SEX VARIABILITY

by

Hazel Summerfield, B.S. in Ed.

SUBMITTED IN PARTIAL FULFILMENT OF THE
REQUIREMENTS FOR THE DEGREE OF
MASTER OF ARTS

in the

GRADUATE SCHOOL

of the

UNIVERSITY OF MISSOURI

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Approved W.H. Pyle.

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The question of variation has long been of interest to scientists. Since the time of Darwin we find investigators endeavoring to determine which sex is the more variable. In a well known controversy on this subject between Havelock Ellis and Karl Pearson, the conflicting opinions are clearly illustrated as shown by the following quotations:-

"A precise knowledge of the actual facts of the life of men and women forbids us to dogmatise rigidly concerning the respective spheres of men and women. It is a matter which experience alone can demonstrate in detail.....It lays the axe at the root of many pseudo-scientific superstitions.....Yet there are certain general conclusions which have again and again presented themselves, even when we have been occupied in considering very diverse aspects of the physical and psychic phenomena of human life. One of these is the greater variability of the male; this is true for almost the whole of the field we have covered, and it has social and practical consequences of the widest significance. The whole of our human civilization would have been a different thing, if in early zoological epochs the male had not acquired a greater variational tendency than the female." (x)

In criticism of this view Karl Pearson asserts:-

"Unfortunately the writer of these very sentences has done much to perpetuate some of the worst of the pseudo-scientific superstitions to which he refers, notably that of the greater variability of the male human being.....The object

(x) H. Ellis "Man and Woman"--London--1897.

of this essay is to lay the axe to the root of this pseudo-scientific superstition. It will not be necessary to prove that the male is either more or less variable than the female, but merely to show that when the proper statistics are considered and are dealt with scientifically there is no evidence to show a preponderating variability in man." (x)

By "proper statistics" Pearson explains that he means those obtained by testing "a normal sample of the population as free as possible from pathological abnormalities, and fairly numerous". He admits the difficulty of finding such and makes a study of all available physical data with apologies for its meagerness and the unreliability of some of it.

Unfortunately he has not touched the question of the variability with reference to mental characteristics. The great need of empirical data for a study of this phase of the question has led me to give certain standard mental tests to eleven hundred school children. I have also worked up the results which several persons have obtained by giving the same or similar tests to other groups.

Before discussing either physical or mental data, I shall give the opinions of earlier investigators in this field, dividing them into four groups as follows:-

1. Those who believe in greater male variability.
2. Those who maintain that the female is more variable.
3. Those who assert that there is no difference.
4. Those who find contradictory evidence sufficient to prevent them from forming a decided opinion.

(x) Karl Pearson "The Chances of Death" London 1897.
Volume 1--Page 37.

The personnel of the groups follows with a brief indication of the material upon which each based his decision.

GROUP I. Advocates of Greater Male Variability.

1. Darwin---A study of the evolution of man.
2. E. L. Thorndike---Calculated the data of Helen B. Thompson and a few original measures of reaction time, spelling and arithmetical ability.
3. Geddes and Thompson---A study of the evolution of sex.
4. Brooks---A study of the evolution of sex.
5. Havelock Ellis---Anatomical and pathological data and a study of eminent men.
6. Fox and Thorndike---Arithmetical abilities of 28 boys and 42 girls.
7. C. Burt and R. C. Moore---Tests of Wallasey school children.
8. Bobertag---Results of Binet tests.
9. J. Jacobs---Studies in Jewish statistics.
10. Edward Carpenter---Study of the evolution of woman.
11. Professor Marshall---Study of Boyd's tables of brain measurements.
12. Results of the tapping test.
13. Clark Wissler---Tests upon 42 college students.

GROUP II. Advocates of Greater Female Variability.

1. Meckel---Pathological data.
2. Karl Pearson---Physical data.
3. H. L. Hollingworth---Judgments of persuasivements using advertisements and 40 college students as subjects.

GROUP II. Continued.

4. Gertrude Kupper---The responses to appeals of 200 children.
5. Stone---Arithmetical abilities of 250 boys and 250 girls.
6. L. S. Hollingworth---Review of the literature leads one to to believe that the females are more variable.

GROUP III. Advocates of Equal Variability.

1. Courtis---Arithmetic tests.
2. H. H. Goddard---Binet tests.
3. Terman---Binet tests of 1000 children.
4. Trabue.
5. H. T. Woolley.

GROUP IV. Writers With Contradictory Evidence.

1. Bonser---
   a). Arithmetical abilities---358 boys and 372 girls. Boys 66% as variable as girls.
   b). Controlled association and selective judgment---Two trials for each test revealed boys more variable in one trial and girls in the other.
   c). Literary interpretation---Boys more variable.
   d). Spelling---Boys more variable.
2. Wm. Brown---
   a). Cancellation of E and R---Females more variable.
   b). Cancellation of S,A,N and O---Males more variable.
   c). Motor performance---Equal variability.
   d). Addition test---Males more variable in speed and females more variable in accuracy.

e). Müller-Lyer illusion test---Male children more variable and female adults more variable.

3. Lipmann---Binet tests.

a). 53% of series---Males more variable.

b). 37% of series---Females more variable.

c). 10% of series---Equal variability.

4. G. C. Meyer---

a). Incidental memory for bills, coins and stamps. 337 males and 367 females divided into 182 groups. 65 groups show greater variability for the males. 107 groups show greater variability for the females. 10 groups show equal variability.

b). Incidental memory for words---773 males and 890 females. Females vary more in the High School and fourth grades. The males vary more in the fifth, sixth, seventh and eighth grades.

5. E. K. Strong---A study of the relative merits of advertisements by the method of relative position. Subjects--15 men and 10 women. Two trials. In one the A. D. for women was 69% greater then that of men. In the other trial the men were more variable.

In comparing these groups we find that the first, advocating greater male variability, contains more names than any of the other groups. However, when considered chronologically, we observe that the third group contains the later investigators. From this we might conclude that the later studies indicate that there is practically no sex difference

in variability in spite of their limitations as to number of subjects and range of traits and functions measured.

Having stated my problem and briefly mentioned the import of previous investigations, I shall review, in tabular form, all physical data that throw light on the subject. In these tables I have used abbreviations for the various races, sources of information and units of measurement and comparison. The abbreviations, with their equivalents, follow:-

Abbreviations for Races.

1. A. Br.-----Ancient Britons.
2. A. Gaul.---Ancient Gaulish.
3. A. Ger.----Ancient German.
4. Ain.-------Aino.
5. Alt. B.----Alt-Bayerisch.
6. Am.--------American.
7. An. Can.---Ancient inhabitants of the Canaries.
8. And.-------Andamanese.
9. A. Rom.----Ancient Roman.
10. A. Sa.-----Anglo-Saxon.
11. Au. A.-----Australian Aborigines.
12. A. Sw.-----Ancient Swiss.
13. Bad.-------Badensian.
14. Bav.-------Bavarian.
15. Bel.-------Belgian.
16. Egy.-------Egyptian.
17. Eng.-------English.
18. Eng. L.----English living.

Abbreviations for Races. Continued.

19. Eng. Mar.---English Married.
20. Eng. Sin.---English Single (unmarried).
21. Eng. W.-----English Whitechapel skulls.
22. E. S.-------English Scotch.
23. Etr.--------Etruscan.
24. Fr.---------French.
25. Fr. C.------French Cite.
26. Fr. Ca.-----French Catacomb skulls.
27. Fr. W.------French West End (of Paris).
28. Frie.-------Friesian.
29. Ger.--------German.
30. It.---------Italian.
31. Kan.--------Kanakas.
32. Lib.--------Libyan.
33. Naq.--------Naquadas.
34. Neg.--------Negro (African).
35. Neol.-------Neolithic man.
36. Ob. F.------Ober-frankisch.
37. Panj.-------Panjabi.
38. Per.--------Peruvian.
39. Poly.-------Polynesian.
40. Rom.--------Roman.
41. Sax.--------Saxon.
42. Scan.-------Scandinavian.
43. S. & Den.---Aborigines of Sweden and Denmark.

Abbreviations for Sources.

1. Dav.--------C. B. Davenport.
2. Gal.--------Frances Galton.

Abbreviations for Sources. Continued.

3. Pe.-------Karl Pearson.

4. Po.-------W. T. Porter.

Abbreviations for Units of Measurements and Comparison.

1. No.-------Number of individuals measured.

2. S. D.-----Standard deviation.

3. C. V.-----Coefficient of variability.

*4. All of the data furnished by Davenport, Galton and Pearson are comparable because they have used the same units of measurement and have found the C. V. by dividing the S. D. by the mean (average). I have not taken the time to change the figures of S. D. Porter, who computed the C. V. by dividing the P. E. by the mean, into those used by the other three men because, for the purpose of comparison of the variabilities of the sexes, it was not necessary. For this reason I have not discussed the differences between the S. D.s or the C. V.s of the four groups of data.

4. P.E.-----------Probable error.(.6745 x S.D.)

STATURE.

Sex	Age	No.	Mean	S.D.	C.V.	Race	Source
M.	New-b.		20.503 in.	1.332 in.	6.500	Eng.	Dav.
F.	"		20.124 "	1.117 "	5.849	"	"
M.	23-51	811	67.9 "	2.55 "	3.75	"	Gal.
F.	" "	770	63.3 "	2.40 "	3.79	"	"
M.	19-30	1077	68.93 "	2.506 "	3.636	"	Pe.
F.	" "	135	63.82 "	2.419 "	3.790	"	"
M.		683	69.215 "	2.592 "	3.74	"Sin.	Dav.
F.		652	64.043 "	2.325 "	3.63	" "	"
M.		200	69.135 "	2.628 "	3.66	"Mar.	"
F.		200	63.869 "	2.303 "	3.60	" "	"
M.		6194	67.36 "	2.54 "	3.8	Eng.	
F.		379	62.65 "	2.37 "	3.8	"	
M.	-65	1000	172.81 cm.	7.04 cm.	4.07	"	Pe.
F.	"	1000	159.90 "	6.44 "	4.03	"	"
M.	20-25		66.95 in.	2.475 "	3.70	A.W.	Dav.
F.	" "		62.50 "	2.365 "	3.79	" "	"
M.	25.30		67.30 "	2.562 "	3.81	" "	"
F.	" "		62.76 "	2.432 "	3.87	" "	"
M.	30-40		67.15 "	2.587 "	3.86	" "	"
F.	" "		62.44 "	2.303 "	3.69	" "	"
M.	40-50		66.91 "	2.618 "	3.91	" "	"
F.	" "		62.96 "	2.555 "	4.06	" "	"
M.	50-60		66.74 "	2.633 "	3.95	" "	"
F.	" "		62.22 "	2.591 "	4.16	" "	"

STATURE.Cont'd.

Sex	Age	No.	Mean		S.D.		C.V.	Race	Source
M.	60-		66.26	in.	2.682	in.	4.04	A.W.	Dav.
F.	"		61.31	"	2.300	"	3.75	" "	"
M.			166.26	cm.	5.50	cm.	3.30	Fr.	"
F.			154.02	"	5.52	"	3.52	"	"
M.		284	166.8	"	6.47	"	3.88	"	Pe.
F.		135	156.1	"	6.79	"	4.35	"	"
M.		390	165.93	"	6.68	"	4.02	Ger.	"
F.		266	153.85	"	6.55	"	4.26	"	"
M.	6	709	108.94	"	3.40	"	3.1	Am.	Po.
F.	6	780	107.67	"	3.42	"	3.2	"	"
M.	7	1850	114.03	"	3.61	"	3.2	"	"
F.	7	1791	112.95	"	3.75	"	3.3	"	"
M.	8	2223	119.13	"	3.89	"	3.3	"	"
F.	8	2193	118.36	"	3.70	"	3.1	"	"
M.	9	2205	124.35	"	3.75	"	3.0	"	"
F.	9	2122	123.67	"	3.83	"	3.1	"	"
M.	10	2087	128.87	"	3.98	"	3.1	"	"
F.	10	2053	128.43	"	4.06	"	3.1	"	"
M.	11	1819	133.84	"	4.23	"	3.2	"	"
F.	11	1772	133.19	"	4.48	"	3.2	"	"
M.	12	1653	138.21	"	4.47	"	3.2	"	"
F.	12	1732	139.11	"	5.23	"	3.4	"	"
M.	13	1268	142.91	"	4.98	"	3.5	"	"
F.	13	1322	146.53	"	5.46	"	3.8	"	"

STATURE.Cont'd.

Sex	Age	No.	Mean	S.D.	C.V.	Race	Source
M.	14	925	148.58 cm.	5.58 cm.	3.8	Am.	Po.
F.	14	1085	150.84 "	5.15 "	3.7	"	"
M.	15	490	154.90 "	6.33 "	4.1	"	"
F.	15	680	155.04 "	4.01 "	3.4	"	"
M.	16	189	160.27 "	5.87 "	3.7	"	"
F.	16	420	157.52 "	4.05 "	2.6	"	"
M.	17	78	165.13 "	5.15 "	3.1	"	"
F.	17	206	159.33 "	3.45 "	2.2	"	"
M.	18	29	170.41 "	4.98 "	2.8	"	"
F.	18	164	159.42 "	3.39 "	2.1	"	"
M.	5.5				5.12	Can.	Boas
F.	5.5				4.80	"	"
M.	6.5				4.82	"	"
F.	6.5				4.80	"	"
M.	7.5				5.08	"	"
F.	7.5				5.30	"	"
M.	8.5				5.58	"	"
F.	8.5				5.53	"	"
M.	9.5				5.59	"	"
F.	9.5				5.32	"	"
M.	10.5				6.15	"	"
F.	10.5				6.20	"	"
M.	11.5				6.15	"	"
F.	11.5				6.52	"	"

STATURE.Cont'd.

Sex	Age	No.	Mean	S.D.	C.V.	Race	Source
M.	12.5				6.80	Can.	Boas
F.	12.5				6.96	"	"
M.	13.5				7.79	"	"
F.	13.5				7.17	"	"
M.	14.5				8.55	"	"
F.	14.5				6.35	"	"
M.	15.5				9.00	"	"
F.	15.5				5.86	"	"

The above table presents data from many sources and of individuals of different ages. It is therefore very difficult exactly to determine its significance. I shall first consider the results by races.

Averaging the six groups of English adult data I find the males more variable by .003 of 1 %, so I may safely say the sexes are equal in variability so far as those data are concerned. New-born British boys are slightly more variable to the extent of .651 of 1 %.

French and German adult statistics indicate a preponderance of variability on the side of the female but the series are much less extensive than the English.

I have treated the measures of the Australian Whites separately and discover here that the females are .008 of 1.% more variable, indicating practically equal sex variability.

The most complete series of measurements are those of American children in the St. Louis schools. The boys are more variable when the C.V. for all ages are averaged but the difference is very slight, being only.223 of 1 %. One interesting point is that they are more variable in the ages from fourteen to eighteen inclusive, the preponderance being .7 of 1 %.

Another study of school children is that of Boas with Canadians as subjects and here again the boys are a trifle more variable. The figures are .53 of 1 % greater for the males and the difference is especially noticeable in the three highest ages.

In summing up the evidence, then , there seems to be little preponderance of variability for either sex to an extent worth considering, However, both Porter and Boas seem to show a slight though definite tendency toward greater male variability in later adolescence.

HEIGHT SITTING.

Sex	Age	No.	Mean	S.D.	C.V.	Race	Source
M.	23-51	1913	36.0 in.	1.41 in.	3.91	Eng.	Gal.
F.	" "	775	33.9 "	1.21 "	3.58	"	"
M.	6	714	61.31cm.	2.82 cm.	4.6	Am.	Po.
F.	6	751	59.45 "	2.03 "	3.4	"	"
M.	7	1853	63.32 "	2.64 "	4.2	"	"
F.	7	1727	61.80 "	2.19 "	3.5	"	"
M.	8	2239	64.74 "	2.26 "	3.5	"	"
F.	8	2120	63.97 "	2.04 "	3.2	"	"
M.	9	2258	66.73 "	2.34 "	3.5	"	"
F.	9	2071	66.16 "	2.11 "	3.2	"	"
M.	10	2118	69.25 "	2.42 "	3.5	"	"
F.	10	2037	68.19 "	2.19 "	3.2	"	"
M.	11	1828	70.67 "	2.56 "	3.6	"	"
F.	11	1748	10.03 "	2.37 "	3.4	"	"
M.	12	1656	72.55 "	2.72 "	3.8	"	"
F.	12	1707	72.67 "	2.61 "	3.6	"	"
M.	13	1285	74.20 "	2.74 "	3.7	"	"
F.	13	1354	76.03 "	2.87 "	3.8	"	"
M.	14	936	76.84 "	3.15 "	4.1	"	"
F.	14	1065	78.68 "	3.11 "	4.0	"	"
M.	15	498	79.74 "	3.59 "	4.5	"	"
F.	15	674	81.42 "	2.54 "	3.1	"	"
M.	16	193	82.28 "	3.48 "	4.2	"	"
F.	16	411	83.76 "	2.36 "	2.8	"	"

HEIGHT SITTING. Cont'd.

Sex	Age	No.	Mean	S.D.	C.V.	Race	Source
M.	17	77	85.68 cm.	3.77 cm.	4.4	Am.	Po.
F.	17	202	84.66 "	2.17 "	2.6	"	"
M.	18	31	88.23 "	2.89 "	3.3	"	"
F.	18	167	85.20 "	1.72 "	2.0	"	"

In sitting height therenis but one comparison of adult statistics and that is one made by Galton and shows the males more variable by .33 of 1 %.

The only other available data on this measure are those of Porter on American children. Here the males are more variable in every age but that of thirteen years. The average variability from sixteen to eighteen years is .7 of 1 % greater for the males. In discussion of this, Pearson concludes that less variability in sitting height is a secondary sex characteristic of the female and these limited data certainly indicate it.

SPAN OF ARMS.

Sex	Age	No.	Mean	S.D.	C.V.	Race	Source
M.	23-51	811	69.9 in.	3.06 in.	4.38	Eng.	Gal.
F.	" "	770	63.0 "	2.77 "	4.39	"	"
M.	-65	1000	69.09 "	3.172 "	4.591	"	Pe.
F.	-"	1000	62.20 "	2.88 "	4.632	"	"
M.	6	708	108.95cm.	3.85 cm.	3.5	Am.	Po.
F.	6	769	106.96 "	3.87 "	3.6	"	"
M.	7	1862	114.42 "	4.16 "	3.6	"	"
F.	7	1724	112.36 "	4.18 "	3.7	"	"
M.	8	2234	120.07 "	4.18 "	3.5	"	"
F.	8	2152	118.33 "	4.28 "	3,6	"	"
M.	9	2272	125.18 "	4.25 "	3.4	"	"
F.	9	2065	123.63 "	4.18 "	3.4	"	"
M.	10	2076	130.22 "	4.70 "	3.6	"	"
F.	10	2045	128.75 "	4.69 "	3.6	"	"
M.	11	1810	135.13 "	4.84 "	3.6	"	"
F.	11	1757	134.24 "	4.87 "	3.6	"	"
M.	12	1664	140.60 "	4.57 "	3.2	"	"
F.	12	1718	140.07 "	4.51 "	3.2	"	"
M.	13	1281	145.09 "	5.71 "	3.9	"	"
F.	13	1368	147.19 "	5.55 "	3.8	"	"
M.	14	934	151.28 "	6.03 "	4.0	"	"
F.	14	1088	152.58 "	5.29 "	3.5	"	"
M.	15	495	158.43 "	7.15 "	4.5	"	"
F.	15	677	156.38 "	4.58 "	2.9	"	"

SPAN OF ARMS. Cont'd.

