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THE UNIVERSITY OF DETROIT

TABLE OF CONTENTS

Chapter	A STUDY OF THE JUDGMENT OF FACIAL EXPRESSIONS OF EMOTION BY SCHIZOPHRENIC PATIENTS	Page
I.	THE PROBLEM.....	1
	Statement of the Problem.....	2
II.	REVIEW OF LITERATURE A THESIS SUBMITTED TO THE GRADUATE FACULTY IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF ARTS.....	4
III.	THE EXPERIMENT.....	16
	The Problem.....	16
	Subjects.....	16
	Materials.....	18
	Procedure.....	18
	DEPARTMENT OF PSYCHOLOGY.....	18
IV.	RESULTS AND CONCLUSIONS.....	23
	Presentation of Results.....	23
	Statistical Interpretation.....	25
	ARTHUR L. DIVITTIS	
	Conclusions.....	30
	New Problems.....	35
	Summary.....	36
	BIBLIOGRAPHY.....	38
	DETROIT, MICHIGAN	
	APPENDIX.....	41
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TPS
D618

TABLE OF CONTENTS

Chapter	Page
I. THE PROBLEM.....	1
Statement of the Problem.....	2
II. REVIEW OF LITERATURE.....	4
III. THE EXPERIMENT.....	16
The Problem.....	16
Subjects.....	16
Material.....	18
Procedure.....	18
IV. RESULTS AND CONCLUSIONS.....	23
Presentation of Results.....	23
Statistical Interpretation.....	25
Conclusions.....	30
New Problems.....	35
Summary.....	36
BIBLIOGRAPHY.....	38
APPENDIX.....	41

CHAPTER I
THE PROBLEM

LIST OF TABLES

Table	Page
I. Categories of Emotional Terms.....	24
II. A Comparison of the Judgments of Schizophrenics and Normals.....	26
III. A Comparison of the Judgments of Schizophrenics and Normals when Judgments are Grouped in Broader Categories.....	28
IV. A Comparison of the Judgments of Acute Schizophrenics and Normal Subjects.....	29
V. A Comparison of the Judgments of Chronic Schizophrenics and Normals.....	31
VI. A Comparison of the Judgments of Acute and Chronic Schizophrenics.....	32

LIST OF FIGURES

Figure	Page
1. A List of Emotional Terms.....	19
2. Form Used to Record the Judgments of Facial Expressions of Emotion.....	20

1. Clarence W. Taber. (Editor), Taber's Cyclopedic Medical Dictionary, pp. 4-30, 3-20.

CHAPTER I

THE PROBLEM

There have been many studies concerning the problem of the judgment of emotions from facial expressions. The results of these studies, though contradictory in many cases, have been a valuable addition to the study of emotions in man.

The problem has been studied and restudied from many viewpoints and with reference to many psychological variables. However, there is one area that is virtually untouched by the researcher in this field, i.e. the area of abnormal psychology. This is surprising insofar as affective disturbances are often a prime differentiating factor in the study and diagnosis of abnormal individuals. In the diagnosis of schizophrenic and manic depressive psychosis, affect is the basic consideration. Taber defines an affective psychosis: "an emotional one as manic depressive psychosis" ¹ and lists as a symptom of schizophrenia "loss of emotions or emotions manifest as out of place." ¹ Thomas Verner Moore did a factorial analysis of forty abnormal symptoms which resulted in five factors or syndromes, three of which were emotional. "That left us with three emotional syndromes: one characteristic of catatonic dementia praecox, one of the manic type of manic-depressive in-

1. Clarence W. Taber. (Editor), Taber's Cyclopedic Medical Dictionary, pp. A-30, S-20.

sanity, and one of the anxious depressed type of manic-depressive insanity." ²

Another phenomenon that is closely allied to affect is that of empathy. As will be shown in Chapter II, there are reasons to suppose that projection influences the judgment of emotional expressions, and that the empathic ability of the subject is probably a necessary condition for the ability to judge emotions from a posed picture. E. E. Southard points out the need for research in this area when he states, "Accordingly, I would set up as a research problem in the empathic reaction the whole field of schizophrenia (dementia praecox) and cyclothymia (manic depressive and similar psychoses)." ³

Thus with the intimate tie-up between affective experiences and what T. V. Moore terms "the essential psychoses" it would seem opportune to launch an exploratory study into the possibility that empathy or projection is employed by abnormal subjects in the judgment of emotional expressions.

Statement of The Problem

There are many questions concerning the relationship between emotional flatness of the schizophrenic and his perception

2. Thomas V. Moore, The Driving Forces of Human Nature, pp. 172-173.
3. E. E. Southard, "The Empathic Index in the Diagnosis of Mental Disease," Journal of Abnormal Psychology, XIII (1918), 212.

or judgment of stimuli from the environment. One such question is whether the patient will project his apparent reduced affect into his judgments of the emotional expressions of others. If the patient is projecting, then we can expect his judgment to reflect his own flatness and, therefore, show a decided tendency to make judgments of less intense emotions and states of feelings. This thesis will be an investigation of the problem concerning the ability to judge the emotions portrayed in a wide range of facial expressions. The salient features of these investigations appear to be the seemingly contradictory evidence presented by the various investigators and the low percentages of correct identifications of the facial expressions they are judging.

The specific hypothesis to be tested is: "Schizophrenic patients with reduced affect when asked to make judgments concerning facial expressions of emotion will tend to choose the less intense emotional states as the apt descriptions of the expressions they are judging."

Among the early investigators, Samuel Fernberger¹ discovered that the percentage of correct judgments of the facial expressions was no greater than 50. He stated, furthermore, that the percentage was increased considerably by suggestion. Dallas Busby² reported the following percentages of correct judgments in two experiments: for women observers, 36 and 32; for male subjects, 32 and 29. J. Frois-Wittman³ stated that in his experiments, the agreement of his subjects regarding the

1. Samuel Fernberger, "6 More Fiderit Faces," American Journal of Psychology, XXXIX (1927), 162-166.
2. Dallas Busby, "The Interpretation of Facial Expressions," American Journal of Psychology, XXIV (1926), 602-604.
3. Jean Frois-Wittman, "The Judgment of Facial Expressions," Journal of Experimental Psychology, XIII (1930), 118-151.

