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COMPARISON OF MENTAL GRADINGS BY THE YERKES-BRIDGES POINT SCALE AND THE BINET-SIMON SCALE¹

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That the Yerkes-Bridges Point Scale and the Binet-Simon Scale do not usually coincide in their mental gradings has already been pointed out by the authors of the Point Scale. We have here undertaken a comparison of the scales, hoping to determine what degree of difference exists between their gradings.

Our comparison is based on 400 cases examined at the Psychopathic Hospital from September, 1914, to August, 1915. These cases comprise house-patients and out-patients of both sexes. They fall into the following five groups, viz., feeble-minded, retarded, defective, psychotic, and normal. We have excluded all cases which graded below four years mental age by the Binet Scale, also cases of illiteracy and those which required the services of an interpreter.

The examination of each patient included the Point Scale, the Binet Scale, and certain supplementary tests. Both scales were given with strict adherence to the directions prescribed by their authors. In every instance, the Point Scale and Binet Scale were given to the patient at the same sitting and by the same examiner.

In regard to the tables contained in this paper, we wish to explain that in all computations we have considered every decimal above .5 as the next unit. Also, the Binet age, given on the hospital records in fractions, has been reduced to decimals for convenience of calculation. As the Binet Scale does not offer mental grading for the years 13 and 14, we have used the Point Scale as a basis for all grouping of cases according to mental age.

¹ Being P. H. Contributions, whole number 118 (1915, 21). *Bibliographical Note*.—The previous contribution, 117 (1915, 20), was by C. S. Rossy, entitled "First Note on the Psychological Study of the Criminals at the Massachusetts State Prison," published in Bulletin No. 13 of the State Board of Insanity.

FEEBLE-MINDED

The feeble-minded group comprises two hundred (200) cases, varying in mental age, according to the Point Scale, from 4— to 12.6 years. In the following list, we have arranged the subjects in order of mental age. The last five cases, Nos. 173, 287, 285, 286, and 90, are included in this group notwithstanding the somewhat high grading by the Point Scale, because their low Binet mental age and their social, personal, and school histories are indicative of feeble-mindedness.

FEEBLE-MINDED (200 CASES)

Case No.	P. S. age	Binet age	Chronological age
324.....	4—	5	28
2.....	4—	5.2	8
3.....	4—	5.4	6
5.....	4	4.8	12
205.....	4	5.4	7
4.....	4	5.6	9
6.....	4.4	5.8	8
7.....	4.6	6.2	8
8.....	4.8	6	8
207.....	5	5.8	17
9.....	5	6.4	14
11.....	5.3	6.4	8
208.....	5.3	6.4	9
304.....	5.3	6.8	33
209.....	5.5	5.4	10
210.....	5.5	6.8	35
12.....	5.5	6.8	23
211.....	5.6	7.4	16
212.....	5.7	6.4	26
14.....	6	7	12
213.....	6	7.4	10
16.....	6.2	7	28
326.....	6.2	7.2	9
214.....	6.2	7.4	11
15.....	6.2	7.4	22
1.....	6.6	7	16
215.....	6.6	7.6	16
216.....	6.8	7.8	10
217.....	7	7.4	20
13.....	7	8.2	26
29.....	7.1	7.4	9
220.....	7.1	6.8	77
42.....	7.1	7.6	14
219.....	7.1	7.8	12
17.....	7.5	7.4	10
218.....	7.5	8.2	30
222.....	7.7	8.8	14
223.....	7.7	8.8	24
224.....	7.9	7.8	18