Sex	Age	No.	Mean	S.D.	C.V.	Race	Source
M.	16	189	163.96 cm.	7.89 cm.	4.8	Am.	Po.
F.	16	413	158.51 "	4.41 "	2.8	"	"
M.	17	75	168.56 "	5.03 "	3.0	"	"
F.	17	202	159.01 "	4.05 "	2.5	"	"
M.	18	32	175.31 "	4.31 "	2.5	"	"
F.	18	164	160.47 "	4.28 "	2.7	"	"

Galton and Pearson each furnish us with a series of adult English span statistics and both point to greater female variability.

On the other hand, in American children, the preponderance is on the side of the males when all ages are averaged. Again I find the older boys, ranging from 13 to 17 years inclusive, more variable, and the slightly greater female variability in the eighteenth year might be due to the fact that there were only 32 males measured. Girls are more variable at ages 6, 7, and 8; the sexes have equal variability at ages 9, 10, 11, and 12; and from 13 on to 17 the males are more variable.

LONG-BONES.

Sex	Bone	No.	Mean	S.D.	C.V.	Race	Source
M.	L.F.	56	45.114 cm.	2.277 cm.	5.05	Lib.	Pe.
F.	L.F.	54	42.536 "	1.899 "	4.46	"	"
M.	L.T.	65	36.054 "	2.199 "	6.10	"	"
F.	L.T.	71	33.832 "	1.674 "	4.94	"	"
M.	L.H.	36	31.475 "	1.639 "	5.21	"	"
F.	L.H.	51	29.424 "	1.504 "	5.11	"	"
M.	R.R.	23	25.406 "	1.189 "	4.68	"	"
F.	R.R.	29	23.230 "	1.225 "	5.27	"	"
M.	F.	110	44.327 "	2.098 "	4.73	Neol.	"
F.	F.	45	40.156 "	1.813 "	4.51	"	"
M.	F.	163	45.006 "	2.088 "	4.64	An.Can.	"
F.	F.	124	41.155 "	1.937 "	4.71	" "	"
M.	L.F.	49	45.371 "	2.293 "	5.05	Fr.	"
F.	L.F.	50	42.342 "	2.135 "	5.04	"	"
M.	L.T.	46	36.548 "	1.818 "	4.976	"	"
F.	L.T.	48	33.381 "	1.791 "	5.365	"	"
M.	L:H.	48	32.642 "	1.599 "	4.89	"	"
F.	L.H.	48	29.246 "	1.641 "	5.61	"	"
M.	R.R.	48	24.398 "	1.189 "	4.87	"	"
F.	R.R.	49	21.490 "	1.125 "	5.23	"	"
M.	L.Fo.	1000	18.384 in.	.964 in.	5.24	Eng.	"
F.	" "	1000	16.534 "	.848 "	5.13	"	"

LONG BONES.Cont'd.

Sex	Bone	No.	Mean	S.D.	C.V.	Race	Source
M.	R.F.	44	40.770 cm.	1.899 cm.	4.65	Ain.	Pe.
F.	R.F.	25	38.204 "	1.598 "	4.18	"	"
M.	R.T.	38	33.89 "	1.669 "	4.92	"	"
F.	R.T.	22	31.86 "	1.434 "	4.50	"	"
M.	R.H.	45	29.50 "	1.342 "	4.55	"	"
F.	R.H.	28	27.39 "	1.279 "	4.57	"	"
M.	R.R.	39	22.91 "	1.117 "	4.88	"	"
F.	R.R.	24	21.08 "	1.009 "	4.79	"	"

ABOVE DATA COMBINED BY PEARSON.

Sex	Femur	Tibia	Humerus	Radius
M.	4.82	5.33	4.88	4.81
F.	4.58	4.93	5.10	5.10

Professor Flinders Petrie took four hundred skeletons of the Libyan race, of 4000 B. C. to England and Mr. E. Warren of University College, London, took a complete series of measurements of them. The latter permitted Karl Pearson to use the long-bone data in his essay on "Variation in Man and Woman".

The statistics for the femurs of Neolithic man and the inhabitants of the Canary Islands were obtained by Pearson from a paper by J. Rahon, "La taille prehistorique".

Dr. E. Rollet is responsible for the modern French measurements and the Japanese University of Tokio for those of the Aino race. Mr. Pearson has certainly gathered his material from sources far and near. His collection of Family

Measurement Cards has furnished the English numbers.

In comparing all of these the femur measurements show greater variability for men in four cases, greater variability for women in one case and in the other, equal variability.

The radius and tibia statistics show the male more variable, and the humerus shows the preponderance on the side of the females. When the whole series is combined, we find greater male variability in the femur and tibia and greater female variability in the humerus and radius. In averaging the S. D.s of the four bone measurements the result for the male is 4.96 and that for the female 4.93. This indicates practically equal sex variability as far as these measurements are concerned.

WEIGHT.

Sex	Age	No.	Mean	S.D.	C.V.	Race	Source
M.	New-b.		7.301 lb.	1.144 lb.	15.66	Eng.	Dav.
F.	" "		7.073 "	1.006 "	14.23	"	"
M.	19-30	1017	154.044 "	16.514 "	10.72	"	Pe.
F.	" "	137	126.590 "	13.990 "	11.051	"	"
M.		520	64.86 kg.	4.54 kg.	10.37	"	Gal.
F.		276	55.34 "	4.60 "	13.37	"	"
M.	New-b.	861	3.335 "	.512 "	15.65	"	Pe.
F.	" "	770	3.225 "	.466 "	14.44	"	"
M.	" "	451	3.230 "	.508 "	15.74	E.S.	"
F.	" "	466	3.152 "	.481 "	15.28	" "	"
M.	" "	500	3.238 "	.439 "	13.56	Ger.	"
F.	" "	500	3.151 "	.418	13.278	"	"
M.	" "	63	3.289 "	.482 "	14.66	Bel.	"
F.	" "	56	3.053 "	.538 "	17.62	"	"
M.		535	50.171 "	10.38 "	20.67	Ger.	"
F.		340	41.922 "	10.51 "	25.07	"	"
M.	6	707	19.75 "	1.43 "	7.2	Am.	Po.
F.	6	798	18.93 "	1.44 "	7.6	"	"
M.	7	1814	21.67 "	1.68 "	7.8	"	"
F.	7	1714	20.82 "	1.88 "	9.0	"	"
M.	8	2188	23.78 "	1.96 "	8.2	"	"
F.	8	2147	22.88 "	1.95 "	8.5	"	"
M.	9	2188	26.06 "	2.09 "	8.0	"	"
F;	9	2055	25.08 "	2.23 "	8.9	"	"

WEIGHT.Cont'd.

Sex	Age	No.	Mean	S.D.	C.V.	Race	Source
M.	10	2064	28.32 kg.	2.23 kg.	7.9	Am.	Po.
F.	10	1947	27.49 "	2.31 "	8.4	"	"
M.	11	1743	31.00 "	2.60 "	8.4	"	"
F.	11	1708	30.15 "	2.91 "	9.6	"	"
M.	12	1644	33.51 "	2.46 "	7.3	"	"
F.	12	1676	33.66 "	3.31 "	9.8	"	"
M.	13	1242	36.61 "	3.88 "	10.6	"	"
F.	13	1343	38.49 "	4.22 "	11.0	"	"
M.	14	946	40.44 "	4.56 "	11.3	"	"
F.	14	1082	42.29 "	4.67 "	11.0	"	"
M.	15	498	46.22 "	5.06 "	11.0	"	"
F.	15	690	46.69 "	4.05 "	8.7	"	"
M.	16	203	51.60 "	6.16 "	12.0	"	"
F.	16	420	50.25 "	4.24 "	8.4	"	"
M.	17	71	55.67 "	4.38 "	7.9	"	"
F.	17	230	52.61 "	3.70 "	7.0	"	"

In weight we have four groups of data for new-born. The males are more variable in three out of the four groups. The conflicting group is so small in comparison with the other three that it is not deserving of much consideration.

In averaging the C. V. of the various ages of American school children I find the girls more variable by .02 of 1%, but in considering the ages separately, I notice greater female variability in the eight earliest ages, equal variability at 15, and greater male variability in the next four ages.

Summarizing weight statistics we find males more variable at birth; greater female variability from 6 to 14 years inclusive; preponderance for the males in ages 14 to 17 inclusive; and adult females more variable.

Therefore, we conclude that sex variability in weight is a matter of age, and no generalization can be made.

LENGTH OF HEAD.

Sex	Age	No.	Mean	P.E.	C.V.	Race	Source
M.	6	606	178.39 mm.	4.21 mm.	2.36	Am.	Po.
F.	6	606	173.45 "	4.20 "	2.42	"	"
M.	7	1493	178.54 "	4.57 "	2.56	"	"
F.	7	1511	174.09 "	4.22 "	2.42	"	"
M.	8	2079	179.62 "	4.85 "	2.70	"	"
F.	8	2125	175.18 "	4.26 "	2.43	"	"
M.	9	1986	180.72 "	4.87 "	2.69	"	"
F.	9	1884	176.39 "	4.39 "	2.39	"	"
M.	10	1912	181.45 "	4.13 "	2.28	"	"
F.	10	1790	177.24 "	4.33 "	2.44	"	"
M.	11	1654	182.37 "	5.26 "	2.89	"	"
F.	11	1560	178.08 "	4.70 "	2.64	"	"
M.	12	1576	182.84 "	4.56 "	2.49	"	"
F.	12	1516	179.50 "	4.46 "	2.49	"	"
M.	13	1207	183.84 "	4.55 "	2.48	"	"
F.	13	1187	181.44 "	4.55 "	2.51	"	"
M.	14	890	186.93 "	5.44 "	2.91	"	"
F.	14	1008	183.41 "	4.53 "	2.47	"	"
M.	15	502	187.01 "	4.66 "	2.49	"	"
F.	15	649	185.12 "	4.58 "	2.47	"	"
M.	16	191	189.06 "	4.93 "	2.61	"	"
F.	16	400	186.84 "	5.12 "	2.74	"	"
M.	17	78	189.45 "	5.08 "	2.68	"	"
F.	17	221	188.14 "	4.09 "	2.17	"	"

LENGTH OF HEAD. Cont'd.

Sex	Age	No.	Mean	P.E.	C.V.	Race	Source
M.	18	32	193.91 mm.	4.13 mm.	2.13	Am,	Po,
F.	18	161	187.97 "	3.20 "	1.70	"	"
			WIDTH OF HEAD.				
M.	6	573	143.29 "	2.82 "	1.97	"	"
F.	6	609	140.27 "	3.81 "	2.72	"	"
M.	7	1571	144.37 "	3.58 "	2.48	"	"
F.	7	1505	141.40 "	3.86 "	2.73	"	"
M.	8	1997	145.30 "	3.68 "	2.53	"	"
F.	8	1985	142.31 "	3.66 "	2.57	"	"
M.	9	1962	145.87 "	3.74 "	2.56	"	"
F.	9	1914	143.04 "	3.65 "	2.55	"	"
M.	10	1827	146.59 "	3.85 "	2.63	"	"
F.	10	1803	143.75 "	3.96 "	2.76	"	"
M.	11	1561	147.29 "	3.76 "	2.55	"	"
F.	11	1541	145.05 "	3.80 "	2.62	"	"
M.	12	1531	147.98 "	3.61 "	2.44	"	"
F.	12	1460	145.64 "	4.03 "	2.77	"	"
M.	13	1175	148.73 "	3.90 "	2.62	"	"
F.	13	1167	146.78 "	3.92 "	2.67	"	"
M.	14	873	149.50 "	3.82 "	2.56	"	"
F.	14	927	147.90 "	3.96 "	2.68	"	"
M.	15	469	149.63 "	4.03 "	2.69	"	"
F.	15	658	148.29 "	3.84 "	2.59	"	"
M.	16	195	150.98 "	3.48 "	2.31	"	"

WIDTH OF HEAD. Cont'd.

Sex	Age	No.	Mean	S.D.	P.E.	Race	Source
F.	16	395	148.95 mm.	4.17 mm.	2.80	Am.	Po.
M.	17	75	152.09 "	4.21 "	2.77	"	"
F.	17	221	150.04 "	3.60 "	2.40	"	"
M.	18	32	151.66 "	3.88 "	2.56	"	"
F.	18	165	149.09 "	3.85 "	2.58	"	"

Porter, alone, has given us length and width measurements of the head, and here we find a peculiar condition.

In length of head the boys are noticeably more variable, their average being .13 of 1% greater in both earlier and later ages. The opposite situation is found in width of head, the females being more variable by about .16 of 1%. In considering these statistics age 18 was omitted in both measurements.

CEPHALIC INDEX.----ANCIENT CELTIC AND TEUTONIC.

Sex	Age	No.	Mean	S.D.	C.V.	Race	Source
M.		62	78.89	6.36	8.06	Swiss	Pe.
F.		36	80.51	5.54	6.88	"	"
M.		24	73.71	2.283	3.09	A.Ger.	"
F.		20	74.07	2.349	3.17	" "	"
M.		36	78.36	4.44	5.66	A.Gaul	"
F.		25	75.40	4.31	5.71	" "	"
M.		115	77.3	5.51	7.12	A.Br.	"
F.		30	76.8	5.42	7.05	" "	"
M.		36	77.31	3.41	4.41	Rom.	"
F.		13	76.08	3.45	4.53	"	"
M.		83	77.75	3.57	4.59	Frie.	"
F.		40	79.03	3.78	4.79	"	"
M.		35	75.00	3.13	4.18	A.Sa.	"
F.		21	75.05	2.55	3.40	" "	"
M.		35	77.86	3.97	5.09	S&Den.	"
F.		13	78.15	4.13	5.28	" "	"
M.		20	78.9	3.51	4.44	Scan.	"
F.		8	79.87	3.85	4.82	"	"
			ANCIENT CIVILIZATIONS.				
M.		84	78.53	3.31	4.21	Etr.	"
F.		36	78.31	3.46	4.42	"	"
M.		336	75.08	3.35	4.46	Egy.	"
F.		173	76.22	3.36	4.41	"	"
M.		89	73.16	2.88	3.93	Lib.	"
F.		125	74.56	2.87	3.86	"	"

CEPHALIC INDEX. ANCIENT CIVILIZATIONS.Cont'd.

Sex	Age	No.	Mean	S.D.	C.V.	Race	Source
M.		47	89.15	8.25	9.11	Per.	Pe.
F.		23	91.80	8.47	9.22	"	"
M.		LOWER RACES.					
M.		87	76.53	2.41	3.15	Ain.	"
F.		63	77.72	2.54	3.27	"	"
M.		54	73.28	2.77	3.78	Neg.	"
F..		23	74.85	3.52	4.70	"	"
M.		79	70.66	2.985	4.22	Panj.	"
F .		17	72.34	3.749	5.18	"	"
M.		69	79.29	4.325	5.43	Poly.	"
F.		57	80.26	4.261	5.31	"	"
M.		12	80.56	2.631	3.26	And.	"
F.		12	82.72	2.157	2.60	"	"
M.		29	70.34	2.986	4.24	Au.A.	"
F.		5	72.20	2.023	2.80	" "	"
		MODERN CIVILIZATIONS.					
M.		50	77.036	3.796	4.92	Eng.	"
F.		25	77.308	4.044	5.23	"	"
M.		107	74.725	3.306	4.42	" W.	"
F.		102	74.990	3.367	4.49	" "	"
M.		150	77.75	2.52	3.24	" L.	"
F.		100	78.75	2.96	3.77	" "	"
M.		77	79.534	3.274	4.11	Fr.W.	"
F.		41	77.923	4.414	5.66	" "	"
M.		67	79.249	4.456	5.62	" C.	"

CEPHALIC INDEX. MODERN CIVILIZATIONS. Cont'd.

Sex	Age	No.	Mean	S.D.	C.V.	Race	Source
F.		42	78.001	2.807	3.59	Fr.G.	Pe.
M.		735	79.673	4.451	5.58	" Ca.	"
F.		283	78.130	4.220	5.40	" "	"
M.		110	80.791	4.676	5.78	It.	"
F.		30	80.017	3.636	4.54	"	"
M.		31	78.09	3.823	4.89	A'Ro.	"
F.		12	78.67	3.369	4.28	" "	"
M.		25	80.00	3.677	4.59	Dutch	"
F.		19	79.395	4.911	6.18	"	"
M.		100	83.41	3.579	4.29	Bav.	"
F.		100	83.095	2.952	3.55	"	"
M.		57	83.91	3.525	4.20	Ob-f.	"
F.		43	84.60	2.790	3.29	"	"
M.		67	83.82	4.003	4.77	Bad.	"
F.		33	83.39	3.380	4.05	"	"

The great variety of sources from which the data on cephalic index were gathered makes it practically impossible to compare one race with another. Pearson divided it into four groups, namely: Ancient; Lower; Ancient Celtic and Teutonic; and Modern.

In the first, second, and third groups the number of races are divided about half and half as regards variability of the sexes. However, Pearson averaged the S. D.s for the various groups and found that of the female slightly greater than that of the male in all but the modern group. There the male was more variable.

When the English are considered separately the women are .33 of 1% more variable. The German series indicates greater male variability and the French does also.

Unfortunately Porter did not compute the cephalic index, in spite of the fact that he had the necessary head measurements, so we have no American data. Pearson worked out a formula by which he calculated this index from Porter's measures of mean length, mean width, and the probable deviations for boys and girls. He used only the ages 6, 7, 8, 9, and 10, and concluded that the girls were slightly more variable.

After surveying the complete table there seems no possible conclusion but the one of practically equal variability for the sexes if all series are given equal weight.

SKULL CAPACITY.----- PRIMITIVE AND UNCIVILIZED RACES.

