

THE CONSTANCY OF THE I.Q.

BY CLAUDE L. NEMZEK

University of Minnesota

That the constancy of the intelligence quotient has attracted much attention is shown by the great amount of research that has been done in order to verify the theory of constancy. Much of the literature concerning the problem has been concisely summarized by Foran (36, 37), Burks (16), and Baldwin (60). They have considered many of the studies in which the Stanford Revision of the Binet-Simon Tests was used; therefore, there seems to be a need for a review of investigations dealing with the constancy of the I.Q. derived from revisions of the Binet-Simon Tests other than the Stanford-Binet and group tests. Furthermore, various researches on the influence of training, environment, and physical condition on the I.Q. have been made.

A. REVISIONS OF THE BINET-SIMON OTHER THAN THE STANFORD-BINET

Using the 1908 and 1911 Binet Tests, the Yerkes-Bridges Point Scale, the Goddard, Kuhlmann, and Herring Revisions, or some altered form of the Stanford-Binet Tests, Bloch and Lippa (69), Bobertag (70), Chotzen and Nicolauer (85), Berry (66), Goddard (131), Descoeudres (245), Downey (105), Rosenow (201), Garrison (124, 125), Kuhlmann (157), Doll (32), Terman (220), Dvorak (107), Wallin (230), Anderson (57), Henmon and Burns (144), Gray and Marsden (134, 135, 136, 137), Goodenough (20, 40), Carroll and Hollingworth (78), and Cuff (92) have contributed some data concerning the constancy of the intelligence quotient of children of all levels of mental ability.

As reported in the literature, most of these studies are inadequate because the data are very fragmentary. In most cases the writers have not specified age, grade, or I.Q. ranges; in many experiments the central tendencies and variabilities of I.Q.'s and other measures are not indicated. Furthermore, some investigators have not reported the coefficients of correlation between test and retest, the intervals between tests, the changes in I.Q.'s, or the P.E. of measure-

ment. Because they have failed to present significant facts, it is impossible to compare their results.

Bobertag (70) used the 1908 Binet Tests to study the constancy of the I.Q. in 83 normal children, finding an r of $.95 \pm .024$ between test and retest, the interval between tests being one year. Using the 1911 Binet Tests and the Stanford-Binet at an average interval of 10.26 months, Rosenow (201) obtained an r of $.82 \pm .027$ between test and retest of 69 cases. With the Herring-Binet, Cuff (92) found r 's of $.98 \pm .01$ between test and retest I.Q.'s of two groups of 23 and 24 cases. The interval between tests was 24 hours. The value of this study is questionable because of the small number of cases.

Results from the Kuhlmann 1922 Revision of the Binet Scale as reported by Goodenough (20, 40) are important. She tested and retested 300 children at an interval of six weeks. The range of changes in I.Q.'s was from +39 to -21. Of the total group, 8.9 per cent gained 20 points or more; 4.9 per cent lost 10 points or more. The r for test and retest was $.813 \pm .012$.

The following table gives the gist of Goodenough's findings.

TABLE I
SUMMARY OF DATA PRESENTED BY GOODENOUGH

Age	Boys	Girls	Mean I.Q.	S.D.	Mean I.Q.	S.D.	Mean Algebraic Changes
			1st Test	1st	2nd Test	2nd	
2	50	50	105.1	13.0	108.1	15.5	3.0
3	50	50	104.4	18.2	107.6	21.7	3.2
4	50	50	109.4	16.6	116.0	15.3	6.6
All	150	150	106.3	16.2	110.6	18.1	4.3

After making a few adaptations in the Stanford-Binet in order to test English children, Gray and Marsden (134, 135, 136, 137) made some important studies concerning I.Q. constancy. Their subjects ranged from three to thirteen years of age at the first testing. A summary of Gray and Marsden's data is given in Table II.

TABLE II
RÉSUMÉ OF STUDIES CONCERNING THE CONSTANCY OF THE I.Q.
BY GRAY AND MARSDEN

Testings	N	r	Range of Middle 50 Per Cent of Differences	Semi-inter-quartile Range of Changes	Median I.Q. Change	Interval in Years
1 & 2	100	$.887 \pm .014$	-2.25 to 7.66	4.95	2.25	1
2 & 3	55	$.908 \pm .016$	-3.03 to 3.0	3.01	0.0	1
1 & 3	63	$.836 \pm .059$	-1.0 to 7.25	4.12	3.5	2
All	218	$.883 \pm .036$	-2.7 to 7.0	4.85	1.6	1-2
1 & 2	100	$.883 \pm .015$	-2.25 to 7.7	5.0	2.25	1
4	371	$.854 \pm .011$				1-3
6	616	$.851 \pm .008$	-6.1 to 4.7	5.5	-1.3	1-5

At an interval of one year, Carroll and Hollingworth (78) retested 52 gifted children, ages seven to nine at the first testing, with the Herring-Binet. From the original data presented by the authors, it was found that the range of I.Q. changes was from -19 to $+22$; the average change regardless of signs was 9.06; algebraically the range of the middle 50 per cent of changes was -4.0 to 11.67 . The r between test and retest was $.73 \pm .044$. Other important data from this study are:

Test	Range of I.Q.'s	Mean I.Q.	S.D. of I.Q.'s
1	108-174	135.8	13.8
2	116-173	138.8	13.3

From the standpoint of the constancy of the I.Q., with the exception of the data presented by Gray and Marsden, Goodenough, and Carroll and Hollingworth, the studies using revisions of the Binet-Simon other than the Stanford are inadequate and incomplete. Studies of lesser importance have been made by Bobertag, Rosenow, and Cuff.

B. THE STANFORD-BINET

The constancy of the I.Q. as derived from the Stanford-Binet has been studied extensively by Cuneo and Terman (93), Terman (10), Stenquist (210, 211), Rugg and Colloton (203), Baldwin and Stecher (27, 61, 62), Poull (187), Garrison (122), Gordon (133), Berry (67), Dickson (4), Johnson (151), Irwin and Marks (6), Madsen (171), Garrison and Robinson (126), Johnson (7), Rugg (204), Hildreth (145), Wentworth (54), Lincoln (164), Randall (190), Freeman, Holzinger, and Mitchell (19), Matthew and Luckey (24), Rogers, Durling, and McBride (25, 197), Carroll and Hollingworth (78), Cattell (79), Lamson (46), Brown (77), and Burks, Jensen, and Terman (1).

Some of these studies were inadequate in that certain data are not presented. Furthermore, the studies include wide age and grade and I.Q. ranges; consequently, one is not justified in comparing these experiments with each other. In Table III the salient features of the important studies are summarized.

Many other sources of data concerning the constancy of the I.Q. are available; however, because of inadequate and incomplete treatment, small number of cases, the method of analysis, or the style of presentation, the researches are of secondary importance. Studies in this category have been made by Fermon (35), Woolley and Ferris (56), Bronner (71), Dougherty (104), Ford (112), Root (200), Slocombe (207, 209), Stern (212, 213), Teagarden (218), Chipman (84), Prouty (188), and Minogue (175).

TABLE III
THE CONSTANCY OF THE STANFORD-BINET I.Q.