CHAPTER II

REVIEW OF LITERATURE

From the original theoretic studies of Bell and Darwin and the construction of the Piderit and other models in the late nineteenth century, there has been a plethora of research on the problems concerning the ability to judge the emotions portrayed in a wide range of facial expressions. The salient features of these investigations appear to be the seemingly contradictory evidence presented by the various investigators and the comparatively low percentages of correct identifications of the expressions.

Among the early investigators, Samuel Fernberger ¹ discovered that the percentage of correct judgments of the facial expressions was no greater than 50. He stated, furthermore, that the percentage was increased considerably by suggestion. Dallas Buzby ² reported the following percentages of correct judgments in two experiments: for women observers, 36 and 32; for male subjects, 32 and 29. J. Frois-Wittman ³ stated that in his experiments, the agreement of his subjects regarding the

1. Samuel Fernberger, "6 More Piderit Faces," American Journal of Psychology, XXXIX (1927), 162-166.
2. Dallas Buzby, "The Interpretation of Facial Expressions," American Journal of Psychology, XXXV (1924), 602-604.
3. Jean Frois-Wittman, "The Judgment of Facial Expressions," Journal of Experimental Psychology, XIII (1930), 118-151.

depicted emotions for all of his pictures was in the vicinity of 37 percent, while the studies by Jenness,⁴ Landis⁵ and Ruckmick⁶ all report percentages lower than 50. Floyd Allport⁷ ran a series of experiments and reported percentages that averaged 45 to 50 with a range of 21 to 72.

These percentages have led many to claim, as Landis did, "the names given by the observers to the expressions were no more often correct than one would expect by chance."⁸

Jenness postulated:

Generalizations concerning identifiability of different patterns of facial expressions are hardly justified if (as in the present case) they are based on the use of only a few pictures or on only a few types of expression.⁹

A rather good resume' on the problem discussed above is presented by Norman Munn in his textbook entitled Psychology. One passage is particularly apropos to the present discussion and reads as follows:

Posed facial expressions of emotion are not judged with a high amount of agreement between judges. In the first

4. Arthur Jenness, "Differences in the Recognition of Facial Expression of Emotion," Journal of General Psychology, VII (1932), 192-196.
5. Carney Landis, "The Interpretation of Facial Expressions in Emotion," Journal of General Psychology, II (1929), 59-72.
6. Christian Ruckmick, "Preliminary Study of the Emotions," Psychological Monographs, XXX (1921), 30-35.
7. Floyd Allport, Social Psychology, pp. 226-228.
8. Carney Landis, op. cit., p. 69.
9. Arthur Jenness, op. cit., p. 195.

place, the judges often disagree with the person who did the posing as to the emotion expressed. Thus, in determining whether or not an individual has judged "correctly", one usually goes by the majority opinion, not by what the actor intended. In other words, if you judge an expression to be rage and more of those who made the original judgments said it was rage than said it was something else, your judgment is said to be correct. In the second place, one can judge "correctly" only a small percentage of posed expressions. For example, very few individuals can correctly judge as many as ten out of the group of thirty-two posed expressions from which expression 1 of Figure 122 was taken ¹⁰--that is, to say, judge them in agreement with majority opinion. ¹¹

Dusenberry and Knower take issue with the foregoing experimenters. They conducted a study on the ability to judge the Rudolph and Feleky pictures as well as the Ruckmick portraits and concluded, "Interpretation of the facial expressions of emotional tendencies and attitudes may be made with a high degree of reliability." ¹² Langfeld ¹³ concurred with this opinion.

Woodworth sheds some light on the reason for the seemingly contradictory conclusions of the various investigators when he states:

10. Expression 1 of Figure 122 refers to a reprint of a portrait in Ruckmick's set of pictures.
11. Norman Munn, Psychology, p. 289.
12. Delwin Dusenberry and Franklin Knower, "Experimental Studies of the Symbolism of Action and Voice. I: A Study of the Specificity of Meaning in Facial Expression," Quarterly Journal of Speech, XXIV (1938), 424-435.
13. H. S. Langfeld, "Judgments of Emotions from Facial Expressions," Journal of Abnormal Psychology, XIII (1918), 172-184.

The low percents of "correct" judgments obtained in several experiments have seemed to justify the conclusion that reading facial expression is mostly a myth, and that we depend in real life upon the situation in which a person is placed and on what he says and does, rather than on his face, to reveal his emotion. The results do not justify such a conclusion because there has been no measure of the degree of error. ¹⁴

Inquiry into the conditions or determinants necessary for the discrimination of emotional expressions is most apropos to the hypothesis that is studied in this paper.

Intelligence was thought to have a decided effect upon one's ability to judge facial expressions of emotions. Arthur Jenness ¹⁵ correlated his subjects' ability to judge Allport's set of facial expressions with their intelligence levels as measured by Morgan's Mental Measurement Test and found an r of .04. Leo Kanner ¹⁶ found that a correlation of .21 existed between the ability to judge facial expressions and intelligence level as measured by the Thorndike Intelligence Test and proposed that there was no obvious connection between the two variables. Other investigations in this area by Gates ¹⁷ showed a correlation (about .20) between the judgment of facial expressions and the chronological or mental age of the subjects.

14. Robert S. Woodworth, Experimental Psychology, p. 249.
15. Arthur Jenness, "The Recognition of Facial Expressions of Emotions," Psychological Bulletin, XXIX (1932), 324-350.
16. Leo Kanner, "Judging Emotions from Facial Expressions," Psychological Monographs, XLI (1931), No. 3, 50.
17. Georgina S. Gates, "A Test for the Ability to Interpret Facial Expressions", Psychological Bulletin, XXII (1925), 120.