Sex	Age	No.	Mean	S.D.	C.V.	Race	Source
M.		76	1461.86 cm.	100.68 cm.	6.89	Ain.	Pe.
F.		52	1306.25 "	89.05 "	6.82	"	"
M.		54	1429.63 "	101.1 "	7.07	Neg.	"
F.		23	1256.00 "	86.7 "	6.90	"	"
M.		78	1364.6 "	98.83 "	7.24	Panj.	"
F.		17	1211.2 "	108.88 "	8.99	"	"
M.		110	1588.18 "	130.21 "	8.20	Poly.	"
F.		55	1397.09 "	77.55 "	5.55	"	"
M.		11	1244.54 "	62.61 "	5.04	And.	"
F.		12	1127.50 "	62.97 "	5.59	"	"
M.					7.72	Naq.	Dav.
F.					6.92	"	"
M.		64	77.63 oz.	5.72 oz.	7.37	Kan.	Pe.
F.		47	70.27 "	4.69 "	6.68	"	"

SKULL CAPACITY.---FOREFATHERS OF ENG.,FR.,AND GERMANS.

M.		33	1521.8 cm.	114.85 cm.	7.55	A.Sa.	Pe.
F.		14	1340.8 "	121.40 "	9.06	" "	"
M.		27	1462.9 "	119.48 "	8.17	Frie.	"
F.		21	1295.0 "	105.82 "	8.17	"	"
M.		29	1477.9 "	114.9 "	7.77	A.Sw.	"
F.		21	1374.5 "	108.6 "	7.90	" "	"
M.		56	1585.1 "	121.1 "	7.64	A.Br.	"
F.		10	1406.8 "	52.69 "	3.75	" "	"
M.		36	1542.9 "	120.70 "	7.82	A.Ro.	"
F.		11	1251.8 "	105.04 2	8.39	" "	"

SKULL CAPACITY.---ANCIENT CIVILIZATIONS.

Sex	Age	No.	Mean	S.D.	C.V.	Race	Source
M.		71	1444.17 cm.	138.39 cm.	9.58	Etr.	Pe.
F.		33	1321.12 "	112.85 "	8.54	"	"
M.		283	1383.00 "	112.40 "	8.13	Egy.	"
F.		154	1254.63 "	104.05 "	8.29	"	"
M.		39	1339.03 "	83.37 "	6.23	Lib.	"
F.		55	1242.82 "	103.12 "	8.30	"	"
M.		47	1312.08 "	112.32 "	8.48	Per.	"
F.		22	1199.23 "	85.54 "	7.13	"	"
SKULL CAPACITIES.----MODERN.							
M.		20	1339.2 "	109.6 "	8.18	Eng.	"
F.		13	1138.1 "	95.5 "	8.29	"	"
M.		26	1522.00 "	116.84 "	7.68	"W.	"
F.		32	1298.59 "	105.75 "	8.15	" "	"
M.		30	1450.00 "	111.9 "	7.72	Sax.	"
F.		26	1300.00 "	127.5 "	9.82	"	"
M.		144	1546.66 "	113.76 "	7.36	Fr.	"
F.		83	1329.31 "	94.35 "	7.10	"	"
M.		75	1476.73 "	123.10 "	8.34	It.	"
F.		26	1283.65 "	115.35 "	8.99	"	"
M.		100	1503.75 "	116.45 "	7.74	Bav.	"
F.		100	1335.50 "	109.45 "	9.82	"	"
M.					8.59	Egy.	Dav.
F.					7.17	"	"

In skull capacity, as in cephalic index, we have a wide range of sources from which the statistics were obtained. The races are divided into four groups:-Ancient; Primitive and Uncivilized; Forefathers of modern English, Germans and French; and Modern Civilizations.

In the Ancient group there are as many races showing greater male variability as female, but the series with the greatest number of subjects falls on the side of greater female variability.

The Primitive and Uncivilized group has six for and one against greater male variability. The Forefather group shows the contrary condition with all on the side of greater female variability.

Turning to the Modern group it is possible to combine several series because they are of the same race. The women are more variable in the English, German and Italian groups, while the men are more so in the French and modern Egyptian groups.

No <u>definite</u> conclusion is possible with this mass of inextensive, unreliable and contradictory data, but I believe I may safely say that it <u>points</u> toward equal sex variability.

Sex	Age	No.	Mean	S.D.	C.V.	Race	Source
FACIAL MEASUREMENTS. ---ALVEOLAR ANGLE.							
M.		30	82.50°	6.51°	7.89	Bav.	Pe.
F.		48	83.46"	8.73"	10.46	"	"
M.		15	86.27"	2.27"	2.63	Ob-f.	"
F.		11	85.86"	2.58"	3.00	" "	"
PROFILE ANGLE.							
M.		50	85.56°	2.79°	3.26	Ger.	"
F.		50	86.88"	3.59"	4.13	"	"
M.		40	89.11"	3.10"	3.47	Bav.	"
F.		61	88.73"	4.12"	4.64	"	"
KOLIMAN'S INDEX.							
M.		54	52.37	3.26	6.22	Alt.B.	"
F.		64	53.23	3.33	6.25	"	"
ECKER'S INDEX.							
M.		62	110.77	8.365	7.55	Bad.	"
F.		33	113.27	12.748	11.2	"	"
NOSE INDEX.							
M.		70	49.18	4.43	9.00	Alt.B.	"
F.		72	49.35	4.51	9.34	" "	"
EYE INDEX.							
M.		71	84.66	6.66	7.75	Alt.B.	"
F.		78	86.75	5.22	6.01	" "	"
M.		32	82.74	7.45	9.00	Ob-f.	"
F.		22	84.28	4.78	5.6	" "	"

Sex	Age	No.	Mean	S.D.	C.V.	Race	Source
FACIAL MEASUREMENTS--EYE SOCKETS.							
M.		57	23.81 mm.	2.098 mm.	8.81	Alt.B.	Pe.
F.		65	23.54 "	2.273 "	9.23	" "	"
FOREHEAD-BREADTH INDEX.							
M.		72	78.5	3.01	3.83	Bav.	"
F.		83	78.5	3.00	3.82	"	"
ROUNDNESS OF FOREHEAD.							
M.		92	87.9	2.88	3.27	"	"
F.		98	87.6	2.68	3.06	"	"
LENGTH OF PALATE.							
M.		55	44.35 mm.	2.848 mm.	6.4	Alt.B.	"
F.		57	43.11 "	2.954 "	6.8	" "	"
HEIGHT OF FACE FROM ROOT OF NOSE TO POINT OF CHIN.							
M.	6	604	93.72 mm.	5.09 mm.	5.23	Am.	Po.
F.	6	612	91.42 "	4.80 "	5.25	"	"
M.	7	1580	95.87 "	4.80 "	5.06	"	"
F.	7	1509	93.77 "	4.46 "	4.75	"	"
M.	8	2057	97.98 "	4.67 "	4.77	"	"
F.	8	2016	95.65 "	4.46 "	4.66	"	"
M.	9	2011	99.51 "	4.82 "	4.84	"	"
F.	9	1898	97.85 "	4.48 "	5.76	"	"
M.	10	1868	101.06 "	4.77 "	4.72	"	"
F.	10	1820	99.39 "	4.64 "	4.67	"	"
M.	11	1660	103.37 "	5.18 "	5.01	"	"
F.	11	1572	101.44 "	4.61 "	4.54	"	"

HEIGHT OF FACE FROM ROOT OF NOSE TO POINT OF CHIN. Cont'd.

Sex	Age	No.	Mean	S.D.	C.V.	Race	Source
M.	12	1568	104.25 mm.	5.22 mm.	5.01	Am.	Po.
F.	12	1523	103.46 "	5.05 "	4.88	"	"
M.	13	1205	106.24 "	5.54 "	5.21	"	"
F.	13	1231	105.92 "	4.68 "	4.42	"	"
M.	14	893	108.43 "	5.21 "	4.80	"	"
F.	14	997	107.87 "	4.94 "	4.58	"	"
M.	15	479	111.64 "	5.21 "	4.67	"	"
F.	15	672	109.79 "	4.98 "	4.53	"	"
M.	16	191	113.63 "	4.79 "	4.22	"	"
F.	16	403	110.48 "	4.91 "	4.45	"	"
M.	17	78	117.56 "	6.57 "	5.59	"	"
F.	17	223	110.04 "	5.15 "	4.68	"	"
M.	18	31	120.84 "	4.92 "	4.16	"	"
F,	18	163	109.77 "	3.79 "	3.45	"	"
--- HEIGHT OF FACE FROM HAIR-LINE TO POINT OF CHIN.							
M.	6	611	152.68 "	5.18 "	3.4	"	"
F.	6	609	150.16 "	5.88 "	3.9	"	"
M.	7	1621	154.57 "	6.40 "	4.1	"	"
F.	7	1486	153.36 "	5.28 "	3.4	"	"
M.	8	2012	157,50 "	5.46 "	3.5	"	"
F.	8	1965	155.19 "	5.27 "	3.4	"	"
M.	9	1997	159.43 "	5.67 "	3.6	"	"
F.	9	1989	157.44 "	5.38 "	3.4	"	"
M.	10	1909	161.37 "	5.55 "	3.4	"	"
F.	10	1835	160.04 "	5.62 "	3.5	"	"

HEIGHT OF FACE FROM HAIR-LINE TO POINT OF CHIN. Cont'd.

Sex	Age	No.	Mean	S.D.	C.V.	Race	Source
M.	11	1653	163.39 mm.	5.89 mm.	3.5	Am.	Po.
F.	11	1581	162.55 "	5.70 "	3.5	"	"
M.	12	1577	165.83 "	5.44 "	3.3	"	"
F.	12	1510	165.29 "	5.76 "	3.5	"	"
M.	13	1211	167.62 "	6.01 "	3.6	"	"
F.	13	1220	168.35 "	6.04 "	3.6	"	"
M.	14	896	170.49 "	7.05 "	4.1	"	"
F.	14	998	171.38 "	6.11 "	3.6	"	"
M.	15	482	174,30 "	6.41 "	3.7	"	"
F.	15	656	174.20 "	5.40 "	3.1	"	"
M.	16	193	178.19 "	5.90 "	3.3	"	"
F.	16	385	176.28 "	5.69 "	3.2	"	"
M.	17	79	182.28 "	7.60 "	4.2	"	"
F.	17	201	178.51 "	6.20 "	3.5	"	"
M.	18	33	183.67 "	8.00 "	4.4	"	"
F.	18	189	180.97 "	6.13 "	3.4	"	"
			WIDTH OF FACE.				
M.	6	608	117.24 "	4.24 "	3.62	"	"
F.	6	608	115.21 "	4.30 "	3.73	"	"
M.	7	1637	117.78 "	4.09 "	3.47	"	"
F.	7	1516	116.11 "	3.92 "	3.38	"	"
M.	8	2062	118.82 "	4.08 "	3.44	"	"
F.	8	2065	117.63 "	3.97 "	3.38	"	"
M.	9	1927	119.91 "	4.44 "	3.70	"	"
F.	9	1905	118.02 "	4.02 "	3.41	"	"

WIDTH OF FACE. Cont'd.

Sex	Age	No.	Mean	S.D.	C.V.	Race	Source
M.	10	1922	121.60 mm.	4.05 mm.	3.33	Am.	Po.
F.	10	1829	119.49 "	4.38 "	3.67	"	"
M.	11	1666	122.73 "	4.52 "	3.68	"	"
F.	11	1504	121.24 "	4.17 "	3.44	"	"
M.	12	1525	123.81 "	4.42 "	3.57	"	"
F.	12	1526	122.44 "	4.26 "	3.48	"	"
M.	13	1213	125.83 "	4.27 "	3.39	"	"
F.	13	1248	124.14 "	4.45 "	3.59	"	"
M.	14	898	126.81 "	4.56 "	3.59	"	"
F.	14	997	125.67 "	4.26 "	3.39	"	"
M.	15	485	128.32 "	4.33 "	3.37	"	"
F.	15	678	127.85 "	4.08 "	3.19	"	"
M.	16	193	130.27 "	5.01 "	3.85	"	"
F.	16	409	129.47 "	4.07 "	3.14	"	"
M.	17	79	131.96 "	4.69 "	3.56	"	"
F.	17	219	130.63 "	4.08 "	3.12	"	"
M.	18	33	135.00 "	4.13 "	3.06	"	"
F.	18	163	131.42 "	3.38 "	2.57	"	"

The table is the best summary here because of the many different measures discussed. In the smaller series the males show greater variability in only three out of the nine groups. In the more extensive studies on the height and width of the face by Porter, the males show a significantly greater variability in all three series.

Sex	Age	No.	Mean	S.D.	C.V.	Race	Source
WEIGHT OF INTERNAL ORGANS.---HEART.							
M.	20-55	181	10.699 oz.	2.121 Oz.	19.825	Eng.	Pe.
F.	" "	110	8.927 "	1.848 "	20.701	"	"
M.	20-55	100	9.52 "	1.578 "	16.58	"	"
F.	" "	100	8.88 "	1.478 "	16.64	"	"
WEIGHT OF LIVER.							
M.	20-55	84	53.48 "	7.658 "	14.32	"	"
F.	" "	52	47.69 "	10.600 "	22.23	"	"
WEIGHT OF RIGHT KIDNEY.							
M.	20-55	100	5.57 "	1.141 "	20.49	"	"
F.	" "	61	5.08 "	1.145 "	22.53	"	"

The above data were obtained by Pearson from the post-mortem examinations conducted by Reid and Peacock.

The first heart series was formed by combining the measurements of Reid and Peacock and we find the women more variable in spite of the fact that the S. D. for the men is greater. The second series is that of Peacock in which all hearts weighing over 12 ozs. are considered unhealthy, and are therefore omitted. The preponderance of variability remains on the side of the women although the same relation exists in the S. D.

In the case of the liver and the right kidney the women are more variable, so there is a decided contradiction to the theory of greater male variability in these three measurements.

BRAIN-WEIGHT.

Sex	Age	No.	Mean	S.D.	C.V.	Race	Source
M.	-55	150	1429 grs.	132.73 grs.	9.29	Eng.	Pe.
F.	- "	100	1280 "	101.49 "	7.93	"	"
M.	- "	90	1282 "	108.01 "	8.07	"	"
F.	-"	71	1201 "	127.74 "	10.64	"	"
M.	Adult	100	1295 "	132.68 "	10.25	"	"
F.	"	98	1225 "	129.73 "	10.59	"	"
M.	"	340	1335 "	124.48 "	9.20	"	"
F.	"	269	1235 "	118.7 "	9.72	"	"
M.		292	1325.18"	121.43 "	9.16	Fr.	"
F.		140	1144.46"	104.56 "	9;14	"	"
M.		559	1361.72"	114.33 "	8.40	Bav.	"
F.		347	1219.09"	102.54 "	8.41	"	"

Very limitedtrustworthy data on the brain are available, but Pearson has combined that of Reid and Peacock to make the first comparison, indicating that the male brain is more variable. When he considered Clendinning's, he found the female more variable, so he turned to Sim's statistics to decide the matter. Here he found the females again showing greater variability and the same was true when he combined the three series. However the difference was not great.

In both the French and German data there was almost equal variability, and one may easily conclude with Pearson that Professor Marshall was mistaken when he determined that the male brain was the more variable. The latter draws his conclusions after studying Boyd's tables of brain measurements.

GIRTH OF CHEST MIDWAY BETWEEN INSPIRATION AND EXPIRATION. (x)

Sex	Age	No.	Mean	S.D.	C.V.	Race	Source
M.	6	677	59.05 cm.	2.22 cm.	3.8	Am.	Po.
F.	6	741	58.34 "	2.48 "	4.3	"	"
M.	7	1708	60.02 "	2.38 "	3.9	"	"
F.	7	1631	59.47 "	2.47 "	4.2	"	"
M.	8	2095	62.18 "	2.35 "	3.8	"	"
F.	8	2040	60.81 "	2.40 "	3.9	"	"
M.	9	2120	63.90 "	2.51 "	3.9	"	"
F.	9	1966	62.51 "	2.53 "	4.0	"	"
M.	10,	1997	65.59 "	2.72 "	4.1	"	"
F.	10	1893	63.02 "	2.67 "	4.2	"	"
M.	11	1732	67.24 "	2.61 "	3.9	"	"
F.	11	1654	65.85 "	3.04 "	4.6	"	"
M.	12	1565	68.76 "	2.94 "	4.3	"	"
F.	12	1624	68.34 "	3.24 "	4.7	"	"
M.	13	1228	70.61 "	3.11 "	4.4	"	"
F.	13	1313	71.29 "	3.54 "	5.0	"	"
M.	14	925	73.27 "	3.58 "	4.9	"	"
F.	14	1020	74.13 "	3.65 "	4.9	"	"
M.	15	498	76.56 "	3.77 "	4.9	"	"
F.	15	659	76.78 "	3.70 "	4.7	"	"
M.	16	205	79.22 "	4.19 "	5.3	"	"
F.	16	397	78.85 "	3.27 "	4.1	"	"

(x) Measurement of chest at full expiration added to measurement at full inspiration and the result divided by two.

GIRTH OF CHEST. Cont'd.

Sex	Age	No.	Mean	S.D.	C.V.	Race	Source
M.	17	80	81.39 cm.	3.15 cm.	3.9	Am.	Po.
F.	17	206	80.39 "	3.34 "	4.2	"	"
M.	18	31	84.52 "	2.94 "	3.5	"	"
F.	18	162	80.45 "	3.23 "	4.0	"	"

Again the only statistics we have for this measure are those of Porter and they indicate a slight preponderance of variability on the side of the girls both in the average of the C. V. s for all ages and in the number of ages in which the girls are more variable, the ratio being 10 to 2 in favor of the girls with one case of equal variability.

Considering the ages separately the female is more variable in ages 6 to 13, there is equal variability at 14, and greater male variability at 15 and 16. The females again are more variable at ages 17 and 18, but there are much fewer male measurements at these two last ages.

RIGHT GRIP.

Sex	Age	No.	Mean	S.D.	C.V.	Race	Source
M.	19-30	1058	85.214 lb.	11.616 lb.	13.64	Eng.	Pe.
F.	" "	133	56.293 "	10.372 "	18.42	"	"
M.	6	626	6.09 kg.	1.41 kg.	23.2	Am.	Po.
F.	6	687	5.14 "	1.39 "	27.0	"	"
M.	7	1551	7.69 "	1.52 "	19.8	"	"
F.	7	1493	6.53 "	1.67 "	25.6	"	"
M.	8	1880	9.38 "	1.95 "	20.8	"	"
F.	8	1873	8.11 "	1.87 "	23.1	"	"
M.	9	2002	11.35 "	2.45 "	21.6	"	"
F.	9	1829	9.23 "	2.11 "	22.9	"	"
M.	10	1878	12.83 "	2.66 "	20.7	"	"
F.	10	1801	10.42 "	2.27 "	21.9	"	"
M.	11	1644	14.37 "	2.74 "	19.1	"	"
F.	11	1613	11.80 "	2.42 "	20.5	"	"
M.	12	1506	16.70 "	3.17 "	18.8	"	"
F.	12	1553	13.46 "	2.83 "	21.0	"	"
M.	13	1152	19.08 "	4.27 "	22.4	"	"
F.	13	1256	16.13 "	3.31 "	20.5	"	"
M.	14	848	22.32 "	4.15 "	18.6	"	"
F.	14	950	18.02 "	4.11 "	22.8	"	"
M.	15	447	26.69 "	5.10 "	19.1	"	"
F.	15	617	20.01 "	3.65 "	18.2	"	"
M.	16	163	31.04 "	5.29 "	17.0	"	"
F.	16	356	21.78 "	3.77 "	17.3	"	"

LEFT GRIP.

