

AN EXPERIMENTAL STUDY OF MUSIC USED AS A  
STIMULUS FOR PROJECTION

by

Richard Henry Thomas

-----

A Thesis

submitted to the faculty of the

Department of Philosophy

and Psychology

in partial fulfillment of the

requirements for the degree of

MASTER OF ARTS

in the Graduate College

University of Arizona

-----

1953

Approved: \_\_\_\_\_

*Osiney*  
Director of Thesis

*May 18, 1953*  
Date

Univ. of Arizona Library

111

2

This thesis has been submitted in partial fulfillment of requirements for an advanced degree at the University of Arizona and is deposited in the Library to be made available to borrowers under rules of the Library. Brief quotations from this thesis are allowable without special permission, provided that accurate acknowledgment of source is made. Requests for permission for extended quotation from or reproduction of this manuscript in whole or in part may be granted by the head of the major department or the dean of the Graduate College when in their judgment the proposed use of the material is in the interests of scholarship. In all other instances, however, permission must be obtained from the author.

SIGNED:

*Richard H. Henry Thomas*

## ACKNOWLEDGMENT

The author wishes to dedicate this work to Margaret, his wife, whose encouragement and assistance have been of inestimable value in the preparation of this work, and to express his gratitude to Dr. Ole A. Simley, director of the present problem, whose suggestions and encouragement have been important factors in the completion of this work.

## TABLE OF CONTENTS

	<u>Page</u>
Introduction . . . . .	1
Statement of the Problem . . . . .	7
Apparatus and Subjects for Part I . . . . .	10
Procedure for Part I . . . . .	13
Results for Part I . . . . .	15
Apparatus and Subjects for Part II . . . . .	19
Procedure for Part II . . . . .	20
Results for Part II . . . . .	23
Correlation of the Results for Part I and Part II . . . . .	26
Conclusions . . . . .	30
Summary . . . . .	35
Appendix A: Major Categories and Sub-Categories for Scoring . . . . .	38
Appendix B: Description of the Thematic Apperception Test Pictures . . . . .	42
Appendix C: Sample Stories for the Second Musical Selection . . . . .	45
Appendix D: Sample Stories for the Second Thematic Picture . . . . .	47
Bibliography . . . . .	49

## INTRODUCTION

The historical introduction of the term projection into psychological literature may be found in Freud's paper The Anxiety Neurosis in 1894 wherein he said that "...the psyche develops the neurosis of anxiety when it feels itself unequal to the task of mastering (sexual) excitation arising endogenously. That is to say, it acts as if it had projected this excitation into the outer world..." (10) From this Freud elaborated upon the concept to include it as an ego (or unconscious) defense process in neurotic and psychotic individuals. (9, 10) From these early works the concept of projection as a defense mechanism was adopted by the psychoanalysts. Even as late as 1930, Healy, Bronner and Bowers define projection as "...a defense process under sway of the pleasure principle whereby the ego thrusts forth on the external world unconscious wishes and ideas, which, if allowed to penetrate into consciousness, would be painful to the Ego." (13) Warren's Dictionary of Psychology (1934) defines projection as "...the tendency or act of ascribing to the external world repressed mental processes which are not recognized as being of personal origin, as a result of which the content of these processes is experienced as an outer perception (e.g. the mechanism of delusions of persecution)." (37) The common elements contained in these definitions of

the concept, as well as others current at the time, were the following:

- (1) the process of projection is unconscious;
- (2) the process of projection serves as a defense mechanism against unconscious drives;
- (3) the process of projection results in the attributing to others of unconscious impulses, feelings, ideas, and attitudes;
- (4) the process of projection reduces personal tensions.

Many techniques have been developed to test these elements of the concept. The most famous of these techniques are the Rorschach ink-blot test and the Murray Thematic Apperception Test. The experimental evidence resulting from the use of these techniques has tended to indicate the inadequacy of the definition of the concept as a defense mechanism or has indicated that the techniques used are not valid for testing the elements of the concept. Typical of these is Ballak's investigation with the use of post-hypnotic suggestion of elation which was later found as projected material in the Thematic Apperception Test stories. (5) The recent trend has been to modify the definition of projection. Freud appeared to presage this trend when he wrote in his later work Totem and Taboo that "...the projection of unconscious hostility upon demons in the taboo of the dead is only a single example from a whole series of processes to which we must grant the greatest influence in the formation of primitive

psychic life. In the foregoing case the mechanism of projection is used to settle an emotional conflict; it serves the same purpose in a large number of psychic situations which lead to neuroses. But projection is not specially created for the purpose of defense, it also comes into being where there are no conflicts. The projection of inner perceptions to the outside is a primitive mechanism which, for instance, also influences our sense-perceptions, so that it normally has the greatest share in shaping our outer world. Under conditions that have not yet been sufficiently determined even inner perceptions of ideational and emotional processes are projected outwardly, like sense perceptions, and are used to shape the outer world, whereas they ought to remain in the inner world." (9) Farther on in the same work, Freud states that "...the thing which we, just like primitive man, project in outer reality, can hardly be anything else but the recognition of a state in which a given thing is present to the senses and to consciousness, next to which another state exists in which the thing is latent, but can reappear, that is to say, the co-existence of perception and memory, or, to generalize it, the existence of unconscious psychic processes next to conscious ones..." (9) Recently, investigators have concluded that these generalizations of the concept of projection more adequately define it and are more consistent with contemporary personality theory than its former definition as a defense mechanism. (1, 7, 19) For the purpose

of this study, projection will be defined as the operation within the organism of past perceptual memories upon contemporary stimuli with varying degrees of apperceptive distortion and of consciousness involved in the operation.

Projective material or stimuli which evoke projection through use of the visual sense modality have been extensively explored. As a result, some refined techniques have been developed by experimental investigations such as Rorschach's ink-blot test and Murray's Thematic Apperception Test. (21, 17) But extensive exploration of the auditory sense modality as a medium for projection has not been well represented in projective research. Many studies of the psychological effects of music have been made (28), but one of the first studies of its use as an auditory projective stimulus was by Kunze in 1938. (16) Kunze, in using what he called the Musical Reverie Test, presented six musical selections by phonograph to several individual subjects who were told that the experimenter was interested in music and was trying to discover the images and themes associated with the music. Two kinds of mental processes were noted by Kunze: free association and thematically organized fantasies. The latter were stated to be more valuable for diagnostic purposes. Skinner in 1936 initiated a technique called the Verbal Summator (31) which was adapted by Trussell in 1939 as an auditory projective stimulus. It consisted of two records of forty patterns of one, two or three vowel sounds presented to normal and abnormal subjects