On the other hand, Kellog and Eagleson used six Ruckmick pictures to test 332 Negroes from ages three to fourteen. They indicated that the percentage of correct judgments on all six pictures increased with age. They proceeded to correlate the ability to judge the photographs correctly with the estimated intelligence of the subjects, and concluded, "a positive relationship of a crude sort is indicated in our figures between social perception and intelligence." ¹⁸ It should be reported that the measurement of intelligence was by an extremely "crude" method, i.e., the estimate by the teachers of the participating subjects.

In the course of the investigations on the problem of judging facial expressions of emotion, it was apparent from the introspections of the subjects and from the observations of the investigators that the individual's set or feel of the emotion was a determining factor in the judgments that he made. For example, Ruckmick pointed out that, "It appeared that the mood of the observer changing from day to day had some effect in the interpretation of the face." ¹⁹ This prompted him to undertake a series of experiments utilizing four observations. He came to the following conclusion:

Our results show...that individuals vary not only with

18. W. M. Kellog and B. M. Eagleson, "The Growth of Social perception in Different Social Groups," Journal of Educational Psychology, XXII, (1931), 372.
19. Christian Ruckmick, op, cit., p. 34.

regard to suggestions from without but also in accordance with emotional experiences often concealed from another in interpreting the same facial expression on different occasions. ²⁰

Three years before Ruckmick's publication, H. S. Langfeld conducted studies on the judgment of emotions from facial expressions. He instructed his subjects to give their introspections on the method they utilized in making their choices. After analyzing the introspections, he made the following observations:

The empathic response or sympathetic imitation of the facial expression in the picture is the one almost invariably adopted... At times the observer consciously imagined himself in the scene. It is probable that at other times he unconsciously identified himself with one of the group. The emotion, at least in its incipient stage, was aroused in him by this participation. ²¹

He went on to state that among all of his subjects only one denied the act of participation or identification with the pictures that he judged.

Other investigations seem to point to a necessary interaction between insight and the ability to project our own feelings into the pictures that we judge, in order to be a competent judge of emotional expressions. The British psychologist, Wedeck, indicated his views on the problem when he said:

It would seem, then, that in order to judge expression it is necessary to understand personality; and this understanding according to McDougall, Spearman, Bain and others, is reached in terms of the judge's experience

20. Christian Ruckmick, op. cit., p. 35.

21. H. S. Langfeld, op. cit., pp. 178-179.

of himself. ²²

P. E. Vernon cites two authorities regarding the importance of insight. He reports that Gross in an essay on criminal psychology contends that the most important of a group of conditions that are necessary for the observation and judgment of men is "to know yourself as well as possible." ²³ He also reported that Gordon Allport ²⁴ considers insight and an artistic process as the two prime requisites for the judgment of emotions. However, Allport's "insight" upon closer examination seemed to be equated to a concept of extending one's self into society, i.e., of broad experience in social situations.

The implication of projection that is found in many of the experiments on this problem is aptly worded by Woodworth who says, "Reading the emotion from the face amounts in large part to reading the emotion into the face." ²⁵

The most thorough and thought-provoking theoretic view on the determinants of one's ability to judge the facial

22. J. Wedeck, "Relationship Between Personality and 'Psychological Ability,'" British Journal of Psychology, XXXVII (1947), 133.
23. Gross, as quoted by P. E. Vernon, "Some Characteristics of the Good Judge of Personality," Journal of Social Psychology IV (1933), 42-57.
24. Gordon Allport as quoted by P. E. Vernon, "Some Characteristics of the Good Judge of Personality," Journal of Social Psychology, IV (1933), 42-57.
25. Robert S. Woodworth, op. cit., p. 247.

27. Sidney J. Fields, "Discrimination of Facial Expressions and its Relationship to Personal Adjustment," Journal of Psychology, V (1930), 309 (abstract).

expressions of emotion was compiled by Camille Nony. She wrote a rather scholarly article for the British Journal of Psychology in which she discussed the various biological and social aspects of the problem. Her conclusions were as follows:

Let us sum up the conditions that were required in order that the expression of the emotions might become a language:

To live in society.

To react spontaneously to an emotional shock in the same way as the beings with which we live.

To be capable of self-observation and of hetero-observation, both for him who is moved and sees the effect of his emotion in others, and for the observer who sees the expression and knows its significance.

To be capable of producing again, by voluntary inner-ventions, or through the medium of representations, or by conditioned reflex, the whole or only a part of the spontaneous emotional reactions, particularly the specific movements that are socially the most important reactions.

That such voluntarily provoked reactions be visible or audible for the spectators.

That there be a social agreement as regards the significance of the socialized expression. ²⁶

Of all the investigations conducted on the problem of the judgment of facial expressions of emotion, there seems to be only one published work that deals more directly with the problem of this thesis. That was a dissertation by Sidney J. Fields ²⁷ in which he correlated the ability to judge emotions from facial expressions with the social and emotional adjustment of the individual. Utilizing the Ruckmick and Frois-Witt-

26. Camille Nony, "The Biological and Social Significance of the Expression of the Emotions," British Journal of Psychology, Gen. Sect., XIII (1922), 91.

27. Sidney J. Fields, "Discrimination of Facial Expressions and its Relationship to Personal Adjustment," American Psychologist, V (1950), 309 (abstract).

man sets of pictures to pursue his problem, Fields discovered five pertinent facts from his investigations. Every individual who took part in the experiment named 7 to 20 pictures correctly. He also noted that the scores of the achievement roughly approximated the normal curve, and that sex was an insignificant variable in his studies. The two most important findings were as follows: (1) a product-moment correlation of 0.24, significant at the .01 level, between the discrimination of the emotional expressions and the individual's social adjustment; (2) a product-moment correlation of 0.03 between the discrimination of emotional expressions and the emotional adjustment of the observers.

