleven months. It should also be noted that there are extreme ages at the upper end of the scale among the girls in all subgroups, so that the highest age in each subgroup is always found among the girls. These extreme ages may be explained in terms of a phenomenon in this island whereby children of school age are at times kept at home to help with household chores and the care of younger children, with the result that some children start school later than others. In the vast majority of cases girls are

Table II.-

Age Differences between Boys and Girls in Three Primary Schools of New Providence.

School		N	Mean Age				
			Months	σ	σ_M	σ_{d_M}	t
I	Boys	20	82.75	6.0	1.3	3.09	.03
	Girls	20	82.65	12.4	2.8		
II	Boys	20	74.95	5.6	1.2	2.44	.19
	Girls	20	74.50	7.7	1.7		
III	Boys	64	72.80	7.5	1.8	2.05	.40
	Girls	60	73.60	7.7	1.0		
Totals	Boys	104	75.10	8.4	.8	1.61	.30
	Girls	100	75.60	9.6	1.0		

the victims of this practice which is more prevalent in rural and lower socioeconomic urban groups. This probably also explains the finding in this study that the rural children, as a group, start school at least eight months later than the urban children.

3. Verbal-Meaning.

The results on the V test are shown in Table III. The boys obtained a mean score of 26.31 compared with a mean score of 26.44 for girls. Once again, the difference between the means is very small and statistically insignificant since t = .15. The mean differences in the subgroups are also small and insignificant.

The small mean difference which the total sample shows on the V test favours the girls. This reflects the fact that in two of the three subgroups the girls score higher than the boys. However, a curious situation presents itself in School I, the rural school, in that boys score higher than girls and in the entire sample these boys and girls obtain the highest and second highest mean scores respectively.

This rural anomaly needs some explanation. The children in the rural school are older than those in the urban schools; but this does not seem to account for their superior score since the children with extreme ages did not

Table III.-

Sex Differences in V Scores of a Sample of Primary School Children in New Providence.

School		N	Mean	σ	σ_M	σ_{d_M}	t	Direction of Difference
I	Boys	20	28.35	5.99	1.34	1.73	.46	Boys higher
	Girls	20	27.55	4.91	1.10			
II	Boys	20	26.05	8.21	1.84	2.20	.48	Girls higher
	Girls	20	27.10	5.30	1.19			
III	Boys	64	25.75	5.66	.71	1.04	.10	Girls higher
	Girls	60	25.85	6.00	.77			
Totals	Boys	104	26.31	6.37	.62	.84	.15	Girls higher
	Girls	100	26.44	5.71	.57			

obtain higher scores than the younger children. However, it may be that there is some social attitude which motivates rural children in general and boys in particular to succeed at school.

On the V test boys are more variable than girls, the standard deviation for boys being 6.37 and for girls 5.71 - a reflection of the greater variability of boys in two out of the three subgroups.

The frequency distributions of boys' and girls' scores on the V test are illustrated in Figure 1; the corresponding raw data will be found in Table XI, Appendix 2. It will be noticed that both distributions approximate a normal curve and a great deal of overlapping occurs between the groups.

4. Perceptual-Speed.

Differences between boys and girls on the P test are shown in Table IV. The means for the boys and girls are 9.65 and 10.98 respectively. With a t value of 1.18 the difference between the means is statistically insignificant. The mean difference in all subgroups is also insignificant.