Sex	Age	No.	Mean	S.D.	C.V.	Race	Source.
M.	19-30	1056	81.152 lb.	11.706 lb.	14.55	Eng.	Pe.
F.	" "	134	53.298 "	10.00 "	18.78	"	"
M.	6	629	5.59 kg.	1.43 kg.	25.6	Am.	Po.
F.	6	686	4.77 "	1.47 "	30.8	"	"
M.	7	1550	7.15 "	1.72 "	24.1	"	"
F.	7	1488	5.70 "	1.62 "	28.4	"	"
M.	8	1882	8.76 "	2.08 "	23.2	"	"
F.	8	1882	7.52 "	2.00 "	26.6	"	"
M.	9	2007	10.43 "	2.66 "	25.5	"	"
F.	9	1828	8.47 "	2.10 "	24.8	"	"
M.	10	1886	11.72 "	2.57 "	21.9	"	"
F.	10	1798	9.38 "	2.23 "	23.8	"	"
M.	11	1650	13.49 "	2.70 "	20.0	"	"
F.	11	1616	11.07 "	2.36 "	21.3	"	"
M.	12	1502	15.37 "	3.11 "	20.2	"	"
F.	12	1554	12.60 "	2.98 "	23.7	"	"
M.	13	1148	17.31 "	3.50 "	20.2	"	"
F.	13	1257	14.83 "	3.36 "	21.3	"	"
M.	14	854	20.27 "	3.93 "	19.4	"	"
F.	14	947	17.13 "	3.90, "	22.7	"	"
M.	15	439	23.94 "	5.10 "	21.3	"	"
F.	15	618	18.23 "	3.84 "	21.1	"	"
M.	16	162	27.25 "	5.58 "	20.5	"	"
F.	16	369	19.86 "	3.93 "	19.8	"	"

STRENGTH OF PULL.

Sex	Age	No.	Mean	S.D.	C.V.	Race	Source
M.	19-30	1066	84.438 lb.	13.152 lb.	15.58	Eng.	Pe.
F.	" "	134	49.127 "	8.217 "	16.72	"	"
M.	23-51	519	74.00 "	11.10 "	15.00	"	Gäl.
F.	" "	276	40.00 "	7.73 "	19.3	"	"
M.		90	144.11 "	23.61 "	15.32		Pe.
F.		197	75.74 "	17.13 "	22.62		"

In both grip and strength of pull measurements the females are more variable and one may conclude that this is a secondary sex characteristic in both children and adults.

CONCLUSION FOR PHYSICAL DATA

From the discussions following the various tables of physical data one can readily see that any generalization concerning sex variability in physical measurements as a whole is impossible. However, some indications of greater male variability are evident in certain measurements and at certain ages, and greater female variability in others--as follows:-

In width of head; arm bone length; weight of internal organs and brain; strength of pull; and adult weight; we find the females more variable.

The males show greater variability in sitting height; length of head; facial measurements; leg bone length; and weight at birth.

Stature, span,weight,and chest girth statistics show a marked tendency toward greater female variability at the ages 6 to 13 years, and greater male variability at adolescence.

Equal variability of the sexes is indicated in cephalic index and skull capacity.

Perhaps the next few years will make enough data available to definitely determine the question of sex variability.

Turning from the physical to the mental data on variation, we find five comparatively recent investigations. They were made by Dr. W. H. Pyle, Professor of Educational Psychology at the University of Missouri, and three of his students.

Certain standardized tests originated or revised by Dr. Pyle were used. His investigations were made in the schools of Missouri, towns and cities, in 1913 and 1916. P. E. Collings, County Superintendent of McDonald County, Missouri, made a survey of the rural schools under his jurisdiction. Creighton's investigation was among the students in Chinese schools, and mine included the pupils in four grade schools and the High School of Joplin, Missouri.

I shall not describe the material, procedure, or purpose of each test since that information is to be found in either of the manuals published by Dr. Pyle. (x)(x)(x)

In computing the C. V. from the data of the investigators I used the A. D. (average deviation) instead of the S. D. (standard deviation).

Since the material used and the methods of grading were practically the same, these five groups of statistics are in a condition to be compared one with the other.

The five sources are abbreviated as follows:-

1. Pyle 1913------Py. '13.
2. Pyle 1916------Py. '16.
3. Collings-------Coll.
4. Creighton------Cre.
5. Summerfield----Sum.

(x)(x)(x)

1. "Examination of School Children". W.H.Pyle. Macmillan 1913.
2. "Manual for the Mental and Physical Examination of School Children". W.H.Pyle. University of Missouri Bulletin. Volume 17---No. 24.

ROTE MEMORY---CONCRETE.

Sex	Age	No.	Mean	A.D.	C.V.	Race	Source
M.	8	34	31.2	6.7	21.47	Am.	Py. '13
F.	8	37	32.9	7.1	21.58	"	"
M.	9	58	32.4	7.4	22.84	"	"
F.	9	68	32.7	6.2	18.96	"	"
M.	10	64	35.8	6.3	17.60	"	"
F.	10	69	39.6	5.2	13.13	"	"
M.	11	55	37.7	6.4	16.97	"	"
F.	11	52	37.7	5.2	13.79	"	"
M.	12	60	37.7	5.0	13.26	"	"
F.	12	70	38.7	6.1	15.76	"	"
M.	13	60	38.3	5.6	14.62	"	"
F.	13	51	40.4	5.4	13.36	"	"
M.	14	35	40.0	6.4	16.00	"	"
F.	14	34	44.2	7.0	15.83	"	"
M.	15	25	40.2	4.9	12.18	"	"
F.	15	13	42.0	7.0	16.66	"	"
M.	16	14	43.4	6.3	14.51	"	"
F.	16	17	42.5	4.8	11.29	"	"

ROTE MEMORY---CONCRETE .Cont'd.

Sex	Age	No.	Mean	A.D.	C.V.	Race	Source
M.	7	11	23.2	2.0	8.62	Am.	Py. '16
F.	7	16	21.5	3.4	15.81	"	"
M.	8	61	21.3	3.5	16.43	"	"
F.	8	56	22.9	2.7	11.79	"	"
M.	9	79	24.0	3.2	13.33	"	"
F.	9	83	22.6	3.5	15.48	"	"
M.	10,	96	23.9	3.4	14.22	"	"
F.	10	83	23.9	2.1	8.78	"	"
M.	11	99	25.5	2.7	10.59	"	"
F.	11	80	25.7	3.2	12.45	"	"
M.	12	97	25.8	2.9	11.24	"	"
F.	12	98	26.3	2.7	10.26	"	"
M.	13	95	26.3	3.2	12.16	"	"
F.	13	81	27.4	2.6	9.49	"	"
M.	14	73	26.3	3.4	12.92	"	"
F.	14	73	27.3	3.0	10.99	"	"
M.	15	90	26.2	3.8	14.50	"	"
F.	15	87	27.3	2.8	10.25	"	"
M.	16	59	26.7	3.6	13.48	"	"
F.	16	65	28.9	2.9	10.03	"	"
M.	17	39	27.0	2.8	10.37	"	"
F.	17	47	28.4	2.2	7.72	"	"
M.	18	30	27.9	4.3	15.41	"	"
F.	18	28	28.9	1.4	4.84	"	"

ROTE MEMORY---CONCRETE.Cont'd.

Sex	Age	No.	Mean	A.D.	C.V.	Race	Source
M.	8	120	13.4	6.2	46.27	Am.	Coll.
F.	8	138	14.5	7.1	48.96	"	"
M.	9	120	14.8	5.3	36.05	"	"
F.	9	98	16.6	6.5	39.15	"	"
M.	10	146	18.3	5.1	27.87	"	"
F.	10	150	18.2	6.2	33.33	"	"
M.	11	124	21.0	4.8	22.86	"	"
F.	11	138	21.5	5.0	23.25	"	"
M.	12	108	21.8	3.9	17.89	"	"
F.	12	128	22.7	4.5	19.82	"	"
M.	13	122	22.2	3.8	17.11	"	"
F.	13	118	25.7	3.1	12.06	"	"
M.	14	104	22.4	3.5	15.62	"	"
F.	14	130	26.2	3.4	12.98	"	"
M.	15	74	24.6	3.4	13.82	"	"
F.	15	94	27.5	3.4	12.36	"	"
M.	16	54	24.4	4.3	17.63	"	"
F.	16	52	26.8	3.3	12.31	"	"
M.	17	30	26.5	3.6	13.58	"	"
F.	17	23	27.7	2.1	7.58	"	"
M.	18	25	25.8	1.8	6.97	"	"
F.	18	28	27.3	2.2	8.05	"	"

ROTE MEMORY---CONCRETE.Cont'd.

Sex	Age	No.	Mean	A.D.	C.V.	Race	Source
M.	8	39	17.5	3.4	19.42	Am.	Sum.
F.	8	38	18.0	3.4	18.88	"	"
M.	9	58	19.2	3.1	16.14	"	"
F.	9	45	19.4	2.8	14.43	"	"
M.	10	71	19.4	3.1	18.04	"	"
F.	10	77	21.5	2.6	12.09	"	"
M.	11	67	21.9	2.8	12.78	"	"
F.	11	73	22.3	2.5	11.21	"	"
M.	12	73	22.3	2.7	12.10	"	"
F.	12	78	23.4	2.5	10.68	"	"
M.	13	70	23.7	2.4	10.12	"	"
F.	13	98	24.4	2.3	9.42	"	"
M.	14	66	24.6	2.6	10.57	"	"
F.	14	74	24.9	2.4	9.64	"	"
M.	15	36	24.8	3.1	12.50	"	"
F.	15	46	26.1	2.7	10.34	"	"
M.	16	17	26.9	2.5	8.93	"	"
F.	16	29	27.3	1.9	6.96	"	"

ROTE MEMORY---CONCRETE.Cont'd.

Sex	Age	No.	Mean	A.D.	C.V.	Race	Source
M.	12	16	45.87	6.5	14.17	Chin.	Cre.
F.	12	12...	44.10	6.9	15.64	"	"
M.	13	32	45.78	8.1	17.68	"	"
F.	13	22	45.59	7.2	15.79	"	"
M.	14	62	49.08	8.1	16.50	"	"
F.	14	22	43.86	6.9	15.73	"	"
M.	15	66	49.08	7.2	14.67	"	"
F.	15	19	44.79	4.9	10.94	"	"
M.	16	49	53.55	6,5	12.13	"	"
F.	16	28	41.46	7.6	18.33	"	"
M.	17	35	51.40	6.2	12.06	"	"
F.	17	20	46.45	6.7	14.42	"	"
M.	Adult	38	28.5	1.8	6.31	Am.	Py.'16
F.	"	61	28.6	1.9	6.64	"	"
M.	"	64	44.3	6.6	14.89	"	Py.'13
F.	"	88	47.6	7.7	16.17	"	"
M.	"	249	49.9	4.9	9.82	"	Sum.
F.	"	447	49.3	5.3	10.75	"	"

Source of Sum. adult data not shown. - See page 105 Line 9

Considering concrete rote memory first, we find the following:-

1. Pyle '13 shows girls more variable at ages 8, 12, and 15, while the boys are more variable at all the other ages. The difference in the average C. V. is 1.02 ~~of 1~~% with the preponderance on the side of the boys.

2. Pyle '16 shows females more variable at ages 7, 9, 11, and 18, the males more variable at 8, 10, 12, 13, 14, 15, 16, and 17 years. The average is again on the male side, being 2.96 greater than that of the female.

3. Colling's data indicates greater female variability at 8, 9, 10, 11, 12, and 18 years, and greater male variability at 13, 14, 15, 16, and 17 years. The average is .53 of 1% greater for the males.

4. My data shows males more variable at every age, the difference in the average C. V. being 2.99 % in favor of the males.

5. The Chinese statistics give only the measures for the ages 12 to 17 inclusive, and the girls are more variable in the first three and the boys in the last three. Here for the first time the average C. V. of the females exceeds that of the males, and to the extent of .6 of 1%.

6. Adult data--The three groups agree in greater female variability, ranging from .33 of 1% to 1.28 %.

When all ages (not including adults) are averaged, greater male variability is indicated in the four American series, but in considering the ages separately, two series

show the girls more variable at 8, 9, and 11, while three show them more variable at 12. The Chinese girls were more variable when all ages were averaged.

This leads me to believe that if there is greater female variability in concrete rote memory, it is to be found in the earlier ages, and among adults. (page 52.)

ROTE MEMORY---ABSTRACT.

Sex	Age	No.	Mean	A.D.	C.V.	Race	Source
M.	8	34	22.9	7.8	34.06	Am.	Py.'13
F.	8	23	20.5	7.8	38.05	"	"
M.	9	58	26.3	7.5	28.51	"	"
F.	9	68	24.0	5.8	24.16	"	"
M.	10	63	26.8	7.0	26.12	"	"
F.	10	69	31.0	6.1	19.68	"	"
M.	11	55	31.7	7.1	22.39	"	"
F.	11	52	31.8	7.1	22.32	"	"
M.	12	60	31.0	6.6	21.29	"	"
F..	12	69	34.0	7.5	22.06	"	"
M.	13	60	32.4	7.7	23.76	"	"
F.	13	52	36.0	4.0	11.11	"	"
M.	14	35	37.3	7.1	19.03	"	"
F.	14	34	39.0	8.4	21.54	"	"
M.	15	25	34.1	6.2	18.18	"	"
F.	15	13	37.8	7.3	19.31	"	"
M;	16	14	40.0	8.3	20.75	"	"
F.	16	17	41.0	5.2	12.68	"	"

ROTE MEMORY---ABSTRACT. Cont'd.

Sex	Age	No.	Mean	A.D.	C.V.	Race	Source
M.	7	11	21.0	2.5	11.90	Am.	Py. '16
F.	7	16	19.5	3.4	17.42	"	"
M.	8	60	18.2	3.6	19.80	"	"
F.	8	56	21.0	2.6	12.38	"	"
M.	9	85	21.3	2.7	12.67	"	"
F.	9	82	21.9	3.0	13.70	"	"
M.	10	97	22.2	3.4	15.31	"	"
F.	10	83	21.9	3.0,	13.70	"	"
M.	11	98	23.4	3.9	16.66	"	"
F.	11	80	24.2	3.1	12.81	"	"
M.	12	96	24.0	3.1	12.91	"	"
F.	12	100	25.2	3.3	13.09	"	"
M.	13	95	24.3	3.3	13.58	"	"
F.	13	82	26.1	3.0	11.49	"	"
M.	14	73	24.7	3.1	12.14	"	"
F.	14	72	26.2	2.8	10.68	"	"
M.	15	92	25.3	3.7	14.62	"	"
F.	15	86	25.8	3.0	11.62	"	"
M.	16	59	25.7	3.2	12.45	"	"
F.	16	63	27.9	3.5	12.54	"	"
M.	17	40	27.2	3.1	11.50	"	"
F.	17	47	27.1	3.0	11.07	"	"
M.	18	30	27.6	3.3	11.95	"	"
F.	18	28	28.9	3.0	10.38	"	"

ROTE MEMORY---ABSTRACT.Cont'd.

Sex	Age	No.	Mean	A.D.	C.V.	Race	Source
M.	8	115	11.2	5.1	45.54	Am.	Coll.
F.	8	133	11.5	7.0	60.87	"	"
M.	9	120	11.3	10.2	90.26	"	"
F.	9	94	13.6	9.9	72.79	"	"
M.	10	144	14.3	4.8	33.56	"	"
F.	10	150	13.9	5.6	40.28	"	"
M.	11	124	17.0	5.8	34.11	"	"
F.	11	138	17.7	5.3	29.93	"	"
M.	12	108	19.0	4.7	24.73	"	"
F.	12	144	20.5	6.1	29.75	"	"
M.	13	122	19.6	5.0	26.31	"	"
F.	13	120	22.4	3.8	16.96	"	"
M.	14	106	20.6	4.6	22.33	"	"
F.	14	128	24.1	3.1	12.86	"	"
M.	15	76	22.0	3.4	15.45	"	"
F.	15	94	23.3	3.5	15.02	"	"
M.	16	54	21.2	5.1	25.05	"	"
F.	16	54	25.6	3.6	14.06	"	"
M.	17	30	24.5	3.0	12.24	"	"
F.	17	23	27.1	2.1	7.75	"	"
M.	18	25	22.9	3.8	16.59	"	"
F.	18	32	26.5	2.4	9.05	"	"

ROTE MEMORY---ABSTRACT'Cont'd.

Sex	Age	No.	Mean	A.D.	C.V.	Race	Source
M.	8	39	16.4	2.9	17.67	Am.	Sum.
F.	8	38	16.8	2.9	17.26	"	"
M.	9	57	17.8	3.2	17.92	"	"
F.	9	45	17.5	3.4	19.43	"	"
M.	10	71	18.1	3.3	18.23	"	"
F.	10	77	20.0	2.3	11.50	"	"
M.	11	67	19.4	2.8	14.43	"	"
F.	11	73	20.4	2.3	11.27	"	"
M.	12	73	20.4	2.6	12.70 ,	"	"
F.	12	78	22.0	2.5	11.36	"	"
M.	13	70	21.9	2.2	10.04	"	"
F.	13	98	22.7	2.3	10.13	"	"
M.	14	66	22.9	2.8	12.22	"	"
F.	14	74	24.4	2.7	11.06	"	"
M.	15	36	23.3	2.4	10.30	"	"
F.	15	46	24.6	2.9	11.80	"	"
M.	16	17	24.8	2.2	8.87	"	"
F.	16	29	25.5	1.9	7.45	"	"

ROTE MEMORY ---ABSTRACT, Cont'd.

Sex	Age	No.	Mean	A.D.	C.V.	Race	Source
M.	12	16	44.25	5.4	12.20	Chin.	Cre.
F.	12	12	46.30	7.7	16.63	"	"
M.	13	32	44.28	7.0	15.80	"	"
F.	13	22	45.86	5.3	11.56	"	"
M.	14	62	46.97	6.8	14.47	"	"
F.	14	22	45.95	5.9	12.84	"	"
M.	15	66	45.14	7.9	17.50	"	"
F.	15	19	46.79	5.8	12.39	"	"
M.	16	50	48.08	6.6	13.72	"	"
F.	16	30	45.87	7.5	16.32	"	"
M.	17	35	49.31	6.5	13.18	"	"
F.	17	20	49.35	6.3	12.76	"	"
M.	Adult	40	28.4	1.8	6.33	Am.	Py. '16
F.	"	61	27.9	2.4	8.60	"	"
M.	"	62	42.3	6.2	14.66	"	Py. '13
F.	"	88	39.8	6.1	15.32	"	"
M.	"	246	47.56	4.7	9.88	"	Sum.
F.	"	423	47.14	4.35	9.22	"	"

Abstract rote memory varies slightly as to results, so must be considered separately. Summarized, they are:-

1. Pyle '13.

   Girls more variable at ages 8, 12, 14, and 15.

