THE DIAGNOSTIC VALUE OF THE VERBAL SUMMATOR *

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EXISTING tests of free association have serious limitations. Word lists as developed by Kent-Rosanoff, while easy to administer and score, are too restricting to allow a wide and therefore significant range of response. The stimulus presented is itself a word, with standard associations, and thus it tends to limit most responses to these associations. Another example is the widely publicized Rorschach ink-blot test. While this test undoubtedly gets closer to the desired "free" association by means of such response categories as movement, detail, color, originality, etc., its limitations have been found to be numerous (4). These shortcomings, along with the major one of requiring a highly trained examiner and interpreter, lead us to question the present widespread use of this test for diagnostic purposes.

Skinner (6) has suggested a new type of free association test, the verbal summator. In presenting as stimuli neither definite words nor pictures, but vocalized speech samples of a type not comparable to any familiar behavior of the subject, the range of responses is greatly widened and to a greater extent uncontrolled. Repeated presentations of the speech sample bring to the verbalized threshold responses which, in a wide variety of samplings, include the stronger associations of the subject. It should follow from this theory that summated speech is not concerned with the usual external stimuli. Thus the author argues that summation of latent speech, undetermined by other acting stimuli, calls forth vocalized responses which are due to their own relative strength. The value of the verbal summator as a *diagnostic* test must rest, therefore, upon its ability to discriminate between groups of normal and abnormal constitution.

The present exploratory study was undertaken to determine whether or not this technique would yield the suggested diagnostic differences. Indications of its value must be determined before any widespread use can be made of such a method on the basis of claims alone. In order to determine this value, a group of normal men and women was given the test, and the resulting data were compared with those obtained from a group of psychopathic patients. Results from such an analysis should reveal the suitability or unsuitability of the technique as a diagnostic test of free association.

PROCEDURE

The method and apparatus were essentially the same as those used by Skinner, whose article contains a detailed description of procedure, as well as of the summator itself. A modification in this experiment consisted of a

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A more complete account of this research is on file in the Library of the University of Minnesota.

time-saving device for self-recording of answers by the normal group of subjects, helpful also in preventing the subjects from being influenced by previous answers.

The summator is an ordinary electrical phonograph, equipped with a mechanical device, which repeats automatically a given sample until a response is obtained, whereupon the experimenter turns a projecting lever to reach the next sample. Two records of forty samples each were used, one recording having been made by a man, one by a woman, to keep constant any effect of the sex of the speaker. Typical samples are: $\text{ēē} * \text{ā} *$ and $* \text{ō} * \text{ī} *$.¹ Testing was done in sound-proof rooms, with an intensity control to aid in carrying out the illusion of actual words, as revealed to the subjects in the directions. With practically no exceptions, all subjects were easily convinced that the clarity of the recorded speech, rather than any behavior of their own, was being tested. Extraneous hunger stimuli were prevented from appearing by controlled hours of testing. Ages and occupations or educational majors were obtained from official records. The time required to administer the test varied from one half-hour to an hour and a half, depending upon the number of sample repetitions required to elicit a response.

The control group for this experiment consisted of 32 psychology laboratory students, 16 males and 16 females, ranging in age from 18 to 24 years. Of these, 26 were given a retest within 30 days of the first testing. Thirty-two patients in the Psychopathic Ward of the University Hospital in Minneapolis formed the experimental group. Because of varied individual attitudes toward the test, the number of subjects in this group varied with the kind of analysis being made. Age range here extended from 18 to 58 years. It is possible that some of the differences reported below are due to age. Probably, however, most differences between normals and abnormals due to this factor are relatively small, in view of variations within groups and of the nature of the behavior being studied.

In all, the diagnostic classification of the psychopathic patients, assigned in staff clinic only after unusual care, is as follows: 10 psychoneurotics, 5 schizophrenics, 4 manic-depressives—depressed stage, 1 manic stage, 3 paranoids, 2 paretics, 2 psychopathic personalities, 1 toxic psychosis, 1 post-traumatic psychosis, and 2 feeble-minded, one of whom was diagnosed as depressed.

RESULTS

The data permit many comparisons in purely quantitative form, such as the number of samples yielding no response. There are also certain data, such as the content of individual records, which must be treated qualitatively. One of the advantages of this test as a diagnostic instrument, however, is the fact that this qualitative data, once summarized, may be treated statistically and used for purposes of comparison. An example may be found in the treatment of characteristics of the specific psychoses.