With reference to the mean difference the same trends are noted on the P test as on the V. The difference is in favour of the girls, who excel in the same urban schools. However, the girls surpassed the boys to a greater extent

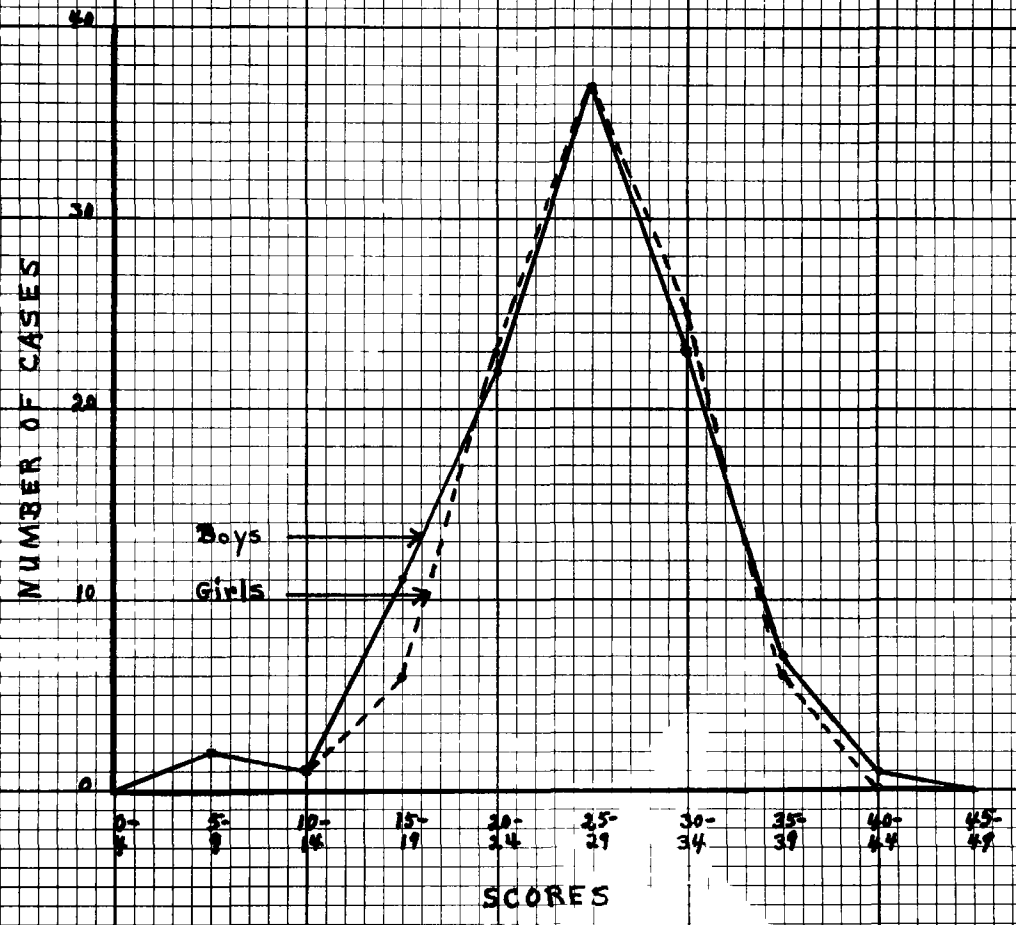

Figure 1. Distributions of Boys and Girls on the V- Verbal Meaning Test

Table IV.-

Sex Differences in P Scores of a Sample of Primary School Children in New Providence.

School		N	Mean	σ	σ_M	σ_{d_M}	t	Direction of Difference
I	Boys	20	14.75	10.11	2.26	2.8	.21	Boys higher
	Girls	20	14.15	7.40	1.66			
II	Boys	20	8.55	6.46	1.44	2.06	1.62	Girls higher
	Girls	20	11.95	6.61	1.48			
III	Boys	64	8.41	7.56	.94	1.40	.60	Girls higher
	Girls	60	9.60	8.11	1.05			
Totals	Boys	104	9.65	8.31	.81	1.13	1.18	Girls higher
	Girls	100	10.98	7.90	.79			

on P, a test of a mechanical aspect of language, than on V, a test of Verbal-Meaning. This supports Anastasi's[3] observation that girls do better on tests involving the mechanics of language like fluency than in vocabulary, verbal comprehension and verbal meaning tests.

Again the boys in the rural school group are superior to the girls; and the highest and second highest mean scores are found in this group. A comment has already been made on this in the previous section on the V test.