Experimenter and Date	N	Testing Intervals	r	P.E.	Mean I.Q. Change	Range of Middle 50 Per Cent of Change	Grade or Age Range
Cuneo and Terman (1918)	31	20-24 mos.	.852	.034	6 (Md.)	5-13	3-11 to 6-4
	21	5-7 mos.	.942	.014	6 (Md.)	3-7	3-8 to 6-6
	25	2 days	.95	.013	3 (Md.)	2-7	3-8 to 8-1
Terman (1919)	428	1 day to 7 years	.93	.004	4.5	-3.3 to 5.7	3 to above 15 years
Stenquist (1920)	274	Less than 1-3 years	.72	.02	Md. gain 9.5; Md. loss 5.9		3-0 to 11-11
Rugg and Colloton (1921)	137	10 mos. to 1 yr. 4 mos.	.84	.012	4.7	-2.3 to 5.6	6.0 to 12
Baldwin and Stecher* (1922)	36		.85	.03	4.11 6.33	-2.33 to 9.00 3.25 to 9.00	
	36		.74	.05	4.36 9.42	-4.00 to 11.00 5.50 to 12.00	
	36		.78	.04	8.53 10.19	2.33 to 15.67 4.00 to 15.67	
	36		.82	.04	11.31 12.25	6.00 to 17.00 7.50 to 17.00	
	36		.85	.03	.25 6.69	-7.00 to 6.00 4.00 to 9.75	
	36		.80	.04	4.42 7.75	-2.00 to 12.00 3.00 to 12.00	
	36		.82	.04	7.19 8.25	2.50 to 13.00 4.00 to 13.00	

	36		.91	.02	4.17 5.61	.33 to 9.00 2.13 to 9.00	
	36		.84	.03	6.94 8.06	2.00 to 11.50 3.50 to 11.50	
	36		.92	.02	2.78 4.78	-2.00 to 6.33 2.40 to 6.50	
Poull (1921)	124	6 mos. to 3 years			4.6	-3.3 to 4.8	4-28 years
Garrison (1922)	468	1-4 years	.88	.007	5.4	-2 to 4	
	43	4 years	.83	.032		-3 to 4	
	127	2 years	.91	.01		-3 to 5	
	298	1 year	.88	.009			
Gordon (1922)	44	1 yr. 3 mos. to 2-10	.84	.03	6.8		4 yrs. 2 mos. to 13-7
Berry (1923)	351	11 mos. (6-18)	.74	.02	5.0		6 to 14 years
	273	23 mos. (19-30)	.67	.02	6.1		
	82	35 mos. (31-48)	.56	.08	7.4		
Dickson (1923)	288	13 mos. (1 mo.— 3 years)	.90	.01	5.1 (Md.)	-5.6 to 4.4	4-16 years
Henmon and Burns (1923)	59	9 mos. to 4 years	.91	.01	5.3	-6 to 3	Not given
Johnson (1923)	94	1-4 years	.69	.03			Grades I-VII
Irwin and Marks (1924) (289)	322	1 mo. to 5 years	.98	.004			5-15 years
Madsen (1924)	16	1½ years	.97	.01	2.125	-1 to 2.67	Grade 1
	34	3 yrs. 5 mos.	.85	.032			Grades 1 to 8
Garrison and Robinson* (1925)	140	10 mos.	.88	.013		-2 to 4	Grades 3 to 8
	131	20 mos.	.91	.01		-3 to 4	Ages 8-5 to 15-3
	131	10 mos.	.92	.009		-2 to 3	

TABLE III (Continued)

Experimenter and Date	N	Testing Intervals	r	P.E.	Mean I.Q. Change	Range of Middle 50 Per Cent of Change	Grade or Age Range
Johnson (1925)	125		.80	.022			2-10 years
Rugg (1925)	114	Md. 21 mos. 4-36 mos.	.948	.006	3.1	-1.2 to 1.9	5-0 to 15-11
Hildreth (1926)	441 1112	Less than a mo. to 8 years Average of 1-2 yrs.	.857 .814	.009 .007	4.605 (Q.) .96 (Md.)	-3.5 to 5.71	3-18 years Mean of 9 years
Wentworth (1926)	145	3 days to 16 mos.	.82	.02	(Md. 5)		Grade 1
Lincoln (1927)	30	3½ to 4 hours	.95	.013	2.57		6 and 7 years
Randall (1927)	103 37 6 6 152	0-18 mos. 19-30 mos. 31-42 mos. 43-66 mos. 0-66 mos.	.798 .699 .793 .801 .794	.025 .057 .103 .100 .020			Grades 1-9 Ages 5-2 to 15-10
Freeman, Holzinger and Mitchell (1928)	74	4 years	.68	.042	Mean Gain 2.5		8 years at test one. 12-2 at retest
Matthew and Luckey	50 100	1-2 years	.92 .74	.01 .03			
Rogers, Durling, and McBride (1928)	44 20 28 32	½-5½ years ½-5½ years 2-4 years Md. 2-5 mos. 1-6 years Md. 3 yrs. and 8 mos.	.78 .89 .75 .32	.04 .05 .05 .06	(Md. -2) (Md. -2)	-7 to 5 -7 to 5	5 to 8-11 Md. 6-5 4 to 8-11 Md. 6-3
Carroll and Hollingworth (1930)	52	1 year	.68	.051	9.02	-3.75 to 11.50	

Cattell (1930)	1 hour to 6 yrs. Mean, 4.7 yrs.	.77				
Lamson (1930)	53 1 year	.72	.045	7.85	—3.44 to 10.38	
	43 1 year	.53	.074	9.37	—8.12 to 9.25	
	43 2 years	.606	.065	8.95	—2.56 to 13.25	
Brown (1930)	707 Mean 15 mos.	.88	.006	5.8		2-18 years. Mean 10.5.
	149 Range a few weeks	.87	.013			67 per cent between
	149 to over 4 years	.70	.028			7 and 14 years
	129 1 yr. or less	.91	.007			
	320 2 years but less than 3	.87	.009			
	449 3 yrs. and less	.88	.015			
	41 4 years but less than 5	.87	.02			
	83	.81	.026			I.Q.'s below 60
	475	.68	.017			I.Q.'s 61-90
	148	.61	.03			I.Q.'s above 90
	458	.88	.007			Boys
	248	.87	.010			Girls
Burks, Jensen, Terman (1930)	54 6 years	.60*	.10			8-13 years of age at re- test
		.81				
		.77				
	73 6 years	.65	.09			

* Baldwin and Stecher have presented data in various sources (27, 61, 62); however, they have not presented sufficient data to include in this table. The data in this table were taken from source (27) and worked over to show various I.Q. changes. The first mean change and the first middle 50 per cent of change indicate algebraic changes; the bottom figures in each instance represent changes regardless of signs.

The data included in the study by Garrison and Robinson are based upon I.Q.'s with the exception of the correlations which, according to the authors, involve scores.

Burks, Jensen, and Terman used three methods to find the correlation between the initial and second I.Q. ratings for a group of 54 children.

C. GROUP TESTS

Garrison and Robinson (126), Olson (50), Johnson (151), Shewman (206), Wentworth (54), Broom (75, 76), Jordan (152), Hirsch (43), Burks, Jensen, and Terman (1), Porter and Lauderbach (247), and Nettels (177) have studied the constancy of the I.Q. with various group tests. The results of their studies are shown in Table IV.

On the whole, these researches have been reported rather meticulously; however, there is a lack of uniformity in specifying changes in intelligence quotients. Many of the criticisms applicable to studies using individual mental examinations may be justifiably used in reviewing group test investigations. Another peculiar circumstance throughout the literature devoted to the constancy of the I.Q. is that only one attempt has been made to correct for practice effects. Olson (50) corrected for practice in his research. He concluded, "The actual median change in I.Q. when Delta 2 is repeated at a year interval is 7.4 points. With allowance for practice the change becomes plus 2.46 points." That this is an important issue has been shown by Miller (174) and Kefauver (154).

Other investigators who have data pertaining to the constancy of the I.Q. as derived from group tests are Cattell (79), Cattell and Gaudet (81), Avery (58), Cole (88), Cowdery (91), Dearborn and Long (100), Garrison and Tippet (127), Kefauver (154), Miller (174), Rogers (196), Root (199), Steckel (214), Colvin (89), Gates (128), Guiler (138, 139), Brooks (73), Pintner (184), and Stenquist (53, 211).