Quantitative aspects of the data. A brief resumé will be given of those results revealing little or no statistically significant differences between normal and abnormal groups. A study of the reaction time, as measured by the number of repetitions of the stimulus required to elicit a response, should, according to the theory of Jung and others, reveal the touching of an emotional complex. Means of the number of repetitions required for normal male and female

¹ A neutral sound, indicated here by *, and pronounced u as in *up*, was interposed to differentiate the vowels.

subjects were 12.20 and 11.45 respectively, for male and female psychopathic subjects, 12.63 and 11.42 respectively, *indicating no differentiation of groups*. Retest means for the normals revealed slight practice effects. Measures of variability show for the reaction time a Fisher's F value of 17.79: that is, *a greater variability on the part of the psychopaths*. This was similar to a general trend found throughout the experiment.

A measure was made of the overlapping of responses in the records of the normals, or the subject's two responses to the same stimulus on test and retest. Here a substantial degree of similarity is to be expected, if the verbal summator is tapping latent reserves of strong associations, rather than shifting influences. This measure of percentage of similarity revealed, however, an average of only 5.35. that is, the equivalent of only one word in every four responses of five-word length was found upon retest to be identical.

A consideration of the amount of perseveration shown, undertaken because of its importance in certain psychoses such as schizophrenia, revealed a similar lack of diagnostic discrimination. The definition of perseveration as used by Percival Symonds (7) was employed rather than the more general one used in studies of word frequency, that is, the word appears, perseverates in the next few successive responses, then disappears. Included in the count were perseveration of the word, and of the rhymed words, or sound. The mean number of perseverative responses for each subject was computed, and resulting means for the all-psychotic group were summarized in 5.57 perseverative responses, with a standard deviation of 6.22, the all-normal group yielded an average of 4.38, with a standard deviation of 4.70. *These summator results are in line with those of Hubbard, who found in a study of free-association that measures of perseveration were of little diagnostic use*.

A measure successful in differentiating the two populations was found in the number of meaningless responses given. Jung, and subsequently Kent and Rosanoff, considered such responses as disguises for significant emotional complexes, the real answer being hidden in nonsensical form. In tabulation here, meaningless words were combined with those responses giving only letters, such as "R*M*N*O" etc. The analysis, made in terms of percentages because of psychopathic variability in number of samples responded to, revealed a mean characteristic percentage of meaningless responses of 8.59 for the 32 normals, with a standard deviation of 13.43. The mean percentage for the 29 psychopaths, weighted for difference in number answered, was 18.62, over twice as many, with a standard deviation of 26.34. A Fisher's Z applied to the difference between standard deviations yielded an F value of 3.819; therefore, *the psychopaths tend to have significantly more meaningless responses, and vary among themselves more than the normals*.

Analysis of content by groups Among the many data analyses made in regard to the thought content of responses, four were felt to be of primary importance. Of these, two measures revealed no discriminatory power whatsoever. The first, the number of references to the subject's occupation, yielded the small totals of 12 and 9 references respectively for normal and psychotic males, 4 and 3 respectively for normal and psychotic females. *Thus no differentiation between preoccupation with emotional ideas, as opposed to everyday life, was found*. Rather, there is the fairly natural difference favoring the entire male sex.

A more complicated survey was next undertaken, that of the manifested egocentricity of the responses, which might reveal the greater personalization

of abnormal delusions, hypochondria, and wishful thinking. Content was classified for each subject under responses involving *I, we, us, me, mine, or our*, percentages again being used because of differences in the number of samples completed. The mean percentage of egocentric answers for the 32 normals was 19.30, with a standard deviation of 22.2, and for the 29 psychotics, 18.60 with a standard deviation of 24.0, *revealing no discrimination by means of the amount of egocentricity found.*

According to the hypothesis behind the verbal summator, an individual would be expected to reveal traces of an emotionally-toned complex or idea by frequent references to it in his responses. Summated speech should be concerned with the stronger associations of the subject, therefore, rather than with the usual external stimuli. In testing this assumption, a computation of the total number of references to the test itself, to the experimenter, and to the room, revealed the small totals of 29 by the normals, 23 by the psychotics. Thus we find that *immediate environmental factors play a small part in the response to the samples.*

A more important indication of significant latent content of responses is to be found in their thematic content. Accordingly, all of the records were analyzed in terms of the number of references made by each subject to a specific theme, on the assumption that the stronger complexes would be made evident by more references to them. Responses were then divided into two groups: the total number of subjects referring to a theme over four times, and the total number of these themes. Resulting data show 46.8 per cent of the 32 normal subjects referring to 5 or more themes, an arbitrarily chosen standard, as against 83 per cent of the 26 psychotics. The total number of themes referred to by these normals was 15, by the smaller group of psychotics, 27. It is thus apparent that *psychotics are concerned with relatively fewer revealed ideas, but these specific ideas occupy their attention more completely and intensely than is the case with the normals.*

Analysis of specific psychotic characteristics. Differences between the psychoses form one of the most important considerations in an evaluation of the verbal summator as a diagnostic tool. The most direct way of testing this function seemed to be that of comparing the responses of a specific psychotic group not only with the characteristics commonly attributed to that psychosis, but also with the characteristics of the other psychoses. Although ten psychotic groups were sampled, only the three containing the largest number of subjects were chosen, *viz.*, psychoneurosis, schizophrenia, and paranoia. Lists of psychotic characteristics commonly accepted and measurable by verbal behavior were obtained from textbooks and psychiatric authorities. Because of differences in the number of samples completed, analyses were made in terms of total number of responses for each group.