   Boys more variable at ages 9, 10, 11, 13, and 16.

   Average--2.58 % greater for males.

2. Pyle '16.

   Females more variable at ages 9, 12, and 16.

   Males more variable at ages 8, 10, 11, 13, 14, 15, 17,

   Average--1.82 % greater for females.

3. Collings.

   Girls more variable at 8, 10, and 12 years.

   Boys more variable at 9, 11, 13, 14, 15, 16, 17 and 18.

   Average--5.07 % greater for boys.

4. Summerfield.

   Girls more variable at 9, 13, and 15 years.

   Boys more variable at 8, 10, 11, 12, 14 and 16.

   Average--1.23 % greater for boys.

5. Chinese.

   Females more variable at 12 and 16 years.

   Males more variable at 13, 14, 15, and 17 years.

   Average--Males more variable by .73 of 1 %.

6. Adult----University of Missouri students. Page 59.

   Pyle '13 and Pyle '16 show girls more variable by .66 of 1 % and 2.27 % respectively.

   Summerfield shows males more variable by .66 of 1 %.

In abstract rote memory we find the males more variable, especially at the ages 10, 11, 13, and 14, and the females more variable at 12 years and when adults. When all ages are averaged, however, greater male variability predominates.

LOGICAL MEMORY---"WILLIE JONES."

Sex	Age	No.	Mean	A.D.	C.V.	Race	Source
M.	7	17	26.5	9.1	34.34	Am.	Py.'16
F.	7	24	29.6	5.4	18.24	"	"
M.	8	120	26.7	6.3	23.59	"	"
F.	8	95	28.5	6.7	23.51	"	"
M.	9	132	28.4	6.6	23.24	"	"
F.	9	139	30.8	5.7	18.50	"	"
M.	10	136	31.6	7.1	22.54	"	"
F.	10	113	33.0	7.1	21.51	"	"
M.	11	90	32.5	7.9	24.30	"	"
F.	11	39	35.4	6.4	18.08	"	"
M.	12	31..	32.7	6.4	19.57	"	"
F.	12	39	33.5	5.8	17.31	"	"
M.	13	23	31.9	6.9	21.63	"	"
F.	13	12	30.7	8.7	28.33	"	"
LOGICAL MEMORY---"FARMER'S SON."							
M.	9	11	31.5	6.0	19.05	"	"
F.	9	10	35.6	6.6	18.54	"	"
M.	10	75	31.2	7.9	25.32	"	"
F.	10	60	32.8	5.8	17.68	"	"
M.	11	107	33.2	6.9	20.78	"	"
F.	11	102	31.9	6.1	19.12	"	"
M	12	118	33.3	7.2	21.62	"	"
F.	12	132	33.4	7.9	23.65	"	"
M.	13	101	34.5	5.9	17.10	"	"
F.	13	86	36.8	7.1	19.61	"	"

LOGICAL MEMORY---"FARMER'S SON".Cont'd.

Sex	Age	No.	Mean	A.D.	C.V.	Race	Source
M.	14	50	35.2	5.3	15.05	Am.	Py.'16
F.	14	42	34.1	7.3	21.37	"	"
M.	15	27	32.9	9.2	27.96	"	"
F.	15	12	37.1	7.0	18.59	"	"

LOGICAL MEMORY---"COSTLY TEMPER".

M.	12	30	52.5	10.8	20.57	"	"
F.	12	50	49.0	8.3	16.94	"	"
M.	13	68	50.3	8.1	16.10	"	"
F.	13	88	53.6	11.1	20.70	"	"
M.	14	74	46.5	9.8	21.07	"	"
F.	14	80	50.9	9.1	17.87	"	"
M.	15	105	48.4	9.2	19.01	"	"
F.	15	110	49.6	9.5	19.15	"	"
M.	16	66	46.8	11.5	24.57	"	"
F.	16	86	47.8	10.8	22.59	"	"
M.	17	49	43.4	10.8	24.88	"	"
F.	17	64	46.9	12.3	26.22	"	"
M.	18	40	46.8	10.3	22.01	"	"
F.	18	35	49.2	10.2	20.73	"	"

LOGICAL MEMORY--"MARBLE STATUE." Cont'd.

Sex	Age	No.	Mean	A.D.	C.V.	Race	Source
M.	8	102	24.3	6.7	27.57	Am.	Py.'13
F.	8	89	28.5	11.3	39.65	"	"
M.	9	148	28.7	9.1	31.71	"	"
F.	9	158	31.0	9.4	30.32	"	"
M.	10	142	30.0	6.7	22.33	"	"
F.	10	138	33.5	6.8	20.21	"	"
M.	11	149	32.9	5.6	17.02	"	"
F.	11	156	36.4	7.7	21.15	"	"
M.	12	156	35.1	7.5	21.08	"	"
F.	12	191	38.1	7.2	18.90	"	"
M.	13	163	36.8	6.3	17.12	"	"
F.	13	164	38.5	7.1	18.44	"	"
M.	14	129	36.1	7.0	18.28	"	"
F.	14	146	39.0	7.5	19.23	"	"
M.	15	89	36.5	6.7	18.35	"	"
F.	15	99	39.1	6.3	16.11	"	"
M.	16	60	34.4	5.6	16.28	"	"
F.	16	94	37.3	5.1	13.67	"	"
M.	17	45	34.6	8.7	25.14	"	"
F.	17	81	36.6	6.9	18.15	"	"
M.	18	32	36.9	6.0	16.26	"	"
F.	18	48	37.8	4.4	11.64	"	"

LOGICAL MEMORY---MARBLE STATUE.

Sex	Age	No.	Mean	A.D.	C.V.	Race	Source
M.	8	70	5;1	3.2	62.74	Am.	Coll.
F.	8	115	5.9	5.1	86.44	"	"
M.	9	123	8.9	6.3	70.78	"	"
F.	9	89	8.1	4.2	51.85	"	"
M.	10	177	11.4	6.1	53.51	"	"
F.	10	146	11.2	8.1	73.32	"	"
M.	11	199	13.9	8.4	60.43	"	"
F.	11	116	17.0	9.9	58.23	"	"
M.	12	141	17.6	9.5	53.98	"	"
F.	12	186	20.4	9.3	45.59	"	"
M.	13	180	17.7	9.5	53,76	"	"
F.	13	110	24.7	9.3	37.65	"	"
M.	14	88	20.0	7.8	39.00	"	"
F.	14	140	28.7	8.1	28.22	"	"
M.	15	72	24.3	7.8	32.09	"	"
F.	15	80	29.6	6.8	22.97	"	"
M.	16	30	22.4	8.3	37.05	"	"
F.	16	30	34.3	4.0	11.66	"	"
M.	17	33	28.2	8.7	30.85	"	"
F.	17	31	32.5	6.4	19.69	"	"
M.	18	21	29.8	5.5	18.45	"	"
F.	18	23	37.2	6.9	18,55	"	"

LOGICAL MEMORY---MARBLE STATUE. Cont'd.							
Sex	Age	No.	Mean	A.D.	C.V.	Race	Source
M.	12	22	28.77	6.3	21.89	Chin.	Cre.
F.	12	12	37.00	5.9	15.94	"	"
M.	13	42	28.38	7.6	26.77	"	"
F.	13	22	37.27	5.2	13.95	"	"
M.	14	69	30.43	6.7	22.01	"	"
F.	14	20	34.70	6.6	19.02	"	"
M.	15	75	32.16	7.3	22.69	"	"
F.	15	18	35.83	6.7	18.69	"	"
M.	16	57	31.42	7.9	25.14	"	"
F.	16	22	35.27	5.7	16.16	"	"
M.	17	35	34.66	5.2	15.29	"	"
F.	17	18	35.00	6.6	18.85	"	"
M.	Adult	65	38.3	7.0	18.27	Am.	Py.'13
F.	"	86	40.1	5.9	14.71	"	"
M.	"	215	36.0	5.73	15.91	"	Sum.
F.	"	415	39.1	5.48	14.01	"	"
M.	LOGICAL MEMORY---COSTLY TEMPER.						
M.	Adult	64	64.0	10.5	16.40	"	Py.'16
F.	"	164	69.6	10.3	14.79	"	"

Logical memory or the reproduction of ideas gives the following results:-

1. "Willie Jones"--given by Pyle '16--shows the females more variable at 13, and the males more so at 7, 8, 9, 10, 11, and 12. The average C. V. is 3.1 % greater for the males.

2. "Farmer's Son"--Pyle '16--shows the females more variable at 12, 13, and 14; while the males are more variable at 9, 10, 11, and 15. The average C. V. being 1.19 % greater for the males.

3. "Costly Temper"--Pyle '16--indicates greater female variability at 13, 15, and 17; and greater male variability at 12, 14, 16, and 18. The boys have a larger average C. V. to the extent of 1.17 %, while the average C. V. for males is 1.9 % greater than that for females. when all ages are combined.

4. "Marble Statue" is the most extensively used story, and four groups of data are available, with these results:-

Collings finds the females more variable at 8, 10, and 18; males more variable at the remaining eight ages; and the average C. V. 5.41 % greater for the males.

Pyle '13 finds the females more variable at 8, 11, 13, and 14; the males more variable at 9, 10, 12, 15, 16, 17, and 18; and the difference in average C. V.s .32 of 1% in favor of the males.

Chinese females are more variable at 17, while the males are more so at ages 12, 13, 14, 15, and 16. The average C. V. being 5.19 % greater for the males.

The fourth group, in which only adult measurements are considered, consists of two series. Pyle '13 indicates greater male variability to the extent of 3.56 % while my data shows the males more variable by 1.9 %.

Averaging all ages in each of the seven series, the boys are found to be more variable in every one. Therefore, the general conclusion is that the males are more variable in logical memory.

FREE ASSOCIATION.

Sex	Age	No.	Mean	A.D.	C.V.	Race	Source
M.	8	33	23.0	7.5	32.61	Am.	Py. '13
F.	8	37	23.7	8.2	34.60	"	"
M.	9	60	26.9	7.6	28.25	"	"
F.	9	82	31.0	8.9	28.71	"	"
M.	10	66	29.7	9.0	30.30	"	"
F.	10	88	32.2	10.8	33.54	"	"
M.	11	66	33.3	11.4	34.23	"	"
F.	11	65	36.8	12.1	32.88	"	"
M.	12	77	34.2	10.9	31.87	"	"
F.	12	90	36.6	15.4	42.07	"	"
M.	13	80	33.9	14.6	43.06	"	"
F.	13	66	38.3	16.8	43.86	"	"
M.	14	57	33.3	13.2	39.64	"	"
F.	14	61	39.1	12.9	32.99	"	"
M.	15	38	40.0	14.8	37.00	"	"
F.	15	46	40.2	13.8	34.33	"	"
M.	16	36	33.3	14.6	43.84	"	"
F.	16	46	40.9	14.1	34.47	"	"
M.	17	16	42.8	12.3	28.37	"	"
F.	17	38	41.6	14.0	33.65	"	"
M.	18	21	48.9	16.6	33.94	"	"
F.	18	29	47.1	13.9	29.51	"	"

FREE ASSOCIATION. Cont'd.

Sex	Age	No.	Mean	A.D.	C.V.	Race	Source.
M.	7	12	17.4	4.4	25.29	Am.	Py. '16
F.	7	16	24.2	8.6	36.53	"	"
M.	8	66	22.3	5.7	25.56	"	"
F.	8	58	24.3	7.9	32.51	"	"
M.	9	75	24.4	8.6	35.24	"	"
F.	9	84	27.0	9.1	33.70	"	"
M.	10	93	29.4	11.7	39.79	"	"
F.	10	76	31.0	12.5	40.32	"	"
M.	11	97	32.3	12.5	38.70	"	"
F.	11	86	39.0	14.4	36.92	"	"
M.	12	97	37.1	14.3	38.54	"	"
F.	12	107	41.7	14.4	34.53	"	"
M.	13	94	39.0	15.3	39.23	"	"
F.	13	90	44.4	14.7	33.11	"	"
M.	14	62	40.9	13.9	33.98	"	"
F.	14	74	47.8	12.7	26.57	"	"
M.	15	78	48.3	11.4	23.60	"	"
F.	15	74	49.4	12.6	25.50	"	"
M.	16	47	47.3	12.6	26.64	"	"
F.	16	68	49.4	13.8	27.93	"	"
M.	17	43	49.0	13.4	27.34	"	"
F.	17	38	47.6	14.2	29.83	"	"
M.	18	24	47.1	13.4	28.45	"	"
F.	18	30	48.9	13.6	27.81	"	"

FREE ASSOCIATION.

Sex	Age	No.	Mean	A.D.	C.V.	Race	Source
M.	8	151	16.5	7.1	43.03	Am.	Coll.
F.	8	152	21.2	9.0	42.45	"	"
M.	9	152	17.3	8.3	47.97	"	"
F	9	120	22.1	9.9	44.79	"	"
M.	10	152	23.6	9.2	38.98	"	"
F.	10	172	27.1	7.7	28.41	"	"
M	11	148	30.0	10;0	33.33	"	"
F.	11	171	32.2	10.0	31.05	"	"
M.	12	120	38.5	12.5	32.46	"	"
F.	12	164	36.6	12.7	34.69	"	"
M.	13	136	35.0	9.5	27.28	"	"
F.	13	156	34.0	11.1	32.64	"	"
M	14	136	32.8	10.7	32.64	"	"
F.	14	128	36.4	10.3	28.29	"	"
M.	15	112	34.3	10.9	31.77	"	"
F.	15	124	36.2	9.9	27.34	"	"
M.	16	84	36.0	11.6	32.22	"	"
F.	16	64	46.4	15.3	32.97	"	"
M.	17	21	35.5	8.2	23.09	"	"
F.	17	34	45.6	13.6	31.58	"	"
M.	18	24	39.9	4.8	12.03	"	"
F.	18	37	42.9	12.4	28.90	"	"

FREE ASSOCIATION . Cont'd.

Sex	Age	No.	Mean	A.D.	C.V.	Race	Source
M.	8	39	24.5	7.5	30.61	Am.	Sum.
F.	8	35	28.2	7.9	28.01	"	"
M.	9	61	28.9	8.8	30.45	"	"
F.	9	45	32.7	7.7	23.54	"	"
M.	10	73	30.1	8.9	29.56	"	"
F.	10	77	38.8	9.9	25.51	"	"
M.	11	64n	37.9	9.5	25.06	"	"
F.	11	73	45.2	9.0	19.91	"	"
M.	12	73	38.6	10.3	26.68	"	"
F.	12	78	48.6	10.6	21.81	"	"
M.	13	70	44.6	11.1	24.88	"	"
F.	13	99	46.3	10.6	22.89	"	"
M.	14	65	48.7	10.9	22.38	"	"
F.	14	74	53.7	10.9	20.30	"	"
M.	15	38	45.8	10.7	24.08	"	"
F.	15	45	51.9	12.5	24.10	"	"
M.	16	17	48.5	14.7	30.30	"	"
F.	16	29	55.9	12.9	23.08	"	"

FREE ASSOCIATION. Cont'd.

Sex	Age	No.	Mean	A.D.	C.V.	Race	Source
M.	12	24	19.15	5.4	28.19	Chin.	Cre.
F.	12	12	18.33	4.7	25.64	"	"
M.	13	42	21.88	5.4	24.68	"	"
F.	13	22	18.45	4.1	22.22	"	"
M.	14	70	19.80	4.5	22.72	"	"
F.	14	22	17.49	4.8	27.44	"	"
M.	15	75	22.32	4.6	20.60	"	"
F.	15	19	17.80	4.6	25.85	"	"
M.	16	57	23 57	3.7	15.69	"	"
F.	16	29	17.21	4.6	26.72	"	"
M.	17	35	24.13	3.6	14.91	"	"
F.	17	20	20.06	4.1	20.43	"	"
M.	Adult	459	51.46	14.5	28.17	Am.	Py. '16
F.	"	816	49.3	15.5	31.44	"	"
M.	"	64	42.2	13.8	32.70	"	Py. '13
F.	"	86	38.3	13.1	34.20	"	"
M.	"	195	49.5	13.36	27.00	"	Sum.
F.	"	379	48.7	14.98	30.76	"	"

There are six series of data in the Free Association group--as follows:-

1. Pyle '13 indicates greater female variability at the ages 8, 9, 12, 13, and 17; greater male variability at 10, 11, 14, 15, 16, and 18; and when all ages are averaged the males are found to be more variable by .26 of 1 %.

2. Pyle '16 shows females more variable at 7, 8, 10, 15, 16, and 17; the males more variable at 9, 11, 12, 13, 14, and 18; and the preponderance in favor of the males .76 of 1%.

3. Colling's series have the girls more variable at 8, 9, 10, 11, 14, and 15; the boys more so at 12, 13, 16, 17, and 18; and contrary to the above series, he finds the females more variable by .76 of 1 % when all ages are averaged.

4. My data indicate greater male variability at all ages except 15, and then the females are only .02 of 1 % more variable. The average C. V. in this series is 3.87 % greater for the males.

5. The Chinese group indicates greater female variability to almost the same extent as mine did for the males. The average C. V. is 3.58 % greater for the female and they are more variable at four out of the six ages given.

The adult data, in three series, agree that girls are more variable to the extent of 3.27 %, 1.5 %, and 3.76 % respectively.

In the four groups of tests made on American children, three show greater male variability. The Chinese girls were more variable in Free Association.

CONTROLLED ASSOCIATION---OPPOSITES.

Sex	Age	No.	Mean	A.D.	C.V.	Race	Source
M.	8	33	9.0	3.3	36.68	Am.	Py. '13
F.	8	33	8.0	4.0	50.00	"	"
M.	9	65	8.4	3.0	35.71	"	"
F.	9	56	7.6	2.9	38.15	"	"
M.	10	60	7.5	3.1	41.33	"	"
F.	10	77	10.9	3.1	28.44	"	"
M.	11	61	10.9	2.9	26.60	"	"
F.	11	65	11.2	3.0	26.78	"	"
M.	12	75	11.5	2.9	25.21	"	"
F.	12	74	13.9	3.6	25.90	"	"
M.	13	65	14.5	4.5	31.03	"	"
F.	13	73	14.9	4.3	28.85	"	"
M.	14	61	14.5	4.5	29.65	"	"
F.	14	58	17.4	3.9	22.41	"	"
M.	15	40	16.0	5.2	32.50	"	"
F.	15	49	17.3	5.1	29.48	"	"
M.	16	33	18.6	5.3	28.49	"	"
F.	16	48	19.3	4.2	21.76	"	"
M.	17	17	19.6	3.3	16.83	"	"
F.	17	27	31.4	4.9	15.60	"	"
M.	18	22	22.4	3.2	14.28	"	"
F.	18	26	23.4	3.1	13.24	"	"
M.	Adult	62	22.1	3.3	14.93	"	"
F.	"	85	23.4	4.0	17.09	"	"

CONTROLLED ASSOCIATION---OPPOSITES I.

