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There was a discussion of wartime physiological research.

Dr. Stephenson stated it was difficult to know where cause and effect leave off.

W. Motivation and Temperament in Psychopathology

Dr. Joseph Zubin

Despite the fact that psychopathology is still in the descriptive rather than quantitative stage, recent developments in this field are beginning to provide objective measures in the general area of motivation and temperament. Feelings and emotion, the primary concern of psychopathology, are given but little attention by other fields of psychology. For the most part, the evaluation of the affective life of the individual is now in the hands of interviewers rather than testers. This is unfortunate because the interview technique is so difficult to standardize and because it does not yield measurable quantitative results which can be related to other factors. Nevertheless, the interview technique is the only one now available for the validation of the objective measures that are being proposed in this area. The provision of specially designed rating scales for the evaluation of the interview and the development of such specific interview approaches as those of Kinsey will perhaps help in establishing quantitative measures. For example, if the Kinsey technique were applied to such phenomena as anxiety or depressive moods, it might be possible to determine the incidence of anxious and depressed moods in the normal population. This could help in the evaluation of deviant personalities within the normal range, that is, individuals who though not mentally ill nevertheless give indications of sufficient deviations from the norm to warrant special attention with regard to job selection, efficiency, and other factors. The interview technique itself and its component processes may be objectified. The chief objections to interviewing (namely, the lack of reliability and validity which this technique presents) may themselves be investigated to determine under what conditions and in which manner the reliability and validity can be increased. Such factors as misinformation, prejudice, halo effect, stereotyped judgment tendencies, generosity bias, neglect of some outstanding characteristic, and improper integration or interpretation of the elements of the interview results, may in turn be investigated and examined experimentally so that the effect of each of these factors on the outcome of an interview may be determined (1). By providing objective and anchored rating scales for evaluating various personality characteristics, it may be possible to overcome some of these sources of difficulty. Recorded interviews carried out under carefully controlled conditions should yield information on how the interview can be made to yield more objective data. It is clear that such studies cannot be conducted on a mass scale, but a few well selected interviews recorded and analyzed ought to throw much light on the methods

and techniques necessary for objectifying this instrument. One may perhaps liken the interview to the human eye. Mechanical instruments can measure carefully and accurately the presence of any quantity of light, but the human eye is by far more sensitive to variations in visual phenomena than any mechanical device thus far created. Similarly no test at the present time can be as discriminating as a skilled interviewer with regard to personality.

The more specific quantitative techniques which have been employed for the measurement of motivation and temperament in psychopathology have improved their usefulness as a result of recent developments in therapeutic procedures with the mentally ill. The abrupt changes in "personality" produced by the somatherapies and newer psychotherapies have provided the experimental psychopathologists with criteria for evaluating concomitant variations in a variety of measures and techniques. In this brief report only a sampling can be made of the various techniques that have been found useful.

1. Measures of motivation and efficiency. One study of efficiency which involves motivation factors is that carried out by F. Hess (2). She compared work efficiency and satisfaction on serial tasks conveyed on an assembly line conveyer at an optimum tempo selected by the subject, with the efficiency and satisfyingness of the same type of work done under free conditions in which there was no movement of the conveyer belt except as the subject caused it to move forward by speaking into a microphone. The "free" work was not as satisfying and not as efficient as the "forced" work. Dueker (3) found that in the case of normal individuals the forced work rate is about 20 per cent and 25 per cent more efficient than the free work rate. In the case of abnormal individuals the rate for forced work is two to three times as high as for free work. It is possible that in this approach we have a method for investigating the degree of interference of incidental motivation with a task at hand. This method has been adapted to learning of syllables on the memory drum. Under the "forced" conditions the memory drum presents each new syllable at an optimal rate while under "free" conditions the subject himself pushes the drum ahead by means of a key so that he learns the list at his own speed. Here again it seems that the "free" method is not as effective as the forced, perhaps because it is more subject to fluctuations in motivation. Preliminary studies of psychosurgery cases indicate that the free work seems to suffer more after operation than the forced.