by a repeating phonograph. The results for normal and abnormal subjects were compared qualitatively and quantitatively. It was stated that the summator did not significantly differentiate the two groups diagnostically, although a few qualities of summated speech were found to be significant (36). In 1940 Shakow and Rosenzweig renamed the Verbal Summator as the Tautophone and developed a new system of scoring the results of its administration. (29) In 1942 Grings administered the Verbal Summator to three groups of "abnormal-mental-states" patients and used the new system of scoring developed by Shakow and Rosenzweig. He found the results differentiated the three groups in many of the scoring-categories and concluded that the device is useful in personality study but limited in diagnostic value. (11) In 1950 Stone (33) suggested a recorded auditory apperception test as a new projective technique which consists of patterns of recorded sound effects to be administered to subjects as a stimulus for the operation of projection by the fantasy or story-telling technique. (27, 39) In 1951 Wilmer mentions that a study is being made of Stone's suggested auditory apperception test. (40) In 1953 Ball and Bernardoni administered a combination of thirteen of Stone's sound effects and of Wilmer's sound associations to three "Court's Martial" disciplinary subjects. The results are analyzed, interpreted and compared with other clinical procedure results. The authors conclude that their Auditory Apperception Test

may be of practical value as a projective technique in clinical diagnosis and that it offers possibilities for further research in personality (3). These studies summarize the extent of the investigation of the use of the auditory sense modality as a medium for projection.

## STATEMENT OF THE PROBLEM

The limited number of investigations of the auditory sense modality indicates a need for further experimental research. This would be of particular value in work with the blind and with individuals having dominant auditory imagery (21, 41) as well as the possibility of being complementary in value with the visual projective stimuli. It is the purpose of this study to determine whether music will give fantasy or story-telling material of a projective type related to the fantasy or story-telling material found in the Murray Thematic Apperception Test.

During the investigations of projection certain techniques and stimuli were developed to test the concept. From the comparison of those that were not successful with those that have become experimentally successful certain factors have been deduced which tend to encourage successful operation of the process of projection. Firstly, the material or stimuli must have the properties such:

- (1) that it be relatively unstructured but subject to spontaneous choice of response and structuring by the responding individual;
- (2) that it produce a maximum expression of individual differences;
- (3) that the realm of behavior to which it is applied

will not be a conventionalized one, or one remote from the personality structure;

- (4) that the response to it be subject to easy observation;
- (5) that the response to it be subject to easy registration;
- (6) that the material obtained from it be subject to systematization or scoring by direct intra- and inter-individual comparison;
- (7) that the significance of the material or stimuli and the response to it be unknown to the subject.

Secondly, the material or stimuli must be presented in a controlled experimental procedure such:

- (1) that it is identical for all subjects yet promoting variation in time, interest and subject's interpretation;
- (2) that it present a problem to be worked out in the subject's own terms without revealing the true purpose of the presentation;
- (3) that the physical situation is comfortable, pleasant, one of minimal distraction, and optimal for experimental conditions;
- (4) that the relation of the experimenter to all subjects is uniform and neutral yet showing friendliness and encouragement for maximal rapport without participating in the individual's problem-solving

behavior;

- (5) that the individual's interest and effort are optimally aroused;
- (6) that, though the individual's behavior in the experimental situation is regulated, he is permitted the fullest and freest self expression in response to the presentation of the material or stimuli.

(15, 18)

For the purpose of this study, these criteria, which serve to distinguish a successful projective stimulus from an unsuccessful one, will be used as the basis for the selection of the musical excerpts and for the procedure used in presenting these excerpts to an experimental group. Likewise, these criteria will be adhered to in presenting the Thematic Apperception Test material.

## PART I

## Apparatus and Subjects

The apparatus used for this part of the study consisted of brief excerpts of fourteen orchestral musical selections transcribed onto a tape recording to permit ease of presentation. The orchestral musical excerpts transcribed were in the following order:

- (1) the full two minutes and fifty seconds of The Rakes of Mallow from the Irish Suite, composed by Leroy Anderson and played by Arthur Fiedler and the Boston Pops orchestra on Victor LM-1093 long playing recording;
- (2) the last two minutes and three seconds of Part IV (Carillon) of Suite I from L'Arlesienne, composed by Georges Bizet and played by André Kostelanetz and his Concert Orchestra on Columbia ML-4409 long playing recording;
- (3) the last two minutes and thirty seconds of Part I (Dreams, Passions) from the Symphonie Fantastique, composed by Hector Berlioz and played by Eugene Ormandy and the Philadelphia Orchestra on Columbia ML-4467 long playing recording;
- (4) the last one minute and forty-one seconds of the Coriolanus Overture, composed by Ludwig van Beethoven and played by Eugene Ormandy and the Philadelphia Orchestra on Columbia AAL-15 long playing recording;
- (5) the last one minute and thirty-nine seconds of Part II (The Structures) of City of Glass, composed by Robert Graettinger and played by Stan Kenton and his Orchestra on Capitol H-353 long playing recording;
- (6) the last two minutes and five seconds of the Overture to Byron's Manfred, composed by Robert Schumann and played by George Lehmann and the Bamberg Symphony Orchestra on Decca DL-4017 long playing recording;

- (7) the first one minute and forty-nine seconds of Part II (Allegro, The Pleasure of Vengeance) from the Symphonic Suite No. 2 Antar, composed by Nikolai Rimsky-Korsakov and played by Erich Leinsdorf and the Cleveland Orchestra on Columbia ML-2044 long playing recording;
- (8) the full one minute and thirty-seven seconds of the Tortured Waltz from Peches de Vieillesse, composed by Giocchino Rossini as arranged in Matinees Musicales by Benjamin Britten and played by Arthur Fiedler and Boston Pops Orchestra on Victor LM-1093 long playing recording;
- (9) the full three minutes and seven seconds of Part IV (Thunderstorm) from the Pastoral Symphony No. 6, composed by Ludwig van Beethoven and played by Bruno Walter and the Philadelphia Orchestra on Columbia ML-4010 long playing recording;
- (10) the first two minutes of Part I (Harold in the Mountains; Scenes of Melancholy, Happiness and Joy) from Harold in Italy, composed by Hector Berlioz and played by Breitenbach as the conductor and Georg Moralt as the violist with the Vienna Symphony Orchestra on Vox PL-6700 long playing recording;
- (11) the first one minute and forty-nine seconds of Part II (The Hero's Adversaries) from Heldenleben, composed by Richard Strauss and played by Fritz Reiner and the Pittsburgh Symphony Orchestra on Columbia ML-4138 long playing recording;
- (12) the first one minute and thirty-five seconds of Part IV (Reflections) from City of Glass, composed by Robert Graettinger and played by Stan Kenton and his Orchestra on Capitol H-353 long playing recording;
- (13) the last one minute and forty seconds of Part IV (March to the Scaffold) from the Symphonie Fantastique, composed by Hector Berlioz and played by Eugene Ormandy and the Philadelphia Orchestra on Columbia ML-446 long playing recording;
- (14) the first one minute and twenty-two seconds of Part III from the Cuban Overture, composed by George Gershwin and played by Paul Whiteman and his Orchestra on Decca DL-8024 long playing recording.