D. PRACTICE, COACHING, TRAINING, ENVIRONMENT, AND THE I.Q.

From a review of studies by Casey, Davidson, and Harter (17), Denworth (18), Burks (14, 15), Freeman, Holzinger, and Mitchell (19), Goodenough (20), Greene (21), Hildreth (22), Rogers, Durling, and McBride (25), Chen (29), Coy (30), Glick (39), Graves (42), Marine (48), Barrett and Koch (64), Bishop (68), Chapman (82), Chauncey (83), De Weerd (102), Dunlap and Snyder (106), Freeman (116, 117), F. S. Freeman (121), Gilmore (130), Hurlock (146), Ide (147), Merriman (173), Odell (179), Renshaw (192), Richardson and Robinson (193), Saer (205), Teagarden (217), Terman (219), Thorndike (221), Wechsler (233), Wells (234), White (236), and Slocombe (208) concerning the effects of practice, coaching, length of school attendance, environment, nursery school or kindergarten attendance, familiarity of the

TABLE IV

THE CONSTANCY OF THE I.Q. DERIVED FROM GROUP TESTS

Experimenter Date Reported	Tests Used	N	Testing Interval	Grade or Age Range	r	P.E.	Changes in I.Q.'s on Retests
Johnson (1923)	Terman Group Test	37	1 yr.	VII—1	.95	.01	
		32	1 yr.	VII—2	.94	.009	
		169	1 yr.	VIII—1	.87	.015	
Olson (1924)	Haggerty Delta 2	56	14 mos.	4, 5, 6, 7, 8 Grades	.866	.021	Median, 6.4 P.E., 4.15 S.D., 6.67 Aver., 7.52
	Haggerty Delta 2	609	15 mos.	8-19 yrs. 3-10 Grs.	.91 (Scores) .81 (I.Q.'s)	.005 .009	Median, 7.4 P.E., 6.5 Range of middle 50 per cent of changes, 1.78 to 10.7 Aver., 7.1
Garrison and Robinson* (1925)	Nat. Int. Test, Form A1 for Tests 1 & 2; Form A2 for Test 3	140	10 mos.	Grs. 3-8	.90	.011	-6 to 6, the range of middle 50 per cent of change
		131	20 mos.	Ages 8-5 to 15-3	.91	.010	-7 to 7
		131	10 mos.	Ages 8-5 to 15-3	.93	.01	Average gain, 3.7 over 20 mos.
Shewman (1926)	Terman Group Test, Forms A & B	229	3 yrs. 4 mos.	H. S.	.72 (I.Q.'s) .77 (Scores)	.02 .02	
Wentworth (1926)	Dearborn A	575	1 yr.	Gr. 1 at Test 1; Gr. 2 at Test 2	.72	.013	Average, 9 Median, 5 P.E.(M), 4.95

TABLE IV (Continued)

Experimenter Date Reported	Tests Used	N	Testing Interval	Grade or Age Range	r	P.E.	Changes in I.Q.'s on Retests
Broom (1927)	Terman Group Test	50	6 mos. to 1 yr. 11 mos.	H. S.	.862	.026	Range of change, —13 to 8
Broom (1930)	Otis-Self Adm. Test of Men- tal Ability, Higher Ex- am., A	212	5 mos.		.83	.014	Range of change, —16 to 22
Jordan (1930)	Nat. Int. Test, 6 testings	183	6 mos.	Grs. 3-7			Median gain, 9.1
Burks, Jensen, Terman (1930)	Terman Group Test	26	.2 yr.	14.5 yrs. at Test 1; 14.7 yrs. at Test 2	.62 (I.Q.'s) .87 (Scores)	.08 .03	Average, 10.96 Q., 6.0 Range, —14 to 29 Middle 50 per cent, 3.5 to 15.5
Miller (Unpub.)	Miller Mental Ability Test, Form A vs. B	57	10 mos.	H. S. Fresh- men. Median C. A., 13-7; S. D. of C. A., 10	.90	.017	
Hirsch (1930)	Tests in order were Otis Primary Test, Forms A, B, A; Otis Adv., A, B, A	343	9-15 mos. Average, 1 yr.	Grs. 1 & 2 at 1st Testing			All below changes are averages
	1 & 2	322			.83	.01	6.7
	2 & 3	252			.89	.008	5.6

	3 & 4	277			.84	.011	7.5
	4 & 5	257			.88	.009	7.5
	5 & 6	*225			.94	.005	7.6
	1 & 6	244			.794	.016	
Porter and Lauderbach (1931)	Pintner - Cun- ningham Pri- mary Mental Test	193	6-17 mos.	Kindergarten and Primary Children	.718	.02	Range of change, -29 to 35

* Garrison and Robinson correlated scores, not I.Q.'s; however, the other data refer to I.Q.'s.

Hirsch reported the correlation between tests 5 and 6 for 225 cases; but when he calculated the average change in I.Q. for tests 5 and 6 he used 230 cases.

examiner, and specialized training on mental ability, one may conclude that the I.Q., as measured or determined by our present testing instruments, may be changed to a certain extent; however, the changes which are due to practice, training, and the like tend to be of a transient nature. In other words, after an interval of time elapses, fluctuations in the I.Q. due to these factors seem to disappear.

E. PHYSICAL CONDITION AND THE CONSTANCY OF THE I.Q.

Researches on this phase of the problem by Hoefler and Hardy (23), Dawson and Conn (31), Rogers (51), Fox (113), Jewett and Blanchard (150), Lowe (167), De Weerd (101) and others have shown that the I.Q. is relatively constant. These studies have disproved the idea that the I.Q. would increase significantly following improvement in physical condition.

F. CONCLUDING REMARKS

In concluding, it may be in order to note that the results from studies concerning the constancy of the I.Q. present a high degree of consistency. As one method of comparing the results of individual examinations with those of group tests, the reliability coefficients found by correlating test and retest I.Q.'s may be arranged into a frequency distribution as follows:

r's	f (Stanford-Binet)	f (Group)*
.95 — .99	5	1
.90 — .94	15	3
.85 — .89	20	9
.80 — .84	23	6
.75 — .79	12	3
.70 — .74	9	4
.65 — .69	8	0
.60 — .64	3	1
.55 — .59	1	0
.50 — .54	1	0
N	97	27
Median	.832	.846
Q ^a	.889	.885
Q ₁	.76	.779
Q	.0645	.053

* In addition to the reliability coefficients between test and retest I.Q.'s presented in Tables III and IV, the distribution of r's contains a number of coefficients from the studies of Baldwin and Stecher (27, 61) and Olson (50).

The validity of this comparison may be readily questioned; however, it is merely presented to show that there is a rather wide range in the magnitude of the reliability coefficients for Stanford-Binet

Tests as well as for various group tests. Furthermore, it is important that one consider the groups studied by the various investigators. As a matter of fact, the extremely low coefficients reported for the Stanford-Binet Tests were not found for unselected groups. In the last analysis, however, the magnitude of the reliability coefficients for group tests tends to be as high as for individual tests, casting doubt upon the conception of the gross unreliability of group testing methods.

BIBLIOGRAPHY

1. BOOKS

1. BURKS, B. S., JENSEN, D. W., and TERMAN, L. M., *Genetic Studies of Genius. III. The Promise of Youth.* Palo Alto: Stanford University Press, 1930. Pp. 508.
2. CLAREMONT, C. A., *Intelligence and Mental Growth.* New York: Norton, 1928. Pp. 120.
3. COX, C. M., *Genetic Studies of Genius. II. The Early Mental Traits of Three Hundred Geniuses.* Palo Alto: Stanford University Press, 1926. Pp. 842.
4. DICKSON, V. E., *Mental Tests and the Classroom Teacher.* New York: World Book Co., 1923. Pp. 231.
5. FREEMAN, F. N., *Mental Tests.* Boston: Houghton Mifflin Co., 1926. Pp. 503.
6. IRWIN, E. A., and MARKS, L. A., *Fitting the School to the Child.* New York: The Macmillan Co., 1924. Pp. 339.
7. JOHNSON, B. J., *Mental Growth of Children in Relation to the Rate of Growth in Bodily Development.* New York: E. P. Dutton & Co., 1925. Pp. 160.
8. PATERSON, D. G., *Physique and Intellect.* New York: The Century Co., 1930. Pp. 304.
9. PINTNER, R., *Intelligence Testing, Methods and Results.* New York: Henry Holt and Co., 1923, 406 pp.; 1931, 555 pp.
10. TERMAN, L. M., *The Intelligence of School Children.* Boston: Houghton Mifflin Co., 1919. Pp. 317.
11. TERMAN, L. M., *The Measurement of Intelligence.* New York: Houghton Mifflin Co., 1916. Pp. 362.
12. TERMAN, L. M., *The Stanford Revision and Extension of the Binet-Simon Scale for Measuring Intelligence.* Baltimore: Warwick and York, 1917. Pp. 179.
13. WOODROW, H., *Brightness and Dullness in Children.* Chicago: J. B. Lippincott Co., 1919. Pp. 322.

