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# Changes in intelligence test scores of psychotic patients given before and after electric shock treatments.

Joseph Gruber

*University of Massachusetts Amherst*

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CHANGES IN INTELLIGENCE TEST SCORES  
OF PSYCHOTIC PATIENTS GIVEN BEFORE  
AND AFTER ELECTRIC SHOCK TREATMENTS

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CHANGES IN INTELLIGENCE TEST SCORES  
OF PSYCHOTIC PATIENTS GIVEN BEFORE  
AND AFTER ELECTRIC SHOCK TREATMENTS

BY

JOSEPH GRUBER

PROBLEM SUBMITTED FOR THE DEGREE OF

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## I. INTRODUCTION

The problem under investigation is a comparison of scores on intelligence tests given before and after electric shock treatments in human patients. The problem is of practical significance in the clinical evaluation of the effects of the electric shock treatments on the comparative mental functioning of psychotics before and after this treatment. Should this study indicate that the intellectual level changes consistently in one direction such evidence with supplementary verification might be used to evaluate electric shock as a method of therapy. However, since this study was of necessity confined to a relatively short period of time, since relatively few hospital patients were available, and since hospital procedure made many controls impossible, the results of this study are inconclusive and must be considered only suggestive.

A number of psychotic patients at the Northampton State Hospital were selected as subjects for this project. All of these patients had been given an intelligence test previous to the administration of electric shock treatments. Following these shock treatments, a second intelligence test was administered, and the results were then compared. The tests used in this study were the Wechsler-Bellevue Adult Intelligence Scale, Form I, and the Revised Stanford-Binet Scale, Form L.

## II. REVIEW OF THE LITERATURE

A review of the literature brings to light the fact that little psychometric evidence has been gathered on the effect of electric shock treatments upon intellectual functioning. Those who are using electric shock treatments are clinical practitioners, and as such lack the facilities, opportunity, or training to do careful psychometric evaluative studies of the treatment effects. A few statistical analyses have been made of these clinical cases, but these deal largely with problems of admission, improvement, remission, and discharge.

The objective evidence that will be cited was obtained in abstract form. A careful search of the literature and personal communications has revealed that either no original papers have been published, or that reprints by authors have been exhausted. Rather than to paraphrase the following articles, and because of their extreme brevity, they will be quoted verbatim.

The earliest article noted was by Stone ( 7 ), entitled, " Characteristic Losses and Gains in Scores on the Wechsler Memory Scale as Applied on Psychotic Patients Before, During, and After a Series of Electric Shock Treatments."

" Two distinct groups were used in this study.

Group 1 received the Wechsler Memory Scale, Form I, one day before the first convulsive shock and Form II one day after the last shock. Group 2 received the

Wechsler Memory Scale, Form I, one day after their last convulsive shock and the Form II approximately two weeks thereafter. Our objective with Group 1 was to ascertain the loss of performance that could be ascribed principally to the series of convulsive shocks. With Group 2, our objective was to determine the amount of recovery one might expect in the course of two weeks following the last convulsive treatment. Fifteen or more patients completed their tests in each of the studies.

For Group 1 the loss was about sixteen per cent of the original score; for Group 2 the gain was twenty seven per cent of the first score. The change in performance, in both instances, are statistically significant."

The procedure that was employed by Dubin ( 2 ) in a study in 1947, was used by this writer. An abstract of this study is quoted below :

" Problem : To determine the changes in intellectual and personality functioning before and after shock treatment, as measured by the Rorschach and Wechsler-Bellevue Intelligence tests.

Population : The population consists of twelve patients diagnosed as schizophrenic. The patients were included in the study if they had no previous psychotic break

and that the symptoms were less than one year's duration.

The control group parallels the experimental group in age, occupation, sex and diagnosis.

Procedure : The Rorschach and Wechsler-Bellevue were administered before shock treatment began.

The same tests were repeated after the insulin and electric shock. Psychotherapy was administered to each of the patients during the treatment period by the psychiatrist.

Results : The results of the Wechsler-Bellevue show an increase of seventeen points in I.Q. The biggest range of increase in one patient was thirty-nine points; the lowest was nine points. T-test scores show that eight of the Wechsler-Bellevue sub-test scores to be significant on the one per cent level, and two on the five per cent level. The data on the Rorschach for the experimental group and data for the control group is not yet ready. A follow-up study is in progress.

Conclusions : A definite increase in I.Q. was obtained by the use of shock therapy. The data on the Wechsler indicates that eight out of the ten sub-tests are significant on the one per cent level and two on the five per cent level as



measured by the T-test. The Rorschach data and the data for the control group are not yet ready."

A similar study was done by Rabin ( 5 ), entitled, " Effects of Electric Shock Treatment upon Some Aspects of Personality and Intellect." To quote the abstract :

" Problem : To determine the effects of electric shock treatment on the memory, intelligence level and personality of clinically improved and not improved patients.

Population : Ten psychotic State Hospital patients ( eight schizophrenics, one case each of involtional and mental deficient with psychosis ) between the ages of twenty and forty.

Procedure : The patients were examined by the Wechsler-Bellevue intelligence and memory scales, Rorschach and Szondi, before and immediately after the completion of a course of Electric Shock Treatments. The average period between examinations was about one month.

Results : The group as a whole shows no significant changes in I.Q. or M.Q. The direction of change in I.Q. and M.Q. tends to be consistent in individual cases, but is apparently unrelated to " clinical improvement ". The Rorschach shows greater productivity (R), the tendency for F / % to gravitate toward the

average range, and an increase in the number of shading responses. There is also a reduction in the number of rejections and a marked improvement in speed of response. No single factor, but the total pattern corresponds with improvement. Szondi findings show a consistent trend of intensification, with, and rejection of, the pictures.

Conclusions : Immediate memory, learning and I.Q. as measured by our instruments remain unaffected by electric shock and are poor indices of improvement. There is a general " loosening " or dilatation of personality as evidenced by a reduction of constriction and greater freedom and speed of association. Single Rorschach factors cannot serve as indices or as predictors of improvement.

The acquisition of greater insight and auto-criticism are supported by Rorschach and Szondi findings."

The latest findings were reported in abstract form by Kessler ( 4 ). Her study dealt with intellectual changes in schizophrenic patients following electric shock therapy. The abstract is quoted below :

" Problem : The object of the present investigation was to note any changes in the Wechsler-Bellevue patterning of a group of unselected electric shock treated schizophrenics.

Population : Twenty fully cooperative patients of various sub-classifications of schizophrenia were accepted.

Procedure : Within the first week of hospitalization, each patient was administered the entire Form I ( excluding vocabulary ). Retesting was done at least two weeks after the shock series were completed. Comparison of the results involved I.Q.'s and sub-test scores, including an item analysis, pattern analysis, and qualitative differences. Psychiatric impressions of each patient's post-shock conditions were correlated with those indicated by testing.

Results : The principal results included greatly improved I.Q. ratings on all three scales, greatest variability in Picture Arrangement, most significant increases in Comprehension and Picture Completion, moderate improvement in Picture Arrangement, Similarities, and Arithmetic, Critical Ratios of zero or near zero for all other sub-tests, typical schizophrenic patterns for the group on the whole, with the exception of Object Assembly, decided decline in bizarre thinking and considerable room for improvement as evidenced by sub-average scores on all sub-tests save Information and Object Assembly.

Conclusions : The reduction in bizarre incongruent thinking, better attention, and increasing social awareness were believed to be important factors in the favorable results revealed by the Wechsler-Bellevue Scale."

In summary, the writers of the above abstracts are almost in unanimous agreement as to the increase in I.Q. scores, or improvement in intellectual functioning following electric shock treatments, as measured by the Wechsler-Bellevue Adult Intelligence Scale, this test having been given before and after the shock treatments. There is one dissenting note in that Rabin ( 5 ) found no significant differences in I.Q.'s as measured by the aforementioned test, but that changes in I.Q. scores were consistent for each individual case and not the group. Rabin concluded that the change in I.Q. score was a poor index of improvement following electric shock treatment. Kessler's ( 4 ) results pointed toward an increase of I.Q. following shock, and she concluded that the increase was influenced by a " reduction of bizarre incongruent thinking, better attention, and increasing social awareness ", factors which this writer believes are to some degree supported by this study.