A tape recorder, mounted on a four-foot-high, projection-machine table, was used to present the orchestral musical selections from the front of a laboratory classroom. The chairs and desks were arranged in five rows with five chairs to a row, the last row being within twenty-five feet of the tape recorder. Paper and extra pencils were available at each chair position.

The twenty-five subjects used were upper division college students obtained from a beginning mental tests and measurements psychology class. These students were of junior, senior, or graduate standing, and had completed at least a year's work in psychology. The students served as subjects during their scheduled three-hour afternoon laboratory period on February 6, 1953.

## PROCEDURE FOR PART I

When the subjects entered the laboratory room, the tape recorder was in position at the front of the room and the subjects were allowed to seat themselves as they wished within the five rows. The paper to be used by the subjects in recording their responses was distributed and extra paper and pencils were placed where they would be available if needed.

The subjects were asked whether they were ready and then the following set of memorized directions, as adapted from the Thematic Apperception Test instructions (32) was given:

"I am going to play some musical selections, one at a time, and your task will be to make up as dramatic a story as you can for each selection. Tell what has led up to what is happening in the music, describe what is happening at the moment in the music, what feelings and thoughts are in the music, and then tell the outcome of what is happening in the music. Write the thoughts as they come to your mind. You will be allowed enough time to complete your writing for each selection before the next one is played. Do you understand?"

When questions were asked, they were answered by quoting the appropriate phrase of the directions with no additional directions, phrases or words appended. When there were no more queries, the first selection was begun with the statement: "Here is the first selection." Upon completion of the playing of the first excerpt, enough time was allowed for the subjects to complete their writing; then the second excerpt was set to playing by the statement: "Here is the second selection."

This procedure was repeated for each succeeding selection through the seventh one. After the seventh selection was played and the subjects had completed their writing, they were told: "You may now take a ten-minute break, but you are requested not to discuss any part of this experiment with anyone until it is completed."

When the subjects had returned to their seats, the eighth selection was introduced by the statement: "Here is the eighth selection." When they had completed their writing, this procedure was repeated for each succeeding selection through the fourteenth and last selection. Then each subject was instructed to be sure his name was on each page and to note at the end of his paper his age, sex, and whether he had any previous musical training, such as lessons or courses, and if any, to note what and how much. At the time of dismissal, the experimental session had lasted two hours and forty-one minutes. The first part before the break lasted one hour and twenty-one minutes and the last part after the break lasted one hour and four minutes.

The written responses obtained were typed and coded with random numbers by a second person to eliminate names and handwriting characteristics, and to conceal the identity of the author from the person analyzing the responses.

## RESULTS OF PART I

Three broad interpretive methods have been devised for analyzing fantasy or story-telling material. (30, 38) Firstly, there is the need-press system of Murray and his associates (16, 17, 2, 23, 25, 32, 35, 22). Secondly, there is the more psychoanalytic interpretive system of Masserman and Balken (6), Ballak (4), Rapaport and associates (19), and Wyatt (42). Thirdly, there are the eclectic interpretive systems of Rotter and associates (24), Rodnick and Klebanoff (20), and Klebanoff (14, 30). Since Klebanoff's system was designed primarily for research rather than clinical interpretation and diagnosis, it has been adopted as the method of analyzing the results of the music responses.

In this method the content of the stories is tallied on a check list according to overtly stated themes, hero figures, solutions, and length of stories. These major categories are further elaborated into sub-categories which may be seen in Table 1 and Appendix A.

A check list format was designed so that each of the musical stories of one set of responses could be tabulated in its respective content categories on two scoring sheets with the assigned code number being used to identify the scoring-sheets. The scoring proceeded in such a manner that

the tabulation of a set of musical responses for one of the major categories, such as for themes, was alternated with the scoring of a set of thematic picture responses, of Part II of this experiment, for the same major category by a random selection of alternating the set of responses.

The major category tabulations for each musical scoring-sheet were summarized and totaled and percentages for the major categories were figured. Tables 1 and 2 show the summary of the percentages for the major categories for each subject.

Appendix C contains three sample stories of long, medium, and short length for one female and two male subjects in response to the presentation of the second musical selection.

TABLE I

MUSICAL REVERIE TEST  
Summary of Percentages in the Major Categories

	Male Subject										
	A	B	C	D	E	F	G	H	I	J	K
<u>I. Major Thema Category</u>											
A Loss of life	7	0	0	0	9	0	0	7	0	7	0
B Phys. Aggr.	43	25	17	14	27	8	21	21	0	14	8
C Non-Phys. Aggr.	7	8	0	29	0	8	0	29	7	14	0
D Int. Emot. Stress	14	8	25	21	18	8	21	7	36	21	17
E Positive Themas	29	58	58	36	45	77	57	36	64	43	75
<u>II. Solutions</u>											
A Fail. of cent. fig.	10	0	0	13	8	12	11	9	10	19	8
B Fail. of min. fig.	10	0	0	22	0	12	5	23	19	14	0
C Suc. of cent. fig.	45	15	42	35	31	47	32	27	43	43	31
D Suc. of min. fig.	20	0	0	17	8	12	21	18	14	19	0
E No solution	15	85	58	13	54	18	32	23	14	5	62
F Fail./cent. & min. fig.	20	0	0	35	8	24	16	32	29	33	8
G Suc./cent. & min. fig.	65	15	42	51	39	59	53	46	57	62	31
<u>III. Hero figure</u>											
A Man	93	85	*	71	*	85	71	93	*	79	97
B Woman	0	8	0	0	0	8	0	0	0	0	0
C Boy	0	0	0	0	0	0	7	0	0	14	0
D Girl	0	0	0	0	0	0	0	0	0	0	0
<u>IV. Length of stories</u>											
Avg. # words per story	94	24	50	43	38	53	80	96	76	109	72
C Boy	* indicates 100%										