2. YEARBOOKS

14. BURKS, B. S., "Comments on the Chicago and Stanford Studies of Foster Children." Pp. 317-323. Twenty-Seventh Yearbook of the National Society for the Study of Education, Part I. Bloomington, Illinois: Public School Publishing Co., 1928.

15. BURKS, B. S., "The Relative Influence of Nature and Nurture Upon Mental Development; A Comparative Study of Foster Parent-Foster Child Resemblance and True Parent-True Child Resemblance." Pp. 219-317. Twenty-Seventh Yearbook of the National Society for the Study of Education, Part I. Bloomington, Illinois: Public School Publishing Co., 1928.
16. BURKS, B. S., "A Summary of Literature on the Determiners of the Intelligence Quotient and the Educational Quotient." Pp. 319-325. Twenty-Seventh Yearbook of the National Society for the Study of Education, Part II. Bloomington, Illinois: Public School Publishing Co., 1928.
17. CASEY, M. L., DAVIDSON, H. P., and HARTER, D. I., "Three Studies on the Effect of Training in Similar and Identical Material Upon Stanford-Binet Scores." Pp. 431-441. Twenty-Seventh Yearbook of the National Society for the Study of Education, Part I. Bloomington, Illinois: Public School Publishing Co., 1928.
18. DENWORTH, K. M., "The Effect of Length of School Attendance Upon Mental and Educational Ages." Pp. 67-93. Twenty-Seventh Yearbook of the National Society for the Study of Education, Part II. Bloomington, Illinois: Public School Publishing Co., 1928.
19. FREEMAN, F. N., HOLZINGER, K. J., and MITCHELL, B. C., "The Influence of Environment on the Intelligence, School Achievement, and Conduct of Foster Children." Pp. 103-219. Twenty-Seventh Yearbook of the National Society for the Study of Education, Part I. Bloomington, Illinois: Public School Publishing Co., 1928.
20. GOODENOUGH, F. L., "A Preliminary Report on the Effect of Nursery School Training Upon the Intelligence Test Scores of Young Children." Pp. 361-371. Twenty-Seventh Yearbook of the National Society for the Study of Education, Part I. Bloomington, Illinois: Public School Publishing Co., 1928.
21. GREENE, K. B., "The Influence of Specialized Training on Tests of General Intelligence." Pp. 421-431. Twenty-Seventh Yearbook of the National Society for the Study of Education, Part I. Bloomington, Illinois: Public School Publishing Co., 1928.
22. HILDRETH, G., "The Effect of School Environment Upon Stanford-Binet Tests of Young Children." Pp. 355-361. Twenty-Seventh Yearbook of the National Society for the Study of Education, Part I. Bloomington, Illinois: Public School Publishing Co., 1928.
23. HOEFER, C., and HARDY, M. C., "The Influence of Improvement in Physical Condition on Intelligence and Educational Achievement." Pp. 370-387. Twenty-Seventh Yearbook of the National Society for the Study of Education, Part I. Bloomington, Illinois: Public School Publishing Co., 1928.
24. MATTHEW, J., and LUCKEY, B., "Notes on Factors that May Alter the Intelligence Quotient in Successive Examinations." Pp. 411-421. Twenty-Seventh Yearbook of the National Society for the Study of Education, Part I. Bloomington, Illinois: Public School Publishing Co., 1928.

25. ROGERS, A. L., DURLING, D., and McBRIDE, K., "The Effect on the Intelligence Quotient of Change from a Poor to a Good Environment." Pp. 323-333. Twenty-Seventh Yearbook of the National Society for the Study of Education, Part I. Bloomington, Illinois: Public School Publishing Co., 1928.
26. Twenty-Seventh Yearbook of the National Society for the Study of Education, Part I, 465 pp.; Part II, 397 pp. Bloomington, Illinois: Public School Publishing Co., 1928.

3. MONOGRAPHS AND BULLETINS

27. BALDWIN, B. T., and STECHER, L. I., "The Mental Growth of Normal and Superior Children Studied by Means of Consecutive Intelligence Examinations." University of Iowa Studies in Child Welfare, Vol. 2, No. 1. Iowa City, Iowa: University of Iowa Bureau of Publications, Jan., 1922. Pp. 60.
28. BROOKS, F. D., "Changes in Mental Traits with Age Determined by Annual Retests." Teachers College Contributions to Education, No. 116. New York: Bureau of Publications, Teachers College, Columbia University, 1921. Pp. 86.
29. CHEN, H. S., "The Comparative Coachability of Certain Types of Intelligence Tests." Teachers College Contributions to Education, No. 338. New York: Bureau of Publications, Teachers College, Columbia University, 1928.
30. COY, G., "The Interests, Abilities, and Achievements of Gifted Children." Teachers College Contributions to Education, No. 131. New York: Bureau of Publications, Teachers College, Columbia University, 1923.
31. DAWSON, S., and CONN, J. C. M., "Effect of Encephalitis Lethargica on the Intelligence of Children." Archives of the Diseases of Childhood, Vol. 1. New York, 1926. Pp. 257-368.
32. DOLL, E. A., "Growth of Intelligence." Psychological Review Supplementary Monograph, Vol. 29, No. 2, 1921.
33. DOUGHERTY, M. L., "A Comparative Study of Nine Group Tests of Intelligence for Primary Grades." The Johns Hopkins University Studies in Education, No. 10. Baltimore: Johns Hopkins Press, 1928. Pp. 112.
34. DOUGHERTY, M. L., "The Educational Clinic of the Department of Education." The Johns Hopkins University Studies in Education. Baltimore: Johns Hopkins Press, 1929. Pp. 78.
35. FERMON, M. L., "Validity of I.Q. as Established by Retests." M.A. Thesis, Columbia University, May, 1920.
36. FORAN, T. G., "The Constancy of the Intelligence Quotient; A Review." Educational Research Bulletins, Vol. 1, No. 10. Department of Education, Catholic University of America. Washington, D. C.: Catholic Education Press, Dec., 1926. Pp. 40.
37. FORAN, T. G., "A Supplementary Review of the Constancy of the Intelligence Quotient." Educational Research Bulletins, Vol. 4, No. 9. Dept. of Education, Catholic University of America. Washington, D. C.: Catholic Education Press, 1929.

38. FURFEY, P. H., "A Selected Bibliography on Child Development." *Educational Research Bulletins*, Vol. 4, No. 4, Dept. of Education, Catholic University of America. Washington, D. C.: Catholic Education Press, April, 1929. Pp. 51.
39. GLICK, H. N., "Effect of Practice on Intelligence Tests." *University of Illinois Bulletin*, No. 27. Urbana, Illinois: Bureau of Educational Research, University of Illinois, 1925.
40. GOODENOUGH, F. L., "The Kuhlmann Binet Tests for Children of Pre-School Age: A Critical Study and Evaluation." *University of Minnesota Institute of Child Welfare Monograph Series*, No. 2. Minneapolis: University of Minnesota Press, 1927.
41. GOODENOUGH, F. L., "Measurement and Prediction of Mental Growth." *Third Conference on Research in Child Development*, 1929. Pp. 118-136.
42. GRAVES, K. B., "The Influence of Specialized Training on Tests of General Intelligence." *Teachers College Contributions to Education*, No. 143. New York: Bureau of Publications, Teachers College, Columbia University.
43. HIRSCH, N. D. M., "An Experimental Study Upon Three Hundred School Children Over a Six Year Period." *Genetic Psychology Monographs*, No. 6, 7: 487-549. Worcester: Clark University Press, June, 1930.
44. KEYS, NOEL, "The Improvement of Measurement Through Cumulative Testing." *Teachers College Contributions to Education*, No. 321. New York: Bureau of Publications, Teachers College, Columbia University, 1928. Pp. 81.
45. KUHLMANN, F., "A Revision of the Binet-Simon System for Measuring the Intelligence of Children." *Jour. of Psycho-Asthenics*, Monograph Supplements, Sept., 1912.
46. LAMSON, E. E., "A Study of Young Gifted Children in Senior High School." *Teachers College Contributions to Education*, No. 424. New York: Bureau of Publications, Teachers College, Columbia University, 1930. Pp. 117.
47. LATSHAW, H. F., "Measurement of Physical Growth." Thesis, Graduate School of Education, Harvard University, 1925.
48. MARINE, E. L., "The Effect of Familiarity with the Examiner Upon Stanford-Binet Test Performance." *Teachers College Contributions to Education*. New York: Bureau of Publications, Teachers College, Columbia University, 1929. Pp. 42.
49. MARTIN, A. H., "What Is the I.Q.?" *Sydney Univ. Repr.*, 1924, Series 12. Pp. 3.
50. OLSON, W. C., "The Constancy and Reliability of an Intelligence Quotient Determined by the Haggerty Intelligence Examination, Delta 2." M.A. Thesis, University of Minnesota, June, 1924. Pp. 87.
51. ROGERS, M. C., "Adenoids and Diseased Tonsils, Their Effect on General Intelligence." *Archives of Psychology*, No. 50. New York, 1922. Pp. 70.
52. ST. JOHN, C. W., "Educational Achievement in Relation to Intelligence." Cambridge: Harvard University Press, 1930. Pp. 219.

