

A Note on the Size-Weight Illusion.

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THE statement has been made that the Mentally Defective do not experience the Size-Weight Illusion. By whom the statement was first made I do not know, but it has been copied into several books without verification. As I have not verified my references, I cannot quote chapter and verse, but anyhow a professional psychologist recently asked me whether the statement is true. I replied that I thought it extremely improbable, but that, as Kirkpatrick said, when Bruce stabbed the Red Comyn, I would "mak siccar."

It is perhaps scarcely necessary to explain that the illusion referred to is as follows:—Two weights are prepared which differ considerably in size but are equal in weight. If these are lifted one in each hand and compared, the smaller weight will seem quite distinctly the heavier. Indeed many people will refuse to believe that the weights are equal until they see them weighed on a balance. Now it is affirmed that if a mentally defective person is tested, and asked which of the weights is the heavier, he will indicate the larger, thus showing that he does not experience the illusion.

To test the matter I made use of two wooden weights, one about the size and shape of the cork of a large bottle (5 c.m. × 2.4 c.m.), the other a short broad cylinder like the bung of a large barrel (3.2 c.m. × 6 c.m.). The smaller piece had been hollowed out and weighted with shot. The weight of each is 52 grams.

The test was carried out in the following way. Each child was tested separately out of sight and hearing of the others. The weights were shown to the children, and one was then placed in each hand. I said, "Feel these two weights carefully." (Pause). "Now, give me the heavy one." It seemed better to use the word "heavy" which the children naturally hear frequently, rather than the word "heavier" which they rarely hear, and certainly never use. If the child gave the smaller weight, he was marked correct or plus. If he gave the larger weight, or proffered both, he was marked incorrect or minus.

Practically all the children examined belong to the imbecile class. They are able to understand simple questions, and to attend to their own wants, e.g., to feed themselves with a spoon.

Of 33 boys tested, 20 were marked plus; of 33 girls tested, 19 were marked plus.

The Mental Ages and Intelligence Quotients of the children tested had been ascertained at various periods prior to the test, and the children were not re-examined. But if we assume that Intelligence Quotients remain practically constant for a moderate time, it is possible to say that children whose Intelligence Quotient is above 40 are likely to succeed in the test unless they are very young; while children with an Intelligence Quotient below 40 are not likely to succeed, though a few of the older children did so. Evidently experience counts for something.

I tested several feeble-minded lads who work with the tradesmen. These are not included in the experiment. These lads promptly and with great assur-

ance gave the smaller weight, and seemed much amused at being asked such a simple question!

It does not seem worth while to draw up a table of all the children tested. The following table shows a number of typical successes and failures, selected according to age.

TABLE.

No.	Age. (Years).	Boys.		
		Mental Age. (approximate).	Intelligence Quotient.	Result. + or —
1	20	7	44	+
2	15	7	46	+
3	13	5.5	44	+
4	12	7	58	+
5	11	6	55	+
6	10	5	50	+
7	8	6	73	+
8	16	3	18	—
9	12	4	33	—
10	10	4	40	—
11	8	5	62	—
12	7	3.5	50	—

The next question which requires a little consideration is why so many children failed. With the idea of ascertaining whether the children did not understand the problem, I retested all those who had failed. In each case, I introduced the test by giving the child a test with two of the Binet Weights. These were two weights of exactly the same size and appearance, but weighing respectively 3 grams and 15 grams. The child was seated at a table, and the weights placed in front of him. I said, "These are two weights which look exactly like each other, but one is heavy and one is light. Lift them up and feel them carefully, and give me the heavy one." The difference between the weights is of course very obvious. As a child may easily be correct by chance, the test was repeated three times. All had to be successful for a pass. If the child offered both weights, the trial did not count, and the directions were repeated carefully.

Of the 13 boys who failed with the Illusion Test, only 2 succeeded with the weights. Twelve of these boys failed again with the Illusion Test. One failed with the weights, but passed the Illusion Test (three times repeated). This is boy number 12 in the Table. Boy number 11 in the Table might have been expected to pass the test, as he has such a high Intelligence Quotient. He succeeded with the weight test as a child with a mental age of five ought to do, but he failed with the Illusion Test each time it was tried. He is an impulsive little boy who responded to the question instantly, without pausing a moment for consideration. Boy 12, though less intelligent, is more deliberate and careful.

The conclusion reached, therefore, is that the Mentally Defective do not differ from normal persons in their response to the Illusion experiment, provided they have sufficient intelligence to appreciate the question; also that the degree of intelligence necessary is comparatively low, as the majority of those with a mental age above five *and* an Intelligence Quotient above 40 respond normally.