TABLE II

MUSICAL REVERIE TEST  
Summary of Percentages in the Major Categories

	Female Subject								
	<u>M</u>	<u>N</u>	<u>O</u>	<u>P</u>	<u>Q</u>	<u>R</u>	<u>S</u>	<u>T</u>	
<u>I. Major Thema Category</u>									
A Loss of life	29	7	14	0	0	0	50	7	
B Phys. Aggr.	14	29	14	7	7	36	14	36	
C Non-Phys. Aggr.	14	14	7	14	43	14	0	7	
D Int. Emot. Stress	21	21	29	21	14	7	14	14	
E Positive Themas	21	29	36	57	36	43	21	36	
<u>II. Solutions</u>									
A Fail. of cent. fig.	29	17	15	7	11	19	45	11	
B Fail. of min. fig.	19	6	20	0	0	13	10	17	
C Suc. of cent. fig.	24	22	25	25	37	25	20	44	
D Suc. of min. fig.	14	17	15	13	27	13	20	6	
E No solution	14	39	25	56	26	31	5	22	
F Fail./cent. & min. Fig.	48	22	35	6	11	31	55	28	
G Suc./cent. & min. fig.	38	39	40	38	63	38	40	50	
<u>III. Hero figure</u>									
A Man	50	29	29	31	21	21	29	38	
B Woman	36	50	43	54	64	50	43	64	
C Boy	0	21	7	0	0	14	0	0	
D Girl	7	0	7	0	0	0	0	0	
<u>IV. Length of stories</u>									
Avg. # words per story	151	71	143	37	56	41	105	73	

## PART II

## Apparatus and Subjects

The apparatus used in this part of the study consisted of twenty of Murray's Thematic Apperception Test picture series in the following number and order: #1, #3GF, #3BM, #4, #6BM, #6GF, #7BM, #7GF, #8BM, #9GF, #12F, #12M, #13MF, #15, #17GF, #17BM, #18GF, #18BM, #19, and #20. (17) An elaborated description of these pictures is contained in Appendix C.

The laboratory classroom was arranged, as in the previous Part I, in five rows with five chairs to the row. A second table was placed immediately in front of and at the center of each row. A means of supporting the T.A.T. pictures one at a time was devised so that all subjects of that particular row could view the picture easily, yet the picture would not be visible to those in the next row ahead. Paper and extra pencils were available at each chair position.

The twenty-one subjects used were from the same beginning mental tests and measurements psychology class as in Part I. Nineteen of the subjects are identical with those of Part I. The students served as subjects during their scheduled three-hour afternoon laboratory period on February 13, 1953.

## PROCEDURE FOR PART II

As the subjects entered the laboratory room, they were placed so that those subjects who wrote the fastest and the least, as based on their previous performance in Part I, were in the last row and those who wrote the slowest and the most were in the front or first row with the rest of the subjects gradated accordingly in the middle three rows. When the subjects were all seated, they were given the reason for the seating arrangement. Those in the front rows were told that there would be a slight delay of about fifteen minutes or less before they would be able to begin the experiment. The subjects were then given the following set of memorized directions, as adopted from Stein's administrative instructions (32):

"I am going to show you some pictures, one at a time, and your task will be to make up as dramatic a story as you can for each. Write what has led up to the scene shown in the picture, describe what is happening at the moment, what the people are feeling and thinking, and then give the outcome. Write your thoughts as they come to mind. You will be allowed enough time to complete your work. Do you understand?"

When questions were asked, they were answered by citing the appropriate phrase of the directions with no additional directions, phrases or words appended. When there were no more queries, the experimenter proceeded to the table in front of the last row (fifth) where the T.A.T. picture cards

were stacked face down in the previously listed order of presentation. As the first card was placed in position for viewing, the subjects in the row were told: "Here is the first picture." After two minutes and thirty-seconds, all the subjects in the last row had completed their writing and a second card was positioned with the comment, "Here is the second picture." The first card was then taken and positioned on the table in front of the next-to-last row (fourth) with the comment, "Here is the first picture." Thus, as each row completed their writing for a particular picture, it was progressively moved from the back row toward the front row with the proper sequential-order number being given when it was positioned for the subjects of that row. A lapse of fifteen minutes duration occurred between the time of presentation of the first picture to the last (fifth) row and its final presentation to the front (first) row.

When the last row had completed their writing for the tenth picture, they were told: "You may now take a ten-minute break, but you are requested not to discuss any part of this experiment with anyone until it is completed." Upon returning to their seats after the rest period, the eleventh card was positioned with the correct order number being mentioned. As each row of subjects, progressively toward the front, completed writing for the tenth card, they were given a rest period with the same instructions given the last row before and after the break.

When the last row had completed their writing for the twentieth and last picture, they were asked to be sure their names were on each sheet of paper; to note, at the end or on the back of their last sheet, their marital status, their brothers and/or sisters, with their ages, and their outside work interest or vocation. After they had supplied this information and turned in their papers, they were dismissed one hour and forty minutes after they had begun. Progressively thereafter, each row of subjects completed their writing and were likewise instructed and dismissed. The front row of subjects completed their work in two hours and fifty minutes.

The written responses obtained were typed and coded by a second person with a different set of random numbers than those used for the musical responses. Only those Thematic Apperception Test responses that were matched by musical responses of the same person were so typed, coded and analyzed.

## RESULTS OF PART II

The Thematic Apperception Test responses, as coded and typed, were analyzed by the use of Klebanoff's system (14, 30) as previously adopted and used for analyzing the musical responses. The same scoring-sheet format was used for tabulating the thematic picture responses in their respective major and minor categories as was used in scoring the musical responses with the exception of its expansion to accommodate the tabulation of a greater number of stories. The procedure for scoring the thematic picture stories, as previously noted, was one of a random selection of alternation with the musical stories in tabulating responses for each of the major categories. The major category tabulations for each picture-scoring sheet were summarized and totaled and percentages for the major categories were figured. Tables 3 and 4 show the summary of the percentages for the major categories for each subject.

Appendix D contains three sample stories of long, medium, and short length for the same female and two male subjects, as those in Appendix C, in response to the presentation of the second Thematic Apperception Test picture.