The populations used in these studies were all psychotic patients with the following diagnoses : forty schizophrenics of various sub-classifications, one involuntal psychosis,

and one mental deficient with psychosis. None of them had been under any extended period of hospitalization before becoming subjects for these studies. The post-shock tests were all administered not later than one month following the last shock.

### III. PROBLEM

The specific purpose of this project was to compare the differences in test scores made by some patients on the Wechsler-Bellevue Adult Intelligence Scale, Form I, and by other patients on the Revised Stanford-Binet Scale, Form L, given before and after electric shock treatments. The tests used were chosen on the basis of their clinical diagnostic values, and because the pre-shock psychological tests included only these two tests.

### IV. SUBJECTS

A thorough investigation of the records of patients who had undergone shock treatment since 1947 ( earlier records not complete ), at the Northampton State Hospital, was made, and only those patients who had had a previous psychometric were selected ( psychometric administered before shock treatment begun ).

Following the advice of the staff psychiatrists, many subjects were eliminated from this group, on the grounds that they had been discharged, allowed to go home on visit, or were not testable due to the fact they were too disoriented or too confused to participate in test situations. The group remaining included six men and two women of varying diagnostic classifications, ages, education, background, and other differentiating characteristics ( amount of shock, shock period, etc.) as indicated in Table 1. on page 11.

These eight individuals not only satisfied the criterion of having had a psychometric( either the Wechsler-Bellevue Adult Intelligence Scale, Form I, or the Revised Stanford-Binet, Form L ) administered before the advent of electric shock treatment, but they were also chosen on the recommendation of the staff psychiatrists as to their ability to participate in the testing situation. As can be seen in the case studies ( see Appendix), they were all testable, but some with great difficulty. The difficulty encountered was that the entire test scale could not be completed with four of the subjects, and the examiner had to use the abbreviated form of the test \* ( see Cases 1,4,5 in Appendix ).

\* see Wechsler, D.: Measurement of Adult Intelligence. Baltimore, 1944

TABLE 1

Case Number	Diagnosis	Age	Sex	Marital Status	Education	Date of Admission	Date and Type of Pre-Shock Test	Shock Period	Shock Series	Shock Number	Date and Type of Post-Shock Test	Time between Last Shock and Test
1	Schiz. Simple	32	M	S	HS. IV.	<del>20</del> 48	4/3/48 W-B *	5/20/48 to 5/24/48	1	2	7/17/50 W-B	2 years & 2 months
2	Schiz. Catatonic	22	M	S	H.S. IV.	<del>26</del> 49	11/8/49 W-B	1/21/50 to 5/10/50	2	84	6/21/50 W-B	1½ months
3	Schiz. Hebephrenic	28	M	S	H.S. I	<del>40</del> 50	5/12/50 W-B	5/24/50 to 6/10/50	2	24	6/20/50 W-B	10 days
4	Manic Depress. (Depress)	38	M	M	H.S. I	<del>63</del> 47	7/16/47 W-B	10/7/49 to 2/27/50	3	24	7/14/50 W-B	5 months
5	Schiz. Unknown	30	M	S	H.S. IV.	<del>64</del> 48	4/22/48 W-B	2/8/49 to 3/17/49	1	8	7/13/50 W-B	1 year & 4 months
6	Schiz. Mixed	25	F	S	H.S. I	<del>36</del> 50	3/22/50 W-B	4/6/50 to 5/19/50	1	12	7/6/50 W-B	15 days
7	Psycho-Neurosis c M.D.	29	M	S	Grade VIII	<del>124</del> 49	1/6/50* S-B	4/12/50 to 5/8/50	1	10	6/21/50 W-B	1½ months
8	Schiz. Catatonic	22	M	S	Trade II	<del>1022</del> 49	11/7/49 S-B	11/17/49 to 4/7/50	2	3	7/10/50 S-B	3 months

\* W-B - Wechsler -Bellevue Adult Intelligence Scale ( Form I )  
 S-B - Revised Stanford-Binet Scale ( Form L )

## V. PROCEDURE

### A. Testing

The pre-shock tests ( Wechsler-Bellevue Adult Intelligence Scale, Form I, or the Stanford-Binet Scale, Form L ) were administered to the eight patients by three members of the psychology staff at the Northampton State Hospital over a period from July, 1947 to May, 1950. The test results, interpretations, summaries and conclusions, and the general behavior of the patients were noted in all cases. According to the hospital records each patient completed the test in one interview.

The post-shock tests ( same as above ) were administered to each of the eight patients by this writer over a period from June, 1950 to July, 1950. The time interval between the final electric shock and the post-shock test, for the different patients, varied from two years and two months to ten days. Again the test results, summaries and conclusions, interpretations, and the general behavior of the patients were noted in all cases. In administering the post-shock test, all of the patients were tested under comparable circumstances i.e. in a small, well lighted, well ventilated room, with a large desk and comfortable chairs. The testing of each patient was completed in one interview.



The results of the tests ( before and after shock ) were then compared on the basis of procedures recommended by Wechsler ( 9 ) and Shafer ( 6 ). In the comparison of the Wechsler-Bellevue scale, first the full I.Q.'s were examined, then the following : verbal I.Q.'s, performance I.Q.'s, deterioration quotients( 9 ), I.Q.V. scores ( 8 ), each test item in the scatter pattern, and finally the general behavior of the patient in the test situations. In comparing the Revised Stanford-Binet tests, first the I.Q.'s were examined, then the I.Q.V. scores, the scatter pattern, and lastly the general behavior in the test situations.

In comparing the results of Case 7. in which the pre-shock test was the Revised Stanford-Binet Scale, Form L, and the post-shock test was the Wechsler-Bellevue Adult Intelligence Scale, Form I, an examination was made of the I.Q.'s, the I.Q.V. scores, the scatter patterns, and the general behavior of the patient in the test situations. The reason the two different tests were used in the pre- and post-shock test situations was that the subject expressed excellent memory for the earlier test, and so an alternative test had to be substituted to counteract the extreme practice effect in this case. This change of tests, however, introduced a new variable that was not considered earlier, that of evaluating changes in intellectual functioning as measured by two different tests. Neither of the two tests had been standardized on the same population, and the scoring and interpretations of the test results were different. Therefore,

there was no justifiable basis for making a comparison other than between separate measures of intellectual functioning. The writer has made a comparison of the results on this basis, citing the qualifications in the test analysis.

#### B. Electric Shock Treatment

The electric shock treatments were all administered by the staff psychiatrists over a period from May, 1948 to June, 1950. The shocks were administered in series and amounts which varied from patient to patient. The number of series and shocks, the amount of current, the duration, the resistance, and the general results of the shock are shown for each patient with his case history in the Appendix.

#### C. Controls

Due to conditions beyond the control of the writer, it was impossible to control adequately the factors of lack of acceptable subjects, age, sex, education, marital status, amount of shock, duration of shock, time between shock and test period, and selection of patients under one diagnostic classification in this study. The only consistently controlled factors were the designation of all the patients as psychotic, as judged by the staff psychiatrists, and the administration of a psychometric to all patients before shock treatment was begun. There was no attempt to control practice effects. Hamister (3) studied practice effects with the Wechsler-Bellevue test and obtained results which proved to be inconclusive. However,

clinical experience has shown the staff of the psychology department at the Northampton State Hospital, that in most cases, practice would have little or no effect upon the scores if the tests are given two or more months apart. In all of the cases in this study, none of the patients were given retests under this minimum.

## VI. RESULTS AND DISCUSSION

The results, Table 2, show that six of the eight subjects in this study had an increase in I.Q. following electric shock treatment, as measured by the Wechsler-Bellevue Adult Intelligence Scale, Form I, or the Revised Stanford-Binet Scale, Form L. This increase, however, is misleading in that only four of the subjects completed both the pre-and post-shock tests. In one case ( see case 7. in Appendix ) both of the tests were completed, one was a Revised Stanford-Binet, and the other a Wechsler-Bellevue scale, and the resultant I.Q.'s could only be compared with the aforementioned qualifications. Of the four cases in which both of the tests were completed, only three of them showed an increase in I.Q., while the fourth showed a decrease. The three subjects with an increase in I.Q. were tested ten, and fifteen days, and three months following shock; and the subject with lowered I.Q. was tested one and one-half months following shock treatments. In the four cases above, the behavior of the subjects in the second test situation improved in one case,

remained the same in two cases, and deteriorated in the fourth. Only three of the four cases had a deterioration quotient and in each case it had decreased perceptibly.