53. STENQUIST, J. L., "Unreliability of Individual and Group Intelligence Tests in Grades 1, 2, and 3." Unpublished Material, 1920.
54. WENTWORTH, M. M., "Individual Differences in the Intelligence of School Children." *Harvard Studies in Education*, No. 7. Cambridge: Harvard University Press, 1926. Pp. 162.
55. WOODYARD, E., "The Effect of Time Upon Variability." *Teachers College Contributions to Education*, No. 216. New York: Bureau of Publications, Teachers College, Columbia University, 1926. Pp. 56.
56. WOOLLEY, H. T., and FERRIS, E., "Diagnosis and Treatment of Young School Failures." *Bureau of Education Bulletin*, No. 1. Washington, 1923. Pp. 115.

4. PERIODICALS

57. ANDERSON, M. L., "A Study of the Data on the Results Gathered from Repeated Mental Examinations of 200 Defective Children Attending Special Schools Over a Period of Eight Years." *Journal of Applied Psychology*, 7: 54-64, 1923.
58. AVERY, G. T., "A Study of the Binet and Terman Intelligence Tests with Eleven-Year Old Children." *Journal of Educational Research*, 7: 429-434, May, 1923.
59. BAGLEY, W., "Educational Determinist and the I.Q." *School and Society*, 15: 373-384, April 8, 1922.
60. BALDWIN, B. T., "Child Psychology, A Review of the Literature, January 1, 1923, to March 31, 1928." *Psychological Bulletin*, 25: 629-697, 1928.
61. BALDWIN, B. T., and STECHER, L. I., "Additional Data from Consecutive Stanford Binet Tests." *Journal of Educational Psychology*, 13: 556-560, Dec., 1922; also in the *Journal of Educational Research*, 8: 375, Nov., 1923.
62. BALDWIN, B. T., and STECHER, L. I., "The Fluctuations of the I.Q. of Normal and Superior Children at Successive Examinations." *Psychological Bulletin*, 18: 99-100, Feb., 1921.
63. BALLARD, P. B., "The Limit of Growth of Intelligence." *British Journal of Psychology*, 12: 125-141, Oct., 1921.
64. BARRETT, H. E., and KOCH, H. L., "The Effect of Nursery-School Training Upon the Mental Test Performance of a Group of Orphanage Children." *Journal of Genetic Psychology*, 37: 102-122, March, 1930.
65. BAYLEY, N., "The Consistency of Mental Growth During the First Year." *Program of the 38th Annual Meeting of the American Psychological Association*, pp. 38-39, Dec., 1930.
66. BERRY, C. S., "Eighty-Two Children Retested by the Binet Tests of Intelligence." *Psychological Bulletin*, 10: 77-78, Feb., 1913.
67. BERRY, C. S., "The Intelligence Quotients of Mentally Retarded School Children." *School and Society*, 17: 723-729, 1923.
68. BISHOP, O., "What Is Measured by Intelligence Tests?" *Journal of Educational Research*, 9: 29-39, Jan., 1924.
69. BLOCH, E., and LIPPA, H., *Zeitschrift f. Angewandte Psych.*, 7: 397-409, 1912.

70. BOBERTAG, O., "Ueber Intelligenzprüfungen." *Zeitschrift f. Angewandte Psych.*, 6: 495-538, 1912.
71. BRONNER, A. F., "Attitude as it Affects Performance of Tests." *Psychological Review*, 23: 303-331, 1916.
72. BROOKS, F. D., "The Accuracy of the Abbreviated Stanford-Binet Intelligence Scale." *Psychological Clinic*, 18: 17-20, 1929.
73. BROOKS, F. D., "The Accuracy of Intelligence Quotients from Pairs of Group Tests in the Junior High School." *Journal of Educational Psychology*, 18: 173-186, 1927.
74. BROOKS, F. D., "Rate of Mental Growth, Ages Nine to Fifteen." *Journal of Educational Psychology*, 12: 502-510, Dec., 1921.
75. BROOM, E., "Constancy of the I.Q." *School and Society*, 25: 295-296, March 5, 1927, No. 636.
76. BROOM, M. E., "How Constant Is the I.Q. Yielded by the Otis Self-Administering Test of Mental Ability?" *Journal of Educational Research*, 22: 53-55, 1930.
77. BROWN, A. W., "The Change in Intelligence Quotients in Behavior Problem Children." *Journal of Educational Psychology*, 21: 341-350, May, 1930.
78. CARROLL, H. A., and HOLLINGWORTH, L. S., "The Systematic Error of Herring Binet in Rating Gifted Children." *Journal of Educational Psychology*, 21: 1-12, Jan., 1930.
79. CATTELL, P., "Comparability of I.Q.'s Obtained from Different Tests at Different I.Q. Levels." *School and Society*, 31: 437-442, March 29, 1930.
80. CATTELL, P., "I.Q.'s and the Otis Measure of Brightness." *Journal of Educational Research*, 22: 31-35, 1930.
81. CATTELL, P., and GAUDET, F. J., "The Inconstancy of the I.Q. as Measured by Repeated Group Tests." *Journal of Educational Research*, 21: 21-29, Jan., 1930.
82. CHAPMAN, A. E., "The Effect of School Training and Special Coaching on Intelligence Tests." *Forum of Education*, 2: 172-183, Nov., 1925.
83. CHAUNCEY, M. R., "The Relation of the Home Factor to Achievement and Intelligence Test Scores." *Journal of Educational Research*, 20: 88-90, Sept., 1929.
84. CHIPMAN, C. E., "The Constancy of the Intelligence Quotient of Mental Defectives." *Psychological Clinic*, 18: 103-111, 1929.
85. CHOTZEN, F., and NICOLAUER, M., "Die Intelligenzprüfungsmethode von Binet-Simon bei Schwachsinnigen Kindern." *Zeitschrift f. Angewandte Psych.*, 6: 411-494, 1912.
86. CLAPARÈDE, E., "De la Constance des Sujets a l'Egard des Tests d'Aptitude." *Arch. de Psych.*, 17: 325-334, 1922.
87. COBB, M. V., "One Element in the Probable Error of a Mental Age Measurement." *Journal of Educational Psychology*, 13: 236-240, 1922.
88. COLE, R. D., "A Conversion Scale for Comparing Scores on Three Secondary School Intelligence Tests." *Journal of Educational Research*, 20: 190-199, Oct., 1929.