2. Measures of rigidity vs. flexibility. One measure of flexibility of mental set can be obtained by means of the multi-meaning word test, in which the subject is asked to give as many definitions as he can of such words as "note" or "bill." The rapidity with which a person can shift from one meaning to another, and the total number of different meanings which he is capable of giving seems to be a function which may be related to such general temperamental qualities as rigidity vs. flexibility.

3. Experimentally induced moods. The introduction of methods for the induction of such moods as sleepiness or anxiety by means of drugs provide the experimenter with an anchored criterion for determining the efficacy of tests in gauging the presence of such moods. In a recent study (4) the effects of phenobarbital, a new antihistamine (thonzylamine), and a placebo were compared on a group of normal individuals. The results indicated that several of the psychological tests reflected the influence of phenobarbital in producing a decrement in performance accompanied by a change in mood. The antihistamine however, produced no change in performance but did effect a change in mood. We have here a clear indication of a split between changes in mood and changes in performance. That changes in mood can be obtained without corresponding change in performance is further evidenced by such studies as the Columbia Greystone Study (5) on psychosurgery cases and studies in shocktherapies on mental patients. In both of these types of studies no psychological changes referable to intelligence or memory or perception have been obtained, but there were definite changes in the level of anxiety. Even such very pathological characteristics as hallucination or delusions are not eliminated by these somatotherapies but are reduced in their emotional quality. The patient reports that he still has the delusions or hallucinations but they no longer bother him. He can now take them in his stride. It is possible that moods induced by specific drugs can be used as anchoring points for the validation and calibration of tests sensitive to mood alteration.

4. Objectification of projective techniques. One of the claims of workers in the field of projective techniques is that they can measure temperament and motivational qualities indirectly through projective methods. They maintain that whereas tests and questionnaires are suitable for tapping the conscious level, the levels of suppressed mental content or repressed mental content which reflect motivational processes are not amenable to the usual type of psychological tests and can only be tapped by means of the indirect projective techniques and cognate methods. Unfortunately these techniques are far from being tests. The methods of scoring the results of these tests are far from standard and far from objective. The interpretation of the obtained results are usually based on clinical hunches which have thus far defied any objective verification. There are only a few trustworthy studies of an objective type in this field and of these the majority are found to be negative. Recently, several studies (6) have indicated that the formal scoring categories of the Rorschach are not related to personality directly. However, when a content analysis of the responses is evaluated along specific dimensions by means of scaling devices, a very definite relationship is found between these results and the ratings of personality characteristics by friends and acquaintances. In our own work (1) we have attempted to provide for the variety of projective techniques that are now available a systematic framework of objective scoring scales. By reviewing the literature we obtained for example as many as 70 different dimensions along which Rorschach performance can be evaluated. After providing a systematic scaling device for each one of these dimensions we were able to evaluate

every response on each of the 70 dimensions that are now in use. Similar scaling devices were developed for the TAT, for handwriting analysis, and for several other projective techniques. Thus far these scales have been applied only to mental patients and definite changes in the scale values have been noted after psychosurgery, especially with regard to anxiety. No changes were observed on the standard scoring methods but when these new techniques were applied it was possible to differentiate between individuals who increased in anxiety and those who declined. Since these scales provide a measure for each response, a matrix of 70 scales times N (N = number of responses) is available for factor analysis within the single individual. If there is such a thing as structure of personality reflected in Rorschach variables, a factor analysis or a pattern analysis of this matrix should yield the framework of the structure of the personality of the individual under scrutiny.

Another approach to the evaluation of projective techniques has emerged from the attempt to simplify rather complex tests like the Rorschach and the TAT. By taking only a limited number of perceptual factors (as, for example, shading and contours in the instrument known as the Levy Movement Blots) and giving specific directions for the perception of movement, a definite score can be applied to the degree of movement perceived by the subject. Such scales for the detection of the amount, variety, and type of movement have been applied to groups of normal individuals, neurotics, psychopathic personalities, and schizophrenics, and the results indicate that the score on the Movement Blots is highly differential in separating these deviant groups from the normal. Similar techniques based on contour alone and on color alone have been developed and applied to children, adults and patients with telling results.