Of the three remaining cases, either one or both of the tests was the abbreviated form of the Wechsler-Adult Intelligence Scale, and only two of these cases could be compared on the basis of a full I.Q. One of the cases which was tested two years and two months after shock, the I.Q. had risen, but the behavior had deteriorated. The other subject tested five months after shock showed an increase in I.Q. and improvement in behavior. The third subject was tested one year and four months after shock, but only a verbal I.Q. could be obtained, so no comparison was made with the pre-shock test. There was a slight improvement in behavior.

In examining the results from the point of view of diagnostic classification, four of the five schizophrenics ( one is not included here for the lack of a full I.Q.-case 5. in Appendix ) showed an increase in I.Q., but two of the five showed behavior deterioration. In the other three cases, the behavior of one improved, and the others remained the same.

The manic-depressive case showed no I.Q. change, but an improvement in behavior was noted. This is an indication that intellectual functioning is relatively unimportant as compared with the affective state in this disease. The subject classified as psychoneurotic had no extreme change in I.Q. as measured by two different tests, but the behavior improved slightly.

In the three cases ( Case 2,3,& 6 ) in which the complete Wechsler-Bellevue Scale was administered, the scatter patterns were less extreme in the post-shock tests.

The results of this study do not agree with those quoted by Dubin ( 2 ) who worked with schizophrenics, but they do concur with the conclusions offered by Kessler ( 4 ) who said, " The reduction in bizarre incongruent thinking, better attention, and increasing social awareness were believed to be important factors in the favorable results revealed by the Wechsler-Bellevue Scale."

Most noticeable from the results, is the factor of improvement of general behavior or attitude toward the test following electric shock treatment. Although no measurements such as attitude scales were used in this study, the results tend to corroborate those of Wittman and Russell ( 10 ) who said, " Improvement in mental efficiency levels following electric shock therapy is directly correlated with change in the patient's attitude resulting from therapy." The question of attitude study is suggested as a future project.

TABLE 2

Case Number	I(pre) - II(post)	Full I.Q.	Verbal I.Q.	Performance I.Q.	Deterioration Quotient	Stanford-Binet Vocab. I.Q.V. score	Information	Comprehension	Digit Span	Arithmetic	Similarities	Vocabulary	Picture Arrangement	Picture Completion	Block Design	Object Assembly	Digit Symbol	Behavior since shock
1	I	106	105	106	13%	119	13	8	9	9	12	-	8	12	12	11	7	↓
	II	113	-	-	-	104	13	7	-	-	-	13	-	-	14	12	-	
2	I	96	101	92	30%	100	13	11	7	7	10	9	6	12	9	10	8	↔
	II	91	96	87	21%	108	9	11	7	9	8	9	9	9	10	9	4	
3	I	83	86	82	41%	108	9	11	7	0	8	9	10	7	7	6	5	↑
	II	90	92	89	27%	119	8	12	6	7	7	9	11	8	7	8	6	
4	I	100	-	-	-	93	10	7	-	-	-	-	-	-	14	-	7	↑
	II	101	89	113	14%	108	10	7	4	4	11	9	11	8	13	12	9	
5	I	92	-	-	-	123	11	5	-	-	-	-	-	-	10	8	-	↑
	II	-	57	-	-	95	7	1	2	0	0	8						
6	I	88	82	96	6%	95	6	6	9	1	10	5	9	6	8	12	10	↔
	II	93	93	93	0	100	5	7	11	9	9	6	10	8	7	9	9	
7	I	73	C.A. - 29 M.A. - 11			95												↑
	II	86	89	84	32%	93	7	8	4	12	7	6	7	4	8	11	6	
8	I	72	C.A. - 21 M.A. - 11			77												↓
	II	77	C.A. 22-1 M.A. 11-6			95												

Case 1-6 (Wechsler-Bellevue scores)

Case 7 (Wechsler-Bellevue &amp; Stanford-Binet Scores)

Case 8 (Stanford-Binet scores)

## VII. SUMMARY AND CONCLUSIONS

This is an investigation of the differences in scores made by hospitalized patients on intelligence tests administered before and after electric shock treatments. The tests used in this study were the Wechsler-Bellevue Adult Intelligence Scale, Form I, and the Revised Stanford-Binet Scale, Form L. Eight psychotic patients from the Northampton State Hospital were subjects for this project. All of the patients had been given one of the intelligence tests mentioned above before the administration of electric shock treatments. Following the treatments at various intervals, a second intelligence test ( with one exception the same as the first ) was given. The results of the two tests and the general behavior of the patients in the test situations were then compared in detail.

The lack of controls in this study makes definite conclusions unjustified. However, some interesting data were noted. Even with the limited number of subjects and the inadequacy of the controls, the evidence seems to point toward an increase in intellectual functioning of those patients who had completed shock treatments within fifteen days of a psychometric.

It is believed that the effects of electric shock treatments on the mental functioning of psychotics can be demonstrated with the use of greater controls in future research.

APPENDIX



## Case Studies

Case 1. Sex: Male Age: 32 Marital Status: Single  
 Diagnosis: Schizophrenia (Simple Type)  
 Education: High School Graduate  
 Date of Admission: 3/20/48  
 Date of Pre-shock test: 4/3/48  
 Date of Post-shock test: 7/17/50  
 Shock Period: 5/20/48 - 5/24/48  
 Series: 1 No. 2  
 Time between shock and test: 2 yr. 2 mos.  
 Test Used: Wechsler-Bellevue (form 1)

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Pre-shock Test Results and Interpretation:

	<u>Test</u>	<u>Wt. S.</u>
Full I.Q. 106	Information	13
Verbal I.Q. 105	Comprehension	8
Performance I.Q. 106	Digit Span	9
	Arithmetic	9
Deterioration Quotient - 13%	Similarities	12
Stanford-Binet Vocab. - 25 words	Vocabulary	-
I.Q.V. - 119	P. Arrangement	8
	P. Completion	12
	Block Design	12
	Object Assembly	11
	Digit Symbol	7

Summary and Conclusions:

The patient is operating with average intelligence and high average vocabulary. He shows a deterioration quotient of 13%. His highest function is information. His lowest function is Digit Symbol showing his poor eye-hand coordination in the motor speed test. His record most nearly resembles that of some type of schizophrenia although it does not coincide completely with the syndrome.

General Behavior:

Patient was reasonably pleasant and cooperative and seemed quite eager to make sure he was giving the right answers. He would ask examiner what the answer was if he was not to sure of it. He would guess at the answer to something rather than say he did not know it.

Examiner: L.M. (Psychometrist)

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Post-shock test results and interpretation:

Full I.Q. (Short Form) - 113	<u>Test:</u>	<u>Wt. S.</u>
Stanford-Binet Vocab. - 21 words	Information	13
I.Q.V. - 104	Comprehension	7
	Vocabulary	13
	Block Design	14
	Object Assembly	12

Summary and Conclusions:

This individual is operating with high average intelligence, as measured by the abbreviated form of the Wechsler. Very little analysis of the scatter can be made, other than indicating that the Performance scale (two items) was higher than the Verbal (two items). Only one item out of the five tested seems to be out of context with the rest of the scale, that is Comprehension, which shows a lack of knowledge of practical information, or a lack of general ability to evaluate past experience. It must be said, however, that although this score is low in comparison with his other scores, it is still within normal limits. The Wechsler Vocabulary score is commensurate with the I.Q. obtained, but the Stanford-Binet Vocabulary falls far short of that score expected from an individual with his range of ability.

One must state, however, that regardless of what this test has shown, a much more complete test must be given, since many of the necessary signposts of diagnosis have not been checked.

General Behavior:

The patient was very shy and seclusive upon entering the test situation. The actual test was not begun until he had relaxed somewhat. He persisted in keeping his head down and his eyes averted from the examiner. He would answer questions with his hand over his mouth. He showed little or no interest in the test itself, but was constantly trying to get the examiner to get him out of the institution. When asked if he kept his head down and his mouth covered because of shame or guilt feelings, he weakly denied it. He did say that he felt badly about his masturbatory habits however. He replied, "I don't know" to every question, and only with urging and praise by the examiner did he give a much more complete answer. Since the patient was so concerned with his own problem, and since he completed only those parts of the test on which the examiner exerted pressure, it was felt that only the short form should be used. It was felt that a longer session might result in loss of whatever rapport had been established between the patient and the examiner.

Examiner: J.G. (Student in Psychology Dept.)