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FEEBLE-MINDED—*Continued*

Case No.	P. S. age	Binet age	Chronological age
225.....	7.9	8.4	28
226.....	8	8	11
18.....	8	8.6	10
19.....	8	8.8	13
21.....	8.1	7.4	21
22.....	8.1	8.6	30
20.....	8.1	8.8	19
23.....	8.2	7.8	9
43.....	8.2	7.8	11
227.....	8.2	8.2	10
25.....	8.2	8.6	32
24.....	8.2	8.8	28
26.....	8.3	8	11
322.....	8.3	8.2	10
27.....	8.3	8.2	12
44.....	8.3	8.2	23
57.....	8.3	8.2	40
58.....	8.4	8	18
28.....	8.4	8.4	17
228.....	8.5	7.8	21
30.....	8.5	8	11
32.....	8.6	7.8	12
31.....	8.6	8.2	10
229.....	8.6	9.2	21
65.....	8.6	9.4	12
73.....	8.7	8.2	30
232.....	8.7	8.2	31
230.....	8.7	8.6	10
34.....	8.7	8.6	12
33.....	8.7	8.8	10
231.....	8.7	9	18
233.....	8.8	8.6	14
75.....	8.8	9	14
36.....	8.9	7.8	11
240.....	8.9	8.4	55
35.....	8.9	8.8	10
85.....	8.9	8.8	21
238.....	8.9	8.8	21
112.....	8.9	9.2	12
113.....	8.9	9.2	12
235.....	8.9	9.2	12
117.....	8.9	9.2	45
236.....	8.9	9.4	12
237.....	8.9	9.4	14
239.....	8.9	9.4	31
38.....	8.9	9.4	41
234.....	8.9	9.6	11
37.....	8.9	9.6	36
10.....	9	7.4	17
244.....	9	7.4	17
243.....	9	8.2	16
242.....	9	8.6	14
40.....	9	8.6	15
41.....	9	8.8	38
39.....	9	9.4	10

FEEBLE-MINDED—*Continued*

Case No.	P. S. age	Binet age	Chronological age
241.....	9	9.4	11
245.....	9	9.6	48
246.....	9.1	9.2	12
247.....	9.1	9.4	15
248.....	9.2	9.4	14
45.....	9.2	9.4	44
249.....	9.3	9.4	56
46.....	9.3	9	26
118.....	9.3	10.2	11
250.....	9.5	9	11
251.....	9.5	9.2	16
48.....	9.5	9.2	21
47.....	9.5	9.6	19
125.....	9.5	9.6	33
170.....	9.6	9.4	16
49.....	9.6	9.6	15
50.....	9.7	9.4	16
330.....	9.7	9.6	54
252.....	9.7	9.8	18
51.....	9.8	9.4	14
253.....	9.8	9.4	15
53.....	9.8	9.8	23
52.....	9.8	10.4	15
54.....	9.9	9.2	21
55.....	9.9	9.6	22
59.....	10	9.2	12
56.....	10	9.8	13
60.....	10	10.6	14
62.....	10.5	9.6	14
64.....	10.5	10	42
63.....	10.5	10.2	15
61.....	10.5	10.8	13
254.....	10.6	10.6	23
172.....	11	9.6	42
66.....	11	9.8	27
256.....	11	10	20
255.....	11	10.4	13
67.....	11.1	10.2	14
68.....	11.1	10.2	16
256.....	11.1	10.2	21
69.....	11.1	10.2	32
70.....	11.1	10.2	33
176.....	11.1	10.6	47
258.....	11.2	10	15
174.....	11.2	10	16
260.....	11.2	10	20
259.....	11.2	10.4	17
175.....	11.3	9.3	15
264.....	11.3	10	41
121.....	11.3	10.2	14
72.....	11.3	10.2	21
177.....	11.3	10.4	15
261.....	11.3	10.4	16

FEEBLE-MINDED—*Continued*

Case No.	P. S. age	Binet age	Chronological age
74.....	11.3	10.4	28
179.....	11.3	10.4	47
265.....	11.3	10.4	47
71.....	11.3	10.6	15
263.....	11.3	10.8	27
357.....	11.3	10.8	45
76.....	11.3	11	37
77.....	11.4	9.6	16
79.....	11.4	10.2	17
78.....	11.4	10.6	16
266.....	11.4	10.8	42
271.....	11.5	10.4	24
268.....	11.5	10.6	18
138.....	11.5	10.6	20
269.....	11.5	10.6	21
80.....	11.5	10.8	16
81.....	11.5	11	18
267.....	11.5	11.2	16
270.....	11.5	11.4	22
180.....	11.6	10	13
83.....	11.6	10.4	19
181.....	11.6	10.4	23
132.....	11.6	10.4	42
272.....	11.6	10.6	20
82.....	11.6	10.8	15
84.....	11.6	10.8	37
182.....	11.6	11	23
86.....	11.7	10	17
275.....	11.7	10.2	16
277.....	11.7	10.4	42
273.....	11.7	10.8	14
274.....	11.7	11	14
276.....	11.7	11	18
87.....	11.7	11	20
389.....	11.7	11.2	28
282.....	11.8	10.4	21
198.....	11.8	10.6	17
280.....	11.8	10.6	17
88.....	11.8	10.6	16
123.....	11.8	10.8	17
163.....	11.8	11.2	16
278.....	11.8	11.2	16
281.....	11.8	11.2	17
89.....	11.8	11.2	40
124.....	11.9	10.6	15
284.....	11.9	10.8	18
128.....	11.9	11.2	18
283.....	11.9	11.4	17
173.....	12	11	18
287.....	12.3	10.4	17
285.....	12.3	11	15
286.....	12.3	11.4	16
90.....	12.6	11	20