As on the V test boys are more variable than girls on the P test, the standard deviation for boys being 8.31 and for girls 7.90. This trend is in keeping with the findings on other aptitude and intelligence tests.

The frequency distributions for boys and girls on the P test are shown in Table XII, Appendix 2, and are illustrated in Figure 2, Just like on V, there is a great deal of overlapping between the two groups, indicating a high degree of homogeneity between them. The distributions, however, are highly skewed to the left. This skewness may be explained in terms of the speed element in the P test which is probably too highly speeded for this sample, with the result

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3 Anne Anastasi, Differential Psychology, Individual and Group Differences in Behaviour, New York, Macmillan, 1958, p. 474.

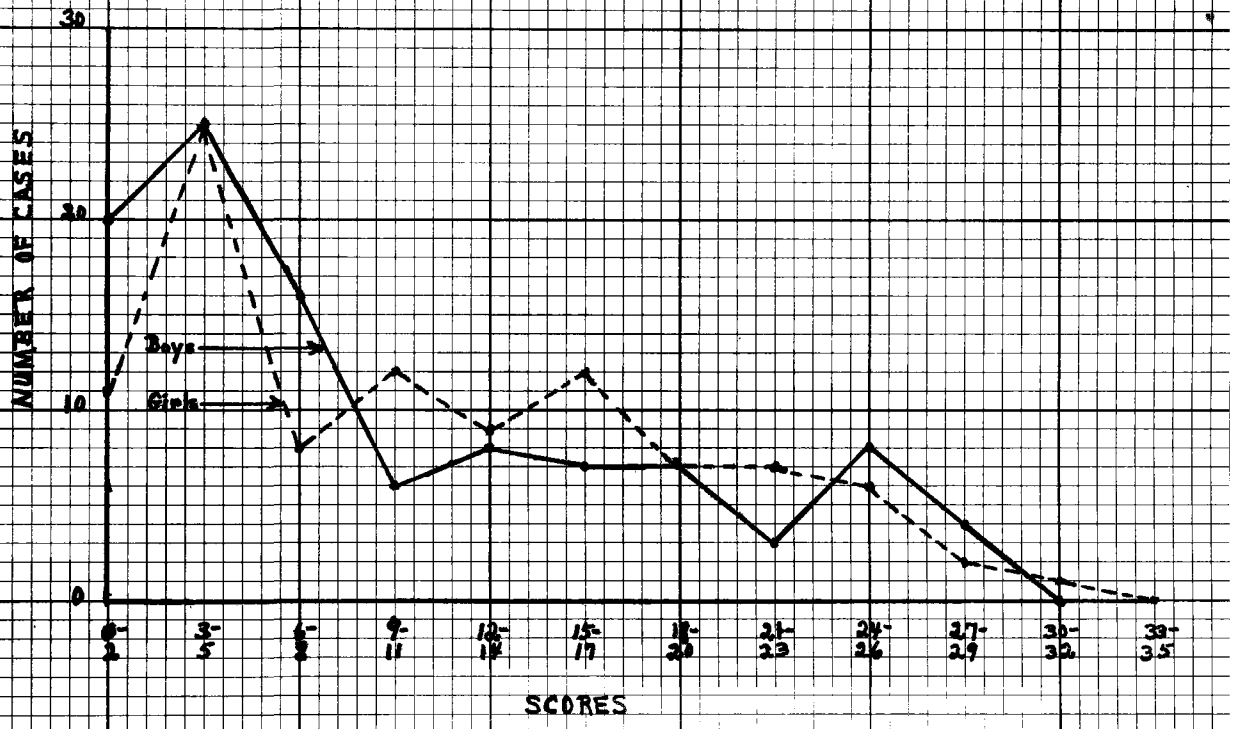

Figure 2. Distributions of Boys and Girls on the P-Perceptual Speed Test.

that accuracy had to be sacrificed for speed. With the large numbers of zero scores it is obvious that this test discriminated very poorly between the examinees.