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Test Analysis

A comparison of this individual's pre and post shock tests reveal that the I.Q.'s have increased seven points. It must be remembered however, that the last I.Q. was measured by the abbreviated form of the Wechsler-Bellevue, and although the abbreviated form is fairly valid, it is possible that if the full scale had been given, a different I.Q. might have resulted. Because of the use of the abbreviated form no deterioration quotient was obtained. A comparison of Stanford-Binet Vocabularies, I.Q.V. shows a drop in score of fifteen points, but the

individual is still operating with average vocabulary. An analysis of the scatter, or rather in this case the four items tested, reveals no extreme change from the first psychometric given over two years ago. Because the Electric Shock Treatment was given such a long time ago and since the patient's condition has not changed, as far as intelligence scores show, I would suggest that the patient seems to have had little or no value from Electric Shock Treatment as indicated by no significant differences in the psychometric test scores.

The general behavior of the patient in the two test situations seems to reveal a deterioration since the earlier Wechsler-Bellevue, and possibly that in this case, the behavioral syndromes reveal the true status of the patient at the present time. The Stanford-Binet vocabulary seems to be a substantiating factor in this case.

The patient did not recall any parts of the test as having been previously administered to him.

---

Shock Record

Series	No.	Date	Volts	Time (se)	R (ohms)	Reaction, other remarks
1	1	5/20/50	50	.1	275	Sub-convulsive
1	2	5/24/50	50	.2	250	Grand Mal

---

Case 2. Sex: Male Age: 22 Marital Status: Single

Diagnosis: Schizophrenia (catatonic type)

Education: High School Graduate

Date of Admission: 10/26/49

Date of Pre-shock test: 11/8/49

Date of Post-shock test: 6/21/50

Shock Period: 11/21/49 - 5/10/50

Series: 2 No. 38

Time between shock and test: 1½ months

Test Used: Wechsler-Bellevue (form 1)

Pre-shock Test Results and Interpretation:

	<u>Test:</u>	<u>Wt.S.</u>
Full I.Q. 96	Information	13
Verbal I.Q. 101	Comprehension	11
Performance I.Q. 92	Digit Span	7
	Arithmetic	7
Deterioration Quotient - 30%	Similarities	10
	Vocabulary	9
Stanford-Binet Vocabulary - 20 words	P.Arrangement	6
I.Q.V. - 100	P.Completion	12
	Block Design	9
	Object Assembly	10
	Digit Symbol	8

Summary and Conclusions:

The patient is operating with average intelligence and commensurate vocabulary. There is a deterioration quotient of 30% which cannot be considered very significant because there is so little difference between vocabulary and full scores. His highest function is general information. His lowest function is poor ability to comprehend and size up a total situation. His abstract attitude is intact in both Verbal and Performance spheres. His record has some schizophrenic features.

General Behavior:

The patient was pleasant and cooperative although extremely slow in answering most questions. This "slowness" may possibly be due to blocking, as it existed during most of the test.

Examiner: J. M. F. (Psychometrist)

Post-shock Test Results and Interpretation:

		<u>Test:</u>	<u>Wt.S.</u>
Full I.Q.	91	Information	9
Verbal I.Q.	96	Comprehension	11
Performance I.Q.	87	Digit Span	7
		Arithmetic	9
Deterioration Quotient - 21%		Similarities	8
		Vocabulary	9
Stanford-Binet Vocabulary - 22 words		P. Arrangement	9
I.Q.V. - 108		P. Completion	9
		Block Design	10
		Object Assembly	9
		Digit Symbol	4

Summary and Conclusions:

The patient is operating with average intelligence. The Verbal score is slightly higher than the Performance score. The scatter is rather narrow except for a low Digit Symbol score. The highest score is on Comprehension showing a capacity to utilize past experience. The lowest Verbal score is Digit Span. This subtest correlates most highly with Digit Symbol (lowest in this test). The subject's psychograph is relatively even, with no marked deviations other than the Digit Symbol, in which category the subject spent almost the full time in recopying the symbols as exactly as possible. This shows poor score in tests calling for immediate and directed effort.

General Behavior:

The subject was very cooperative, smiled and laughed at humorous situations, was slightly nervous at the outset, but became more confident as the test progressed. His attitude throughout the test was one of complacency. He performed each test slowly and methodically, perhaps overmethodically. This was true in both Verbal and Performance scores, more noticeably in the latter, especially in Digit Symbol. There was almost no overt trial and error behavior, but each movement and answer seemed to be thought out before responding. Speech was slow and exacting.

Throughout the test a very disturbing noise was audible, and when the subject was questioned, "Does the noise bother you?", he smiled and said, "No." He did not seem anxious to leave the test room. A description of his test behavior may be termed "consistent."

Examiner: J.G. (Student in Psychology Department)

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### Test Analysis

An examination of the pre and post shock I.Q. scores, Full, Verbal and Performance, reveals a consistent five point decrease in all of them. This would seem to show that the patient's general intellectual level is falling. The Deterioration Quotient score is decreased however, but this score has often been shown to be valueless, in the light of clinical experience on the part of the psychology staff at the Northampton State Hospital. The Wechsler-Bellevue vocabulary scores have remained the same, while the Stanford-Binet vocabulary I.Q.V. has increased five points.

The scatter analysis reveals that the psychograph is not as extreme as it was in the pre-shock test. The patient seems to be more consistent throughout the test. There are, however, some marked changes in the psychograph; the most significant are a lowered Information, reflecting poor retention of previously learned material, and lowered Digit Symbol, indicating poor attempt at tasks calling for immediate and directed effort, in a new learning situation. The remainder of the scatter is fairly consistent throughout both tests. In view of the total decrease in all spheres, Full I.Q., Verbal and Performance the shock treatment has not shown an improving effect upon the patient's intellectual level, but rather the patient seems to be fitting into the syndromes of his diagnostic classification, as

witnessed by some intellectual deterioration and a definite slowness and methodical approach as mentioned in General Behavior.

The patient expressed no memory for having taken or seen this test before.

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Shock Record

Series	No.	Date	Volts	Time (se)	R (ohms)	Reaction, other remarks
1	1	11/21/49	150	.3	150	Grand Mal
1	2	11/23/49	150	.3	150	Grand Mal
1	3	11/28/49	150	.3	150	Grand Mal
1	4	11/30/49	150	.3	170	Grand Mal
1	5	12/2/49	150	.3	200	Grand Mal
1	6	12/8/49	150	.3	200	Grand Mal
1	7	12/12/49	150	.3	200	Grand Mal
1	8	12/14/49	150	.3	200	Grand Mal
Discontinued for Observation						
2	1	12/30/49	150	.3	175	Grand Mal
2	2	1/4/50	150	.3	175	Grand Mal
Improving Slowly						
2	3	1/6/50	150	.3	175	Grand Mal
2	4	1/9/50	150	.3	200	Grand Mal
2	5	1/11/50	150	.3	200	Grand Mal
2	6	1/13/50	160	.3	300	Grand Mal
Improving						
2	7	1/16/50	160	.3	175	Grand Mal
2	8	1/18/50	160	.3	175	Grand Mal

Going home for weekend - (Confused on return)



Series	No.	Date	Volts	Time(sec)	R(ohms)	Reaction, other remarks
2	9	1/23/50	160	.3	150	Grand Mal
2	10	1/25/50	160	.3	200	" "
2	11	2/1/50	"	"	"	" "
Discontinued for Observation						
2	12	2/20/50	160	.3	200	Grand Mal
2	13	2/22/50	"	"	"	" "
2	14	2/24/50	"	"	"	" "
2	15	2/1/50	"	"	"	" "
2	16	3/8/50	"	"	"	" "
2	17	3/15/50	"	"	"	" "
2	18	3/17/50	"	"	"	" "
2	19	3/20/50	"	"	"	" "
2	20	3/24/50	"	"	"	" "
2	21	3/29/50	"	"	"	" "
2	22	4/5/50	"	"	"	" "
2	23	4/12/50	"	"	"	" "
2	24	4/21/50	"	"	"	" "
2	25	4/26/50	"	"	"	" "
2	26	5/10/50	160	.3	200	Grand Mal

Discontinued for Observation

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Case 3. Sex: Male Age: 28 Marital Status: Single  
 Diagnosis: Schizophrenia (Hebephrenic Type)  
 Education: High School I  
 Date of Admission: 4/20/50  
 Date of Pre-shock Test: 5/12/50  
 Date of Post-shock Test: 6/20/50  
 Shock Period: 5/24/50 - 6/10/50  
 Series: 1 No. 24  
 Time between shock and test: 10 days  
 Test Used: Wechsler-Bellevue (form I)