RETARDED

The retarded group comprises twenty-eight (28) cases, all of which show a chronological age under 16 years. The diagnosis of "retarded" has been made whenever the patient obtains a mental grading less than two years lower than his chronological age.

RETARDED (28 CASES)

Case No.	P. S. age	Binet age	Chronological age
306.....	4.2	6	6
114.....	4.8	6	7
115.....	5.1	6	7
116.....	5.7	6	6
308.....	6.4	7.4	9
99.....	7	7	8
310.....	7.5	7.4	9
94.....	7.9	7.2	8
102.....	8.2	8.2	9
105.....	8.2	8.8	9
311.....	8.5	8.8	9
312.....	8.6	8.4	9
107.....	8.6	8.8	10
109.....	8.8	8.6	10
358.....	8.9	9.2	10
365.....	9.1	10.2	10
313.....	9.3	9.8	10
314.....	9.5	9.6	11
315.....	10.5	10.4	12
119.....	11.1	10	12
120.....	11.1	10.4	12
135.....	11.1	10.6	12
316.....	11.3	9.8	12
370.....	11.5	10.6	13
122.....	11.7	10.6	12
317.....	11.7	10.6	12
262.....	11.7	10.6	12
388.....	14	11.4	15

DEFECTIVE

The term "defective" is used in this paper to designate patients who do not fall in the feeble-minded or retarded groups, who are not suffering from any mental disturbance, and yet who show distinctly a specialized defect in one or more of the mental functions. To determine these specialized defects, we applied tests devised by Healy, Ebbinghaus, Whipple, Knox, and others for particular mental functions. In this

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group, comprising eighty (80) cases, are included a large number of delinquents and those alcoholics who do not show sufficient impairment to be classed as psychotic.

DEFECTIVE (80 CASES)

Case No.	P. S. age	Binet age	Chronological age
168.....	4	5.8	5
169.....	6.4	7	7
349.....	7.7	7.8	7
350.....	7.9	8	7
351.....	8.9	9	9
352.....	9	8.8	8
353.....	9.2	9.8	9
354.....	9.5	10	9
355.....	10	10	11
171.....	10.5	9.4	10
356.....	11	10.4	12
134.....	11.5	10.2	11
178.....	1.16	10.4	11
359.....	11.7	10.4	11
360.....	11.7	11.2	12
363.....	12.3	11.2	13
366.....	12.3	11.4	38
364.....	12.3	12	13
183.....	13	10.6	17
368.....	13	11.2	16
391.....	13	11.2	55
369.....	13	11.4	16
136.....	13	11.4	22
367.....	13	11.6	13
140.....	13	11.6	19
139.....	13	11.6	20
371.....	13	11.6	30
319.....	13	11.6	43
374.....	14	11.2	43
373.....	14	11.4	15
375.....	14	11.4	50
185.....	14	11.6	19
186.....	14	11.6	26
372.....	14	11.8	13
184.....	14	11.8	16
187.....	14	11.4	36
376.....	14.5	11.6	17
188.....	14.5	11.6	40
377.....	14.5	11.8	17
378.....	14.5	11.8	24
382.....	15	11.2	17
191.....	15	11.2	26
379.....	15	11.4	13