5. General Discussion.

On reviewing the results it is evident that the null hypothesis must be accepted on the basis of the critical ratios of .15 and 1.18 obtained on V and P respectively, evaluated at the .01 level of significance. That is, primary school boys and girls in New Providence do not differ significantly in verbal ability as measured by the V and P factors of the Primary Mental Abilities Test.

Although the difference between the sexes is not statistically significant it must be noted that the difference is in favour of the girls. When the findings of this study, which was carried out in a different culture, are placed vis-a-vis the abundance of pre-existing experimental evidence of female superiority in verbal ability, the writer cannot but agree with McCarthy[4] that "there appears to be little need for the reassurances of the statistical significance of the critical ratios". It will be recalled that having reviewed many studies of verbal ability McCarthy found that differences in favour of the girls were at times

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4 See quotation from Dorothea McCarthy in the review of the literature, p. 10.

small and statistically insignificant. However, the persistent direction of the differences in favour of the girls obtained by so many experimenters in different places and using different criteria led McCarthy to suggest that, in spite of the statistical evidence of insignificance, a real difference in verbal ability exists.

In view of the remarkable similarity between trends found in this study and those in the American studies there is reason to believe that culture is not a significant factor in sex differences in verbal ability. Possibly, the explanation of the difference lies in the biological sphere. For, according to Anastasi[5] and others, girls mature in physical development more rapidly than boys, with the result that they also mature in articulation earlier; which, in turn, may give girls an advantage in mastering other aspects of verbal ability. However, a single study such as this cannot pretend to give conclusive evidence on this matter. A great deal more research, particularly of a biological nature, will have to be done to arrive at a truly scientific explanation of female superiority in verbal ability.

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5 Anastasi, Op. Cit., p. 473.

SUMMARY AND CONCLUSIONS

This experiment was done to theat the hypothesis that primary school boys and girls in New Providence do not differ significantly in verbal ability as measured by the Verbal-Meaning (V) and Perceptual-Speed (P) factors of the SRA Primary Mental Abilities Test. The results have been presented and it now remains to summarize the findings and make recommendations for further research.

Boys and girls were compared for age and it was found that the difference was not statistically significant. However, girls were more variable than boys; this being due to some extreme ages at the upper end of the scale among the girls. Also, rural children on the average started school later than urban children. It was suggested that the extreme ages could be explained in terms of a phenomenon in this island whereby children of school age may be kept at home to help with household chores and the care of younger children so that some children start school later than others. The practice is more prevalent in rural and lower socioeconomic urban groups and affects girls much more often than boys. A study could be done to test this hypothesis.

On both the V and P tests the differences between the boys and girls were significant. However, the differences were in favour of the girls and they surpassed the boys to

a greater extent on P, a test of a mechanical aspect of language than on V, a test of verbal meaning. These trends are consistent with findings in the literature.

In the rural subgroup a different situation obtained. Boys were superior to girls on both V and P and rural boys and girls as a group scored higher than the urban children. It was hypothesized that special attitudes exist among rural people that motivate these children generally and boys in particular to succeed at school. Greater insight into this could be gained through further study. Specifically, studies on child rearing practices and parental attitudes toward children of different sexes are needed on the general population of New Providence.

Boys were found to be more variable than girls on V and P. This is in keeping with the results of many other studies.

The frequency distributions of boys and girls on V and P both show a great deal of overlapping. The distributions on V approximate the normal curve and its norms could be used generally for children in class I in this island. However, the distributions on the P test are skewed, likely due to the highly speeded nature of the test. If the time allotted for this test were increased it would probably discriminate better among the subjects and different sex differences on P may be found. The latter having been done,

norms could then be set up for P which along with V could be evaluated as possible criteria for reading-readiness.

On the basis of the aforementioned findings the null hypothesis is upheld. That is, primary school boys and girls in New Providence do not differ significantly in verbal ability as measured by the V and P factors of the SRA Primary Mental Abilities Test.