TABLE III

THEMATIC APPERCEPTION TEST  
Summary of Percentages in the Major Categories

	Male Subject										
	A	B	C	D	E	F	G	H	I	J	K
<u>I. Major Thema Category</u>											
A Loss of life	15	0	5	5	5	0	0	10	0	0	10
B Phys. Aggr.	25	10	5	15	20	25	15	15	10	10	5
C Non-Phys. Aggr.	0	0	10	25	5	5	10	20	10	10	20
D Int. Emot. Stress	40	15	35	25	25	25	45	20	35	35	25
E Positive Themas	20	75	45	30	45	45	30	35	45	45	40
<u>II. Solutions</u>											
A Fail. of cent. fig.	15	0	0	0	0	23	11	28	18	29	28
B Fail. of min. fig.	21	0	9	24	0	4	14	24	5	7	8
C Suc. of cent. fig.	33	17	22	45	0	35	32	28	32	21	8
D Suc. of min. fig.	18	17	4	10	0	19	21	10	5	21	12
E No solution	12	65	65	21	*	19	21	10	41	22	44
F Fail./cent. & min. fig.	36	0	9	24	0	27	25	52	23	37	36
G Suc./cent. & min. fig.	52	35	26	55	0	54	54	38	36	43	20
<u>III. Hero figure</u>											
A Man	58	50	45	45	50	60	50	45	50	55	55
B Woman	21	25	25	25	25	25	30	30	25	25	30
C Boy	16	15	20	15	10	10	10	20	15	10	10
D Girl	0	5	5	10	5	5	10	5	10	10	5
<u>IV. Length of stories</u>											
Avg. # words per story	155	40	37	34	43	71	53	78	70	93	59

\* indicates 100%

TABLE IV

THEMATIC APPERCEPTION TEST  
Summary of Percentages in the Major Categories

	Female Subject							
	M	N	O	P	Q	R	S	T
<b>I. <u>Major Thema Category</u></b>								
A Loss of life	22	10	10	15	5	0	20	5
B Phys. Aggr.	17	15	15	15	20	15	15	20
C Non-Phys. Aggr.	17	20	10	0	10	10	20	5
D Int. Emot. Stress	28	30	20	40	35	50	25	25
E Positive Themas	17	25	45	30	30	25	20	45
<b>II. <u>Solutions</u></b>								
A Fail. of cent. fig.	31	0	19	0	7	6	40	5
B Fail. of min. fig.	23	0	7	4	7	21	20	0
C Suc. of cent. fig.	15	5	23	21	42	36	27	9
D Suc. of min. fig.	12	5	26	13	29	18	13	9
E No solution	19	91	26	63	16	18	0	77
F Fail./cent. & min. fig.	54	0	26	9	13	9	60	5
G Suc./cent. & min. fig.	27	10	48	33	71	55	40	18
<b>III. <u>Hero figure</u></b>								
A Man	44	25	25	30	25	25	25	25
B Woman	38	60	51	50	60	55	50	60
C Boy	11	5	12	5	10	10	20	10
D Girl	6	5	6	5	5	5	5	5
<b>IV. <u>Length of stories</u></b>								
Avg. # words per story	126	60	133	34	57	56	94	55

## CORRELATION OF THE RESULTS OF PART I AND PART II

The resulting summary percentages in each of the major categories for each set of musical responses were matched with their respective resulting summary percentages for each set of picture responses. Coefficients of correlation were calculated by the product-moment formula and were corrected for the number of cases. These corrected correlation values between the scoring-categories of the musical responses and the picture responses were transformed into normally distributed "z" function values and critical ratios were calculated from the standard error of the "z" function values. Table 5 shows a summary of the calculated correlation coefficients, critical ratios and the probability against the occurrence of a deviation as great as or greater than the designated standard error between the two sets of corresponding scoring-categories of the musical responses and the picture responses.

Tables 1, 2, 3, and 4 show a related division between the sexes under the scoring-category of Hero Figure, overtly expressed as man or woman, on both the musical stories and the picture stories which is not evident on any of the other major categories. The null hypothesis has been applied to determine if these differences of means and variances are

significant between the sexes in the two Hero Figure categories for both the musical stories and the picture stories. The results are summarized in Table 6.

TABLE V

Summary of the Correlations Between the Corresponding Scoring-Categories of the Musical Responses and the Picture Responses

	r	z	C.R. of z	Probability against occurrence
<u>I. Major Thema Category</u>				
A Loss of life	0.678	0.825	3.291	1000:1
B Phsy. Aggr.	0.272	0.279	1.116	3:1
C Non-Phsy. Aggr.	0.781	0.105	4.192	16000:1
D Int! Emot. Stress	0.105	0.127	0.423	less than 1:1
E Positive Themas	0.519	0.575	2.300	45:1
<u>II. Solutions</u>				
A Fail. of cent. fig.	0.611	0.711	2.842	220:1
B Fail. of min. fig.	0.450	0.484	1.939	18:1
C Suc. of cent. fig.	0.146	0.147	0.588	less than 1:1
D Suc. of min. fig.	0.404	0.428	1.7136	10:1
E No solution	0.685	0.839	3.35	1200:1
F Fail./cent. & min. fig.	0.672	0.814	3.258	900:1
G Suc./cent. & min. fig.	0.462	0.500	2.000	21:1
<u>III. Hero Figure</u>				
A Man	0.912	1.539	6.157	$5 \times (10)^8 : 1$
B Woman	0.966	2.029	8.115	$4 \times (10)^{11} : 1$
<u>IV. Length of stories</u>				
Avg. # words per story	0.824	1.162	4.668	$(10)^4 : 1$

TABLE VI

Summary of Related Sex Differences on the Corresponding Scoring Categories of Hero Figure for Both Sets of Test Responses

<u>Category</u>	<u>Hero Figure Man</u>			
	<u>M.R.T.</u>		<u>T.A.T.</u>	
Test	Man	Woman	Man	Woman
Sex of Person	Man	Woman	Man	Woman
Means	88	30.75	51.2	28
S. D.	10.24		5.883	
S. E.	1.24		0.83	
C. R. (t)	40.3		28.3	
Sign. of means	above 1% level		above 1% level	
C. R. (F)	0.71		1.64	
Sign. of var.	below 5% level		below 5% level	

  

<u>Category</u>	<u>Hero Figure Woman</u>			
	<u>M.R.T.</u>		<u>T.A.T.</u>	
Test	Man	Woman	Man	Woman
Sex of person	Man	Woman	Man	Woman
Means	1.45	50.5	26	53.1
S. D.	6.438		3.919	
S. E.	0.89		0.54	
C. R. (t)	55.1		49.8	
Sign. of means	above 1% level		above 1% level	
C. R. (F)	9.5		3.38	
Sign. of var.	above 1% level		above 5% level	

## CONCLUSIONS

### A. Relationships

The purpose of this study has been to determine whether music will give fantasy or story-telling material of a projective type related to the fantasy or story-telling material found in the Murray Thematic Apperception Test.

Firstly, the results in Table 5 show seven positive correlations between the scoring-categories of the musical responses and the picture responses that have reliability above the one percent level of significance; three positive correlations between the scoring-categories that have reliability above the five percent level of significance; and five correlations between the scoring-categories that have reliability below the five percent level of significance, although they all show some degree of positive relationship. Thus, the results would seem to indicate a better than ten to five ratio of statistical relationship between the story-telling material elicited by the auditory musical stimuli, Kunze's Musical Reverie Test (16), and visual picture stimuli, Murray's Thematic Apperception Test (17).