Perhaps one of the reasons why the problem of judging portraits of emotional expression was not extended to studies with schizophrenics and other abnormal was due primarily to the long accepted concept that the schizophrenics, being out of contact with reality, were not capable of communication and thus would be difficult subjects to deal with. This is brought out very graphically by Rickers-Ovsiankina who quotes from three rather classic sources on the responsiveness of schizophrenics. She indicates that Bleuler, ²⁸ in his text on dementia praecox, says that because of the loss of contact with reality, schizophrenic patients remain entirely unresponsive to what they are told and to what is going on around them. She then quotes Hoch, ²⁸ who refers to schizophrenics as shut-in persons who have no natural tendencies to be open and get in

contact with the environment. He describes them as reticent, seclusive, hard to influence and having little interest in what is going on. He blames this on constitutional factors in dementia praecox. Noyes in his textbook on psychiatry states:

Schizophrenics show loss of capacity for attachment of energy and interests to external objects and reality. Interest, and therefore attention, is centered on subjective creations on matters within and not without the patient.²⁸

These statements prompted Rickers-Ovsiankina to study the accessibility of schizophrenics to environmental objects. She set up an experiment in which 123 schizophrenics and 75 normals were observed through a one-way screen when they were left alone in a room with a number of attractive objects. Her experiment revealed:

...that on the whole schizophrenics respond to the environmental objects approximately to the same extent as normals. Such variables as the duration and the consistency of response did not bring out any difference between the two groups. There is, however, a distinct difference between normals and schizophrenics in the way the outside impressions affect the internal systems of the personality. Whereas in normal individuals contact with the object leads predominately to a preoccupation with directed activities, in schizophrenics the activities remained more superficial and less directed.²⁹

28. Bleuler, Hoch, and Alfred Noyes, as quoted by Maria Rickers-Ovsiankina, "Studies of Personality Structure of Schizophrenic Individuals: I. Accessibility of Schizophrenics to Environmental Influences," Journal of General Psychology, XVI (1937), 153-178.
29. Maria Rickers-Ovsiankina, "Studies of Personality Structure of Schizophrenic Individuals: I. Accessibility of Schizophrenics to Environmental Influences," Journal of General Psychology, XVI (1937), 177.

Sullivan³⁰ supports the view that schizophrenics are capable of contact with others, maintaining that there is no developmental period when the human being exists outside the realm of interpersonal relatedness. Interpersonal relations begin in the very early post-natal stages, at which time the infant first senses approval and disapproval from the mothering person by a rather embryonic type of empathy. He goes on to show that some degree of interpersonal relatedness is maintained throughout life by everyone and that this relatedness is merely disrupted in the schizophrenic's dealing with other people.

Frieda Fromm-Reichmann after discussing much of the work that was done by other authors in their efforts to communicate with and maintain rapport with schizophrenics in psychotherapy says:

It appeared then that it was possible to deal with schizophrenic communication as meaningful and potentially understandable...³¹

By way of summary, it is apparent from the many studies on the accuracy with which subjects are able to discriminate emotions from facial expressions that the majority of these researchers reported percentages of correct judgments below 50. Despite some controversy over the reported data and methods, it seems that individuals vary greatly in their ability to judge

30. H. S. Sullivan, "Affective Experience in Early Schizophrenia," American Journal of Psychiatry, VI (1927), 467-483.

31. Frieda Fromm-Reichmann, "Notes on the Development of Treatment of Schizophrenics by Psychoanalytic Psychotherapy," in Specialized Techniques in Psychotherapy, edited by Boychowski and Despert, p. 162.

facial expressions of emotions and generally are not too accurate in their judgments. What seems to be the cause of this? Intelligence was found to be only slightly involved as a determinant in one's ability to judge the pictures. Some authors hold that the observer tends by empathy to feel with the person in the portrait and then to project the emotion he feels into the pictured facial expression. Other determinants include social perception and, to some extent, social maturity.

There is also ample evidence from the literature to suppose that schizophrenics are communicable and, therefore, valid subjects for an experiment.

Thus, it seems there are no studies in the literature that deal directly with the specific problem of this thesis.

However, there is a considerable amount of theory and data which helped formulate the problem at hand.

The sample consisted of a group of forty-seven schizophrenic patients with reduced affect who were hospitalized at the St. Joseph Retreat in Dearborn, Michigan. The criterion for the reduction of affective tone was the clinical judgment of the interviewing psychiatrist. The basis for his judgment was the presence of the following symptoms: immobile facies, monotonous tone of voice, superficial reactions, retardation of motor activities, and delayed, and usually brief, responses.

There were eleven males and thirty-six females in the group. Their ages ranged from 17 to 72; the median age was 36;

CHAPTER III

THE EXPERIMENT

The Problem

This thesis concerns the judgments of facial expressions of emotions by schizophrenics with reduced affect, in an effort to see whether they project their emotional flatness into the portraits. The specific hypothesis to be tested is: "Schizophrenic patients with reduced affect when asked to make judgments concerning facial expressions of emotion will tend to choose the less intense emotional states as the apt descriptions of the expressions they are judging."

Subjects

The subjects for this investigation consisted of a group of forty-seven schizophrenic patients with reduced affect who were hospitalized at the St. Joseph Retreat in Dearborn, Michigan. The criterion for the reduction of affective tone was the clinical judgment of the interviewing psychiatrist. The basis for his judgment was the presence of the following symptoms: immobile facies, monotonous tone of voice, superficial reactions, retardation of motor activities, and delayed, and usually brief, responses.

There were eleven males and thirty-six females in the group. Their ages ranged from 17 to 72; the median age was 36;

the mean, 40.7; and the mode, 26. Seventeen of the group were married, twenty-six single, one was divorced, and the marital status for three subject was unknown. There were seventeen chronic patients, i.e., individuals who had been institutionalized for longer than one year. The remaining thirty subjects could be classified as acute patients, whose stay in the hospital before they were tested ranged from one day to five weeks. Some of the acute patients were in an electro-convulsive or insulin shock treatment program, but these individuals were not tested unless they had received no treatment for at least forty-eight hours.