Differences found in this study were in favour of the female. This result parallels the findings of many researchers in the field. Because of this the writer felt that this female superiority in verbal ability must be considered real, in spite of its lack of statistical significance. It was also pointed out that the same result of female superiority in verbal ability was found in contrasting cultures. Although the results of this study could not be considered conclusive, yet there is a suggestion that culture may not be a significant factor in sex differences in verbal ability. Certainly, continued research on this subject in different cultures is desirable but some attention should be focussed on the biological aspects of this question.

Finally, the writer believes that the undertaking of this study in a different culture constitutes a step towards universalization of the theory of sex differences in verbal ability, in that it will lead to a greater

understanding of the problem. Besides, it introduces to the literature some experimental evidence on individual differences of primary school children in New Providence. In conclusion, it is hoped that this project will arouse interest in others to conduct further research on this population.

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In a very large sample grade school girls exceeded in reading comprehension, fluency and speed of reading while high school girls only excel in reading comprehension.

Terman, Lewis M. and Leona E. Tyler, "Psychological Sex Differences", in Manual of Child Psychology, Leonard Carmichael (Ed.), New York, Wiley, 1954, p. 1064-1114.

These authors say that sex differences are at the same time physical and psychological; and they summarize findings on sex differences.

APPENDIX 1

RAW DATA

APPENDIX 1

RAW DATA

Table V.-

V and P Scores, and Ages of Twenty Boys from Sandilands Preparatory School in New Providence.

Age Yrs.Mths.	V	P
7 - 0	28	15
6 - 7	28	15
6 - 8	33	6
8 - 0	28	24
7 - 1	38	26
7 - 8	16	4
6 - 9	32	24
6 - 5	26	18
6 - 8	32	27
7 - 6	32	28
6 - 5	19	8
6 - 11	27	3
6 - 9	41	14
7 - 5	30	26
6 - 10	25	0
6 - 11	33	26
6 - 6	29	25
7 - 3	25	1
6 - 11	27	6
5 - 8	18	1

Table VI.-

V and P Scores, and Ages of Twenty Girls from Sandilands Preparatory School in New Providence.

Age Yrs.Mths.	V	P
6 - 9	20	4
7 - 1	39	22
8 - 0	35	17
5 - 11	24	18
6 - 6	34	12
6 - 10	28	24
8 - 7	32	30
6 - 3	21	4
7 - 9	27	9
6 - 4	27	12
5 - 8	25	12
5 - 5	30	17
6 - 7	23	7
6 - 1	25	4
9 - 9	34	17
5 - 8	25	5
7 - 6	29	20
7 - 4	24	11
7 - 2	25	25
6 - 7	24	13

APPENDIX 1

Table VII.-

V and P Scores, and Ages of Twenty Boys from Eastern Preparatory School III in New Providence.

Ages Yrs.Mths.	V	P
5 - 4	22	4
5 - 4	28	13
5 - 7	20	4
7 - 1	34	20
7 - 2	34	15
7 - 8	27	7
5 - 5	25	11
6 - 7	34	3
6 - 2	25	4
6 - 0	21	1
5 - 11	34	12
5 - 7	25	5
5 - 7	24	6
5 - 9	32	17
6 - 2	7	0
6 - 5	34	16
6 - 4	22	2
7 - 9	36	20
6 - 10	31	11
6 - 3	6	0

Table VIII.-

V and P Scores, and Ages of Twenty Girls from Eastern Preparatory School III in New Providence.

Age Yrs.Mths.	V	P
6 - 10	35	4
5 - 11	21	2
7 - 0	25	10
5 - 3	21	6
6 - 9	34	21
6 - 5	31	7
6 - 3	32	21
5 - 4	24	15
5 - 6	25	9
5 - 7	28	15
6 - 2	26	16
6 - 2	28	8
5 - 10	17	2
5 - 9	30	20
6 - 0	31	15
6 - 6	31	24
6 - 8	24	5
6 - 7	33	16
5 - 8	16	7
8 - 0	30	16

Table IX.-

V and P Scores, and Ages of Sixty-four Boys from Western Preparatory School III; and Retest V and P Scores of 50 Boys of the Same Group.

