PSYCHOMETRIC TESTS IN ESSENTIAL EPILEPSY

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ESSENTIAL or idiopathic epilepsy, by which is meant an epilepsy that is referable to no organic lesion, is defined by L. Pierce Clark, the leading epileptologist of this country, as a "life reaction disorder." (1) In such cases the characteristic features or mental stigmata are present in a more or less marked degree from birth or early childhood, and are but little affected by the presence or absence of the seizures. The epileptic is a psychopath whose psychopathy manifests itself in a hyper-development of the ego, an extreme super-sensitivity, marked emotional poverty and a rigidity of ideation and mentation. Psychometric tests are of value in epilepsy in giving us a mental level and in indicating the presence or absence of deterioration and its degree. The writer feels that they ought also to give us some indication of the presence or absence of the characteristic stigmata, to show some distinctive features of the "great disorder," which might help us to determine its presence when the history of seizures is vague or perhaps altogether wanting, as frequently occurs with the younger cases.

In a consideration of tests from this standpoint we find ourselves not so much concerned with the distribution, that is, the scattering of responses through a number of years on an age-level scale such as the Binet, but with the character of the individual reactions and with the mental and emotional attitude of the subject during the examination.

The following studies, extending over a period of several months, were made upon a carefully selected group of epileptics in the Wyoming State Training School. Only essential epileptics, those who had shown the mental stigmata in greater or less degree since early childhood, were included. Though the cases are few, they range from the greatly deteriorated, at the lowest point where it was possible to get repeated testings upon them, to those deteriorated little if at all. The psychologist was in daily contact with each case, and had an excellent opportunity to observe improvement or the contrary in conduct and general mental condition, and thus to check up the test results by clinical evidence.

Case No. 1, John, aged 25, has been 6 years in the institution. He has had the seizures since the age of 5, but held his own fairly.

Reprinted from The Journal of Abnormal Psychology and Social Psychology, Boston December, 1921-March, 1922
well until late adolescence. He then became so quarrelsome and irresponsible that he had to be placed in the institution. He is now deteriorating very rapidly. On the Stanford Binet his mental age is 6 years 10 months, the distribution ranging from the 4th to the 8th years inclusive; his highest test is the comprehension questions in the 8th year. John makes a great effort to comprehend the directions and carry them out correctly, but his reactions are on the childish level. His poor motor co-ordination shows in an inability to copy the diamond, though he does all the other 7-year tests rather easily. He cannot name the 4 colors, nor repeat one of the sentences in the 6th year without error. He is extremely slow reacting, and his attention is so unstable that things have to be repeated to him again and again before he grasps them. His abnormal egotism shows itself in an overweening desire to talk about himself and his own affairs; he can hardly be induced to leave the Laboratory, so enamored is he of the chance to talk about himself. The association test — the Kent-Rosanoff series of 100 words — takes 20 minutes, an average reaction time of 12 seconds, and is remarkable for the number of individual reactions. He gives 26 phrases and 44 words with a frequency value of zero. Perseveration of one idea or one type of response is strongly marked; he gives "short" or "shortness" 19 times. Nine days later, after a severe nocturnal seizure, he gives 52 phrases and 29 zero reactions, many of which are sheer nonsense, though several are associations to a preceding stimulus or response — perseveration in the sense in which Kent and Rosanoff (4) use the term. Three weeks later he is still further deteriorated, though he has had no seizures for several days. His reaction time is lengthened, and there are now 12 words to which he can find no response. He has developed a fondness for the suffix "ness"; he says "darkness," "whiteness," "workness," "cartness," "boyikness," "sleepness," the first syllable usually being an association to a preceding idea.