The breakdown of the group according to diagnosis was as follows: for seventeen, or 36 percent: schizophrenic reaction, paranoid type; eleven patients, or 23 percent: schizophrenic reaction, acute undifferentiated type; seven subjects, or 15 percent: schizophrenic reaction, hebephrenic type; four patients, or 9 percent: schizophrenic reaction, chronic undifferentiated type; three patients, or 6 percent: schizophrenic reaction, simple type; and the remaining five, or 11 percent: other types of schizophrenia.

The control group consisted of thirty-three male and forty-two female students of general psychology at the University of Detroit who were tested for a prior investigation. Their ages ranged from 17 to 23; the median age was 18.9, the mean, 19.2; and the mode, 18.7. It is quite obvious that there is a wide discrepancy in the age limits of the two groups, and, hence, that

the group of normals is not a perfect control.

Material

The test material included a set of Ruckmick's pictures of emotional expressions, a printed list of 47 emotional terms, and a printed answer form.

The Ruckmick set of pictures consists of 32 separate photographs of emotional states that were posed by an amateur actress. The pictures, manufactured by C. H. Stoelting and Company, are 3" x 2" in size and mounted on white, 5" x 3" cardboard backgrounds. They display only the face of the actress.

The list of emotions and the answer form are represented in Figures 1 and 2.

Procedure

The subjects in the experimental group were tested individually in their respective rooms at the hospital. Because of the nature of their illness, it was necessary to spend a period of time to gain adequate rapport in preparation for the test proper. When the investigator was assured that the patient was cooperative, he briefly explained the purpose of the test and proceeded with the experiment.

Each patient was given the list of emotions reproduced in Figure 1 and asked to read the terms on the list. Any incomprehensible terms were defined for the subject. The experimenter had to change the directions that are printed on the

A LIST OF EMOTIONAL TERMS.

Admiration	Horror
Adoration	Interest, cynical
Amusement	Interested attention
Anger	Interested inquiry
Anguish	Interested observation
Anxiety, hopeful	Joy
Appeal, wistful	Love
Apprehension	Mirth
Astonishment	Pain, exhausting
Consternation	Pleading
Contemplation	Rage, Vindictive
Contemptuous sneer	Reconciliation
Curiosity	Resentment
Defiance	Rueful meditation
Despair	Scorn
Disappointment	Sorrow
Distrust, critical	Suffering
Distrust, resentful	Sulkiness
Fear, maniacal	Surprise
Fear, startled	Suspense, torturous
Grief	Sympathy
Happiness	Terror
Hate	Wonder
Haughtiness	

FIGURE 2

FORM USED TO RECORD THE JUDGMENTS OF FACIAL EXPRESSIONS OF EMOTION

Name: _____ Date: _____

First read through the list of emotions. Pictures will be presented in numerical order. Decide what emotion each picture seems to portray. In the "Emotion" column write the name of the emotion which each picture portrays beside the number of each picture. Judge by your general impression or by the feeling the picture seems to communicate to you. Make your choices as quickly as possible. Try to spend no more than one minute on any picture. When in doubt, choose the emotion that seems nearest to being correct. Add remarks, if you wish, in the space provided.

Picture	Emotion	Remarks
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26		
27		
28		
29		
30		
31		
32		

Age _____ Race _____ Date of birth _____

Sex _____ Descent _____ Marital status _____

answer sheet (Figure 2) so that he could write in the answers himself and better control the test situation. The directions were as follows:

First read through the list of emotions. Pictures will be presented in numerical order. Decide what emotion each picture portrays. Judge by your general impression or by the feeling the picture seems to communicate to you. Make your choices as quickly as possible. Try to spend no more than one minute on any picture. When in doubt, choose the emotion that seems nearest to the one you think is correct.

To assure adequate comprehension of the directions, the experimenter answered any and all questions the subjects asked. He proceeded to display the pictures in numerical order and recorded the responses tendered by the patients. There was no rest interval. Although it was suggested that the subjects take no longer than one minute for each card, in many cases the patients greatly exceeded the suggested limit. It should be noted, also, that a considerable amount of urging was necessary in some cases in order to complete the task. With more deteriorated patients, it was often necessary to re-read the directions and to re-define many of the terms.

The control group was administered the experiment as a group test. The experiment took place during a number of laboratory sessions in the psychology laboratory at the University of Detroit. There was an average of seven observers to a table. The experimenter used one set of pictures for each table of subjects. He, assisted by his proctors, passed out lists of emotion and answer forms. Then he read the directions printed on the form in Figure 2. He further directed the subject who

was nearest the stack of pictures to observe the first picture of the stack, make his judgment, record it in the appropriate space, and pass it clockwise around the table. The remainder of the pictures were viewed in numerical order and passed to the other observers at the table. As each subject finished a picture, he passed it to the next person, so that all of the pictures circulated in clockwise order around the table.

Although the directions suggested a time limit of one minute, no actual limits were enforced. It should also be reported that sufficient and adequate proctoring was available to guard against copying and to meet individual difficulties that arose during the testing period.

and terror would logically belong in the fear category, just as suffering and pain would belong in the suffering category. The second was used when there was no obvious logical basis for placing an emotion in one category rather than another. In these instances, the decision was made on the basis of similarity of distribution. The emotions were grouped so that they could be more easily managed. This procedure also allowed the investigator to use larger figures, making the statistical results more meaningful.