Age Yrs.Mths.	V	P	Retest V	Retest P
6 - 0	30	4	28	12
5 - 6	26	25	25	24
7 - 1	29	11	35	20
6 - 5	37	19	39	19
5 - 6	25	4	26	18
6 - 4	25	6	33	14
5 - 8	34	18	34	29
6 - 3	30	0	30	13
6 - 11	28	20	31	26
6 - 2	28	10	32	11
7 - 8	26	7	31	11
5 - 5	15	3	20	7
5 - 10	24	1	25	7
7 - 7	23	2	20	10
5 - 4	39	3	34	13
7 - 2	29	3	34	6
7 - 4	28	6	35	11
5 - 7	25	2	27	4
5 - 10	33	16	37	20
6 - 8	31	21	35	24

Table IX.- (Cont'd.)

V and P Scores, and Ages of Sixty-Four Boys from Western Preparatory School III; and Retest V and P Scores of 50 Boys of the Same Group.

Age Yrs.Mths.	V	P	Retest V	Retest P
5 - 7	25	6	27	10
6 - 0	23	13	29	17
5 - 11	32	14	32	25
6 - 4	20	1	23	1
5 - 8	30	5	29	16
6 - 0	25	4	31	15
8 - 2	28	3	30	3
6 - 0	24	8	23	8
6 - 1	24	11	25	10
5 - 7	28	3	26	3
5 - 5	19	10	25	23
5 - 7	27	2	30	7
6 - 10	17	4	20	5
6 - 10	29	15	26	23
6 - 0	20	24	32	14
6 - 2	15	0	21	10
5 - 11	20	3	27	5
5 - 4	28	7	22	12
5 - 5	25	0	22	1
6 - 3	32	12	35	17

Table IX.- (Cont'd.)

V and P Scores and Ages of Sixty-Four Boys from Western Preparatory School III; and Retest V and P Scores of 50 Boys of the Same Group.

Age Yrs.Mths.	V	P	Retest V	Retest P
6 - 3	24	19	30	26
5 - 5	22	3	19	0
5 - 11	19	1	21	1
5 - 4	28	3	24	5
5 - 8	25	0	17	2
5 - 9	22	21	31	27
5 - 4	21	2	18	7
6 - 3	16	6	13	2
5 - 5	13	7	15	5
6 - 4	30	5	37	7
5 - 11	35	2		
6 - 1	24	12		
7 - 2	22	8		
5 - 5	24	4		
6 - 4	19	3		
6 - 4	36	22		
5 - 8	23	7		
5 - 7	15	7		
5 - 9	28	5		
6 - 1	33	17		
5 - 4	24	27		
5 - 6	27	0		
6 - 2	26	3		
6 - 1	36	28		

Table X.-

V and P Scores, and Ages of Sixty Girls from Western Preparatory School III; and Retest V and P Scores of 50 Girls of the Same Group.

Age Yrs.Mths.	V	P	Retest V	Retest P
5 - 11	14	12	21	17
5 - 4	8	3	10	9
5 - 6	29	18	34	17
5 - 4	23	7	19	5
5 - 1	29	4	28	5
5 - 5	21	1	22	7
6 - 3	6	3	13	3
6 - 1	21	0	24	12
5 - 8	28	0	28	8
5 - 9	27	3	25	10
5 - 9	25	15	22	18
5 - 9	27	4	27	22
6 - 5	29	12	30	19
6 - 0	21	13	31	29
6 - 1	27	11	30	23
6 - 2	30	3	27	6
8 - 2	36	26	36	27
6 - 0	25	10	29	16
5 - 6	26	9	23	7
8 - 2	28	9	28	15

Table X.- (Cont'd.)