DEFECTIVE—Continued

Case No.	P.S. age	Binet age	Chronological age
384.....	15	11.4	37
394.....	15	11.4	38
383.....	15	11.6	19
190.....	15	11.8	18
189.....	15	12	15
381.....	15	12	16
380.....	15	12.2	16
387.....	15+	11	15
396.....	15+	11.2	21
141.....	15+	11.2	26
386.....	15+	11.4	14
137.....	15+	11.6	27
385.....	15+	11.8	14
399.....	15+	11.8	16
395.....	15+	11.8	19
397.....	15+	11.8	26
199.....	15+	11.8	30
403.....	15+	11.8	54
192.....	15+	12	14
393.....	15+	12	18
196.....	15+	12	20
197.....	15+	12	20
321.....	15+	12	45
400.....	15+	12.2	17
390.....	15+	12.2	17
131.....	15+	12.2	21
398.....	15+	12.2	28
133.....	15+	12.2	39
343.....	15+	12.4	16
193.....	15+	12.4	16
195.....	15+	12.4	18
200.....	15+	12.4	34
401.....	15+	12.4	40
344.....	15+	12.6	15
392.....	15+	12.6	18
201.....	15+	12.6	42
194.....	15+	15	17

PSYCHOTIC

This group comprises sixty-one (61) cases, which have been diagnosed in the hospital as suffering from permanent or temporary mental disturbance. We find here many cases of dementia praecox, chronic alcoholism, and psychoneuroses. The psychological examination was given to these cases with the purpose of determining the degree of irregularity occurring in the patients' reactions.

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PSYCHOTIC (61 CASES)

Case No.	P. S. age	Binet age	Chronological age
142.....	6.6	7	12
143.....	7	7.4	7
329.....	8.2	8.2	19
331.....	8.3	9.2	54
318.....	8.5	8.4	43
144.....	8.7	8.8	16
126.....	9.5	9.4	41
127.....	9.5	9.8	55
320.....	9.7	9.6	24
145.....	9.8	8.6	23
307.....	9.8	9.6	23
332.....	9.8	9.6	46
146.....	9.8	9.8	26
147.....	10	10.2	22
148.....	10.5	10.4	46
309.....	11.1	10.2	26
149.....	11.2	10.8	55
129.....	11.4	9.4	71
150.....	11.4	10.4	18
333.....	11.4	10.8	16
130.....	11.5	10.2	48
151.....	11.5	10.4	20
152.....	11.5	10.6	24
334.....	11.5	11	18
305.....	11.5	11	18
335.....	11.6	10.4	23
336.....	11.6	11	35
153.....	11.7	10.8	12
154.....	11.7	10.8	20
327.....	11.7	11.2	14
295.....	11.7	11.4	25
361.....	11.7	11.4	48
155.....	11.8	10.4	26
157.....	11.8	11	47
156.....	11.8	11.2	46
362.....	11.8	11.2	51
158.....	11.9	11	22
159.....	11.9	11.6	29
301.....	12.3	10.8	30
289.....	12.3	11	44
337.....	12.3	11.8	30
338.....	12.6	10.2	34
339.....	12.6	11.2	37
340.....	12.6	11.2	39
150.....	12.8	11.4	39
202.....	13	11.6	43
341.....	14	11.8	28
342.....	14.5	11.6	32
203.....	14.5	11.8	24

PSYCHOTIC—*Continued*

Case No.	P. S. age	Binet age	Chronological age
162.....	15	10.8	15
161.....	15	11	14
165.....	15+	11.8	16
347.....	15+	11.8	36
164.....	15+	12	15
345.....	15+	12	31
204.....	15+	12	45
206.....	15+	12.2	27
346.....	15+	12.2	31
166.....	15+	12.4	29
167.....	15+	12.4	40
288.....	15+	15	39

NORMAL

We feel that the term "normal" demands an explanation, since it is questionable if truly normal individuals are ever referred to a psychopathic hospital as patients. What we have placed in this group are the cases, thirty-one (31) in number, which could not be classified as feeble-minded, retarded, psychotic, or defective. These subjects showed an adequate mental development in so far as the mental age agreed with their chronological age and their reactions to all tests were satisfactory.