The frequency with which each subject selected emotions falling within each category was tabulated. It should be noted that besides the thirteen categories in the table there

1. See Appendix.

CHAPTER IV

RESULTS AND CONCLUSIONS

Presentation of Results

For the purposes of this study, the forty-seven emotional terms were grouped in thirteen categories, as shown in Table I. The categories are entitled: Fear, Suffering, Sorrow, Anger, Hate, Contempt, Distrust, Hope, Sympathy, Love, Happiness, Interest, and Surprise. There were two criteria for the distribution of emotions into their respective categories. The first was a priori. For example, it is quite obvious that startled fear, maniacal fear, horror, and terror would logically belong in the fear category, just as suffering and pain would belong in the suffering category. The second was used when there was no obvious logical basis for placing an emotion in one category rather than another. In these instances, the decision was made on the basis of similarity of distribution. The emotions were grouped so that they could be more easily managed. This procedure also allowed the investigator to use larger figures, making the statistical results more meaningful.

The frequency with which each subject selected emotions falling within each category was tabulated.¹ It should be noted that besides the thirteen categories in the table there

1. See Appendix.

TABLE I
CATEGORIES OF EMOTIONAL TERMS.

<u>FEAR</u>	<u>HATE</u>	<u>LOVE</u>
Fear, startled	Hate	Love
Fear, maniacal	Resentment	Adoration
Horror	Sulkiness	Admiration
Terror		Reconciliation
Suspense, torturous	<u>CONTEMPT</u>	<u>HAPPINESS</u>
Consternation	Contemptuous sneer	Happiness
Apprehension	Scorn	Joy
	Haughtiness	Mirth
	Interest, cynical	Amusement
<u>SUFFERING</u>		
Suffering	<u>DISTRUST</u>	<u>INTEREST</u>
Pain, exhausting	Distrust, critical	Interested attention
Anguish	Distrust, resentful	Interested inquiry
<u>SORROW</u>		Interested observation
Sorrow	<u>HOPE</u>	Curiosity
Grief	Anxiety, hopeful	Contemplation
Rueful meditation	Appeal, wistful	<u>SURPRISE</u>
Disappointment	Pleading	Surprise
Despair		Astonishment
<u>ANGER</u>	<u>SYMPATHY</u>	Wonder
Anger	Sympathy	
Rage, vindictive		
Defiance		

is a fourteenth category entitled "other." This refers to any term not included in the list, but nevertheless used by the subjects.

Statistical Interpretation

A cursory inspection of the means in Table II would show that the Fear, Sorrow, Happiness, Interest, and Surprise categories have figures that seem to indicate a rather large incidence of judgments among the individuals of the experimental group. To determine the statistical significance of the various figures in the categories, t-ratios were computed for the difference between this group and the control group. The formula used was that for large, uncorrelated samples.

In Table II the two groups are compared in regard to the judgments they made in each category. The t-ratios are not given for the Distrust, Hope, Sympathy, and Love categories, because it was quite apparent that the distributions would not approximate the normal curve. The t-ratio for the Contempt category indicates that the difference in the number of judgments in that group was significant at the .01 level. That is, the control group averaged significantly more judgments in the Contempt category than the experimental group. The schizophrenics with reduced affect, however, made significantly more judgments in the Sorrow, Interest, and Surprise groupings. The level of significance for the difference in the Sorrow group was .05; for the difference in the Interest and Surprise Groups, .01.

TABLE II

A COMPARISON OF THE JUDGMENTS OF SCHIZOPHRENICS AND NORMALS.

Category	Schizophrenics		Normals		t
	N=47		N=75		
	Mean	S. D.	Mean	S. D.	
Fear	3.47	1.68	3.37	1.47	.33
Suffering	1.59	1.22	1.64	1.05	.23
Sorrow	3.40	2.09	2.66	.77	2.31 *
Anger	1.62	1.43	1.88	.93	1.10
Hate	1.61	1.29	2.01	1.15	1.82
Contempt	2.91	1.79	4.07	1.52	3.66 **
Distrust	.66	.86	1.59	1.03	
Hope	1.32	1.49	1.79	1.19	
Sympathy	.28	.49	.67	.56	
Love	1.17	1.26	2.41	1.22	
Happiness	5.11	2.22	4.69	1.37	1.15
Interest	4.40	2.47	2.93	1.59	3.59 **
Surprise	4.38	2.49	2.51	1.30	4.76 **
Other	.47	.94			

* Significant at .05 Level

** Significant at .01 Level

The categories were further combined into six groups which approximate the six groups of Woodworth. The six groups were: Fear-Suffering-Sorrow; Anger-Hate; Contempt-Distrust; Hope-Sympathy; Love-Happiness; Interest-Surprise. Means and t-ratios were then calculated for the schizophrenic and the normal groups according to the above six groupings. The results, which are given in Table III, show that there are significant differences in every category. The most significant difference is the one in the Interest-Surprise category which shows that the abnormal subjects tended to describe the emotional expressions in terms of the Interest-Surprise group to a much greater extent than did the normals. The difference is significant at the .01 level. Since there was such a large number of judgments by the schizophrenics in the Interest-Surprise group, it is logical that the judgments in at least some of the other groups would be significantly less. The normals tended to make significantly more judgments in all the remaining categories except the Fear-Suffering-Sorrow category in which the experimental group made more judgments. The level of significance was .05.

Table IV shows the t-ratios that were attained when a group of normals was compared with the schizophrenic patients who were described as "acute," i.e., hospitalized for less than one year. In this comparison, there were significant findings in only three categories. The difference between the acute schizophrenics and the normals in the Interest-Surprise group was significant at the .01 level. This means the acute schizophrenics made

TABLE III

A COMPARISON OF THE JUDGMENTS OF SCHIZOPHRENICS AND NORMALS
WHEN JUDGMENTS ARE GROUPED IN BROADER CATEGORIES.

Category	Schizophrenics		Normals		t
	N=47		N=75		
	Mean	S. D.	Mean	S. D.	
Fear Suffering Sorrow	8.47	3.00	7.45	1.83	2.08 *
Anger Hate	2.83	1.98	3.89	1.32	3.21 **
Contempt Distrust	3.57	2.13	5.65	2.09	5.24 **
Hope Sympathy	1.60	1.52	2.45	1.21	3.58 **
Love Happiness	6.28	2.24	7.11	1.56	2.21 *
Interest Surprise	9.79	3.77	5.44	1.98	5.56 **
Other	.47	.94			

* Significant at .05 Level

** Significant at .01 Level

TABLE IV

A COMPARISON OF THE JUDGMENTS OF ACUTE SCHIZOPHRENICS AND NORMAL SUBJECTS.