Another variety of techniques that has been found useful is that of handwriting analysis. When the principles of contraction and release proposed by Klages are applied to the development of scales for measuring handwriting, it is possible to develop a scoring system to differentiate handwriting of mental patients from those of normals (7). Thus far only small groups of individuals have been examined with these techniques. The difficulty in the application of these techniques is that they require a detailed measure of many factors such as height, width, slant, distance between letters, etc. Recently, a suggestion has been developed for recording the movements involved in the formation of the script. This technique may lead to an over-all rather than a detailed analysis. The pattern of the actual movement of the pen gives rise to a series of wave-like undulations which can be evaluated in an over-all manner to determine the frequency of different wave lengths in the same manner as EEG records are analyzed for their spectrum by means of brain-wave analyzers.

5. Subdivision of a selected group according to patterns of motivation (motivational types). One of the problems raised by the conference was: how to determine the variety of motivational patterns that

underlie identical or similar scores on such instruments as Interest Blanks, Psychoneurotic Inventories, etc. For example, there are probably a wide variety of motivational patterns that produce equivalent total scores that indicate probable success in say, pilot training. It can be readily shown that on a yes-no questionnaire of 100 items, a total score of 10 for example, can be obtained in 17 trillion different ways. It is not impossible that at least some of these 17 trillion patterns represent different motivational patterns.

There are probably several approaches that are worthwhile investigating. A factor analysis of the items in the instrument can perhaps produce the underlying factors. By computing factor scores for each individual the particular pattern of each individual's interests can then be evolved and individuals with like-structured patterns placed together into groups of potentially like-motivated individuals. These groups could then be studied further by interview methods to determine their patterns of motivation. A simpler approach, involving fewer assumptions is the method of "like-mindedness" measures (8). In this method, the pattern of answers of each individual constitutes a scoring key against which all of the other individuals' patterns are scored. This can be readily achieved by utilizing the IEM Test Scoring Machine and scoring each test paper on the basis of all other test papers in the group. This will give rise to a matrix of scores of like-mindedness. These like-mindedness scores can then be subjected to a factor analysis and the resulting factors will represent potential types. The individual factor scores for each person can then be computed. Individuals can then be segregated into like-minded subgroups in accordance with their factor scores resulting from the factor analysis.

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X. Some Approaches to Temperamental Dimensions Through Perception

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The researches reported here have been carried out by Dr. George Klein and co-workers at the Menninger Foundation. The assumptions underlying the researches are as follows: (1) that each person has an ego control system through which tensions are resolved and a "steady state" reached, (2) that persons differ in their favored and stabilized means of tension reduction, (3) that these means appear to be "attitudes" which express the flavor of the person's approach to situations, the organizing theme he uses, (4) that certain people have "attitudes" in common with others, (5) that all part-systems of response-perception, motor processes, and thinking can be put to use in achieving the "steady state," and (6) that the perceptual apparatus may be used as a basis for discovering the manner of working of the entire ego control system.

The general method of approach has been the following: (1) Select a perceptual task which may be expected to show a range of individual differences in the "attitudes" adopted toward it. (2) Give the task to a number of persons on whom there are readily available sources of information. (3) Select from the group the extremes and study their behavior and experience as shown by their actions and their descriptions of what they thought they were doing. (4) Formulate a tentative description of an "attitude" to account for the differences. (5) Seek out and utilize other perceptual tasks which should elicit the same attitude and see if the separation of the original extreme groups is maintained and whether it is necessary to modify the original description of the "attitude." (6) Branch out into concomitant aspects of the "attitude" such as clinical descriptions and motor or physiological behavior.

Experiments with the Leveling and Sharpening Dimension

The subjects were 47 men and women, 41 of whom were patients and 6 of whom were employees for whom personality and clinical data were available.