NORMAL (31 CASES)

Case No.	P. S. age	Binet age	Chronological age
91.....	4—	4.2	4
290.....	7.1	7	7
348.....	8.2	8.2	7
92.....	8.3	8	8
291.....	8.6	8.8	8
93.....	9.6	9.8	9
292.....	11.4	10.4	10
293.....	11.7	10.4	11
95.....	12.3	10.6	12
96.....	13	11.2	13
325.....	15+	11.8	10
294.....	15+	11.8	13
302.....	15+	11.8	26
303.....	15+	12	30
323.....	15+	12	16
299.....	15+	12	22

NORMAL—*Continued*

Case No.	P. S. age	Binet age	Chronological age
298.....	15+	12	18
110.....	15+	12.2	37
100.....	15+	12.2	15
97.....	15+	12.2	13
103.....	15+	12.2	17
104.....	15+	12.4	17
106.....	15+	12.4	19
296.....	15+	12.4	15
297.....	15+	12.6	17
300.....	15+	12.6	24
101.....	15+	12.6	16
328.....	15+	12.6	20
108.....	15+	12.6	20
111.....	15+	15	45
98.....	15+	15	15

COMPARISON OF RESULTS

1. *Instances in which the two scales coincide.* Out of the four hundred cases examined, it was found that only sixteen obtained exactly equal grading by both scales. It is interesting to note that this coincidence of the two scales occurred most commonly in the mental ages of 8, 9, and 15 years. In no instance was there a case of equal grading in the years 4 to 6 and 11 to 14.

TABLE I

DISTRIBUTION OF EQUAL GRADINGS BY BOTH SCALES

Mental age	Feeble-minded	Re-tarded	De-fective	Psy-chotic	Normal	Total equal ages	Number cases for each year
4	0	0	0	0	0	0	13
5	0	0	0	0	0	0	12
6	0	0	0	0	0	0	12
7	0	1	0	0	0	1	19
8	3	1	0	1	1	6	62
9	2	0	0	1	0	3	46
10	1	0	1	0	0	2	13
11	0	0	0	0	0	0	106
12	0	0	0	0	0	0	16
13	0	0	0	0	0	0	12
14	0	0	0	0	0	0	16
15	0	0	1	1	2	4	73
Total	6	2	2	3	3	16	400

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2. *Percentage of cases showing higher grading by either scale.* In three hundred and eighty-four cases out of four hundred, the two scales did not coincide. We find that from 4— to 9 years mental age, inclusive, the per cent of cases that grade higher by the Binet Scale is larger than the per cent of cases that grade higher by the Point Scale, and that from 10 to 15 years mental age, inclusive, the opposite is true, i. e., the per cent of cases that grade higher by the Point Scale is greater than the per cent of cases that grade higher by the Binet Scale. Up to the 6th year mental age, *all* cases grade higher by the Binet Scale, with the exception of one case in the 5th year. In the 10th year, the Binet Scale exceeds the Point Scale in only 19% of the cases, and after the 10th year, the percentage of cases grading higher by the Point Scale is 100.

TABLE II

PER CENT OF CASES WITH HIGHER GRADING BY EITHER SCALE

Mental age	Feeble-minded		Re-tarded		De-fective		Psy-chotic		Normal		Av. P. S.	Av. Binet
	P.S.	Bin.	P.S.	Bin.	P.S.	Bin.	P.S.	Bin.	P.S.	Bin.		
4—	0	100							0	100	0	100
4	0	100	0	100	0	100					0	100
5	10	90	0	100							5	95
6	0	100	0	100	0	100	0	100			0	100
7	25	75	67	0	0	100	0	100	100	0	38	55
8	49	45	29	57	0	100	25	50	33	33	27	57
9	53	41	0	100	33	67	71	14	0	100	31	64
10	63	25	100	0	50	0	50	50			66	19
11	100	0	100	0	100	0	100	0	100	0	100	0
12	100	0			100	0	100	0	100	0	100	0
13					100	0	100	0	100	0	100	0
14			100	0	100	0	100	0			100	0
15					100	0	100	0			100	0

3. *Average increase per year of one scale over the other.* The following tables are presented to show the average increase of one scale over the other for each year of mental age. These tables do not include cases for which the mental gradings of both scales coincide.