Category	Acute Schizophrenics N=30		Normals N=75		t
	Mean	S. D.	Mean	S. D.	
Fear Suffering Sorrow	8.43	3.09	7.45	1.83	1.60
Anger Hate	3.27	2.09	3.89	1.32	1.49
Contempt Distrust	4.03	2.05	5.65	2.09	3.59 **
Hope Sympathy	1.77	1.60	2.45	1.21	2.07 *
Love Happiness	6.30	2.34	7.11	1.56	1.72
Interest Surprise	7.73	3.46	5.44	1.98	3.36 **
Other	.47	.94			

* Significant at .05 Level

** Significant at .01 Level

more judgments in terms of the Interest-Surprise group. The normals made a significantly higher number of judgments in the Contempt-Distrust and Hope-Sympathy categories. The significance levels were .01 and .05 respectively.

In Table V the control group was compared with the remaining seventeen patients, the "chronic" portion of the experimental group. It is not difficult to perceive the wide divergence between the two groups, since the differences in four of the six categories were statistically very significant. As was expected, the chronic patients made many more judgments than the normals in terms of the Interest-Surprise listings, while the judgments of the normals tended to cluster in the Anger-Hate, Contempt-Distrust, and Hope-Sympathy areas.

Finally, the two schizophrenic groups were compared and the results are shown in Table VI. The figures show that the chronic group chose more items in the Interest-Surprise category than the acute group did, while the group of acute patients selected more items in the Anger-Hate category. The differences in these categories were statistically significant at the .05 level.

Conclusions

From the data presented, it is evident that the experimental group, i.e., schizophrenics with reduced affect, tended to prefer the emotional terms in the Interest-Surprise category. These are the least intense of the emotional terms and would

TABLE VI
TABLE V

A COMPARISON OF THE JUDGMENTS OF CHRONIC SCHIZOPHRENICS AND
NORMALS

Category	Chronic Schizophrenics N=17		Chronic Normals N=75		t
	Mean	S. D.	Mean	S. D.	
Fear Suffering Sorrow	8.06	4.76	7.45	1.84	1.98
Anger Hate	2.06	4.76	3.89	1.32	4.74 **
Contempt Distrust	2.76	1.47	5.65	2.09	5.10 **
Hope Sympathy	1.29	1.32	2.45	1.21	3.32 **
Love Happiness	6.24	2.03	7.11	1.56	1.62
Interest Surprise	10.65	3.57	5.44	1.98	5.65 **
Other	.47	.94			

** Significant at .01 Level

TABLE VI

A COMPARISON OF THE JUDGMENTS OF ACUTE AND CHRONIC SCHIZOPHRENICS

Category	Acute Schizophrenics N=30		Chronic Schizophrenics N=17		
	Mean	S. D.	Mean	S. D.	
Fear Suffering Sorrow	8.43	3.09	8.06	4.76	.28
Anger Hate	3.27	2.09	2.06	1.47	2.26 *
Contempt Distrust	4.03	2.05	2.76	2.05	2.00
Hope Sympathy	1.77	1.60	1.29	1.32	1.10
Love Happiness	6.30	2.34	6.24	2.03	.09
Interest Surprise	7.73	3.46	10.65	3.57	2.65 *
Other	.47	.94			

* Significant at .05 Level

be the ones selected if the hypothesis posited in Chapter I is tenable. The trend toward the use of less intense emotional terms by the subjects with reduced affect is indicated by the results in Tables II and III. If we assume that the chronic patients are the subjects with a more pronounced reduction of affect, the results in Tables IV, V, and particularly VI, suggest that the trend toward the selection of the items in the Interest-Surprise grouping has a direct, linear relationship to the reduction of affect. This is most clearly indicated by the data in Table VI, in which both groups with reduced affect were compared, since the group which seemed to have the greater reduction of affect also tended to judge the pictures more in terms of the Interest-Surprise category, i.e., the category with the least intense emotional terms. Inspection of the other tables shows that the divergence between the selections of the normals and the schizophrenics resulted in all cases in a statistically significant difference between the two groups in the Interest-Surprise category. The experimental group also tended to pick the Fear-Suffering-Sorrow category more often than normals but the difference was not always statistically significant. It was proved, therefore, that in all cases the subjects with reduced affect showed a tendency to make greater selections in the areas of less intense emotions and states of feelings, and that this tendency increased with the increase of the reduction of affect.

Although the results seem to make the hypothesis tenable,

a word of caution is warranted. In the first place, the criterion for the reduction of affect was subjective, i.e., the judgment of the interviewing psychiatrist. Secondly, the assumption that the chronic patients generally showed more pronounced reduction of affect was based on the observation of the experimenter during the test and the general opinion of the hospital staff. The third important consideration is the wide discrepancy in the ages of the control and experimental groups. However, the primary purpose of this research was exploratory.

To provide a remedy for the age defect in the control group, the Interest-Surprise totals were correlated with age and the following figures were obtained. When all schizophrenics were used, the correlation was .422 which is significant at the .01 level. When the chronic schizophrenics were excluded, the correlation was .237. This latter figure was not statistically significant.

This means, therefore, that since the correlation with age is not significant when the chronics are excluded some of the variance in the sample is associated with age. The higher correlation for the whole group is attributed to the fact that the chronic schizophrenics in this sample are older. Thus, the results, i.e., the differences of schizophrenics from normal college students, can in part be related to age, but some of the difference must be related to reduction of affect. It is difficult to show the exact amount of the difference that is due to reduction of affect, but the results indicate it is worthwhile

to pursue the matter further.