Secondly, the results of Table 6 show that, when the hero-figure category is man, men have a significantly higher percentage of man heroes than women on both the musical stories and the picture stories. The results of Table 6 also show that,

when the hero-figure category is woman, women have a significantly higher percentage of women heroines than men heroes on both the musical stories and the picture stories.

Thirdly, clinical interpretation and diagnosis has not been attempted as a means of evaluating the relationship between these two tests. However, during the analysis of the tests it was noted that there was a slight increase in the overt expression of aggression and fatigue in the last few stories of the musical responses and the picture responses.

#### B. Comparison with other results

A search of the literature has disclosed no study of the quantitative relationship of the Musical Reverie Test and the Thematic Apperception Test. Kunze (16) in his study using musical stimuli states that two mental processes were noted: free associations and thematically organized fantasies. The latter were stated to be more valuable for diagnostic purposes. No quantitative data were included as evidence to support this conclusion. Likewise, Ball and Bernardoni (3) in their study state that their Auditory Apperception Test has been used on groups and individuals, with the results indicating practical clinical value. Here, also, no quantitative evidence was presented to verify this conclusion. Shakow (29) and fellow experimenters (36, 11) using the Tautophone (Verbal Summator) have endeavored to relate their auditory apperceptive technique with the Rorschach.

ink-blot test but not with the Thematic Apperception Test. This is the extent of research with the use of the Musical Reverie Test and related techniques as auditory projective stimuli.

Murray (17) contends that subjects draw on past experience during the production of fantasy material for the Thematic Apperception Test. Several studies have been undertaken to demonstrate the relationship of T.A.T. story material and other fantasy production material. Sarason (26) showed that twenty-five institutionalized mentally defective girls produced the same major themes in T.A.T. stories and in dreams when both were interpreted from the same basis, i.e., that of the T.A.T. stories. Combs (8) used T.A.T. story material and autobiographical material of forty-six college students and reduced each T.A.T. story and autobiographical incident to a "thema." When he had examined the two sets of data simultaneously and had isolated those instances in which a T.A.T. thema could be substantiated from autobiographical material, he found perfect agreement with his previous analysis which would tend to substantiate Murray's contention. Likewise, the T.A.T. and the Rorschach have been found to overlap with case history data (12). These studies suffer from three difficulties. Firstly, the T.A.T. material may show unconscious fantasies and desires as well as conscious material. Secondly, the process of summarization used in analyzing the materials may promote loss of important

relationships. Thirdly, the data may be contaminated by the clinician's projections or biased organization rendering the findings in line with his desires.

### Discussion

In this study an attempt has been made to minimize those difficulties encountered in previous studies on the relationships of T.A.T. produced material with other production materials. Firstly, the related stimuli have been chosen such that it may satisfy the previously elaborated criteria of successful projective techniques or stimuli. Secondly, an attempt has been made to present the material or stimuli under controlled experimental conditions. Thirdly, a quantitative method of scoring has been sought and adapted.

However, certain difficulties have been encountered and noted. Firstly, in some instances the musical stimuli did not promote the overt expression of precisely the same types of hero figures as the T.A.T. picture material. This may be noted in the summary results of Table 6 on related sex differences and Table 1 and 2 for the major categories of man and woman. The men rarely mention women hero-figures in the musical stories; whereas in the T.A.T. stories they did to a much higher degree. Also, the hero-figures had to be introduced into the musical stories; whereas in the T.A.T. material there were human figures pictured in the presented material. Secondly, the procedure used in presenting the T.A.T. material

may account for the extremely high correlation for the length of stories. In this regard, the giving of the reason for the seating arrangement to the subjects may have carried a suggestion for writing shorter, or longer, stories as based on their previous performance. Thirdly, even though the procedure for scoring the responses was designed for "blind" analysis, there is still the possibility of the introduction of the personal bias of the scorer. This may account for all the calculated categories being positively related. In this regard, however, no subject's musical-response-scoring was immediately followed by his picture-response-scoring, except by chance, because of the random procedure adopted in scoring the two sets of responses alternately. Fourthly, since this study is in the nature of an experimental exploration, certain experimental control variables have not been accounted for and equated out by the design. Some of these variables that should be investigated by further research are: (1) fatigue effects, (2) effects of presenting the T.A.T. pictures first and the musical selections second, (3) independent analysis of the two sets of responses by two different analyzers, (4) use of a different scoring system, (5) presenting the same tests to two differing personality groups that are matched for sex, age, intelligence, such as blind individuals or institutionalized groups, and (6) presenting the tests to one individual at a time rather than to a single group at one or two sessions.

## SUMMARY

In 1894 Freud (10) first introduced the term projection to psychological literature as a phenomenon of personality behavior. Since then many techniques have been developed to determine and test the elements of this phenomenon. Visual projective stimuli have been extensively explored but a search of the literature reveals a dearth of the use of auditory stimuli for projection.

The purpose of this study has been to determine whether music will give fantasy or story-telling material of a projective type related to the fantasy or story-telling material found in the Murray Thematic Apperception Test. The procedure consisted of presenting fourteen short musical selections in a laboratory classroom session to a psychology class group with directions to make up a dramatic story for each selection. The Thematic Apperception Test of twenty pictures was also given to the same group. The results of both tests were analyzed by a system of content scoring-categories adapted from Klebanoff's work (14). A scoring procedure was devised so that the names were replaced by randomly different code numbers for both sets of stories. The responses were then typed. The scoring proceeded by random alternation of each set of coded responses on each of four major categories with fifteen sub-categories thereunder. Correlations between the corresponding scoring-categories of the musical responses and the

picture responses were calculated for which the following statistical relationships were found.

1. Seven positive correlations that are significant at or above the one percent level were found between the thema scoring-categories of loss of life and of non-physical aggression; between the solution scoring-categories of no solution and of failure of central and minor figure; between the hero-figure scoring-categories of man and of woman; and between the scoring-category of length of stories.

2. Three positive correlations that are significant at or above the five percent level were found between the thema scoring-category of positive themas; between the solution scoring-categories of failure of the central figure and of success of the central and minor figures.

3. The five correlations between the scoring-categories of themas and solutions of the musical responses and the picture responses that are not significant at the five percent level or higher are all in a positive direction.

A related percentage-difference was found between the sexes in the corresponding scoring-categories of hero-figure man, or woman, for both the musical responses and the picture responses.

The results have been related to those of other investigators along the same or similar lines and have tended to support their qualitative findings with the statistical evidence presented herein. Mention has been made of some of the

difficulties and differences encountered in the results of the two sets of responses and recommendations have been made for further experimental research and exploration regarding relationships of these two test materials.