Case No. 2, Blanche, is 23 years old and has been in the institution since she was 16. The seizures began at 11, but she was always a nervous child and never able to remain in school an entire year. In the Institution she is usually pleasant, but is super-sensitive and suspicious of others' attitudes toward her. She has the seizures during her menstrual periods, though under medication goes long periods without them. On the Stanford Binet her mental age is 8 years, with a basal age of 6 and a range of 3 years above that. But she barely misses a number of higher tests, such as the absurdities,
reading and report, and comprehensions in the 10th year, and the ball-and-field and interpretation of pictures in the 12th year; she is quite evidently considerably deteriorated. She cannot copy the diamond, and fails in counting backward and making change because of her delayed reaction times. She is anxious to please, and keeps asking if her responses are correct. Her work is not nearly so childish as John's, but shows many of the same characteristics; i.e., she is slow reacting, her motor co-ordination is poor, and her interest is not so much in the things she is asked to do as in the examiner's attitude toward her work; she has an abnormal, childish desire for approval. The association test again shows the delayed reaction times, the average being 8.64 seconds. She gives 13 phrases, but aside from this her reactions are not markedly pathological. In 6 subsequent tests she reduces her reaction time but is never able to eliminate the phrases.

Case No. 3, Harry, is an over grown fellow of 15, whose grand mal seizures have been more or less frequent since babyhood. He had a history of quarrelsomeness and truancy, and general incorrigibility at home and school, but gets on fairly well in the institution, except that his lack of interest in his environment makes it difficult for him to remember instructions or to profit much from training. His mental age is 9 years 1 month by the Stanford Binet scale, with a range of 6 years above a basal year of 6. He succeeds on the diamond but fails the design, and though his ball-and-field plan is correctly conceived it is poorly executed. His memory is not inherently poor, but his attention is so unstable that he makes poor use of it; he repeats only 4 digits forward though he does the same number backwards; he can define only 18 words in the vocabulary test, which gives him less than 8 year credit; he reads well, but can recall barely 8 items out of the possible 21. He is indifferent to the test, but wants to talk about himself and his own experiences. The association test shows delayed reaction times, with 2 phrases and 20 zero reactions. In 4 subsequent tests he reduces both the reaction times and the number of zero reactions, though both remain considerably above the normal. He shows marked stereotypy of the type of reaction; on the 5th test 44 reactions out of the hundred are still identical with those of the first.

Case No. 4, Lewis, is also 15 years old. His seizures began at 3 and are of a very severe grand mal type; they occur every 2 weeks except when he is under medication. Lewis is in the main a good-natured fellow, with marked emotional apathy and a tendency to
day-dreaming. His mental age on the Stanford Binet scale is 9 years and 1 month. This is the third Stanford he has had in the last year, and he barely succeeds in the reading selection, fails the design completely, and though his ball-and-field is creditable it is poorly drawn. On the association test his reaction times are delayed and he shows perseveration of one idea, besides several instances of association to the preceding stimulus or response. The next day he had a severe seizure at 11 A.M. and at 3.30 he was given another association test, which shows the same peculiarities in a more marked degree. During the next 4 weeks he had 5 tests, in only one of which he succeeds in lowering his reaction times appreciably, and the last of the series has but 56 different reactions as against 69 on the first test.