Pre-shock Test Results and Interpretations:

		<u>Test</u>	<u>Wt. S.</u>
Full I.Q.	83	Information	9
Verbal I.Q.	86	Comprehension	11
Performance I.Q.	82	Digit Span	7
		Arithmetic	0
Deterioration Quotient - 41%		Similarities	8
Stanford-Binet Vocabulary - 22 words		Vocabulary	9
I.Q.V. - 108		P. Arrangement	10
		P. Completion	7
		Block Design	7
		Object Assembly	6
		Digit Symbol	5

Summary and Conclusions:

The patient is operating with low average intelligence, but this is probably not a valid measure of his potential capacity. This opinion is based on the variations among subtests and the discrepancy between Vocabulary and other scores. Some functions are still within average range. These include range of information, ability to use past knowledge in a new situation and to comprehend and arrange facts in logical sequence. There is some impairment but not total loss of abstract attitude. Many

of his lowered functions seem to be due to poor attention. This is particularly true in Arithmetic where he receives no credit. xi

Interpretation:

The patient is operating with low average intelligence. Although both Verbal and Performance scales fall within an average range, there is a wide scatter among the sub-tests, particularly in the Verbal scale. He received no credit in Arithmetic. However, this seems to be more a function of attention than inability to use arithmetic processes. On several he was able to give the right answer but he did not earn credit because of his slowness. He would lose time by repeating the question in a bland expressionless tone. His highest score was obtained on Comprehension indicating retention of ability to utilize past experience. Information and Picture Arrangement were also within average range of the general population.

There is some impairment of abstract attitude in both the Verbal and Performance spheres, but this function does not show total loss. On Similarities he was inclined to give answers in terms of use and function rather than true generalities.

General Behavior:

Although the patient was cooperative, it was difficult to be sure he had his attention on the tests. He mentioned several times he could feel sweat running down and attributed this to his nervousness. The patient made several references to a girl (or girls) he had known. These remarks were seldom apropos. Often he talked to himself and at such times smiled inappropriately. When asked to repeat his murmured comments, he mentioned that he was thinking about a girl. The examiner thought he might be hallucinating, but when asked if he had ever seen or heard the girl talking, he denied it. When it was necessary to repeat questions during these periods,

he apologized profusely and was able to attend to the test for a few minutes.

Examiner: H.D. (Psychologist)

Post-shock test results and interpretation:

Full I.Q.	90	<u>Test</u>	<u>Wt. S.</u>
Verbal I.Q.	92	Information	8
Performance I.Q.	89	Comprehension	12
Deterioration Quotient - 27%		Digit Span	6
Stanford-Binet Vocabulary - 25 words		Arithmetic	7
		Similarities	7
		Vocabulary	9
		P. Arrangement	11
		P. Completion	8
		Block Design	7
		Object Assembly	8
		Digit Symbol	6

Summary and Conclusions:

This individual is operating with average intelligence. The Verbal and Performance scores are equal as a whole, with some scatter within each scale. The highest score was obtained in Comprehension and Picture Arrangement showing awareness to social situations. He shows two scores which are below normal limits, they are Digit Span and Digit Symbol, which are highly correlated as indicative of lack of concentration and attention. The subject shows excellent possession of practical information and ability to utilize past experience. He shows equally good ability in sizing up total situation.

General Behavior:

The subject was willing and cooperative throughout the test. At the outset he seemed to exhibit some self-consciousness, but this seemed dissipated as the test progressed. The subject was slow in action and in speech throughout the test, as if held by a certain amount of tension and control.

Answers that were given were of the more popular variety as if seeking acceptance. He complained of poor eyesight and need for glasses, but reading did not seem impaired. Following the completion of the test, the subject became expansive, showed spontaneity in conversation and sociability; almost a complete reversal of test behavior. Upon questioning, he expressed some memory for certain items on the test, and remembered taking a similar test earlier.

Examiner: J.G. (Student in Psychology Department)

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#### Test Analysis

This individual's total post-shock test reveals that his intellectual level has increased since Electric Shock Treatments. The Full I.Q. was increased by 7 points, the Verbal I.Q. by 6 points, and the Performance I.Q. by 7 points. His Stanford-Binet vocabulary I.Q.V. has increased by 11 points, the Deterioration Quotient has decreased, all these signs pointing toward higher intellectual functioning.

The analysis of the scatter of the two tests reveals an almost perfect parallelism with the exception of one score, Arithmetic. On the pre-shock test the patient scored zero on this item and as the examiner reported, the patient got answers, but a little too slowly to get credit, reflecting lack of attention and concentration. In the post-shock test, however, his Arithmetic score is commensurate with the rest of the scale, reflecting his increased attention and concentration. As in the pre-shock test two significant scores are noted in the post-shock test, Comprehension and Picture Arrangement, revealing exceptionally high awareness to the social situation.

Since the use of Electric Shock Treatments, there has been a general

overall increase in intellectual functioning as shown by the total scores and scatter analysis of the Wechsler-Bellevue. The scatter pattern, however, remains quite the same, pointing toward the justification of the diagnostic classification of psychosis (Schizophrenia - Hebephrenic Type). The patient's condition as a psychosis has failed to improve, but his intellectual level has risen, due perhaps to his increased concentration and attention and attitude toward test situation. The most noticeable change in pre- and post- shock tests is the change in behavior and attitude toward the test. It is believed that the shock treatments have improved patient's attitude, as well as raising intellectual level. In view of the lack of controls it is possible that these changes might have come about during the period of usual hospitalization.

The rapport was greatly improved in the post-shock test situation. The patient remembered seeing some of the test items earlier.

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Shock Record

Series	No.	Date	Volts	Time (se)	R (ohms)	Reaction, other remarks
1	1	5/24/50				Violent reaction
1	2	5/26/50				
1	3	5/28/50				
1	4	5/30/50				Improved
1	5	6/1/50				Improved
1	6	6/3/50				Improved
1	7	6/5/50				Improved
1	8	6/10/50				Improved

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Case 4. Sex : Male Age : 38 Marital Status : Married  
 Diagnosis : Manic-Depressive ( Depressive type)  
 Education : High School I  
 Date of Admission : 6/3/47  
 Date of pre-shock test : 7/16/47  
 Date of post-shock test : 7/14/50  
 Shock Period : 3 No. 24  
 Time between shock and test : 5 months  
 Test Used : Wechsler-Bellevue ( Form I)

Pre-shock Test Results and Interpretations :

Short Form	<u>Test</u>	<u>Wt. S.</u>
Full I.Q. - 100	Information	10
	Comprehension	7
Stanford-Binet Vocabulary - 16 words I.Q.V. - 93	Block Design	14
	Digit Symbol	7

Summary and Conclusions :

Because of his great difficulty in thinking, the obtained average is likely to be at least ten points too low. His highest function was visuo-motor analysis, and since this is one of the tests which ordinarily is poorest in the psychoses, the question of malingering is raised (see General Behavior for subconscious resistance to being tested). On the Vocabulary he complained that he knew the words but just could not phrase the definitions. On the Comprehension often he simply restated the question in answer form (e.g. Why are shoes made of leather?, answer, " The best material "). There did not seem to be any true mental confusion

or inability to grasp direction or abstract concepts. His evident relief at not being asked verbal questions seemed to show itself in a spurt of effort in the Block Design; he really tried for speed and accuracy. Where speed was the main issue, in Digit Symbol, he did not hurry. It is suggested that he be tested again when he is subconsciously less rebellious. The entire Wechsler was not administered this time to avoid the items where there is the most practice effect. The examiner does not feel that he was malingering consciously, but that his subconscious resistance showed up as blocking when an answer or speed was demanded, and that consciously he was only aware of his own blocking, hence his anxiety over the results. True confusion would have given a different pattern( see General Behavior).

General Behavior :

He came in and appeared mute and almost in a stupor. Although he did not appear to be aware of the directions, when he was presented with the first item, he started right off without initial blocking, and had grasped everything. He spontaneously began to speak. The more he was questioned about things the muter he became as a sort of negativistic ability to speak. It seemed as though it were an unconscious reaction, because he spoke about not being able to remember what he knew as a boy. At the end of the testing he asked if he could get the results. It appeared to the examiner that his mutism was an involuntary rebellion at being asked to do anything spontaneous, because it was often overcome if the examiner suggested something for him. As such, it represents dependence on a basis of rebellion at being asked to do something independent but not of his own choosing. He tended to take charge



of the situation, that is take the materials and administer them to himself, and the blocking did not occur when he himself could decide how and when to do things.