## APPENDIX A

Major Categories and Sub-Categories  
For Scoring

The following is a complete list of the major categories and sub-categories used in scoring both sets of responses:

## I. Themes:

## A. Loss of life

1. Murder

2. Death

3. Suicide

## B. Physical Aggression

1. Physical Violence

2. Injury - accidental

3. Illness

4. Crime

5. Punishment

6. Arrest - capture

7. Escape

8. Threat - repression - bullying

## C. Non - Physical Aggression

1. Quarrel

2. Domination

3. Antagonism

4. Dishonesty - cheating

5. Disloyalty

6. External Conflict

7. Hate - revenge

8. Anger - rage

D. Internal Emotional Stress

1. Deprivation

2. Internal Conflict

3. Emotional Stress

4. Misfortune

5. Disappointment

6. Separation

7. Despondency

8. Jealousy

9. Fear

10. Anxiety

11. Rejection

12. Guilt

E. Positive Themes

1. Reassurance

2. Sex

3. Pity - forgiveness

4. Gratitude - friendship

5. Love

6. Happiness

7. Obligation

8. Affection

9. Repentance

## 10. Goal

## II. Solutions:

## A. Failure of central figure

1. Economic
2. Social
3. Power
4. Love

## B. Failure of minor figure

1. Economic
2. Social
3. Power
4. Love

## C. Success of central figure

1. Economic
2. Social
3. Power
4. Love

## D. Success of minor figure

1. Economic
2. Social
3. Power
4. Love

## E. No Solution

## III. Hero Figure:

## A. Man

## B. Woman

- C. Boy
- D. Girl
- E. Animal
- F. Inanimate object

IV. Length of stories.

## APPENDIX B

Description of the Thematic  
Apperception Test Pictures

The following list is a description of the Thematic Apperception Test pictures used:

- (1) #1. A young boy is contemplating a violin which rests on the table in front of him.
- (2) #3GF. A young woman is standing with down-cast head, her face covered with her right hand. Her left arm is stretched forward against a wooden door.
- (3) #3BM. On the floor against a couch is the huddled form of a boy with his head bowed on his right arm. Beside him on the floor is a revolver.
- (4) #4. A woman is clutching the shoulders of a man whose face and body are averted as if he were trying to pull away from her.
- (5) #6BM. A short elderly woman stands with her back turned to a tall young man. The latter is looking downward with a perplexed expression.
- (6) #6GF. A young woman sitting on the edge of a sofa looks back over her shoulder at

an older man with a pipe in his mouth who seems to be addressing her.

- (7) #7BM. A gray-haired man is looking at a younger man who is sullenly staring into space.
- (8) #7GF. An older woman is sitting on a sofa close beside a girl, speaking or reading to her. The girl, who holds a doll in her lap, is looking away.
- (9) #8BM. An adolescent boy looks straight out of the picture. The barrel of a rifle is visible at one side, and in the background is the dim scene of a surgical operation, like a reverie-image.
- (10) #9GF. A young woman with a magazine and a purse in her hand looks from behind a tree at another young woman in a party dress running along a beach.
- (11) #12F. The portrait of a young woman. A weird old woman with a shawl over her head is grimacing in the background.
- (12) #12M. A young man is lying on a couch with his eyes closed. Leaning over him is the gaunt form of an elderly man, his hand stretched out above the face of the reclining figure.

- (13) #13MF. A young man is standing with down-cast head buried in his arm. Behind him is the figure of a woman lying in bed.
- (14) #15. A gaunt man with clenched hands is standing among gravestones.
- (15) #17GF. A bridge over water. A female figure leans over the railing. In the background are tall building and small figures of men.
- (16) #17BM. A naked man is clinging to a rope. He is in the act of climbing up or down.
- (17) #18GF. A woman has her hands squeezed around the throat of another woman whom she appears to be pushing backwards across the banister of a stairway.
- (18) #18BM. A man is clutched from behind by three hands. The figures of his antagonists are invisible.
- (19) #19. A weird picture of cloud formations overhanging a snow-covered cabin in the country.
- (20) #20. The dimly illumined figure of a man (or woman) in the dead of night leaning against a lamp post. (17)

## APPENDIX C

## Sample Stories for the Second Musical Selection

Subject 0

They were at the ball, and it was lovely--it was just as all spring nights are with the smell of spring flowers, the clear nights, the stars and all of those things that only people in love really seem to appreciate. Her only thoughts seem to be concerned with making those short hours last forever, and they do--at least until the next morning when the realization comes that maybe last night's ball was only part of the magic that comes from your first date, your first dance, and your first long dress. For after all everyone says it is really much more convenient to fall in love and marry someone older than you, taller than you and isn't related to you, by being your aunts youngest son.

Subject I

The reflective man went into the woods to think, to learn, to understand. His mood was heavy. At first all that he saw seemed to express the tone of his own melancholy. Nature seemed pensive, yet noble and intimate. Then, as most men will, he felt a change of mood. He sensed the excitement of ever flowing life. The noises of the forest which at first were muffled and undisturbed, grew clear. He heard the wind in

the leaves, the brook whispering on its journey across the rocks, he heard the forest sing forth in a multiplicity of sounds. He found a new energy, a new meaning and he was happy.

#### Subject B

Brings to mind the orderliness, majesty and serenity of beautiful western scenery, as yet unspoiled by contact with civilization. The latter portions especially brings to mind the rugged majesty of a cloud-cloaked summit in the Rockies, while the earlier portions brought to mind a more serene scene--green wooded slopes and cold rushing streams.

## APPENDIX D

## Sample Stories for the Second Thematic Picture

Subject O

Jeanne had failed her entrance exams for the 2nd time. Oh, how she had hoped for the years to come. She had slaved over that test, and it was very hard for her to see that it would be necessary for her to work; and see her friends only on the week-ends that they came home. Also this mean't that Jeanne could not become a teacher, this too was a blow as this was what she had been planning for years. As she left the room, Dr. Washburn came up to her, he had obviously been very kind to her, it was not until he had talked to her for several minutes until she finally recovered enough to listen. She had been studying for this test for weeks, but she had, had no help and much of the material was hard for her to understand. Dr. Washburn suggested that maybe he could tutor her and could give her the test again before school started in Sept---Why had she been so upset, Jeanne thought to herself, she always became emotional before she looked at her problem objectively, and then when she did look at her problem objectively everything was soon settled.

Subject I

A woman sobs. Her uncontrollable weeping is so vented hopelessly into the night air. The Cause: I don't know the cause. Perhaps she has lost her love, or her child. She stands grasping on to the door as if for support. Life has doomed her into an abyss of endless melancholy. Question on question raise themselves to the threshold of her consciousness-- "Why oh Why?" She questions the very forendation of the former meanings which for her had proclaimed the infinite joy and pleasure of life. How could she ever have laughed, as young girls do, in high pitching squeals of senseless gayety. Yet tomorrow, what of tomorrow? She looks and wonders and fears. She fears herself; she fears life. Will her future be all that her past wasn't, --shadowed in endless panorama by gray shades of platent melancholy? Yet for her tomorrow will be bright and again she will face all with her former optimism.