Case No. 5, Mary, aged 17, has had petit mal since she was 5 years old, but developed grand mal about a year ago, shortly before being sent to the institution. She has frequent petit mal and an occasional grand mal for several days preceding and during her menstrual periods, and petit mal occasionally during the intervals. At first glance she shows practically none of the epileptic stigmata; she is quiet and fairly good natured, apparently unselfish and not at all sensitive; but she is stubborn, will do petty pilfering, lie until cornered, and has been sexually promiscuous since she was a small child. Emotionally she is still a child, and her rigid attitude of mind is shown in the fact that, though she is quite capable of learning as far as memory and comprehension are concerned, she insists upon doing her household tasks in the manner to which she has been accustomed. Her Stanford age is 10 years and 5 months; the only tests she can do above the 10th year are the picture interpretations and the clock problems, and she misses the absurdities in the 10th year. Her work is childish, not nearly what one would expect from her appearance and manner; during the examination she was self possessed and co-operated well, but was nervous, her voice and hands shaking. The association tests, given at varying intervals over a period of 9 months, show curious fluctuations: the number of zero reactions rises and falls with a fair degree of regularity, completing a cycle in from 4 to 6 weeks. It is highest during the time of the menstrual seizures, and lowest about 2 weeks before that time; ad interim seizures seem to have no effect upon it. This is quite in accord with Mary's institution history; during her menstrual periods the seizures leave her more or less confused and stupid, but in the intervals there are no apparent after effects.
Case No. 6, Harold, aged 13, has been in the institution 6 months. He has had petit mal seizures since the age of 18 months, but they have been very infrequent until within the last year. He has always been an exceedingly difficult child; has been subject to temper attacks — psychic equivalents — in which he was wholly unmanageable at home; he is an egregious egotist, is extremely sensitive to remarks or actions directed toward himself, but has small regard for others' feelings; though he has a bright and active mind, his field of attention is so narrow and his interest in his environment so slight that his general information is quite poor; he reached the 6th grade in school at the age of 12 after repeating the 5th grade. He was sent to the institution only after he became impossible at home. In the institution he has had a series of ups and downs; the seizures have been quite frequent, usually a matutinal petit mal for several days, then a series of 5 and 6 in a day, culminating in grand mal; after which he is free from seizures for a varying number of days, from 3 or 4 to 2 or 3 weeks. During these free periods he is very apt to have the epi-gastric aura. He was tried under luminal, which controlled the seizures but he developed an acute mania, in which he shouted, sang, and swore nearly all the time, and became violent if crossed in any-thing. When not under medication he is often very unstable, hyper-irritable, and unreasonable, but is amenable to discipline and responds to training. On the whole his conduct has shown considerable improvement since his admission.

By the Stanford Binet scale his mental age is 11 years and 10 months, the responses ranging from the 9th to the 16th years inclusive. His vocabulary is below the 10-year level, and though he reads readily he makes errors and cannot recall enough items for credit. He can repeat 7 digits backward but only 6 forward. He shows no lack in comprehension or in ability to reason when he has the necessary data, but his mental grasp is shallow and his attention is so unstable that he fails on tests that are easily within his ability. His drawings show good motor co-ordination, but the test was given on one of his “good” days; there are other days when he cannot control his movements without exhausting effort. The association test, given on the same date as the Stanford, shows a number of phrases and perseveration of one type of response, and delayed reaction times. During March and April a series of tests was given; he was having petit mal nearly every day, and had one series of 9 seizures in 24 hours, some of them severe grand mal. However, the tests approximate
the norm quite closely, even on the days when his convulsions were most severe. His reaction time is lowered, until it is but little more than an average of 2 seconds, which is as well as the average normal subject can do; and pathological material is practically nil. This is quite in accord with the clinical evidence of his improvement.

Case No. 7, George, aged 24, developed grand mal attacks about 3 years ago. He had had no previous convulsions. The seizures are relatively frequent, but much less so under medication. He was a bright boy, learned readily in school, was not quarrelsome, nor did he have tantrum episodes. He is, however, very egotistic, with grandiose ideas concerning himself, his home, and everything with which he is connected. Emotionally he is quite childish; he has never had a love affair, and is childishly attached to his home and his parents. His Stanford Binet age is 14 years and 7 months, the responses ranging from the 9th through the 18th year. He has a poor vocabulary, receiving only 10-year credit for definitions. He is able to repeat 7 digits both forward and backward; he is evidently a good visualizer, accomplishing the code and the cut design, but he can reproduce only part of the design in the 10th year. Comprehension and reasoning ability are unimpaired, and memory is good; but his attention is poor; he must be stimulated and his interest aroused, and even then he fails tests well within his ability because he overlooks essential factors. He is very slow reacting. Nine association tests, given over a period of 8 weeks, show a progressive decrease in the phrase type of reaction, though the number of zero reactions remains high. There is perseveration of words and phrases relating to himself. His reaction time decreases also, to a remarkable degree; in the first test his average time on the 100 words was 19.52 seconds, and was slightly above or below this for the first 6 tests; on the 7th it suddenly dropped to 3.6 seconds; on the 8th it was 3 seconds, and on the last 3.17 seconds. These last 3 tests were accompanied by a great improvement in his general condition; he soon after left the institution.