Examiner : M.M.R. (Psychologist)

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Post-shock Test Results and Interpretations :

		<u>Test</u>	<u>Wt. S.</u>
Full I.Q.	101	Information	10
Verbal I.Q.	89	Comprehension	7
Performance I.Q.	113	Digit Span	4
		Arithmetic	4
Deterioration Quotient - 14%		Similarities	11
		Vocabulary	9
Stanford-Binet Vocabulary -22 words		P.Arrangement	11
I.Q.V. - 108		P.Completion	8
		Block Design	13
		Object Assembly	12
		Digit Symbol	9

Summary and Conclusions :

On the basis of the test results on the Wechsler-Bellevue, this patient is operating with average intelligence. It is felt however, that a true evaluation of this individual's scatter was not obtained. The performance score is a great deal higher than the verbal, with a great deal of scatter in the latter sphere, but little in comparison with the performance sphere. Although the above signs point toward a psychosis, contraindicative signs are available, in that all tests measuring visual-motor analysis were performed with superior ability. ( In most psychoses these are usually lower). The highest scores were obtained in Block Design and Object Assembly, both performance items which are supposed to measure some sort of creative ability, but in this case it is felt that these scores were influenced by the patient's

background( a printer). The lowest scores were obtained in Arithmetic and Digit Span which together point toward a lack of concentration and attention, but this also seems to be false, in that the patient was cooperating fully, in the examiner's opinion. Rather in this case, these low scores point to a strong underlying anxiety which seems to be blocking the patient. The vocabulary in both the Wechsler and the Stanford-Binet is commensurate with the patient's full I.Q.

It is felt that the signs demonstrating the great amount of anxiety present, somewhat invalidate the total results or picture obtained. Were one to ignore this sign and judge the individual on the basis of the overall result, a serious error might be made.

#### General Behavior :

The patient was smiling and cooperative throughout the test situation. He said that he liked the test, especially the performance items, since he was a printer and could put things together quickly. His approach to the performance items was trial and error and he worked at a very fast rate of speed. His performance with the verbal items lacked the spontaneity of the performance section. There were several instances in which the patient seemed to be in a stupor resembling catatonia, but when he came out of it, he answered the question that was asked without having it repeated. These were noted especially on Digit Span, Arithmetic, and Comprehension. When questioned if he were tired, or had something on his mind that was worrying him, he denied this and wanted to go on with the test. He did not seem to know that he dropped off into this stuporous state, but it made the examiner suspect an unconscious anxiety state

which was blocking him, a state of which the patient was not aware. In the verbal situation, the patient was directed to answer questions and this stuporous state appeared, but in the performance situation, the patient took complete control of it and he was not blocked in any way.

Examiner : J.G. ( Student in Psychology Department )

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### Test Analysis

As was noted in an earlier case analysis, comparison of a complete Wechsler-Bellevue with the abbreviated form of the scale, although valid, according to the author of the text, should be tempered with qualifications. In this particular case, however, since the records are so similar after a period of three years, it is difficult to question the validity of the abbreviated form. The full I.Q.'s and the four items tested have remained relatively stable over a period of years, even to the point of similar responses on certain test items i.e. Why are shoes made of leather?, answer, " The best material". The scatter runs parallel in both tests, but the I.Q.V. has risen fifteen points. The question of subconscious resistance was raised by the examiner in the pre-shock test and seems to corroborate the objective evidence showing underlying anxiety in the post-shock test.

The rapport was excellent in the post-shock situation as compared to the pre-shock. The patient's behavior was greatly improved since the administration of shock. As was said in the earlier case, although the intellectual level does not seem to increase, the change in attitude seems to be the general resultant following shock. The patient cooperated quite well and was attentive which made the examiner suspect that

the low Digit Span and Arithmetic scores reflected subconscious anxiety.

The patient had no remembrance of having taken a similar test or performed with similar material at an earlier period.

Shock Record

Series	No.	Date	Volts	Time (se)	R (ohms)	Reaction, other remarks
1	1	10/7/49	140	.3	250	Grand Mal
1	2	10/12/49	"	"	"	" "
1	3	10/14/49	"	"	"	" "
1	4	10/17/49	"	"	"	" "
Discontinued for Observation						
2	1	11/7/49	140	.3	220	Grand Mal
2	2	11/9/49	"	"	"	" "
2	3	11/21/49	"	"	"	" "
2	4	11/28/49	"	"	"	" "
Discontinued for Observation						
3	1	1/13/50	180	.3	200	Grand Mal
3	2	1/16/50	"	"	225	" "
3	3	1/18/50	"	"	"	" "
3	4	1/20/50	"	"	"	" "
3	5	1/23/50	"	"	"	" "
3	6	1/25/50	"	"	"	" "
3	7	1/27/50	"	"	"	" "
3	8	1/30/50	"	"	"	" "
3	9	2/1/50	"	"	"	" "

Series	No.	Date	Volts	Time (se)	R(ohms)	Reaction, other remarks	
3	10	2/3/50	180	.3	225	Grand	Mal
3	11	2/10/50	"	"	"	"	"
3	12	2/15/50	"	"	"	"	"
3	13	2/17/50	"	"	"	"	"
3	14	2/20/50	"	"	"	"	"
3	15	2/24/50	"	"	"	"	"
3	16	2/27/50	"	"	"	"	"

Patient has improved greatly-on Parole

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Case 5. Sex: Female Age: 30 Marital Status: Single

Diagnosis: Schizophrenia (mixed type)

Education: High school graduate

Date of Admission: 4/6/48

Date of Pre-shock test: 4/22/48

Date of Post-shock test: 7/13/50

Shock Period: 2/18/49 - 3/17/49

Series: 1 No.: 8

Time between shock and test: 1 yr., 4 mos.

Test Used: Wechsler-Bellevue (Form 1)

Pre-shock Test Results and Interpretation:

Full I.Q. (Sort Form) - 92	Test:	Wt. S.
Stanford-Binet Vocab. - 27 words	Information	11
I.Q.V. - 123	Comprehension	5
	Block Design	10
	Object Assembly	8

Accompanying Remarks:

Patient kept looking anxiously out the window and toward the door. She made no attempt to leave but it was felt that she might. She cooperated in everything but was not the least bit pleasant about any of it.

Examiner: J.M.M. (Psychometrist)

Post-shock test results and interpretation:

Full I. Q. - Not done.  
Perform. I. Q. - Not done

Verbal I. Q. - 57

Stanford-Binet Vocab. - 17 words

Summary and Conclusions:

The results obtained on this test cannot, in any sense of the word, be considered a valid measure of this patient's intelligence. It was only possible to do the Verbal portion of the test, and the resultant I. Q. is probably unreliable. An analysis of the scatter was not made because of the aforementioned unreliability. The only items which were felt to be valid were the Vocabulary items on the Wechsler and Binet, which were both given at the start of the test. The Vocabulary scores place her in the average intelligence group, and this, the examiner feels, possibly represents her true level.

It is felt, however, that another psychometric should be done at a later date in order to obtain the true evaluation of this patient's intelligence.

General Behavior:

At the outset of the test, the patient was cooperative and affable, but within a short time she became subdued, withdrawn and unresponsive. She complained of a sore left hand, but when asked to write, immediately used her right hand. She avoided looking at the examiner, but would look outside or at the walls. She seemed to be hallucinating, but when questioned, she denied this after a short pause. She seemed to be "in a fog", and all the questions following Vocabulary had to be repeated more than once. She then went into sort of a stuporous state for a minute or two, then repeated questions, apologized quite often and then answered the questions in a haphazard fashion, as if to get rid of the examiner. She would not perform any of the Performance items, even Picture Comple-

tion, because of the pain in her left hand.

Examiner: J.B. (Student in Psychology Dept.)

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### Test Analysis

The patient in both pre- and post-shock test was only able to complete part of the test. It was felt that in view of her behavior another test interview should not be attempted.

It was very difficult to compare the results in these two tests in that the pre-shock test used the short form of the Wechsler-Bellevue, and the post-shock test included only the Verbal portion of the same test. The reader should refer back to the Summary and Conclusions, General Behavior of the post-shock test, and the accompanying remarks of the pre-shock test to note why the comparison would be unwarranted.