Subject B

The girl has a hangover resulting from too much drink on the nite before. It is morning and she has just arisen--only to find that she is still dizzy and has a headache. She will make her way to the kitchen for some cold fruit juice and aspirin, both of which should help her condition immediately.

## BIBLIOGRAPHY

- (1) Abt, L. E., and Ballak, L. Projective Psychology  
New York: Alfred A. Knopf, 1950, 3-66.
- (2) Aron, B. A Manual for Analysis of the Thematic  
Apperception Test: A method and technique  
for personality research. New York: Willis E.  
Berg, 1949.
- (3) Ball, T. S., and Bernardoni, L. C. The application  
of an auditory apperception test to clinical  
diagnosis. J. Clin. Psychol., 1953, 9: 54-58.
- (4) Ballak, L. A Guide to the Interpretation of the  
Thematic Apperception Test. New York:  
Psychological Corporation, 1937.
- (5) Ballak, L. A concept of projection: an experimental  
investigation and study of the concept. Psychiat.,  
1944, 7: 353-370.
- (6) Balken, E. R., and Masserman, J. H. The language of  
phantasy: III. The language of the phantasies  
of patients with conversion hysteria, anxiety  
state, and obsessive - compulsive neuroses.  
J. Psychol., 1940, 10: 75-86.
- (7) Bell, J. E. Projective Techniques: A dynamic approach  
to the study of personality. New York: Longmans,  
Green and Company, 1948, 1-11.

- (8) Combs, A. W. A method of analysis for the Thematic Apperception Test and autobiography. J. Clin. Psychol., 1946, 2: 240-247.
- (9) Freud, S. Basic Writings of Sigmund Freud. Edited by A. A. Brill. New York: Random House, 1938, p. 857, p. 879.
- (10) Freud, S. Collected Papers. London: International Psychoanalytic Press, 1924, 1: 101-102.
- (11) Grings, W. W. The verbal summator technique and abnormal mental states. J. Abnorm. soc. Psychol., 1942, 37: 529-45.
- (12) Harrison, R. Studies in the use and validity of the Thematic Apperception Test with mentally disordered patients: III. Validation by the method of "blind analysis." Charact. & pers., 1940, 9: 134-138.
- (13) Healy, W., Bronner, A., and Bowers, A. The Structure and Meaning of Psychoanalysis. New York: Alfred A. Knopf, 1930, p. 230.
- (14) Klebanoff, S. G. Personality factors in symptomatic chronic alcoholism as indicated by the T.A.T. J. Consult. Psychol., 1947, 11: 111-119.
- (15) Levinson, D. J. A note on the similarities and differences between projective tests and ability tests. Psychol. Rev., 1946, 53: 189-194.

- (16) Murray, H. A. Explorations in Personality. New York: Oxford University Press, 1938, 63-64.
- (17) Murray, H. A. Thematic Apperception Test: Manual. Harvard University Press, 1943.
- (18) Rapaport, D. Principles underlying projective techniques. Charact. & Pers., 1942, 10: 213-219.
- (19) Rapaport, D., Gill, M., and Schafer, R. Diagnostic Psychological Testing, Vol. II. Chicago: Year Book Publishers, 1945.
- (20) Rodnick, E. H., and Klebanoff, S. G. Projective reactions to induced frustrations as a measure of social adjustment (abstr.). Psychol. Bull., 1942, 39: 489.
- (21) Rorschach, W. Psychodiagnostics. Translation by Lemkau, P., and Kronenbur, P. Berne: Hans Huber, 1942, p. 105.
- (22) Rosenzweig, S., and Fleming, E. E. Apperceptive norms for the Thematic Apperception Test: II. An empirical investigation. J. Pers., 1949, 17: 483-503.
- (23) Rotter, J. B. Thematic Apperception Test: Suggestions for administration and interpretation. J. Pers., 1946, 15: 70-92.

- (24) Rotter, J. B., and Rodnick, E. H. A study of the reactions to experimentally induced frustration. (abstr.) Psychol. Bull., 1940, 37: 577.
- (25) Sanford, R. N. Procedure for Scoring the Thematic Apperception Test. Harvard Psychological Clinic, 1939.
- (26) Sarason, S. B. Dreams and Thematic Apperception Test stories. J. Abnorm. soc. Psychol., 1944, 39: 486-492.
- (27) Sargent, H. Projective methods: Their origins, theory, and application in personality research. Psychol. Bull., 1945, 42: 257-293.
- (28) Schoen, Max. The Effects of Music. London: Harcourt Brace and Company, Inc., 1927.
- (29) Shakow, D., and Rosenzweig, S. The use of the Tautophone ("verbal summator") as an auditory apperception test for the study of personality. Charact. & Pers., 1940, 8: 216-226.
- (30) Shneidman, E. S. Thematic Test Analysis. New York: Grune and Stratton, 1951, p. 126-131.
- (31) Skinner, B. F. The verbal summator and a method for the study of latent speech. J. Psychol., 1936, 2: 71-107.

- (32) Stein, M. L. The Thematic Apperception Test: An introductory manual for its clinical use with adult males. Cambridge, Mass.: Addison-Wesley Press, 1948.
- (33) Stone, D. R. A recorded auditory apperception test as a new projective technique. J. Psychol., 1950, 29: 349-353.
- (34) Tomkins, S. S. The present status of the Thematic Apperception Test. Amer. J. Orthopsychiat., 1949, 19: 358-362.
- (35) Tomkins, S. S. The Thematic Apperception Test: The theory and technique of interpretation. New York: Grune and Stratton, 1947.
- (36) Trussell, M. A. The diagnostic value of the verbal summator. S. Abnorm. soc. Psychol., 1939, 34: 533-538.
- (37) Warren, H. C. Dictionary of Psychology. New York: Houghton Mifflin Company, 1934, p. 212.
- (38) Watson, R. I. The Clinical Method in Psychology. New York: Harper and Brothers, 1951, 436-521.
- (39) Watson, R. I. Readings in the Clinical Method in Psychology. (Also in J. Abnorm. soc. Psychol., 1942, 37: 40-51.) New York: Harper and Brothers, 1949, 287-313.

- (40) Wilmer, H. A. An auditory sound association technique. Science, 1951, 114: 621-622.
- (41) Woodworth, R. S. Experimental Psychology. New York: Henry Holt and Company, 1948, 39-43.
- (42) Wyatt, F. The scoring and analysis of the Thematic Apperception Test. J. Psychol., 1947, 24: 319-330.