Sex	Age	No.	Mean	A.D.	C.V.	Race	Source
M.	8	110	4.9	3.8	77.55	Am.	Coll.
F.	8	102	6.2	3.8	61.29	"	"
M.	9	98	6.4	4.0	62.50	"	"
F.	9	122	6.9	3.9	56.52	"	"
M.	10	130	8.2	4.4	53.65	"	"
F.	10	159	7.4	4.3	58.11	"	"
M.	11	142	9.9	5.0	50.50	"	"
F.	11	140	9.0	4.2	46.66	"	"
M.	12	122	9.8	4.2	42.85	"	"
F.	12	123	13.1	3.7	28.24	"	"
M.	13	140	11.0	4.0	36.36	"	"
F.	13	136	12.4	4.0	32.26	"	"
M.	14	118	11.7	4.1	35.07	"	"
F.	14	119	14.8	3.9	26.35	"	"
M.	15	96	12.6	3.4	26.98	"	"
F.	15	85	15.0	5.5	36.66	"	"
M.	16	52	13.5	3.1	22.96	"	"
F.	16	44	16.7	3.4	20.00	"	"
M.	17	30	14.9	2.9	19.46	"	"
F.	17	30	16.9	3.5	20.71	"	"
M.	18	32	15.2	2.9	16.59	"	"
F.	18	27	16.6	4.0	24.09	"	"

CONTROLLED ASSOCIATION---OPPOSITES I.Cont'd.

Sex	Age	No.	Mean	A.D.	C.V.	Race	Source
M.	7	11	8.0	2.1	26.333	Am.	Py.'16
F.	7	16	9.1	1.5	16.48	"	"
M.	8	54	8.5	2.4	28.23	"	"
F.	8	51	9.3	2.3	24.73	"	"
M.	9	62	8.6	2.5	29.07	"	"
F.	9	68	10.2	2.6	25.49	"	"
M.	10	60	10.6	3.1	29.25	"	"
F.	10	56	10.8	3.0	27.77	"	"
M.	11	38	10.9	2.5	22.93	"	"
F.	11	28	12.4	3.3	26.61	"	"
M.	8	39	7.2	2.0	27.77	"	"
F.	8	38	7.4	2.5	33.78	"	"
M.	9	58	8.4	2.1	25.00	"	"
F.	9	45	9.2	2.6	28.26	"	"
M.	10	62	8.6	2.7	31.40	"	"
F.	10	66	11.7	2.2	18.80	"	"
M.	11	36	9.7	2.4	24.74	"	"
F.	11	32	10.9	3.2	29.36	"	"
M.	12	29	9.8	2.9	29.60	"	"
F.	12	20	10.2	3.1	30.10	"	"

CONTROLLED ASSOCIATION---OPPOSITES II.

Sex	Age	No.	Mean	A.D.	C.V.	Race	Source
M.	8	113	3.8	2.2	57.89	Am.	Coll.
F.	8	105	4.4	2.1	47.73	"	"
M.	9	129	3.5	2.0	57.14	"	"
F.	9	81	5.0	3.1	62.00	"	"
M.	10	126	5.1	4.0	78.43	"	"
F.	10	149	5.4	3.5	64.81	"	"
M.	11	140	5.7	3.5	61.40	"	"
F.	11	130	5.6	3.0	53.57	"	"
M.	12	112	5.6	2.8	50.00	"	"
F.	12	144	7.2	3.2	44.44	"	"
M.	13	146	6.8	5.1	75.00	"	"
F.	13	112	7.2	3.7	51.39	"	"
M.	14	112	7.1	2.8	39.43	"m	"
F.	14	130	8.8	3.7	42.04	"	"
M.	15	86	7.2	3.2	44.44	"	"
F.	15	82	10.3	4.3	41.74	"	"
M.	16	56	9.8	4.0	40.81	"	"
F.	16	33	11.6	3.8	32.76	"	"
M.	17	30	10.5	2.8	26.66	"	"
F.	17	30	12.9	3.8	29.45	"	"
M.	18	29	11.0	2.6	23.63	"	"
F.	18	29	12.5	2.4	19.20	"	"

CONTROLLED ASSOCIATION---OPPOSITES II. Cont'd.

Sex	Age	No.	Mean	A.D.	C.V.	Race	Source
M.	8	34	4.1	1.2	29.27	Am.	Py. '16
F.	8	10	5,0	1.7	34.00	"	"
M.	9	34	4.6	3.9	84.80	"	"
F.	9	44	5.7	2.2	38.59	"	"
M.	10	60	8.4	3.3	39.29	"	"
F.	10	55	7.4	3.1	41.89	"	"
M.	11	96	9.4	2.9	30.85	"	"
F.	11	95	9.0	3.4	37.77	"	"
M.	12	117	10.2	2.9	28.43	"	"
F.	12	125	10.4	3.3	31.73	"	"
M.	13	112	10.8	4.6	42.59	"	"
F.	13	125	11.9	3.6	30.25	"	"
M.	14	70	11.2	3.4	30.35	"	"
F.	14	91	13.2	3.5	26.51	"	"
M.	15	84	13.3	2.8	21.05	"	"
F.	15	76	14.6	3.7	25.34	"	"
M.	16	43	14.0	3.4	24.30	"	"
F.	16	57	15.0	3.7	24.66	"	"
M.	17	24	14.0	3.7	26.43	"	"
F.	17	22	16.2	3.0	18.51	"	"
M.	18	23	14.4	2.3	15.97	"	"
F.	18	21	17.1	2.9	16.96	"	"

CONTROLLED ASSOCIATION---OPPOSITES II.

Sex	Age	No.	Mean	A.D.	C.V.	Race	Source
M.	10	11	9.1	2.8	30.77	Am.	Sum.
F.	10	10	10.2	1.6	15.68	"	"
M.	11	27	8.5	2.6	30.58	"	"
F.	11	41	9.6	2.5	26.04	"	"
M.	12	43	10.3	2.3	22.33	"	"
F.	12	57	10.6	3.3	31.32	"	"
M.	13	61	10.2	3.1	30.39	"	"
F.	13	85	10.9	3.0	27.52	"	"
M.	14	60	11.6	4.1	35.34	"	"
F.	14	70	11.9	3.3	27.71	"	"
M.	15	35	11.6	4.2	36.20	"	"
F.	15	41	14.5	4.7	32.41	"	"
M.	16	16	15.7	4.2	26.75	"	"
F.	16	29	17.9	5.7	31.84	"	"
M.	12	24	7.09	1.7	23.97	Chin.	Cre.
F.	12	12	5.16	2.0	38.76	"	"
M.	13	42	6.84	2.1	30.70	"	"
F.	13	22	6.29	1.8	28.61	"	"
M.	14	70	7.89	2.1	26.61	"	"
F.	14	22	6.50	2.7	41.54	"	"
M.	15	75	8.07	2.5	30.97	"	"
F.	15	19	7.12	2.2	30.90	"	"
M.	16	56	8.76	2.5	28.54	"	"
F.	16	28	6.30	2.3	36.50	"	"
M	17	35	9.63	2.1	21.80	"	"
F.	17	20	6.95	1.9	27.48	"	"

CONTROLLED ASSOCIATION---OPPOSITES III.

Sex	Age	No.	Mean	A.D.	C.V.	Race	Source
M.	12	24	6.59	1.9	28.91	Chin.	Cre.
F.	12	12	5.38	2.2	40.89	"	"
M.	13	42	6.65	1.9	28.57	"	"
F.	13	22	6.54	1.7	25.99	"	"
M.	14	70	7.08	1.7	24.01	"	"
F.	14	22	6.37	2.8	43.95	"	"
M.	15	65	7.62	2.2	28.87	"	"
F.	15	19	6.67	2.3	34.48	"	"
M	16	57	8.36	2.2	26.31	"	"
F.	16	29	6.34	2.1	33.12	"	"
M.	17	35	8.93	2.1	23.51	"	"
F.	17	20	7.73	2.7	34.92	"	"

CONTROLLED ASSOCIATION---OPPOSITES IV.

Sex	Age	No.	Mean	A.D.	C.V.	Race	Source
M.	12	23	8.23	1.5	18.22	"	"
F.	12	12	9.10	1.8	19.67	"	"
M.	13	42	8.47	2.0	23.61	"	"
F.	13	28	9.74	2.1	21.56	"	"
M	14	70	8.85	1.8	20.33	"	"
F.	14	22	9.45	2.6	27.51	"	"
M.	15	75	9.36	2.0	21.36	"	"
F.	15	19	10.0	2.4	24.00	"	"
M.	16	57	9.93	1.9	19.13	"	"
F.	16	29	9.95	3.2	32.16	"	"
M.	17	35	10.72	2.0	18.65	"	"
F.	17	20	11.80	2.1	17.79	"	"

CONTROLLED ASSOCIATION---PART-WHOLE.

Sex	Age	No.	Mean	A.D.	C.V.	Race	Source
M.	8	31	5.5	3.6	65.45	Am.	Py. '13
F.	8	43	4.6	2.6	56.52	"	"
M.	9	67	6.5	2.9	44.61	"	"
F.	9	64	5.9	2.4	40.67	"	"
M.	10	70	7.3	2.5	34.24	"	"
F.	10	88	7.8	2.9	37.18	"	"
M.	11	65	8.9	2.8	31.46	"	"
F.	11	67	10.0	3.5	35.00	"	"
M.	12	76	8.9	3.4	38.20	"	"
F.	12	87	10.0	3.7	37.00	"	"
M.	13	77	11.1	4.3	38.74	"	"
F.	13	71	10.8	3.5	32.40	"	"
M.	14	62	12.2	4.1	33.60	"	"
F.	14	65	12.5	3.2	25.60	"	"
M.	15	42	14.8	5.5	37.16	"	"
F.	15	48	14.0	4.5	32.14	"	"
M.	16	35	15.9	5.3	33.33	"	"
F.	16	51	16.9	4.5	26.62	"	"
M.	17	12	15.8	4.0	25.31	"	"
F.	17	38	16.2	4.8	29.63	"	"
M.	18	23	19.3	5.6	29.01	"	"
F.	18	28	19.7	4.6	23.35	"	"
M.	Adult	66	18.5	3.6	19.46	"	"
F.	"	87	19.7	3.4	17.26	"	"

CONTROLLED ASSOCIATION---GENUS-SPECIES.

Sex	Age	No.	Mean	A.D.	C.V.	Race	Source
M.	8	29	4.6	3.4	73.91	Am.	Py. '13
F.	8	34	5.5	3.6	65.45	"	"
M.	9	67	5.7	3.4	59.65	"	"
F.	9	65	5.4	2.5	46.29m	"	"
M.	10	66	6.5	3.7	56.92	"	"
F.	10	84	7.8	3.2	41.02	"	"
M.	11	62	7.2	3.3	45.83	"	"
F.	11	63	8.2	3.7	45.12	"	"
M.	12	69	7.1	2.5	35.21	"	"
F.	12	81	9.3	2.9	31.18	"	"
M.	13	68	10.0	3.8	38.00	"	"
F.	13	64	9.5	3.2	33.68	"	"
M.	14	64	10.5	3.8	36.19	"	"
F.	14	55	11.8	3.2	27.12	"	"
M.	15	41	11.1	5.4	48.65	"	"
F.	15	40	14.0	4.2	30.00	"	"
M.	16	33	15.2	4.3	28.29	"	"
F.	16	45	16.4	5.4	32.92	"	"
M.	17	18	14.0	4.1	29.28	"	"
F.	17	32	16.0	4.9	30.62	"	"
M.	18	16	17.3	6.0	34.68	"	"
F.	18	25	18.3	5.3	28.96	"	"
M.	Adult	65	15.1	4.0	26.48	"	"
F.	"	86	15.5	3.8	24.51	"	"

Controlled Association as tested by various lists of opposites, genus, species, and part-whole series, has the following results:-

1. Pyle '13 series show the females more variable at ages 8, 9, 11, 12, and adults; the males more variable at the remaining ages; and the average C. V. 1.61 % greater for the males.

2. Opposites I, given in the lower grades by Dr. Pyle and me, and in all grades by Collings, show these results:-

a). Pyle '16--Males more variable at ages 7, 8, 9, and 10; females more so at 11; and the average C. V. 1.22 % greater for males.

b). Collings finds the females more variable at 10, 15, 17, and 18; the males at 8, 9, 11, 13, 14, and 16; and the average 3.05 % greater for the males.

c). My results are the only ones of this group to have a larger average C. V. for the girls--it is .36 of 1 % greater. I find the females more variable at 8, 9, 11, and 12, and the boys more so at 10.

3. Opposites II has four groups of data:-

a). Collings found the males more variable at all ages except 9, 14, and 17; and the average in their favor by 9.61 %.

b). Pyle '16 found the females more variable at all ages except 9, 13, 14, and 17; but the average C. V. was 5.19 % greater for the males.

c). The Chinese series also indicated greater female variability, their average being 6.87% greater than that of the males; and considering the ages separately, they were more variable at 12, 14, 16, and 17, while the males were more so at 13 and 15 years.

d). My data indicates greater male variability at 10, 11, 13, 14, and 15; greater female variability at 12 and 16; and the average C. V. 2.84 % greater for the males.

4. Opposites III and IV given only to Chinese show the females more variable to the extent of 8.87 % and 3.57 % respectively.

5. The part-whole and genus species series both show greater male variability.

In the American series the males are shown to be more variable, but the Chinese girls were more variable.

COMPLETION---JOE AND THE FOURTH OF JULY.

Sex	Age	No.	Mean	A.D.	C.V.	Race	Source
M.	8	110	4.4	3.0	68.18	Am.	Coll.
F.	8	122	5.3	3.2	60.38	"	"
M.	9	101	5.5	3.2	58.18	"	"
F.	9	81	5.3	5.1	96.22	"	"
M.	10	112	6.9	4.1	59.42	"	"
F.	10	124	6.9	4.0	57.97	"	"
M.	11	125	8.0	4.2	52.50	"	"
F.	11	112	9.9	8.0	88.88	"	"
M.	12	121	8.4	4.3	51.19	"	"
F.	12	111	10.3	4.1	39.80	"	"
M.	13	126	9.8	4.2	42.85	"	"
F.	13	104	10.0	4.6	46.00	"	"
M.	14	100	11.4	4.1	35.96	"	"
F.	14	130	12.4	3.5	28.22	"	"
M.	15	67	11.3	4.4	38.93	"	"
F.	15	84	12.6	4.0	31.74	"	"
M.	16	52	11.9	2.4	20.17	"	"
F.	16	50	14.4	2.2	15.28	"	"
M.	17	30	15.6	2.4	17.64	"	"
F.	17	26	15.1	2.1	13.91	"	"
M.	18	26	15.4	2.8	18.18	"	"
F.	18	29	18.2	2.2	12.09	"	"

COMPLETION---JOE AND THE FOUR TH OF JULY.Cont'd.

Sex	Age	No.	Mean	A.D.	C.V.	Race	Source
M.	7	15	10.9	3.6	33.03	Am.	Py.'16
F.	7	24	12.0	4.4	36.66	"	"
M.	8	121	10.9	4.3	39.45	"	"
F.	8	1000	12.3	3.8	30.90	"	"
M.	9	145	11.5	4.4	38.26	"	"
F.	9	155	14.1	3.2	22.70	"	"
M.	10	131	14.0	3.6	25.71	"	"
F.	10	121	14.5	3.4	23.45	"	"
M.	11	87	13.9	3.3	23.74	"	"
F.	11	52	15.1	3.1	20.53	"	"
M.	12	29	12.1	3.2	26.44	"	"
F.	12	36	14.5	3.1	21.38	"	"
M.	8	39	11.9	3.9	32.77	"	Sum.
F.	8	39	11.2	3.9	34.83	"	"
M.	9	59	12.4	4.5	36.29	"	"
F.	9	44	13.9	3.1	22.30	"	"
M.	10	58	12.9	3.5	27.13	"	"
F.	10	67	16.1	2.4	14.90	"	"
M.	11	38	14.6	2.7	18.49	"	"
F.	11	32	15.4	2.7	17.53	"	"
M.	12	31.	13.3	3.6	27.06	"	"
F.	12	19	15.4	2.4	15.56	"	"

COMPLETION---TROUT.

Sex	Age	No.	Mean	A.D.	C.V.	Race	Source
M.	9	13	16.8	6.7	39.98	Am.	Py. '16
F.	9	10	18.9	6.9	36.51	"	"
M.	10	76	16.1	5.2	32.30	"	"
F.	10	68	15.0	4.5	30.00	"	"
M.	11	120	17.5	5.9	33.71	"	"
F.	11	114	16.1	4.3	26.71	"	"
M.	12	114	17.8	6.1	34.27	"	"
F.	12	132	17.0	6.6	38.82	"	"
M.	13	93	20.3	5.7	28.07	"	"
F.	13	94	18.8	4.5	23.93	"	"
M.	14	51	20.4	5.5	26.96	"	"
F.	14	57	19.2	5.4	28.12	"	"
M.	15	38	19.9	5.3	26.63	"	"
F.	15	24	20.3	6.0	29.55	"	"
M.	16	13	19.7	6.5	32.69	"	"
F.	16	17	21.1	4.1	19.43	"	"
M.	10	11	16.6	4.3	25.90	"	" Sum.
F.	10	10	17.4	4.9	28.16	"	"
M.	11	27	18.5	5.4	29.18	"	"
F.	11	41	18.3	4.3	23.60	"	"
M.	12	43	18.2	5.6	30.76	"	"
F.	12	58	19.3	4.2	21.76	"	"
M.	13	59	21.4	3.6	16.80	"	"
F.	13	83	18.9	4.6	25.40	"	"
M.	14	43	18.8	4.0	21.27	"	"
F.	14	47	18.9	4.6	24.34	"	"

COMPLETION---DR. GOLDSMITH.