New Problems

Since this thesis was primarily an exploratory study, it is obvious that there is a considerable need for research in the ability of abnormal patients to judge emotional expression. The obvious need would appear to be a study in which the control and experimental groups were more evenly matched for age, marital status, and background. Another problem that readily comes to mind would be the repetition of the present study with an objective measure of the patient's affect. The use of some apparatus like the psychogalvanometer to measure the bodily changes of emotion appears to be an appropriate control.

Other possible studies include some research with paranoid-type patients to see if they prefer "negative" rather than "positive" emotions. The "negative" emotions would include the terms used in the Fear, Suffering, Sorrow, Anger, Hate, Contempt, and Distrust categories. The "positive" emotions would refer to the emotional terms used in the other categories. It would also be interesting to see if the paranoids tended to give a significantly larger number of responses in the Hate, Contempt, and Distrust categories.

Another investigation of interest would be the use of another set of pictures, preferably posed by a professional actor. Finally, experiments could be designed to show the relationship between a patient's ability to judge facial ex-

pressions of emotion and his progression or regression in the hospital. Such methods as test and retest after shock treatments, group therapy, or individual therapy would seem to be appropriate.

act relationship between the difference in their judgments and the reduction of affect. It seems substantial enough, however, to warrant further investigation.

Summary

1. Forty-seven schizophrenic patients with reduced affect judged emotions portrayed in a set of Ruckmick's facial expressions of emotions. Each subject used a list of forty-seven emotional terms. The terms were then grouped into thirteen categories for easier handling.

2. The schizophrenics were compared with seventy-five normal observers. The results showed that the experimental subjects tended to judge the facial expressions in terms of less intense emotions and feeling states.

3. The thirteen categories were then combined into six groups which approximated Woodworth's categories, and the subjects in the schizophrenic group were divided according to the acuteness or chronicity of their illness. Both the chronic and acute groups tended to make significantly more judgments in terms of the less intense emotional states than did the normals. The results also showed that the chronic schizophrenics made more judgments in terms of the less intense emotional items than the acute group of schizophrenic patients. This latter difference was statistically significant at the .05 level.

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4. The results indicate that the hypothesis seems tenable. However, some of the differences between the schizophrenics and the normals are related to age, and, thus, it is difficult to determine the exact relationship between the difference in their judgments and the reduction of affect. It seems substantial enough, however, to warrant further investigation.
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NUMBERS OF JUDGMENTS IN EACH CATEGORY MADE BY EACH SUBJECT.

APPENDIX

Categories	SUBJECTS															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Fear	4	3	3	3	4	5	6	8	5	2	5	5	3	4	8	4
Suffering	2	4	1	2	2	1	1	4	2	1	3	2	2	3	2	
Sorrow	3	3	5	5	1	5	4	4	2	2	2	2	3	2	4	2
Anger	1	2	2	4	4	5	3		2	4	1	3	3	2	1	2
Hate			2	1	1	4	2		2	1	2	2	1	2	1	3
Contempt	1	4	6	2	6	5	4	1	2	2	5	1	3	2	3	2
Distrust	1	1	1		2	1			1	1	1			1	1	1
Hope	3	2	3		3	4	1	3	2	1	2	2	1	6	2	6
Sympathy	1				1		1		2	2	1					
Love	2	3	5	2	2	1	2	2	2	3	3	1	1	1		3
Happiness	3	3	7	6	5	1	4	9	8	7	6	1	7	3	5	2
Interest	7	4	3	4	1	7	2	3	2	5	6	3	6	4	2	4
Surprise	4	3	4	4	5	1	4	1	1	1	2	12	2	3	2	4
Others				1				2	1				3			

Categories	SUBJECTS																	
	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
Fear	3	4	3	2	3	2	3	3	4	4	2	2	4	4	3	4	1	2
Suffering		2	2	3	2	1	2	4	1		3		2	2	1	2	3	3
Sorrow	8	1	4	4	2	1	1	5	5	7	4	4	5	9	3	8	1	2
Anger		2	2	1	1	3					3	4			1	4		
Hate			2		2	1	2				1		3	1	1	2	1	
Contempt	1	7	3	2	3	6	2	1		1	3	2	3	4	3	1	5	
Distrust		2	1		1					1	1	1			1	1	1	
Hope	1	1	1		3		1	3	2			1	3				1	1
Sympathy					1		1				1							
Love		3		2	2	1		2	2		3	1	1	1	1		3	1
Happiness	7	4	7	7	6	8	10	6	6	7	7	6	5	2	5	4	4	3
Interest	4	2	4	7	3	7	3	6	7	9	1	8	3	4	6	1	5	12
Surprise	8	4	3		3	2	7	2	6	3	3	3	3	5	7	2	7	7
Others				2												3		1

APPENDIX (Cont'd)

Categories	35	36	37	38	39	40	41	42	43	44	45	46	47	TOTAL	MEAN	S.D.
Fear		4	3	2	1		7	5	4	2	2	2	4	163	3.47	1.68
Suffering	3	1	3	1	1			1	2	1		3	3	75	1.59	1.22
Sorrow	3	6		7	2	4		2	4	4	1	3	2	160	3.40	2.09
Anger		1	2	4		1	1	1	1	3	1		1	76	1.62	1.43
Hate	1	2				2	1		4		2	6	1	57	1.61	1.29
Contempt	4			1	3	4	3	5	5	4	4	3	5	137	2.91	1.79
Distrust			2		4	3		1	1					31	.66	.86
Hope	2								2	1		1	1	62	1.32	1.49
Sympathy		1			1	1	1		1					13	.28	.49
Love	1				2		1	4		1	1			55	1.17	1.26
Happiness	8	6	4	4	5	3	6	4	4	6	5	2	9	240	5.11	2.22
Interest	5	6	9	5	3	7	3	5		3	7	4	2	207	4.40	2.47
Surprise	5	4	9	8	8	7	7	4	4	6	5	7	4	206	4.38	2.49
Others		1					2			1	4	1		22	.47	.94

APPENDIX (Cont'd)