DISCUSSION

The foregoing tests have many features in common. Perhaps the outstanding feature on the Stanford is the disorder of attention. In every one of the 7 cases it shows plainly. Not one of them but has to have directions repeated, gets confused and needs extra explanation, fails tests well within his ability because he forgets part of the
aufgabe or fails to notice all the factors involved. Thus case No. 7 reproduces only the first figure of the design, explaining that he forgot to look at the second; case No. 6 reproduces the lines of the code correctly but omits the dots, and cannot recall what he has read because, as he says, he wasn't paying attention, only trying to read well; No. 4 doesn't know the date, "just don't pay no attention to it." Every one who works with epileptics knows this characteristic; its origin is probably not so much intellectual as emotional, i. e., the epileptic's interest in his environment, except in so far as it relates to himself and the satisfaction of his own needs and desires, is slight.

Poor motor co-ordination shows in the drawings, and is greater or less according to the degree of deterioration; only case No. 6 succeeds in all of them. The vocabulary is consistently poor; even cases 6 and 7, from good homes and excellent schools, possess a small vocabulary. Not one of them is specially interested in the test itself, as the normal child or the straight defective is; they are all interested to know how they are doing or what the examiner thinks of their performances, and all are childishly eager for praise.

But the association test is perhaps a better gauge of the epileptic's mental condition; all show delayed reaction times in comparison with the normal subject, and an abnormal number of zero and phrase reactions. The phenomenon of perseveration, either the repetition of one or another word or association to a preceding stimulus or response, appears in all of them. These abnormal types of reaction tend to decrease and the reaction time to lessen as the subject's general condition improves. Several investigators have noted these tendencies as characteristic of epileptic reactions to association tests. Kent and Rosanoff (4) in their monograph report tests upon 24 subjects, in which they found "the dominant characteristic, so far as shown in the test records, to be a narrowing of the mental horizon manifested firstly by a tendency to repeat many times one or another word, and secondly by an abnormally pronounced tendency to make use of non-specific reactions or particles of speech. Occasionally other abnormalities are noted, such as perseveration or distraction." P. 47. The non-specific reactions and parts of speech are relatively infrequent in our material, but only one of our cases shows advanced dementia, and the above mentioned investigators state that many of their cases were of this type. Hahn (3) found lengthened reaction times and a tendency to perseveration characteristic of epileptic subjects, while Clark and Mileau (2) conclude their study of psychometric
tests in epilepsy with the statement that "the degree of perseveration and the length of reaction time are the main criteria for determining the presence and amount of mental deterioration." P. 6.

SUMMARY

1. Essential or idiopathic epilepsy is a "life reaction disorder," with characteristic mental stigmata; psychometric tests, in addition to a mental level and the indication of the presence or absence of deterioration, ought also to give us some indication of the characteristic mental attitude, thus enabling us to suspect the presence of the "great disorder" when the history of seizures is vague or entirely absent.

2. The present article reports the results of the study of a group of 7 essential epileptics, so selected as to range from the greatly deteriorated to those deteriorated but slightly if at all. The Stanford Binet was used, and repeated association tests were made with the Kent-Rosanoff series of 100 words.

3. Disorders of attention show in every case on the Stanford. All have to have directions repeated, get confused and need extra explanation, fail tests well within their ability because they forget part of the aufgabe or fail to notice all of the factors involved. Poor motor co-ordination shows in nearly every case, and is greater or less according to the degree of deterioration. The vocabulary is consistently poor, even in the cases from good homes.

4. Interest in the test itself is subordinated to desire for approval and interest in the examiner's attitude toward the subject—an egoistic attitude.

5. The association test shows in every case delayed reaction times and an abnormal type of response, perseveration of one idea or association to a preceding one. These tendencies lessen as the general condition improves.

6. The mental condition, as shown by the tests, bears no essential relation to the frequency or severity of the seizures.

REFERENCES