Sex	Age	No.	Mean	A.D.	C.V.	Race	Source
M.	11	13	41.3	3.0	7.26	Am.	Py. '16
F.	11	15	40.7	7.4	18.18	"	"
M.	12	30	36.8	6.9	18.75	"	"
F.	12	47	40.6	6.9	16.99	"	"
M.	13	53	40.3	5,5	13.64	"	"
F.	13	48	41.7	6.1	14.62	"	"
M.	14	58	37.8	8,6	22.75	"	"
F.	14	60	44.3	4.1	9.25	"	"
M.	15	83	39.0	6.3	16.15	"	"
F.	15	92	42.3	4.9	11.58	"	"
M.	16	62	38.8	7.1	18.29	"	"
F.	16	82	43.0	4.5	10.36	"	"
M.	17	45	41.1	5,2	12.65	"	"
F.	17	61	44.1	3.7	8.39	"	"
M.	18	37	40.9	6.2	15.16	"	"
F.	18	45	45.2	3.4	7.52	"	"
M.	14	16	43.8	3.8	8.67	"	Sum.
F.	14	22	45.6	1.9	4.16	"	"
M.	15	14	44.2	2.4	5.43	"	"
F.	15	28	46.1	1.9	4.12	"	"
M.	16	11	46.1	2.2	4.77	"	"
F.	16	26	46.7	1.4	3.00	"	"
M.	Adult	20	48.1	1.7	3.53	"	"
F.	"	25	49.0	1.0	2.04	"	"

The Completion Tests--three in number--have the following results:-

1. "Joe and the Fourth of July"
   a). Colling's series show the males more variable at eight of the seven ages, and their average C. V. 2.48 % greater than the females.
   b). Pyle '16 finds the males more variable at 8, 9, 10, 11, and 12 as compared with the females being more variable at 7; and the average C. V. 6.93% greater for the males.
   c). My data shows the males more variable at 9, 10, 11, and 12; the females more so at 8; and the average 7.33 % greater for the males.
2. "The Trout"
   a). Pyle '16 finds the females more variable at 12, 14, and 15; the males more variable at 9, 10, 11, 13, and 16; and the average 2.18 % greater for the males.
   b). My data shows the average C. V. .07 of 1 % greater for the males in spite of the fact that the females are more variable at four of the six ages tested.
3. "Dr. Goldsmith"--in two series--shows greater male variability, the difference in the series being 3.46 % and 2.53 % respectively.

The Completion Tests show the males more variable in six of the seven series when the average C. V.s are compared.

SUBSTITUTION---DIGIT-SYMBOL.

Sex	Age	No.	Mean	A.D.	C.V.	Race	Source
M.	8	34	10.3	3.5	33.98	Am.	Py. '13
F.	8	37	13.0	3.2	24.61	"	"
M.	9	58	12.6	4.1	32.54	"	"
F.	9	61	15.6	4.1	26.11	"	"
M.	10	50	15.4	3.9	25.32	"	"
F.	10	58	18.8	4.4	23.40	"	"
M.	11	49	16.3	3.6	22.08	"	"
F.	11	49	18.5	4.1	22.16	"	"
M.	12	56	19.1	5.1	26.70	"	"
F.	12	68	22.7	4.9	21.58	"	"
M.	13	62	22.6	5.8	25.66	"	"
F.	13	49	23.4	5.2	22.22	"	"
M.	14	48	21.1	4.5	21.32	"	"
F.	14	46	26.8	5.0	18.65	"	"
M.	15	35	24.7	4.6	18.62	"	"
F.	15	34	26.8	4.7	17.54	"	"
M.	16	31	24.8	5.4	21.77	"	"
F.	16	46	27.5	5.3	19.27	"	"
M.	17	14	23.8	4.3	18.06	"	"
F.	17	38	28.5	5.7	20.00	"	"
M.	18	17	28.7	3.5	12.19	"	"
F.	18	29	25.9	7.0	27.02	"	"
M.	Adult	67	29.3	8.7	26.69	"	"
F.	"	88	32.2	4.2	28.18	"	"

SUBSTITUTION---SYMBOL-DIGIT.

Sex	Age	No.	Mean	A.D.	C.V.	Race	Source
M.	8	37	10.0	5.3	53.00	Am.	Py. '13
F.	8	41	10.9	5.3	48.62	"	"
M.	9	72	13.2	5.0	37.88	"	"
F.	9	82	16.0	5.2	32.50	"	"
M.	10	76	16.5	5.8	35.15	"	"
F.	10	82	19.9	6.4	32.16	"	"
M.	11	62	17.7	5.4	30.51	"	"
F.	11	63	19.6	6.3	32.14	"	"
M	12	75	19.3	5.4	27.97	"	"
F;	12	89	23.1	6.6	28.57	"	"
M.	13	78	20.7	5.7	28.53	"	"
F.	13	66	25.6	6.4	25.00	"	"
M.	14	59	23.3	5.4	23.17	"	"
F.	14	62	27.4	6.1	22.26	"	"
M.	15	45	25.8	5.9	22.86	"	"
F.	15	44	29.7	6.7	22.55	"	"
M.	16	38	27.8	6.3	22.66	"	"
F.	16	55	29.1	5.3	18.21	"	"
M.	17	20	26.1	7.4	28.35	"	"
F.	17	43	32.0	6.3	19.69	"	"
M.	18	17	28.0	5.1	18.21	"	"
F.	18	29	33.1	4.4	13.29	"	"
M.	Adult	56	33.0	9.3	28.18	"	"
F.	"	89	31.3	5.4	17.25	"	"

SUBSTITUTION---DIGIT-SYMBOL.

Sex	Age	No.	Mean	A.D.	C.V.	Race	Source
M.	8	98	10.07	3.4	33.75	Am.	Py. '16
F.	8	77	12.7	3.6	28.34	"	"
M.	9	122	11.8	3.5	29.66	"	"
F.	9	121	13.76	4.8	34.88	"	"
M.	10	148	13.6	3.9	28.69	"	"
F.	10	126	15.7	4.8	30.57	"	"
M.	11	155	15.4	4.3	27.92	"	"
F.	11	127	18.9	4.8	25.39	"	"
M.	12	150	17.7	4.6	25.99	"	"
F.	12	167	20.5	4.9	23.90	"	"
M.	13	149	17.71	4.7	26.54	"	"
F.	13	141	22.5	4.3	19.11	"	"
M.	14	108	29.8	4.8	23.08	"	"
F.	14	109	23.5	4.5	19.15	"	"
M.	15	113	23.4	4.9	20.94	"	"
F.	15	111	26.8	4.9	18.28	"	"
M.	16	70	24.16	4.9	20.28	"	"
F.	16	92	27.7	4.3	15.52	"	"
M.	17	51	26.0	5.2	20.00	"	"
F.	17	65	29.2	4.1	14.04	"	"
M.	18	36	24.75	4.2	16.96	"	"
F.	18	48	27.9	5.5	19.71	"	"
M.	Adult	64	29.1	5.3	18.21	"	"
F.	"	167	32.2	5.8	18.01	"	"

SUBSTITUTION---DIGIT-SYMBOL.

Sex	Age	No.	Mean	A.D.	C.V.	Race	Source
M.	8	113	6.0	3.2	53.33	Am.	Coll.
F.	8	134	7.1	3.4	47.88	"	"
M.	9	117	7.7	2.8	36.36	"	"
F.	9	101	8.4	4.3	51.19	"	"
M.	10	130	9.2	3.4	36.95	"	"
F.	10	152	11.9	5.5	46.22	"	"
M.	11	150	12.4	5.9	47.58	"	"
F.	11	141	15.2	8.6	56.57	"	"
M.	12	125	14.6	6.0	41.09	"	"
F.	12	138	19.8	8.0	40.40	"	"
M.	13	106	17.3	6.3	36.41	"	"
F.	13	154	21.9	6.6	30.14	"	"
M.	14	112	19.8	6.2	31.31	"	"
F.	14	124	23.5	6.0	25.53	"	"
M.	15	80	20.5	5.8	29.89	"	"
F.	15	92	24.8	5.3	21.37	"	"
M.	16	52	21.2	6.2	29.71	"	"
F.	16	50	27.6	5.8	21.01	"	"
M.	17	17	22.3	5.6	25.00	"	"
F.	17	30	28.6	3.9	13.63	"	"
M.	18	28	25.5	4.3	16.86	"	"
F.	18	30	28.3	6.5	22.96	"	"

SUBSTITUTION---DIGIT-SYMBOL. Cont'd.

Sex	Age	No,	Mean	A.D.	C.V.	Race	Source
M.	13	42	20.36	5.3	26.03	Chin.	Cre.
F.	13	22	18.98	4.8	25.29	"	"
M.	14	70	21.68	3.9	18.00	"	"
F.	14	22	18.91	4.5	25.37	"	"
M.	15	76	22.28	4.7	21.09	"	"
F.	15	19	19.81	6.5	32.81	"	"
M.	16	57	23.89	6.0	25.11	"	"
F.	16	27	18.06	7.4	40.97	"	"
M.	17	35	25.96	4.5	17.37	"	"
F.	17	30	21.26	5.8	27.28	"	"

SUBSTITUTION---SYMBOL-DIGIT.

M	13	43	16.04	6.2	38.65	"	"
F.	13	22	21.53	3.6	16.72	"	"
M.	14	70	18.39	4.3	23.38	"	"
F.	14	32	20.88	6.3	30.18	"	"
M.	15	76	17.87	6.4	35.81	"	"
F.	15	19	22.85	6.7	29.32	"	"
M.	16	57	18.29	6.4	34.99	"	"
F.	16	28	19.88	8.2	41.24	"	"
M.	17	35	23.12	3.8	16.43	"	"
F.	17	20	23.96	5.7	23.79	"	"

The substitution of symbols for digits and digits for symbols indicates greater male variability in five out of six series--as follows:-

1. Collings found males more variable at all ages except 9, 10, 11, and 18, and their average .55 of 1 % greater.

2. Pyle '13 found males more variable at all ages tested except 9, 10, and 18, and their average 2.25 % greater in the digit-symbol test. In the symbol-digit test they were more variable at every age except 11, and 12, and their average was 2.93 % greater than that of the female.

3. Pyle '16 found the males more variable at all ages except 11, 17, and 18, and the average 1.43 % greater for the males.

4. The Chinese data are somewhat contradictory. When all ages are averaged in the symbol-digit test the females are more variable at 14, 16, and 17; the males at 13, and 15; and the average C. V. 1.6 % greater for the males. In the digit-symbol test the females are more variable at ages 14, 15, 16, and 17. The males are more variable at 13, and the average is 6.82 % greater for the females.

The three American series indicate greater male variability, and the Chinese data shows girls more variable in one test and the boys in the other.

INVENTION---WORD-BUILDING.

Sex	Age	No.	Mean	A.D.	C.V.	Race	Source
M.	8	18	6.5	3.9	60.00	Am.	Py. '13
F.	8	17	6.7	4,0	59.70	"	"
M.	9	45	7.3	3.6	49.31	"	"
F.	9	53	8.4	4.5	53.57	"	"
M.	10	48	9.4	3.1	32.98	"	"
F.	10	66	10.4	4.1	39.42	"	"
M.	11	51	11.0	3.8	34.54	"	"
F.	11	52	12.12	4.0	32.78	"	"
M.	12	55	11.0	4.1	37.27	"	"
F.	12	66	14.2	5.4	38.03	"	"
M.	13	62	12.4	4.9	39.51	"	"
F.	13	41	15.8	5.3	33.54	"	"
M.	14	46	11.8	4.3	36.44	"	"
F.	14	51	16.0	5.8	36.25	"	"
M.	15	30	16.0	4.4	27.50	"	"
F.	15	36	17.1	3.4	19.88	"	"
M.	16	29	16.4	3.6	21.95	"	"
F.	16	50	16.5	4.9	29.69	"	"
M.	17	21	18.9	3.0	15.87	"	"
F.	17	37	16.4	5.3	32.31	"	"
M.	18	20	14.3	4.1	28.67	"	"
F.	18	29	19.6	3.7	18.88	"	"
M.	Adult	22	22.7	3.2	14.09	"	"
F.	"	38	22.0	3.6	16.37	"	"

WORD BUILDING---Cont'd.

Sex	Age	No.	Mean	A.D?	C.V.	Race	Source
M.	7	11	6.2	1.6	38.75	Am.	Py. '16
F.	7	16	7.4	1.9	26.67	"	"
M.	8	52	8.2	2.8	34.14	"	"
F.	8	53	7.8	2.2	28.20	"	"
M.	9	63	7.6	2.7	35.52	"	"
F.	9	67	9.0	3.9	43.33	"	"
M.	10	70	9.5	3.8	40.00	"	"
F.	10	60	9.6	3.6	37.50	"	"
M.	11	77	11.1	4.7	42.73	"	"
F.	11	56	11.4	3.6	31.58	"	"
M.	12	76	12.2	3.5	28.69	"	"
F.	12	66	12.9	4.0	31.00	"	"
M.	13	66	12.2	3.4	27.87	"	"
F.	13	66	14.1	4.4	31.20	"	"
M.	14	42	13.9	3,6	25.89	"	"
F.	14	51	14.5	3.5	24.11	"	"
M.	15	48	12.7	3.5	27.55	"	"
F.	15	46	15.3	3.7	24.18	"	"
M.	16	36	14.5	4.7	32.41	"	"
F.	16	40	14.2	4.5	31.68	"	"
M.	17	27	13.4	4.1	30.59	"	"
F.	17	25	16.8	4.2	25.00	"	"
M.	18	14	15.6	2.2	14.73	"	"
F.	18	19	15.1	4.5	29.80	"	"
M.	Adult	40	20.5	2.8	13.66	"	"
F.	"	59	20.1	3.5	17.41	"	"

WORD BUILDING. Cont'd.

Sex	Age	No.	Mean	A.D:	C.V.	Race	Source
M.	Adult	64	18.5	3.7	19.89	Am.	Py.'13
F.	"	86	21.1	2.7	12.79	"	"
M.	"	40	20.5	2.8	13.66	"	Py.'16
F.	"	59	20.1	3.5	17.42	"	"
M.	"	244	18.5	3.4	18.38	"	Sum.
F.	"	431	19.1	3.8	19.89	"	"

The two groups of results in the word-building test were taken from Dr. Pyle's Manuals.

The 1913 Manual shows girls more variable at 9, 10, 11, 16, and 17 years; and the boys more variable at 8, 11, 13, 14, 15, and 18 years. The average C. V. is .91 of 1 % greater for the girls.

The 1916 Manual indicates greater female variability at 9, 12, 13, and 18 years; and greater male variability at the other ages. The difference in average C. V.s is .18 of 1 % with that of the males predominating.

In the three series of adult data the males are more variable.

The series of results among school children agree that the males are more variable at 8, 11, 14, and 15; and the female more variable at 9, and 12 years. The other ages show contradictory evidence. At least we can say definitely that the male adults are more variable in word-building than female adults.

CANCELLATION.

Sex	Age	No.	Mean	A.D.	C.V.	Race	Source
M.	8	57	7.8	2.3	29.48	Am.	Py. '13
F.	8	53	8.2	2.3	28.05	"	"
M.	9	83	9.2	2.3	25.00	"	"
F.	9	89	10.6	3.0	28.30	"	"
M.	10	80	10.4	2.8	26.92	"	"
F.	10	80	11.4	3.2	28.07	"	"
M.	11	75	11.4	3.0	26.31	"	"
F.	11	68	13.3	3.4	25.56	"	"
M.	12	77	13.8	3.8	27.53	"	"
F.	12	85	14.5	3.4	23.45	"	"
M.	13	67	13.2,	2.8	21.21	"	"
F.	13,	60	16.4	3.6	21.95	"	"
M.	14	52,	16.9,	4.1	24.26	"	"
F.	14	57	17.8	4.1	23.03	"	"
M.	15	38	15.2,	3.7	24.34	"	"
F.	15	49	18.9	4.2	22.22	"	"
M.	16	29	17.5	3.8	21.71	"	"
F.	16	46	20.4	4.5	22.06	"	"
M.	17	15	7.6			"	"
F.	17	42	21.5	4.9	22.79	"	"
M.	18	21	21.5	4.5	20;93	"	"
F.	18	28	22.5	3.6	16.00	"	"
M.	Adult	63	22.2	4.4	19.82	"	"
F.	"	87	23.0	4.1	17.83	"	"

The single series of cancellation tests show the females more variable at the ages 9, 10, 13 and 16. The males are more variable at the remaining seven ages, and among the adults. The average C. V. is .51 of 1 % greater for the males, but this one series is too limited to permit any generalization concerning preponderating male variability.

Sex	Age	No.	Mean	A.D.	C.V.	Race	Source
			SPEED WRITING.				
M.	13	41	29.95	5.4	18.03	Chin.	Cre.
F.	13	16	22.56	2.3	10.19	"	"
M.	14	65	27.92	4.3	15.40	"	"
F.	14	13	22.87	3.4	14.86	"	"
M.	15	69	30.86	5.3	17.17	"	"
F.	15	12	21.58	2.3	10.66	"	"
M.	16	51	29.33	6.5	21.71	"	"
F.	16	16	23.41	2.9	12.38	"	"
M.	17	34	32.44	4.8	14.80	"	"
F.	17	14	25.16	2.8	11.13	"	"
			ANALOGUES.				
M.	13	42	5.28	4.2	79;54	"	"
F.	13	21	6.03	2.4	39.80	"	"
M.	14	69	5.65	3.4	60.17	"	"
F.	14	22	4.20	4.0	95.24	"	"
M.	15	74	6.15	3.1	50.40	"	"
F.	15	19	3.92	3.3	84.18	"	"
M.	16	57	6.24	4.0	64.10	"	"
F.	16	29	3.97	2.9	73.04	"	"
M.	17	35	7.51	4.8	65.24	"	"
F.	17	19	4.67	2.6	55.67	"	"

The male Chinese student is more variable in speed of writing at every age, the average C. V. being 5.58 % greater for that sex.

In analogues the females are more variable at 14, 15, and 16 years, the males more variable at 13, and 17. The average C. V. of the females is 5.7 % greater than that of the males.

SUMMARY

A summary of the results of the physical measurements would be, for the most part, merely a copy of the data because they are the results of many different investigations. The units and methods were not always uniform, so that combinations and comparisons of them are not justified.

The most extensive series is Porter's data on St. Louis school children. From it we are able to make a study of the various ages with the result that in stature, span, weight, and chest girth, the girls appear more variable at the ages six to thirteen inclusive, and the boys more variable at adolescence.

Girls appear more variable in grip, width of head, arm-bone length; weight of internal organs and brain, strength of pull, and adult weight. Boys show greater variability in sitting height, length of head, facial measurements, leg-bone length, and weight at birth.

In skull capacity and cephalic index the sexes appear equally variable. The bone length data cannot be treated by age, and the strength of pull, weight of internal organs, and some other measurements are for adults only, so that no comparison of variability at various ages is possible.

Therefore, owing to the fact that the physical data are inadequate, I can only say, in conclusion, that the indications are that girls are more variable between six and thirteen years, and the boys show greater variability at adolescence.

Fortunately the mental dataare uniform as to method and treatment, because it is the result of investigations made by Dr. W. H. Pyle, Professor of Educational Psychology at the University of Missouri, and three of his students. Colling's data were obtained from tests given to rural school children in McDonald County, Missouri. Creighton examined the pupils of a Chinese school in which he was a teacher. My own data were obtained in the Joplin, Mo. schools with the exception of the adult measurements. The latter came from University records. Dr. Pyle's two groups are the results of testing school children in various Missouri towns and cities.