89. COLVIN, S. S., "Some Recent Results Obtained from the Otis Group Intelligence Scale." *Journal of Educational Research*, 3: 1-12, Jan., 1921.
90. CORNELL, E. L., "Taking the Dogma Out of the I.Q." *Mental Hygiene*, 11: 804-810, 1927.
91. COWDERY, K. M., "Repeated Thorndike Intelligence Examinations." *School and Society*, 27: 367-369, March 24, 1928.
92. CUFF, N. B., "Is the I.Q. Constant?" *Peabody Journal of Education*, 8: 32-35, July, 1930, No. 1.
93. CUNEO, I., and TERMAN, L. M., "Stanford Binet Tests of 112 Kindergarten Children and 77 Repeated Tests." *Pedagogical Seminary*, 25: 414-428, 1918.
94. CURETON, E. E., "The Measurement of Brightness." *Journal of Educational Psychology*, 19: 88-98, 1928.
95. CURETON, E. E., and DUNLAP, J. W., "A Nomograph for Estimating the Reliability of a Test in One Range of Talent When Its Reliability is Known in Another Range." *Journal of Educational Psychology*, 20: 537-538, 1929.
96. CUSHMAN, C. L., "A Study of the Reliability of Mental Tests as Used in Oklahoma City." *Journal of Applied Psychology*, 11: 509-511, 1927.
97. DAVIDSON, F. A., "Interpretations of the Curve of Normal Growth." *Science*, 72: 226, 1930.
98. DEARBORN, W. F., "Intelligence Quotients of Adults and Related Problems." *Journal of Educational Research*, 6: 307-326, Nov., 1922.
99. DEARBORN, W. F., "Repeated Measurements of the Physical and Mental Development of School Children." *School and Society*, 20, No. 513, Oct. 25, 1924.
100. DEARBORN, W. F., and LONG, H. H., "On Comparing I.Q.'s at Different Age Levels on the Same Scale." *Journal of Educational Research*, 18: 265-274, Nov., 1928.
101. DE WEERDT, E. H., "The Effect of Malnutrition Upon Expression of Intelligence." *School and Society*, 27: 540-541, May 5, 1928.
102. DE WEERDT, E. H., "The Transfer Effect of Practice in Related Functions Upon a Group Intelligence Test." *School and Society*, 25: 438-440, 1927.
103. DOLL, E. A., "The Average Mental Age of Adults." *Journal of Applied Psychology*, 3: 317-328, Dec., 1919.
104. DOUGHERTY, M. L., "What Changes the I.Q.?" *Elementary School Journal*, 29: 114-121, Oct., 1928.
105. DOWNEY, J. E., "The Constancy of the I.Q." *Journal of Delinquency*, 3: 122-129, 1918.
106. DUNLAP, K., and SNYDER, A., "Practice Effects in Intelligence Tests." *Journal of Experimental Psychology*, 3: 396-403, Oct., 1920.
107. DVORAK, A., "The Relation of I.Q. to the Prognosis of Special Class Pupils." *School and Society*, 19: 736-744, 1924.
108. ENGLISH, H. B., "The Predictive Value of Intelligence Tests." *School and Society*, 26: 783, 1927.

109. FARNSWORTH, P. R., "Concerning So-called Group Effects." *Journal of Genetic Psychology*, 35: 587-594, 1928.
110. FORAN, T. G., "The Cessation of Intellectual Development." *Catholic Educational Review*, 24: 272-283, 1926.
111. FORAN, T. G., "The Constancy of the Intelligence Quotient." *Catholic Educational Review*, 24: 135-144, 1926.
112. FORD, C. A., "The Variability of I.Q.'s for Psychopaths Retested Within Fifteen Days." *Psychological Clinic*, 18: 199-204, 1929.
113. FOX, E. J., "An Investigation of the Effect of Glandular Therapy on the I.Q." *Mental Hygiene*, 12: 90-102, 1928.
114. FRANZEN, R., "Statistical Issues." *Journal of Educational Psychology*, 15: 367-383, Sept., 1924.
115. FREEMAN, F. N., "Comments on Professor Peterson's Criticism." *Journal of Educational Psychology*, 12: 155-159, March, 1921.
116. FREEMAN, F. N., "The Effect of Environment on Intelligence." *School and Society*, 31: 623-633, May 10, 1930.
117. FREEMAN, F. N., "An Evaluation of the Evidence in Part I of the Year-book and Its Bearing on the Interpretation of Intelligence Tests." *Journal of Educational Psychology*, 19: 374-380, 1928.
118. FREEMAN, F. N., "The Interpretation and Application of the I.Q." *Journal of Educational Psychology*, 12: 3-14, Jan., 1921.
119. FREEMAN, F. N., "Mental Tests." *Psychological Bulletin*, 17: 353-362, Nov., 1920.
120. FREEMAN, F. N., "Tests." *Psychological Bulletin*, 10: 271-274, 1913; 11: 253-256, 1914; 12: 187-188, 1915; 13: 268-271, 1916; 14: 245-249, 1917; 16: 374-381, 1919.
121. FREEMAN, F. S., "Influence of Educational Attainment Upon Tests of Intelligence." *Journal of Educational Psychology*, 19: 230-242, 1928.
122. GARRISON, S. C., "Additional Retests by Means of the Stanford Revision of the Binet Simon Tests." *Journal of Educational Psychology*, 13: 307-312, 1922.
123. GARRISON, S. C., "Fluctuation of the I.Q." *School and Society*, 13: 647-649, 1921.
124. GARRISON, S. C., "Retests on Adults at an Interval of Ten Years." *School and Society*, 32: 326-328, Sept. 6, 1930.
125. GARRISON, S. C., "Yerkes's Point Scale for Measuring Mental Ability as Applied to Normal Adults." *School and Society*, 5: 747-750, 1917.
126. GARRISON, S. C., and ROBINSON, M. S., "A Study of Retests." *Journal of Educational Research*, 11: 190-196, March, 1925.
127. GARRISON, S. C., and TIPPETT, J. S., "Comparison of the Binet Simon and Otis Tests." *Journal of Educational Research*, 6: 42-49, June, 1922.
128. GATES, A. I., "The Unreliability of M.A. and I.Q. Based on Group Tests of General Mental Ability." *Journal of Applied Psychology*, 7: 93-100, March, 1923.
129. GESELL, A., "The Measurement and Prediction of Mental Growth." *Psychological Review*, 34: 385-390, 1927.
130. GILMORE, M. E., "Coaching for Intelligence Tests." *Journal of Educational Psychology*, 18: 119-121, 1927.

131. GODDARD, H. H., "Three Annual Testings of 400 Feeble-minded Children and 500 Normal Children." *Psychological Bulletin*, 10: 75-77, Feb., 1913.
132. GOODENOUGH, F. L., "The Relation of the Intelligence of Pre-School Children to the Education of Their Parents." *School and Society*, 26: 54-56, July 9, 1927.
133. GORDON, K., "Some Retests with the Stanford Binet Scale." *Journal of Educational Psychology*, 13: 363-365, 1922.
134. GRAY, P. L., and MARSDEN, R. E., "The Constancy of the Intelligence Quotient." *British Journal of Psychology*, 13: 315-324, Jan., 1923.
135. GRAY, P. L., and MARSDEN, R. E., "The Constancy of the I.Q.: Final Results." *British Journal of Psychology*, 17: 20-26, 1926.
136. GRAY, P. L., and MARSDEN, R. E., "The Constancy of the Intelligence Quotient—Further Results." *British Journal of Psychology*, 15: 169-174, Oct., 1924.
137. GRAY, P. L., and MARSDEN, R. E., "The Stanford Binet Tests in Some English Schools." *Journal of Educational Research*, 8: 150-156, Sept., 1923.
138. GUILER, W. S., "How Different Mental Tests Agree in Rating Children." *Elementary School Journal*, 22: 734-744, June, 1922.
139. GUILER, W. S., "The Predictive Value of Group Intelligence Tests." *Journal of Educational Research*, 16: 365-375, Dec., 1927.
140. HAGGERTY, M. E., "Intelligence Examination Delta 2." *Journal of Educational Psychology*, 14: 257-276, May, 1923.
141. HART, H., "The Slowing Up of Growth in Mental Test Ability." *School and Society*, 19: 573-574, Nov. 1, 1924.
142. HEINIS, H., "La Loi du Développement Mentale." *Archives de Psychologie*, 19: 97, 1924.
143. HEINIS, H., "A Personal Constant." *Journal of Educational Psychology*, 17: 163, 1926.
144. HENMON, V. A. C., and BURNS, H. M., "The Constancy of I.Q.'s With Borderline and Problem Cases." *Journal of Educational Psychology*, 14: 247-250, 1923.
145. HILDRETH, G., "Stanford Binet Retests of 441 School Children." *Pedagogical Seminary*, 33: 365-386, Sept., 1926.
146. HURLOCK, E. B., "The Effect of Incentives Upon the Constancy of the I.Q." *Pedagogical Seminary*, 32: 422-434, Sept., 1925.
147. IDE, G. G., "The Increase of the Intelligence Quotient Through Training." *Psychological Clinic*, 14: 159-162, 1922.
148. JANSSON, A., "Intelligensprovens Konstans." (The Constancy of the Intelligence Test.) *Ark. f. Psykol. o. Ped.*, 7: 125-152, 1928.
149. JANSSON, A., "Om Orsakerna Till Intelligensprovens Bristande Konstans." (Causes for the Inadequate Constancy of Intelligence Tests.) *Ark. f. Psykol. o. Ped.*, 8: 132-159, 1929.
150. JEWETT, S. P., and BLANCHARD, P., "Influence of Affective Disturbances on Responses to the Stanford Binet Test." *Mental Hygiene*, 6: 39-56, 1922.
151. JOHNSON, O. J., "Data on the Repetition of Certain Mental Tests." *Journal of Educational Research*, 7: 458-460, May, 1923.