It is evident from a study of Table 1 that the verbal summator discriminates the psychoses here compared in some of the characteristics measured, but not in others. There seems to be, for example, a definite discrimination of the neurotics from the schizophrenes and the paranoids with respect to references to fears and anxiety, and with respect to responses given in the form of a question. The differences found in the amount of paranoid egocentricity and inferiority might also be considered significant. On the other hand, the amount of stereotypy (thematic perseveration) and formal perseveration found in the paranoid's responses are more typical of expected schizophrenic behavior than that revealed by these schizophrenes themselves. In view of these findings,

it seems safe to conclude that, *as measured here, the verbal summator has little value in discriminating between specific psychoses.*

As a final analysis, an examination of those subjects refusing to undertake or to complete the test should be of value. In this experiment all of the normal group were willing to answer the 40 samples, but 8 psychopaths out of 32, or one-fourth of the total number, failed to complete all the samples. Of these, the two who refused to try the test at all had been diagnosed as in the depressed stage of manic-depression, and the other as a schizophrenic. Of the remaining five refusals, all attempted from four to twenty-eight samples, but usually left many with no response. It was seen that, as might be expected, refusals occurred mainly in those psychoses characterized by apathy—for example, three depressed patients and two schizophrenes. It seems significant that none of the ten cases of psychoneurosis was unwilling to be tested.

TABLE 1

COMPARISON OF GROUPS WITH RESPECT TO THE ALLEGED CHARACTERISTICS OF SPECIFIC PSYCHOSES

CHARACTERISTICS	RESPONSES OF THREE CLINICAL GROUPS					
	NEUROTICS NUMBER=251		SCHIZOPHRENES NUMBER=140		PARANOIDS NUMBER=120	
	N	Per cent	N	Per cent	N	Per cent
NEUROTIC						
1. Anxiety and morbid fears	55	22	13	9	19	15
2. Hypochondria	17	7	1	1	4	4
3. Question form of response	26	10	2	1	3	3
4. Doubt and self-criticism	5	2	3	2	6	5
5. Egocentricity	56	22	32	23	32	27
6. Perseveration (moderate)	38	15	7	6	25	21
SCHIZOPHRENIC						
1. Perseveration (marked)	38	15	7	6	25	21
2. Bizarre and absurd responses	30	11	23	16	18	15
3. Telescoping	5	2	5	4	1	1
4. Ideas of reference (grandiose)	3	1	2	1	3	3
5. Possibly over-religious	3	1	0	0	0	0
6. Stereotypy (thematic perseveration)	82	35	34	24	53	44
PARANOID*						
1. Persecution	23	9	8	6	8	7
2. Egocentricity	56	22	32	23	32	27
3. Inferiority	14	6	5	4	9	8
4. Wishful thinking	24	10	19	14	5	4

CONCLUSIONS

As was previously stated, this study was undertaken, not as a conclusive test of the diagnostic value of the verbal summator, but as an exploratory survey to determine certain trends indicative of its value. The results found

are, therefore, not to be taken as the final evidence. Certain conclusions as revealed by these data can, however, be made.

1. The records of these abnormal subjects can be differentiated from the normal on the basis of the number of samples to which no response was given, the number of meaningless responses, and the number of syllables in the response. Of little or no diagnostic value according to these data are the amount of perseveration and the mean number of repetitions required to elicit a response.

2. An analysis of the content of responses reveals no difference in references to occupations and no diagnostic value of the mean percentages of "personalized" or egocentric responses of the subjects.

3. There are two results which bear out the hypothesis stated at the beginning of the paper, that is, the value of the summator in reaching latent verbal content and emotionally-toned ideas through the use of unfamiliar stimuli. These are the lack of reference to external stimuli, and the thematic content as measured by the number of references to special themes. In the latter analysis, the abnormal group revealed a greater average number of themes referred to more than four times, and a greater individual frequency of appearance of these references.

4. A noticeable trend revealed by the data was the significantly greater variability shown in general by the psychotics in the characteristics studied.

5. The data failed to reveal any sex differences in those traits measured, in either the normal or the abnormal group.

In this study the data have been interpreted merely in terms of their clinical significance, with no consideration of the value of the verbal summator as an instrument of research in other types of investigation. Although few qualities of summated speech have here been found to differentiate abnormal from normal subjects, this technique doubtless has value in other directions.

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