Since the administration of shock, however, it is apparent in the patient's general behavior that there has been little or no improvement in the intellectual ability but that rather all evidence points to the deterioration expected in a patient with the diagnostic classification, "Schizophrenia, mixed type".



Shock Record

Series	No.	Date	Volts	Time (se)	R (ohms)	Reaction, other re- marks
1	1	2/18/49	150	.3	250	Satisfactory
1	2	2/22/49	160	.3	260	"
1	3	2/25/49	150	.3	250	"
1	4	3/1/49	160	.3	240	"
1	5	3/3/49				"
1	6	3/8/49	160	.3	260	"
1	7	3/10/49	160	.3	260	"
1	8	3/17/49	150	.3	250	"

No improvement - Discontinued

Case 6. Sex: Female Age: 25 Marital Status: Single  
 Diagnosis: Schizophrenia (Type Undetermined)  
 Education: High School I  
 Date of Admission: 3/6/50  
 Date of Pre-shock Test: 3/22/50  
 Date of Post-shock Test: 7/6/50  
 Shock Period: 4/6/50 - 5/19/50  
 Series: 1 No.: 12  
 Time between shock and test: 15 days  
 Test Used: Wechsler-Bellevue (Form 1)

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Pre-shock Test Results and Interpretation:

		<u>Test</u>	<u>Wt. S.</u>
Full I.Q.	88	Information	6
Verbal I.Q.	82	Comprehension	6
Performance I.Q.	96	Digit Span	9
		Arithmetic	1
Deterioration Quotient - 6%		Similarities	10
		Vocabulary	5
Stanford-Binet Vocab. - 17 words		P. Arrangement	9
I.Q.V. - 95		P. Completion	6
		Block Design	8
		Object Assembly	12
		Digit Symbol	10

Summary and Conclusions:

The patient is operating with low average intelligence and average vocabulary. There is a wide scatter throughout but the Performance scale is generally higher and gives her a rating of average. This wide scatter reflects uneven intellectual functioning. Her score on the Arithmetic sub-test is definitely below her

own average and indicates complete lack of ability to use arithmetical processes. Her highest score was on Object Assembly which she remembered taking previously and there may be some practice effect here. Her immediate memory, as measured by Digit Span, is within average range. Yet on the Information test, which samples previously obtained knowledge, her score is definitely lower. The abstract attitude is impaired in the Performance sphere, but is well developed in the Verbal sphere. Although the Stanford-Binet Vocabulary is somewhat higher, the score on the Wechsler-Bellevue Vocabulary is definitely lower than most of the other Verbal tests. This discrepancy is probably due to her uneven functioning which is apparent throughout the tests. Although schizophrenics follow the exact pattern shown here, Shafer believes that any wide scatter is suggestive of this psychosis.

General Behavior:

The patient was pleasant and cooperative. Although she frequently "took time out" to discuss her symptoms and the possibility of leaving the hospital soon, she gave her attention to the task when presented. Several times she mentioned that she really enjoyed taking the test. Parts of it she remembered taking at the Massachusetts General Hospital, but she was not sure that she had had the whole Wechsler.

Examiner: N.D. (Psychologist)

Post-shock test results and interpretation:

Full I.Q.	93	<u>Test</u>	<u>Wt. S.</u>
Verbal I. Q.	93	Information	5
Performance I.Q.	93	Comprehension	7
Deterioration Quotient - None		Digit Span	11
Stanford-Binet Vocab. - 20 words		Arithmetic	9
I.Q.V. - 100		Similarities	9
		Vocabulary	6
		P. Arrangement	10
		P. Completion	8
		Block Design	7
		Object Assembly	9
		Digit Symbol	9

Summary and Conclusions:

The patient is operating with average intelligence. The Performance score is higher than the Verbal with a slight scatter in both scales. The highest score obtained was in Digit Span which is indicative of the concentration and attention in tasks calling for immediate and directed effort. The within-limits Arithmetic score and the high Digit Span speaks well for the patient's attention and concentration, although she spoke of a great dislike for Arithmetic. The lowest scores obtained were Information and Vocabulary. These were both outside the normal limits and significant scores in this psychograph. It indicates either that previously obtained knowledge was poorly retained or inadequately learned. The I.Q.V. is commensurate with her total I. Q., but there is an inconsistency between the Binet and Wechsler Vocabulary scores. The scatter is, according to Wechsler, typical of that often found in psychopaths, but since these diagnostic scatters have not been able to hold up conclusively, I should like to make the suggestion of the possibil-

ity of simple schizophrenia, with reference to Shafer, who says that individuals in this category often resemble psychopaths by guessing wildly but blandly on the difficult items, and who have minimal general interests, vague reality testing and impaired judgement. There is a deterioration Quotient of 23% which may or may not be significant. It may be said that the psychogram is indicative of a psychosis.

General Behavior:

Patient was smiling and cooperative at the outset of the test. She was slightly nervous but her composure was quite contained almost throughout the test. When presented with difficult questions or difficult situations, she developed a severe twitching of the eyes. When questioned about this, she said that her eyes were fine, and she did not need nor use glasses. Her behavior was acceptable, and her answers were given in a very logical manner. Her method of approach on the Performance items was trial and error. The patient admitted no confusion until she had returned from the ladies room. She said, "I'm worried." When asked about it, she replied, "It's because I saw something outside that I didn't want to look at, so I looked at the test material." "But I saw what I didn't want to see and it confused me." She became very incoherent at this point and only with a great deal of praise and urging did she complete the test. She left the testing situation in a rather confused manner.

Examiner: J. G. (Student in Psychology Department)

### Test Analysis

A comparison of pre- and post-shock tests reveals that the patient's overall intellectual level has risen, full I.Q., 5 points; Verbal I.Q., 11 points; performance I.Q., however, has decreased 3 points. Her Stanford-Binet Vocabulary I.Q.V. has risen 5 points and the Deterioration Quotient has been reduced to zero. The Wechsler Vocabulary has increased but is definitely lower than other verbal tests in both pre- and post-shock tests.

The psychographs in both tests reveal an almost parallel scatter with general increases throughout the scale except for lower score on Object Assembly and Digit Symbol, which are commensurate with the scale and within normal range of achievement. The largest change is in Arithmetic which indicates an increase in attention and concentration more than anything else in the scale. In all, it appears that her intellectual level as far as the whole picture is concerned is improved because of this increased attention and concentration, but that her psychotic condition, as revealed by the scatter, remains the same.

The behavioral syndromes corroborate this quite well. (See General Behavior on post-shock test.)

Since the administration of electric shock treatments, the overall scatter has not changed greatly, but the overall intellectual level has improved, because, as hypothesized earlier, her attitude had changed toward that of a more cooperative individual.

Shock Record

Series	No.	Date	Volts	Time (sec)	R (ohms)	Reaction, other re- marks
1	1	4/6/50				No more information
1	2	4/10/50				
1	3	4/13/50				
1	4	4/17/50				
1	5	4/20/50				
1	6	4/24/50				
1	7	4/26/50				
1	8	5/1/50				
1	9	5/4/50				
1	10	5/8/50				
1	11	5/11/50				
1	12	6/19/50				

Case 7. Sex: Male Age: 29 Marital Status: Single  
Diagnosis: Psychoneurosis (Mixed Neurosis with  
Mental Deficiency)  
Education: Eighth Grade  
Date of Admission: 12/4/49  
Date of Pre-shock test: 1/6/50  
Date of Post-shock test: 6/21/50  
Shock Period: 4/12/50 - 5/5/50  
Series: 1 NO. 10  
Time between shock and test: 1½ months  
Test Used: Stanford-Binet and Wechsler-Bellevue

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Pre-shock Test Results and Interpretation:

C.A. 29  
M.A. 11  
I.Q. 73 (Borderline)  
Vocabulary - 17 words  
I.Q.V. - 95

Summary and Conclusions:

The patient is operating with borderline intelligence. His basal age is six years and his performance scattered through year fourteen. His lowest function is rote memory for digits forward, although later in the test he was able to do the same backwards. His highest functions are vocabulary and self-orientation. The wide scatter on the psychometric is indicative of a possible psychosis.



General Behavior:

The patient was pleasant and cooperative, although during much of the first part of the psychometric he sat with his head hanging down. After the examination was over he talked readily and easily about his home town, farm, etc.