152. JORDAN, A. M., "Mental Growth." *Journal of Applied Psychology*, 14: 517-532, Dec., 1930, No. 6.
153. KEEN, A. M., "Growth Curves and I.Q.'s as Determined by Testing Large Families." *School and Society*, 32: 737-742, Nov. 29, 1930.
154. KEFAUVER, G. N., "Need of Equating I.Q.'s Obtained from Group Tests." *Journal of Educational Research*, 19: 92-102, Feb., 1929.
155. KUHLMANN, F., "Binet and Simon's System for Measuring the Intelligence of Children." *Journal of Psycho-Asthenics*, 1911.
156. KUHLMANN, F., "Degree of Mental Deficiency in Children as Expressed by the Relation of Age to Mental Age." *Journal of Psycho-Asthenics*, June, 1913.
157. KUHLMANN, F., "The Results of Repeated Mental Re-examinations of 639 Feeble-minded Over a Period of Ten Years." *Journal of Applied Psychology*, 5: 195-224, 1921.
158. KUHLMANN, F., "Some Results of Examining a Thousand Public School Children with a Revision of the Binet-Simon Tests." *Journal of Psycho-Asthenics*, March and June, 1914.
159. KUHLMANN, F., "What Constitutes Feeble-mindedness?" *Journal of Psycho-Asthenics*, pp. 214-236, 1915.
160. LANIER, L. H., "Prediction of the Reliability of Mental Tests and Tests of Special Abilities." *Journal of Experimental Psychology*, 10: 69-113, April, 1927.
161. LEAHY, S. R., and FOX, E. J., "An Investigation of the Effect of the Emotional Factor on the Intelligence Quotient." *Journal of Juvenile Research*, 14: 260-266, 1930.
162. LINCOLN, E. A., "The Constancy of I.Q.'s (A Case Study)." *Journal of Educational Psychology*, 13: 484-495, 1922.
163. LINCOLN, E. A., "The Mental Age of Adults." *Journal of Educational Research*, 6: 133-145, Sept., 1922.
164. LINCOLN, E. A., "Reliability of the Stanford Binet Scale and the Constancy of Intelligence Quotients." *Journal of Educational Psychology*, 18: 621-627, 1927.
165. LINCOLN, E. A., "Time Saving in the Stanford-Binet Test." *Journal of Educational Psychology*, 13: 94-97, 1922.
166. LIU, N. C., "Physical and Mental Growth." *Chinese Students Quar.*, 12: 13-33, 1927.
167. LOWE, G. M., "Mental Changes After Removing Tonsils and Adenoids." *Psychological Clinic*, 15: 92-100, 1923-24.
168. LUH, C. W., "Formula of the Growth of Intelligence." *Chinese Educ. Rev.*, 18, No. 7, 1926.
169. LUH, C. W., "A Note on the Relation Between the Constancy of the I.Q. and the Rate of Mental Growth." *Journal of Genetic Psychology*, 36: 185-187, 1929.
170. LUH, C. W., "A Note on the Curve of Mental Growth." *Journal of Genetic Psychology*, 36: 183-185, 1929.
171. MADSEN, I. N., "Some Results with the Stanford Revision of the Binet Simon Tests." *School and Society*, 19: 559-562, 1924.
172. MATHEWS, J., "Irregularity in Intelligence Tests of Delinquents." *Journal of Delinquency*, 6: 355-361, 1921.

173. MERRIMAN, C., "Coaching for Mental Tests." *Educational Administration and Supervision*, 13: 59-64, 1927.
174. MILLER, W. S., "The Variation and Significance of I.Q.'s Obtained from Group Tests." *Journal of Educational Psychology*, 15: 359-367, Sept., 1924.
175. MINOGUE, B. M., "The Constancy of the I.Q. of Mental Defectives." *Mental Hygiene*, 10: 751-758, 1926.
176. MURDOCK, K., and SULLIVAN, L. R., "Some Evidence of an Adolescent Increase in the Rate of Mental Growth." *Journal of Educational Psychology*, 13: 350-356, 1922.
177. NETTELS, C. H., "A Study of the Constancy of the I.Q." *Educational Research Bulletin (Los Angeles)*, 6: 9-10, Nov., 1926.
178. ODELL, C. W., "A Few Data on the Use of the Stanford Revision of the Binet-Simon Tests by Halves." *Journal of Educational Research*, 4: 437-438, 1921.
179. ODELL, C. W., "Some Data as to the Effect of Previous Testing Upon Intelligence Scores." *Journal of Educational Psychology*, 16: 482-486, 1925.
180. ODOM, C. L., "Study of the Mental Growth Curve with Special Reference to the Results of Group Intelligence Tests." *Journal of Educational Psychology*, 20: 401-416, 1929.
181. OTIS, A. S., and KNOLLIN, H. E., "The Reliability of the Binet Scale and of Pedagogical Scales." *Journal of Educational Research*, 4: 121-142, Sept., 1921.
182. PAULSEN, G. B., "A Coefficient of Trait Variability." *Program of the 38th Annual Meeting of the American Psychological Association*, pp. 28-29, Dec., 1930.
183. PETERSON, J., "The Growth of Intelligence and the I.Q." *Journal of Educational Psychology*, 12: 148-155, March, 1921.
184. PINTNER, R., "Group Tests After Several Years." *Journal of Educational Psychology*, 16: 391-395, 1925.
185. PINTNER, R., "Intelligence Tests." *Psychological Bulletin*, 23: 366-382, 1926; 24: 391-408, 1927; 26: 381-397, 1929; 27: 431-457, 1930.
186. PINTNER, R., "Results Outlined with the Non-Language Group Test." *Journal of Educational Psychology*, 15: 42-48, 1924.
187. POUILL, L. E., "Constancy of the I.Q. in Mental Defectives, According to the Stanford Revision of Binet Tests." *Journal of Educational Psychology*, 12: 323-324, 1921.
188. PROUTY, R. A., "Psychological Classification Versus Clinical Diagnosis." *Psychological Clinic*, 18: 213-220, 1929.
189. PYLE, W. H., "The I.Q. and the Individual." *School and Society*, 26: 788-790, 1927.
190. RANDALL, F. B., "A Study on the Constancy of the I.Q." *School and Society*, 26: 311-312, Sept. 3, 1927.
191. RAYMOND, C. S., "Intellectual Development of Morons Beyond the Chronological Age of Sixteen Years." *Proc. Amer. Asso. Study Feeble-minded*, 32: 243-248, 1927.