V and P Scores, and Ages of Sixty Girls from Western Preparatory School III; and Retest V and P Scores of 50 Girls of the Same Group.

Age Yrs.Mths.	V	P	Retest V	Retest P
8 - 2	22	9	24	14
6 - 2	28	4	19	7
6 - 5	18	1	19	4
5 - 11	25	14	26	18
5 - 11	30	26	35	27
6 - 2	34	22	35	26
6 - 2	24	4	24	5
6 - 4	25	3	30	3
5 - 6	27	3	27	5
6 - 4	30	5	37	7
7 - 4	28	3	31	16
5 - 10	21	3	31	3
6 - 1	30	4	29	8
7 - 0	33	3	31	12
6 - 2	31	19	36	23
5 - 10	29	20	34	21
6 - 7	22	10	25	11
6 - 2	30	0	28	16
5 - 5	15	24	26	17
7 - 1	35	22	35	27

Table X.- (Cont'd.)

V and P Scores, and Ages of Sixty Girls from Western Preparatory School III; and Retest V and P Scores of 50 Girls of the Same Group.

Age Yrs.Mths.	V	P	Retest V	Retest P
5 - 10	25	2	28	15
5 - 7	23	5	25	7
6 - 9	27	12	30	18
6 - 3	29	2	29	15
6 - 2	32	23	34	25
6 - 0	30	2	33	11
6 - 3	29	19	23	17
6 - 4	32	9	28	23
5 - 8	17	8	18	11
6 - 2	29	11	29	16
6 - 1	33	17		
6 - 1	36	27		
5 - 4	24	28		
6 - 2	26	0		
6 - 2	27	5		
7 - 2	21	7		
5 - 9	26	4		
6 - 2	24	3		
6 - 1	18	7		
5 - 4	32	23		

APPENDIX 2

FREQUENCY DISTRIBUTION

APPENDIX 2

FREQUENCY DISTRIBUTION

Table XI.-

Frequency Distribution of V Scores of 104 Boys and 100 Girls in Primary School in New Providence.

Scores	Frequencies	
	Boys	Girls
45 - 49	0	0
40 - 44	1	0
35 - 39	7	6
30 - 34	23	25
25 - 29	37	37
20 - 24	22	23
15 - 19	11	6
10 - 14	1	1
5 - 9	2	2
0 - 4	0	0

Table XII.-

Frequency Distribution of P Scores of 104 Boys and 100 Girls in Primary School in New Providence.

Scores	Frequencies	
	Boys	Girls
33 - 35	0	0
30 - 32	0	1
27 - 29	4	2
24 - 26	8	6
21 - 23	3	7
18 - 20	7	7
15 - 17	7	12
12 - 14	8	9
9 - 11	6	12
6 - 8	16	8
3 - 5	25	25
0 - 2	20	11

APPENDIX 3

ABSTRACT OF

Sex Differences in the Verbal Ability of Primary School Children in New Providence

APPENDIX S

ABSTRACT OF

Sex Differences in the Verbal Ability of Primary School Children in New Providence.[1]

The vast amount of research in sex differences in verbal ability in the United States of America points to a female superiority in this area. This study was conducted to test the null hypothesis that primary school boys and girls in New Providence do not differ significantly in verbal ability as measured by the Verbal Meaning and Perceptual Speed factors of the SRA Primary Mental Abilities Test.

The sample consisted of 104 boys and a hundred girls in Class I, the first year of formal education. It was chosen from three schools which together were considered representative of all socioeconomic levels in this island. The subjects were tested on the Verbal Meaning and Perceptual Speed factors of the Primary Mental Abilities Test.

The differences on both tests were small and insignificant so the null hypothesis was upheld. However, the trend indicated differences in verbal ability in favour of

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1 Mizpah C. Tertullien, master's thesis presented to the School of Psychology and Education of the University of Ottawa, Ontario, March 1964, x- 53 p.

the female, supporting the findings of many researchers in this field.

Some recommendations were made for future research on this population.