Examiner: J.M.F. (Psychometrist)

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Post-shock Test Results and Interpretations:

Full I.Q.	86	<u>Test</u>	<u>Wt.S.</u>
Verbal I.Q.	89	Information	7
Performance I.Q.	84	Comprehension	8
		Digit Span	4
Deterioration Quotient - 32%		Arithmetic	12
		Similarities	7
Stanford-Binet Vocab. - 16 words		Vocabulary	6
I.Q.V. - 93		P. Arrangement	7
		P. Completion	4
		Block Design	8
		Object Assembly	11
		Digit Symbol	6

Summary and Conclusions:

This individual is operating with low average intelligence. His Verbal Scale is slightly higher than his Performance, and the scatter is extreme in both groups with significant scores in the Verbal group (Digit Span and Arithmetic) and in the Performance Scale (P. Completion and Object Assembly). The high scores were Arithmetic and Object Assembly, and the low scores were Digit Span and Picture Completion. A pathognomic sign is apparent in the large differences between the sums of Object Assembly plus Picture Arrangement vs. Block Design plus Picture Completion. The low scores in Digit Span and Picture Completion point toward impaired intellectual functioning. The high Object Assembly points toward the individual's capacity for persistence at a

task. The high Arithmetic score reflects upon the individual's attention and concentration, excellent in this case, and especially toward the familiarity with practical problems of this nature.

General Behavior:

The subject was smiling, affable, conscientious and very interested and cooperative throughout the test. The approach to each Performance task was trial and error, and he exhibited a persistency in working toward perfection, or satisfaction with what was required, i.e. Picture Arrangement and Digit Symbol. He worked slowly in all Performance tasks, using very small amounts of material, i.e. Block Design and Object Assembly.

Examiner: J.G. (Student in Psychology Department)

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Test Analysis

At the outset, the Stanford-Binet was used but the patient remembered many of the items so the Wechsler-Bellevue was substituted. That the results of the test do not correlate with those found on the earlier test must be taken in the light of the differences that exist between the two tests. According to the literature, adult subjects frequently obtain lower scores on the Binet than on the Wechsler. A contributing factor to this difference may be that the Wechsler has been standardized on various age groups among the adult population, whereas the Binet was intended for and standardized on children. It is the opinion of this writer that the latter test and the results obtained are,

therefore, more valid. Rote memory (Digits) and Vocabulary level seem to be at the same level in both tests. The wide scatter obtained in the Binet can also be seen in the Wechsler-Bellevue, and this according to Shafer is indicative of a psychosis. From the above information it seems that the subject has shown little change (intellectual level) since the use of electric shock treatments, but this conclusion must be qualified once again, by the fact that two different tests were used, and similar results have often been obtained in individuals without intervening shock therapy. The behavior encountered was about the same in both of the tests, but there was improvement in rapport.

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Shock Record

Series	No.	Date	Volts	Time (se)	R (ohms)	Reaction, other Remarks
1	1	4/12/50	160	.2	180	Grand Mal
1	2	4/14/50	160	.2	200	Grand Mal
1	3	4/17/50	160	.2	225	Grand Mal
1	4	4/21/50	160	.2	250	Grand Mal
1	5	4/24/50	160	.2	220	Grand Mal
1	6	4/26/50	160	.2	220	Grand Mal
1	7	4/28/50	160	.2	210	Grand Mal
1	8	5/1/50	160	.2	200	Grand Mal
1	9	5/3/50	160	.2	190	Grand Mal
1	10	5/5/50	160	.2	200	Grand Mal

Patient discontinued for observation. Very much improved.

Case 8. Sex: Male Age: 22 Marital Status: Single  
 Diagnosis: Schizophrenia (Catatonic Type)  
 Education: Trade School II.  
 Date of Admission: 10/22/49  
 Date of Pre-shock test: 11/7/49  
 Date of Post-shock test: 7/10/50  
 Shock Period: 11/17/49 - 4/7/50  
 Series: 2 No. 25  
 Time between shock and test: 3 months  
 Test Used: Stanford-Binet (1937 revision) (form L)

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Pre-shock Test Results and Interpretation:

Stanford-Binet Vocabulary - 13 words	C.A. - 21
I.Q.V. - 77	
	M.A. - 11
	I.Q. - 73

Summary and Conclusions:

The patient is operating with borderline intelligence. His basal age is 7 years and his performance is scattered through year 14. His lowest functions are memory for meaningful material and finding verbal absurdities, although the latter test was passed at a higher level. His highest function is finding picture absurdities, although the same function had been failed at a lower level. These inconsistencies plus the very wide scatter show that his low intelligence is most likely accompanied by a psychosis.

(Case 8 continued)

General Behavior:

The patient was pleasant and cooperative. He seemed interested in the items and appeared more "alert" than when seen at staff meeting a few days ago.

Examiner: J.M.F. (Psychometrist)

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Post-shock Test Results and Interpretation :

Stanford-Binet Vocabulary - 17 words	C.A. - 22-1
I.Q.V. - 95	M.A. - 11-6
	I.Q. - 77

Summary and Conclusions:

The patient is operating with borderline intelligence. His basal age is 6 years and his performance is scattered through year 14. His lowest function is finding verbal absurdities and there is a low score in items calling for memory for meaningful material. Almost all items requiring verbal facilitation were low. His highest function was rote memory; i.e. digits forward and back, and sentences. The scatter is not extreme except for those items requiring verbal manipulation.

General Behavior:

The patient was nervous at the outset, but self-contained enough to answer all questions. He cooperated well, but lacked spontaneous expansion of answers, usually one phrase or word was sufficient. He displayed a blank stare almost constantly throughout the test. He showed no signs of affectivity, but seemed to be hallucinating.

hallucinating. When questioned about it, he denied it.

Examiner: J.G. (Student in Psychology Department)

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Test Analysis

The patient's I.Q. has been increased by four points, his M.A. by six points, and his age by one year and one month since the pre-shock examination. His Stanford-Binet Vocabulary I.Q.V. has increased by 18 points which is commensurate with his increase in I.Q. The basal age in the post-shock test shows a decrease from that of the pre-shock test. In both of the tests, the lowest function seems to be memory for meaningful material and finding picture absurdities. The highest function in the pre-shock test was finding picture absurdities, and in the post-shock test rote memory. Although the vocabulary score was increased, all items on the post-shock test requiring verbal manipulation were very low and extreme in the scatter analysis. The scatter in the post-shock test was not as wide as in the pre-shock test.

Since the administration of Electric Shock Treatments, the patient's intellectual level seems to have increased somewhat, but his behavior is more consistent of that of his diagnostic classification, as is also shown by highest score obtained on the test-rote memory. The behavioral syndromes of catatonia were much more predominant than was noted during the pre-shock test. The patient expressed no memory for having taken this test earlier. That the increase in I.Q. can be attributed to the E.S.T., cannot be said, in that he might have shown the same results, after a period of time without shock.

Shock Record

Series	No.	Date	Volts	Time(sec)	R(ohms)	Reaction, other remarks
1	1	11/7/49	150	.3	220	Grand mal
1	2	11/9/49	150	.3	220	" (delayed)
1	3	11/14/49	155	.3	220	"
1	4	11/21/49	155	.3	220	"
1	5	11/23/49	155	.3	220	"
1	6	11/28/49	155	.3	150	"
1	7	11/30/49	155	.3	175	"
1	8	12/2/49	155	.3	220	"
1	9	12/12/49	155	.3	220	"
1	10	12/14/49	155	.3	220	"
1	11	12/16/49	155	.3	220	" (delayed)
1	12	12/19/49	160	.3	220	"
1	13	12/21/49	160	.3	220	"

## Discontinued

2	1	3/13/50	160	.2	225	Grand mal
2	2	3/15/50	170	.2	200	"
2	3	3/17/50	190	.2	200	"
2	4	3/20/50	180	.2	200	"
2	5	3/22/50	180	.2	200	"
2	6	3/24/50	190	.2	200	"
2	7	3/27/50	190	.2	200	"
2	8	3/29/50	200	.2	200	"
2	9	3/31/50	200	.2	200	"
2	10	4/3/50	210	.2	200	"
2	11	4/5/50	220	.2	200	"
2	12	4/7/50	220	.2	200	"

Discontinued

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APPROVED BY

Claude C. Jett

Amplified by (.)

W. H. Roman

DATE

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