192. RENSHAW, S., "The Intelligence of Teachers, with a Note on Practice Effects with Intelligence Tests." *Journal of Educational Research*, 7: 28-36, 1923.
193. RICHARDSON, F., and ROBINSON, E. S., "Effect of Practice Upon the Scores and Predictive Value of the Alpha Intelligence Examination." *Journal of Experimental Psychology*, 4: 300-317, 1921.
194. RILEY, G. L., "A Comparison of the P.C. and the I.Q." *Psychological Clinic*, 18: 261-265, 1930.
195. ROCKWELL, J. G., "Genius and the I.Q." *Psychological Review*, 34: 377-384, 1927.
196. ROGERS, A. L., "The Growth of Intelligence at the College Level." *School and Society*, 31: 693-699, May 24, 1930.
197. ROGERS, A. L., DURLING, D., and McBRIDE, K., "The Constancy of the I.Q. and the Training of Examiners." *Journal of Educational Psychology*, 19: 257-262, 1928.
198. ROOT, W. T., "The Intelligence Quotient from Two Viewpoints." *Journal of Applied Psychology*, 6: 267-275, 1922.
199. ROOT, W. T., "Transmutation of Scores Between Binet Tests and Group Tests." *Journal of Educational Research*, 7: 338-344, April, 1923.
200. ROOT, W. T., "Two Cases Showing Marked Changes in I.Q." *Journal of Applied Psychology*, 5: 156-158, 1921.
201. ROSENOW, C., "The Stability of the Intelligence Quotient." *Journal of Delinquency*, 5: 160-173, 1920.
202. ROSSY, C. S., and SAWYER, M. H., "Comparison of Mental Gradings by the Yerkes-Bridges Point Scale and the Binet-Simon Scale." *Pedagogical Seminary*, 23: 452-467, 1916.
203. RUGG, H. O., and COLTON, C., "Constancy of the Stanford Binet I.Q. as Shown by Retests." *Journal of Educational Psychology*, 12: 315-322, 1921.
204. RUGG, L. S., "Retests and the Constancy of the I.Q." *Journal of Educational Psychology*, 16: 341-343, May, 1925.
205. SAER, D. J., "An Inquiry Into the Effect of Bilingualism Upon the Intelligence of Young Children." *Journal of Experimental Pedagogy*, 6: 232-240, 1922.
206. SHEWMAN, W. D., "A Study of the Intelligence and Achievement of the June, 1925, Graduating Class of the Grover Cleveland High School, St. Louis." *School Review*, 34: 137-146, Feb., 1926, No. 2; 219-226, March, 1926, No. 3.
207. SLOCOMBE, C. S., "The Constancy of 'g,' General Intelligence." *British Journal of Psychology*, 17: 93-110, Oct., 1926.
208. SLOCOMBE, C. S., "The Influence of Practice in Mental Tests." *Forum of Education*, 3: 173-179, 1926.
209. SLOCOMBE, C. S., "Why the I.Q. Is Not, and Cannot Be Constant." *Journal of Educational Psychology*, 18: 421-423, 1927.
210. STENQUIST, J. L., "Constancy of the Stanford Binet I.Q. as Shown by Retests." *Journal of Educational Psychology*, 13: 54-56, 1922.
211. STENQUIST, J. L., "Unreliability of Individual Scores in Mental Measurements." *Journal of Educational Research*, 4: 347-355, Dec., 1921.

212. STERN, W., "Der Intelligenzquotient als Mass der Kindlichen Intelligenz, Insbesondere der Unternormalen." *Zeitschrift f. Angewandte Psych.*, 11: 1-18, 1926.
213. STERN, W., "The Theory of the Constancy of Intelligence." *Psychological Clinic*, 16: 110-118, 1925. (Translated by H. Klüver.)
214. STECKEL, M. L., "The Restandardization of I.Q.'s of Different Tests." *Journal of Educational Psychology*, 21: 278-283, 1930.
215. SYMONDS, P. M., "A Second Approximation of the Curve of Distribution of Intelligence of the Population of the United States, with a Note on the Standardization of the Stanford Revision of the Binet Simon Scale." *Journal of Educational Psychology*, 14: 65-81, Feb., 1923.
216. SYMONDS, P. M., "A Study of Extreme Cases of Unreliability." *Journal of Educational Psychology*, 15: 99-106, Feb., 1924.
217. TEAGARDEN, F. M., "Change of Environment and the I.Q." *Journal of Applied Psychology*, 11: 289-296, 1927.
218. TEAGARDEN, F. M., "The Constancy of the I.Q. Again." *Journal of Educational Psychology*, 13: 366-372, 1922.
219. TERMAN, L. M., "The Influence of Nature and Nurture Upon Intelligence Scores: An Evaluation of the Evidence in Part I of the 1928 Yearbook of the National Society for the Study of Education." *Journal of Educational Psychology*, 19: 362-373, 1928.
220. TERMAN, L. M., "Mental Growth and the I.Q." *Journal of Educational Psychology*, 12: 401-407, Oct., 1921, 325-341, Sept., 1921.
221. THORNDIKE, E. L., "Practice Effect on Intelligence Tests." *Journal of Experimental Psychology*, 5: 101-107, 1922.
222. THORNDIKE, E. L., "On the Improvement of Intelligence Scores from Fourteen to Eighteen." *Journal of Educational Psychology*, 14: 513-516, Dec., 1923.
223. THORNDIKE, E. L., "On the Improvement of Intelligence Scores from Thirteen to Nineteen." *Journal of Educational Psychology*, 17: 73-76, Feb., 1926.
224. THORNDIKE, E. L., "The Significance of the Binet Mental Ages." *Psychological Clinic*, 8: 185-189, Dec., 1914.
225. THURSTONE, L. L., and ACKERSON, L., "The Mental Growth Curve for the Binet Tests." *Journal of Educational Psychology*, 20: 569-583, 1929.
226. TRABUE, M. R., "Some Pitfalls in the Administrative Use of Intelligence Tests." *Journal of Educational Research*, 6: 1-12, June, 1922.
227. VAN WAGENEN, M. J., "Has the College Student Reached His Mental Maturity When He Enters College?" *School and Society*, 9: 663-666, 1919.
228. WALLIN, J. E. W., "A Further Note on Scattering in the Binet Scale." *Journal of Applied Psychology*, 11: 143-154, 1927.
229. WALLIN, J. E. W., "Intelligence Irregularity as Measured by Scattering in the Binet Scale." *Journal of Educational Psychology*, 13: 140-151, 1922.
230. WALLIN, J. E. W., "The Results of Retests by Means of the Binet Scale." *Journal of Educational Psychology*, 12: 392-400, 1921.

231. WALLIN, J. E. W., "The Value of the Intelligence Quotient for Individual Diagnosis." *Journal of Delinquency*, 4: 109-124, May, 1919.
232. WALTERS, F. C., "Language Handicap and the Stanford Revision of the Binet Simon Tests." *Journal of Educational Psychology*, 15: 276-284, 1924.
233. WECHSLER, D., "On the Influence of Education on Intelligence as Measured by the Binet Simon Tests." *Journal of Educational Psychology*, 17: 248-257, April, 1926.
234. WELLS, F. L., "Effects of Instruction on Test Performance." *Journal of Genetic Psychology*, 37: 314-317, June, 1930.
235. WHEELER, L. R., "A Study of the Mental Growth of Dull Children." *Journal of Educational Psychology*, 21: 367-379, May, 1930.
236. WHITE, W., "The Influence of Certain Exercises in Silent Reading on Scores on the Otis Group Intelligence Test." *Elementary School Journal*, 23: 783-786, 1923; also in *Educational Administration and Supervision*, 9: 179-182, 1923.
237. WILE, I. S., "The Changing I.Q. in Children's Institutions." *Survey*, 61: 89-91, 1928.
238. WILLIAMS, M. L., "The Growth of Intelligence as Measured by the Good-enough Drawing Test." *Journal of Applied Psychology*, 14: 239-256, 1930.
239. WILNER, C. F., "An Extreme Case of Mis-measurement." *Journal of Educational Research*, 8: 86-88, 1923.
240. WILSON, G. M., "Standard Deviation Versus Age as a Score Unit." *Journal of Educational Research*, 13: 189-197, March, 1926.
241. WOOLLEY, H. T., "The Validity of Standards of Mental Measurement in Young Childhood." *School and Society*, 21: 478-482, 1925.
242. YEPSEN, L. N., "The Reliability of the Goodenough Drawing Test with Feebleminded Subjects." *Journal of Educational Psychology*, 20: 448-451, 1929.
243. ANON., "Is the 'I.Q.' Necessarily Constant?" *Eug. News*, 15: 74, 1930.
244. BALDWIN, B. T., and STECHER, L. I., *The Psychology of the Preschool Child*. New York: D. Appleton and Co., 1925. Pp. 305.
245. DESCOEUDRES, A., "Les Tests de Binet-Simon Comme Mesure de Développement des Enfants Anormaux." *Arch. de Psychol.*, 15: 59, 1915.
246. HOLLINGWORTH, L. S., *The Psychology of Subnormal Children*. New York: The Macmillan Co., 1920. Pp. 285.
247. PORTER, M. P., and LAUDERBACH, J. C., "On the Constancy of the I.Q." *School and Society*, 33: 675-676, May 16, 1931, No. 855.