TABLE III

AVERAGE INCREASE PER YEAR OF POINT SCALE OVER BINET SCALE

Mental age	Feeble-minded	Retarded	Defective	Psychotic	Normal
4	0	0	0	0	0
5	.1	0	0	0	0
6	0	0	0	0	0
7	.2	.4	0	0	.1
8	.4	.2	0	.1	.3
9	.5	0	.2	.6	0
10	.5	.1	1.1	.1	0
11	.9	1.0	1.0	.8	1.2
12	1.3	0	.8	1.4	1.7
13		0	1.6	1.4	1.8
14		.4	2.6	2.6	0
15			3.4	4.1	0

TABLE IV

AVERAGE INCREASE PER YEAR OF BINET SCALE OVER POINT SCALE

Mental age	Feeble-minded	Retarded	Defective	Psychotic	Normal
4	1.4	1.5	1.8	0	0
5	1.0	.6	0	0	0
6	1.0	1.0	.6	.4	0
7	.7	0	.1	.4	0
8	.5	.4	.1	.5	.2
9	.3	.3	.6	.3	.2
10	.5	0	0	.2	0
11	0	0	0	0	0
12	0	0	0	0	0

4. *Average difference between the scales per year.* In the following table, we present the average mental age per year for each group, the average mental age per year for the five groups, and the average difference between the scales per year. This table brings out: first, the fact stated already by the authors of the Point Scale, that the greatest variation between the scales occurs at the extremes, and second, that the least variation is found in the years 6 to 10 inclusive, amounting on the average to 0 in the 8th year.

TABLE V
AVERAGE MENTAL AGE AND AVERAGE VARIATION PER YEAR FOR BOTH
SCALES

Mental age		Fee-ble-minded	Re-tarded	De-fective	Psy-chotic	Nor-mal	Aver-age	Average difference between scales
4	P. S. . .	4.3	4.5	4			4.3	
	Binet. . .	5.8	6	5.8			5.9	1.6 higher
5	P. S. . .	5.4	5.4				5.4	
	Binet. . .	6.5	6				6.3	.9 higher
6	P. S. . .	6.3	6.4	6.4	6.6		6.4	
	Binet. . .	7.3	7.4	7	7		7.2	.6 higher
7	P. S. . .	7.4	7.4	7.8	7	7.1	7.3	
	Binet. . .	7.9	7.3	7.9	7.4	7	7.5	.2 higher
8	P. S. . .	8.6	8.5	8.9	8.4	8.4	8.6	0
	Binet. . .	8.6	8.5	9	8.7	8.3	8.6	0
9	P. S. . .	9.4	9.3	9.2	9.7	9.6	9.4	
	Binet. . .	9.2	9.9	9.5	9.5	9.8	9.6	.2 higher
10	P. S. . .	10.3	10.5	10.3	10.3		10.3	.1 higher
	Binet. . .	10.1	10.4	10	10.3		10.2	
11	P. S. . .	11.5	11.4	11.5	11.6	11.6	11.5	1.0 higher
	Binet. . .	10.5	10.4	10.5	10.8	10.4	10.5	
12	P. S. . .	12.3		12.3	12.5	12.3	12.3	1.3 higher
	Binet. . .	11		11.5	11	10.6	11	
13	P. S. . .			13	13	13	13	1.6 higher
	Binet. . .			11.4	11.6	11.2	11.4	
14	P. S. . .		14	14.2	14.3		14.2	2.6 higher
	Binet. . .		11.4	11.6	11.7		11.6	
15	P. S. . .			15	15		15	3.7 higher
	Binet. . .			11.6	10.9		11.3	

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Figure 1. Relation of Point Scale grading to Binet grading. Solid line (—) indicates average Point Scale age per year. Broken line (- - -) indicates average Binet age per year. Abscissae = mental age. Ordinates = average mental age.

CONCLUSIONS

Our results, briefly summarized, show:

1. That the Binet-Simon Scale usually grades higher than the Yerkes-Bridges Point Scale for the mental ages 4 to 9, inclusive, and that the Point Scale usually grades higher for the remaining years.
2. That the Binet-Simon Scale never grades higher than the Point Scale after the 10th year, although it may show an equal grading in a few instances.
3. That the greatest variation between the scales is found at the extremes, and the least variation in the years 6 to 10, inclusive. At the 8th year, the average variation amounts to 0.
4. That the two scales exactly coincide in 4% of the cases.

For convenient reference we present again in brief form the average difference per year.

Mental age	Higher scale	Average variation
4.....	Binet.....	1.6
5.....	".....	.9
6.....	".....	.6
7.....	".....	.2
8.....	".....	0.0
9.....	Binet.....	.2
10.....	Point Scale.....	.1
11.....	".....	1.0
12.....	".....	1.3

Mental age	Higher scale	Average variation
13.....	Point Scale	1.6
14.....	" "	2.6
15.....	" "	3.7

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