Collings gave eight tests to eleven ages--making eighty-eight coefficients of variation for each sex. Fifty-seven times out of the eighty-eight the boys' C. V. was greater than the girls'. When all tests were combined the girls showed greater variability at the ages 8,9, 11, and 18; while the boys were more variable at 12, 13, 14, 15, 16, and 17 years. However, when the ages were combined, the boys proved more variable in six of the eight tests. The only exceptions were Free Association and Completion.

I also gave eight tests but varied them as to ages so my series gave only fifty-three C. V's for each sex. The boys' C. V. was greater thirty-nine of the fifty-three times. When all my tests were averaged the boys showed greater variability at all ages except thirteen, and when all ages were averaged they proved more variable in every test except Opposites I and that was a small series.

Dr. Pyle's '13 series has eleven tests at various ages making one hundred and twenty-one in all. Of that number, the boys have a preponderating variability eighty-one times. When all tests were averaged the males were more variable at all ages except 11, 14, and 17, and when the ages were combined they showed greater variability in every test except word building.

The 1916 series show greater variability for the boys, the ratio being seventy-four to thirty-eight with the boys in the majority. When the tests are averaged the boys are more variable at every age except eleven, and when ages are combined they appear more variable in every test.

Creighton's is the only series which shows predominating variability for the girls when ages or tests are combined and out of sixty-two chances the girls are more variable in thirty-three cases.

My general conclusion from the mental data is that the boys show greater variability--especially in adolescence.

AVERAGE C.V.'S CREIGHTON CHINESE

Test	12	13	14	15	16	17	Average	
Rote-Memory Concrete	14.17	17.69	16.50	14.67	12.13	12.06	14.54	M.
	15.64	15.79	15.73	10.94	18.33	12.42	15.14	F.
Rote-Memory Abstract	12.20	15.80	14.47	17.50	13.72	13.18	14.48	M.
	16.63	11.56	12.84	12.39	16.32	12.76	13.75	F.
Free Association	28.19	24.68	22.72	20.60	15.69	14.91	21.13	M.
	25.64	22.22	27.44	25.85	26.72	20.43	24.71	F.
Opposites II	23.97	30.70	26.61	20.97	28.54	21.80	27.09	M.
	38.76	28.61	41.54	30.90	36.50	27.48	33.96	F.
Opposites III	28.91	28.57	24.01	28.87	26.31	23.51	26.69	M.
	40/89	25.99	43.95	34.48	33.12	34.92	35.56	F.
Opposites IV	18.22	23.61	20.33	21.36	19.13	18.65	20.21	M.
	19.67	21.56	27.51	24.00	32.16	17.79	23.78	F.
Substitution Digit-Symbol		26.03	18.00	21.09	25.11	17.37	23.52	M.
		25.29	25.37	32.81	40.97	27.28	30.34	F.
Substitution Symbol-Digit		38.65	23.38	35.81	34.99	16.43	29.85	M.
		16.72	30.17	29.32	41.24	23.79	28.25	F.
Logical Mem.	21.89	26.77	22.01	22.69	25.14	15.29	22/29	M.
Marble Statue	15.94	13.95	19.02	18.69	16.16	18.85	17.10	F.
Speed Writing		18.03	15.40	17.17	21.71	14.80	17.42	M.
		10.19	14.86	10.66	12.38	11.13	11.84	F.
Analogues		79.54	60.17	50.40	64.10	65.24	63.89	M.
		39.80	95.24	84.18	73.04	55.68	69.59	F.
Average	21.08	30.01	23.96	25.56	26.05	21.20		M.
	24.74	21.06	32.15	28.57	31.54	24.05		F.

Creighton's Chinese girls are more variable in seven of the eleven tests when all ages are averaged and when all the tests are averaged they are more variable at the ages 12,14,15,16 qnd 17.

AVERAGE C.V.'S.

Test		8	9	10	11	12	13	14	15	16	17	18	Average	
Rote-Memory Concrete	M	21.27	22.84	17.60	16.97	13.26	14.62	16.00	12.18	1			16.61	M.
	F	21.58	18.96	13.13	13.79	15.76	13.36	15.83	16.66	9			15.59	F.
Rote-Memory Abstract		34.06	28.51	26.12	22.39	21.29	23.76	19.03	18.18	5			23.79	M.
		38.05	24.16	19.68	22.32	22.06	11.11	21.54	19.31	8			21.21	F.
Free Association		32.61	28.25	30.30	34.23	31.87	43.06	39.64	37.00	4	28.73	33.94	34.86	M.
		34.60	28.71	33.54	32.88	42.07	43.86	32.99	34.33	7	33.65	29.51	34.60	F.
Opposites		36.68	35.71	41.33	26.60	25.21	31.03	29.65	32.50	9	16.83	14.28	28.94	M.
		50.00	38.15	28.44	26.78	25.90	28.85	22.41	28.46	6	15.60	13.24	27.33	F.
Part-Whole		65.45	44.61	34.24	31.46	38.20	38.74	33.60	37.16	3	25.31	29.01	37.64	M.
		56.52	40.67	37.18	35.00	37.00	32.40	25.60	32.14	2	29.63	23.35	34.19	F.
Genus-Species		73.91	59.65	56.92	45.83	35.21	38.00	36.19	48.65	9	29.28	34.68	44.24	M
		65.45	46.29	41.02	45.12	31.18	33.68	27.12	30.00	4	30.62	28.96	37.49	F.
Substitution Digit-Symbol		33.98	32.54	25.32	22.08	26.70	25.66	21.32	18.62	7	18.06	12.19	23.48	M.
		24.61	26.11	23.40	22.16	21.58	22.22	18.65	17.54	7	20.00	27.02	22.05	F.
Substitution Symbol-Digit		53.00	37.88	35.15	30.51	27.97	27.53	23.17	22.86	6	28.35	18.21	29.75	M.
		48.62	32.50	32.16	32.14	28.57	25.00	22.26	22.55	1	19.69	13.29	26.82	F.
Logical-Mem. Marble.Statue		27.57	31.71	22.33	17.02	21.08	17.12	18.28	18.38	8	25.14	16.26	21.01	M.
		39.65	30.32	20.21	21.15	18.90	18.44	19.23	16.11	7	18.15	11.64	20.74	F.
Word Building		60.00	49.31	32.98	34.54	37.27	39.51	36.44	27.56	5	15.87	28.67	34.91	M.
		59.70	53.57	39.42	32.78	38.03	33.64	36.25	19.89	9	32.31	18.88	35.82	F.
Cancellation		29.48	25.00	26.92	26.31	27.54	21.21	24.26	24.34	1		20.93	24.28	M.
		28.05	28.30	28.07	25.56	23.45	21.95	23.03	22.22	6	22.79	16.00	23.77	F.
Average	M	42.56	36.01	31.75	27.99	27.78	29.11	23.91	27.02	7	23.84	23.13		M.
	F	42.44	33.43	28.75	28.15	27.68	25.86	24.08	23.66	6	24.79	20.21		F.

This table is a summary of the material in Dr. Pyle's Manual which was issued in '13.

When all ages are combined the males are more variable in every test except word building. When the average C.V.'s of all tests are combined the males are more variable at the age 8,9,10,11,12,13,15,16 and 18.

AVERAGE C.V.'S. PYLE '16.

Test	8	9	10	11	12	13	14	15	17	18	Average.	Sex
Rote-Memory	16.43	13.33	14.22	10.59	11.24	12.16	12.92	14.50	10.37	15.41	13.15	M.
Concrete	11.79	15.48	8.78	12.45	10.26	9.49	10.99	10.25	7.72	4.84	10.19	F.
Rote-Memory	19.80	12.67	15.31	16.66	12.91	13.58	12.14	14.62	11.40	11.95	13.95	M.
Abstract	12.38	13.70	13.70	12.81	13.09	10.49	10.68	11.62	11.07	10.38	1 12.13	F.
Completion	39.45	38,26	25,71	23.74	26.44						30.72	M.
Joe.	30.90	22.70	23.45	20.53	21.38						23.79	F.
Completion		39.98	32.30	33.71	34.27	28.07	26.96	26.62			31.81	M.
Trout		36.51	30.00	26.71	38.82	23.93	28.12	29.53			29.13	F.
Completion				7.26	18.75	13.64	22.75	16.15	12.65	15.16	15.58	M,
Dr. Goldsmith				18.18	16.99	14.62	9.25	11.58	8.39	7.52	12.12	F.
Free	25.56	35.24	29.79	38.70	38.54	39.23	33.98	23.60	27.34	28.45	32.46	M.
Association	32.51	33.70	40.32	36.92	34.52	33.11	26.57	25.50	29.83	27.81	31.70	F.
Opposites	28.23	29.07	29.24	22.93							27.37	M.
I	24.73	25.49	27.77	26.61							26.15	F.
Opposites	29.27	84.80	39.29	30.85	28.43	42.59	30.25	21.05	26.43	15.97	34.85	M.
II	34.00	38.59	41.89	37.77	31.73	30.25	26.51	25.34	18.51	16.96	29.66	F.
Logical-Mem.	26.58	23.24	22.54	24.30	19.57	21.63				b	24.48	M.
Willie Jones	23.51	18.50	21.51	18.08	17.31	28.33					21.37	F.
Logical Memory		19.05	25.32	29.78	21.62	17.10	15.05	27.96			20/98	M.
Farmer's Son.		18.54	17.68	19.12	23.65	19.61	21.37	18.59			19.79	F.
Logical Memory					20/57	16.10	21.07	19.01	24.88	22.01	21.77	M.
Costly Temper.					16.94	20.70	17.87	19.15	26.22	20.83	20;60	F.
Substitution	33.76	29.66	28.69	27,92	25.99	26,54	23.08	20.94	20.00	16.96	24.89	M.
	28.34	34.88	30.57	25.39	23.90	19.11	19.15	18.22	14.04	19.71	22.62	F.
Word	34.14	35.52	40.00	42.72	28.68	27,86	25.89	27.56	30.59	14.74	30.92	M.
Building	28.20	43.33	37.50	31.58	31.01	31.20	24.11	24.18	25.00	29.80	30.69	F.
	27.80	32.80	28.40	23.79	23.92	23.50	22.41	21.29	20.46	17.58		M.
	25.15	27.40	26.65	23.85	23.30	21.98	19.46	19.43	17.59	17.22		F.

This summary shows the males more variable in every test when all ages are averaged. When the tests are combined the males appear more variable at every age except 11 years.

Test	Average C.V.'s 8	9	10	11	12	13	14	15	Collings.	17	18	Average	
Rote-Memory Concrete	46.27	36.05	27.37	22.86	17.89	17.11	15.62	13.82	62	13.58	6.97	21.42	M.
	48.96	39.15	33.33	23,25	19.82	12.06	12.98	12.36	61	7.58	8.05	20.89	F.
Rote-Memory Abstract	45.54	90.26	33.56	34.11	24.73	27.31	22.33	15.45	05	12.24	16.59	33.19	M.
	60.87	72.79	40.28	29.93	29.75	16.96	12.86	15.02	06	7.75	9.05	28.13	F.
Completion Joe	68.18	58.18	59.42	52.50	51.19	42.85	35.96	38.93	17	17.64	18.18	42.11	M.
	60.38	96.22	57.97	88.88	39.80	46.00	28.22	31.74	28	13.91	12.09	44.59	F.
Free Association	43.03	47.97	38.98	33.33	32.46	27.28	32.64	31.77	22	23.09	12.03	32.25	M.
	42.45	44.79	28.41	31.05	34.69	32.64	28.92	27.34	97	31.58	28.90	33.01	F.
Opposites I	77.55	62.50	53.65	50.50	42.85	36.36	35.05	26.98	96	19.46	16.59	40.40	M.
	61.29	56.52	58.11	46.66	28.24	32.26	26.35	36.66	00	20.17	24.09	37.35	F.
Opposites II	57.89	57.14	78.43	61.40	50/00	75.00	39.43	44.44	81	26.66	23.63	50.44	M.
	47.73	62.00	64.81	53.57	44.44	51.39	42.04	41.84	76	29.45	19.20	40.83	F.
Substitution	53.33	36.36	36.95	47.58	41.09	36.41	31.31	28.89	71	25.00	16.86	34.81	M.
	48.88	51.19	46.22	56.57	40.04	30.14	25.53	21.37	01	13.63	22.96	34.26	F.
Logical-Mem. Marble Statue	62.72	70.78	53.51	60.43	53.98	53.76	39.00	32.09	05	30.85	18.45	46.60	M.
	86.44	51.85	72.32	58.23	45.59	37.65	28.22	22.97	66	19.69	18.55	41.19	F.
Average	56.81	57.41	47.79	45.34	39.27	39.38	31.41	28.97	08	21.06	16.16		M.
	57.00	59.31	50.18	48.52	35.34	32.39	25.56	26.15	61	18.04	17.86		F.

Test	Average C.V.'s 8	9	10	11	12	13	14	15	Summerfield		
Rote-Memory Concrete	19.42	16.14	18.04	12.78	12.10	10.12	10.57	12.50	93	14.51	M.
	18.88	14.43	12.09	11.21	10.68	9.42	9.62	10.34	96	11.52	F.
Rote-Memory Abstract	17.67	17.92	18.23	14.43	12.70	10.04	12.22	10.30	87	13.59	M.
	17.26	19.43	11.50	11.27	11.36	10.13	11.06	11.80	45	12.36	F.
Completion Joe	32.77	36.29	27.13	18.49	27.06					28.35	M.
	34.82	22.30	14.90	17.53	15.56					21.02	F.
Completion Trout			25.90	29.18	30.76	16.80	21.27	18.40		23.72	M.
			28.16	23.60	21.76	25.40	24.34	18.64		23.65	F.
Completion Dr.Goldsmith							8.67	5.43	77	6.29	M.
							4.16	4.12	00	3.76	F.
Free Association	30.61	30.45	29.56	25.06	26/68	24.88	22.38	24.08	30	27.11	M.
	28.01	23.54	25.51	19.91	21.81	22.89	20.30	24.10	08	23.24	F.
Opposites I	27.77	25.00	31.40	24.74	29.60					27.70	M.
	33.78	28.26	18.80	29.36	30.10					28.06	F.
Opposites II			30.77	30.58	22.33	30.39	35.34	36.20	75	30.34	M.
			15.68	26.04	31.32	27.52	27.71	32.41	84	27.50	F.
Average	26.56	25.16	24.72	22.18	23.03	18.44	18.41	17.82	92		M.
	26.55	21.59	18.10	19.84	20.37	19.07	16.20	16.90	46		F.

AVERAGE C.V.'S

Test	Colings M.	Colings F.	Pyle '13 M.	Pyle '13 F.	Pyle '16 M.	Pyle '16 F.	Summerfield M.	Summerfield F.	Chinese F.	Summary American M.	Summary American F.	Summary Chinese M.	Summary Chinese F.
Rote-Memory	21.42	20.89	16.61	15.59	13.15	10.19	14.51	11.52	15.14	4	0	0	1
Rote-Abstract	33.19	28.12	23.79	21.21	13.95	12.12	13.59	12.36	13.75	4	0	1	0
Free Assoc.	32.25	33.01	34.86	34.60	32.46	31.70	27.11	23.24	24.71	3	1	0	1
Opposites I	40.40	37.35			27.37	26.15	27.70	28.06		2	1		
Opposites II	50.44	40.83			34.85	29.66	30.34	27.50	33.96	3	0	0	1
Opposites III									35.56			0	1
Opposites IV									23.78			0	1
Opposites			28.94	27.33						1	0		
Completion Joe	42.11	44.59			30.72	23.79	28.35	21.02		2	1		
" Trout					31.81	29.13	23,72	23,65		2	0		
" Dr.G.					15.58	12.12	6.29	3.76		2	0		
Log.Memory Willie					24.48	21.37				1	0		
"Farmer's Son					20.98	19.79				1	0		
"Costly Temper					21.77	20.60				1	0		
"Marb.Statue	46.60	41.19	21.01	20.74					17.10	2	0	1.	0
Substitution	34.81	34.26	23,48	22.05					30.34	2	0	0	1
"Sym.-Digit			29.75	26.82					28.25	1	0	1	0
Word-Building			34.91	35.82						0	1		
Genus-Species			44.24	37.49						1	0		
Part-Whole			37.64	34.19						1	0		
Cancellation			24.28	23.77						1	0		
Analogues									69.59			0	1
Speed Writing									51.84			1.,	0
	6	2	10	1	11	0	7	1	6	34	4	4	7

Colling's material shows the boys predominating in variability in six tests when all ages are averaged while the girls are more variable in only two. His tables also show that when all the tests are averaged the girls are more variable at the ages 8, 9, 10, 11, and 18, while the boys are more so at 12, 13, 14, 15, 16, and 17. This conforms with my general conclusion that the girls are more variable during the earlier ages and the boys are more variable during adolescence.

In my own data I find the average C. V. of the boys greater in all tests when all ages are averaged with the exception of Opposites I. When all tests are averaged the males show greater variability at all ages except 13.

When these five tables are combined and the number of tests in which each sex shows greater variability is noted, I find the following results:-

Age	M.	F.
8	18	12
9	21	12
10	23	13
11	23	11
12	21	14
13	20	10
14	26	5
15	21	9
16	23	6
17	12	10
18	14	8

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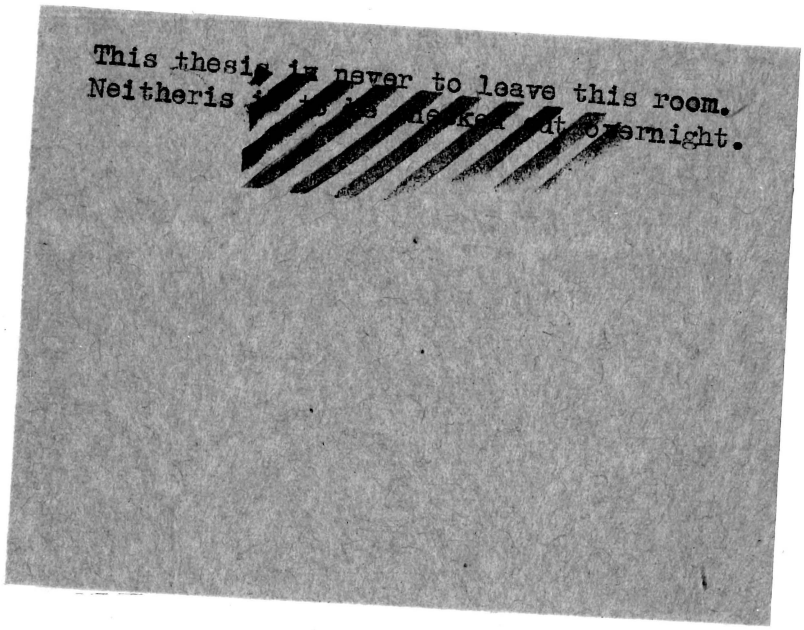

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