



1958

## A Comparison of Psychogalvanic Responses with Certain Categories of the MMPI

Stanley J. Cabanski  
*Loyola University Chicago*

Follow this and additional works at: [https://ecommons.luc.edu/luc\\_theses](https://ecommons.luc.edu/luc_theses)



Part of the [Psychology Commons](#)

---

### Recommended Citation

Cabanski, Stanley J., "A Comparison of Psychogalvanic Responses with Certain Categories of the MMPI " (1958). *Master's Theses*. 1369.

[https://ecommons.luc.edu/luc\\_theses/1369](https://ecommons.luc.edu/luc_theses/1369)

This Thesis is brought to you for free and open access by the Theses and Dissertations at Loyola eCommons. It has been accepted for inclusion in Master's Theses by an authorized administrator of Loyola eCommons. For more information, please contact [ecommons@luc.edu](mailto:ecommons@luc.edu).



This work is licensed under a [Creative Commons Attribution-Noncommercial-No Derivative Works 3.0 License](#).  
Copyright © 1958 Stanley J. Cabanski

A COMPARISON OF PSYCHO GALVANIC RESPONSES WITH  
CERTAIN CATEGORIES OF THE MMPI

by

Stanley J. Cabanski

A Thesis Submitted to the Faculty of the Graduate School  
of Loyola University in Partial Fulfillment of  
the Requirements for the Degree of

Master of Arts

February

1958

## TABLE OF CONTENTS

Chapter	Page
I. REVIEW OF THE LITERATURE.....	1
II. PURPOSE.....	7
III. METHOD, APPARATUS, PROCEDURE.....	10
IV. RESULTS AND CONCLUSIONS.....	14
V. SUMMARY.....	25
BIBLIOGRAPHY.....	27

## LIST OF TABLES

Table	Page
I. MEANS AND STANDARD DEVIATIONS OF THE PSYCHOGALVANIC REACTIONS OF THE SS USED IN THE PRESENT STUDY TO THE 16 EMOTIONALLY TONED WORDS.....	15
II. MEANS AND STANDARD DEVIATIONS OF THE PSYCHOGALVANIC REACTIONS TO THE NORMAL Ss USED IN THE HERR-KOBLER STUDY OF THE 16 EMOTIONALLY TONED WORDS.....	16
III. RANK ORDER OF THE MEAN HAGGARD SCORES OF EACH OF THE 16 EMOTIONALLY TONED WORDS USED IN THE HERR-KOBLER STUDY AND THE PRESENT STUDY.....	17
IV. MEANS AND STANDARD DEVIATIONS OF THE MMPI CATEGORIES FOR THE GROUP USED IN THE PRESENT STUDY.....	19
V. MEANS AND STANDARD DEVIATIONS OF MMPI CATEGORIES REPORTED BY CLARK (2).....	20
VI. TABLE OF RANK DIFFERENCE CORRELATIONS BETWEEN PGR RESULTS AND CERTAIN MMPI CATEGORIES.....	21

## CHAPTER I

### REVIEW OF THE LITERATURE

Since its discovery more than sixty years ago, the psychogalvanic skin reflex has been employed in many different studies. These studies have concerned themselves with the studying of the phenomenon itself, and also with the use of the psychogalvanic reflex in investigating other physiological and psychological phenomena.

Basically the psychogalvanic reflex is a measure of the resistance (or its reciprocal, conductance) of the body to a small electric current. Since it has been found that the conductance of the body is low during sleep, rises during waking hours, and rises even more during effort or activity, the psychogalvanic reflex is considered one of the best measures of the general level of activation of the organism.

There are actually two methods by which a psychogalvanic reflex can be elicited. The first of these, the Fere method, employs a weak electric current to measure the more or less permanent resistance of the body (basic resistance), and also the temporary variations of the "basic resistance" resulting from some form of stimulation of the subject. The temporary variations in resistance are termed the PGR, PGSR, or GSR responses.

The Tarchanoff method does not involve passing a current through the skin. Rather, it has been found that if two poles of a galvanometer are placed upon the skin, stimulation of the subject will produce measureable changes in

resistance. But since the Tarchanoff method does not give basal resistance scores, the Fere method is used in this study (20).

The question as to exactly what produces the PGR responses has not yet been conclusively answered. There is fairly general agreement that it is in some way associated with sweat gland activity, although it is not a direct measure of the amount of sweat secreted. It is more likely that the PGR responses are the result of pre-secretory changes in the sweat glands. (14)

One of the major problems involved in the use of the psychogalvanometer is the choice of an adequate unit of measure. This is necessary to make the results of different individuals comparable. It has been established that the magnitude of any individual PGR response is in part determined by the level of "basic resistance" of the subject at the time of stimulation. The higher the basic resistance, the larger the momentary variations will be.

Because of this, Darrow (3) has shown that if resistance scores are used, disregarding the level of basic resistance, the distribution of scores will be markedly skewed. Similarly, if conductance change scores are used, a skewed distribution will also result, since conductance is simply the reciprocal of resistance. But Darrow also found that a log conductance change gives a much more normal distribution.

Haggard (7,8) after reviewing a number of different methods found a logarithmic transformation most useful. The advantages of using Haggard's transformation are the following: simplicity of transformation, equal units, and a normal distribution. The Haggard score is computed by adding a constant to the log resistance change score, and dividing the sum by the level of basal resistance. Since the resulting scores are in decimals, they can be multiplied

by a constant for more convenient computation.

Therefore the resulting formula, which is used in this study is:

$$Sc = \frac{\text{Log resistance change} + K}{\text{level of basal resistance}} \times 10$$

The PGR has been used as a means of distinguishing normals from abnormals in a number of different studies. Paintal (15) used psychogalvanic responses as a basis of differentiating psychotics from normals. Paintal's results indicated that the psychological mechanism operative in PGR reactions to shock was not impaired in psychotics. But there was a significant decrease in responses to threat of shock in psychotics which differentiated them from normals.

Herr and Kobler (11), in another study, used the psychogalvanometer to compare the responsiveness of normals and neurotics to emotionally toned words. They found that the individual words could not significantly distinguish between the two groups. But they did find some words to which the neurotics were, as a group, more responsive, and other words to which the neurotics were, as a group, under responsive. Therefore, by using a ratio score of the under-responsive words to the over-responsive words they were able to significantly distinguish between the two groups.

There has been very little published research regarding the use of the PGR to examine broad personality traits among normals. One study by Holtzman and Bitterman (13, 16) was designed to search for common factors in predicting adjustment to stress. Among the measures used were conditioning of the galvanic skin responses and various psychometric measures, one of which was the MMPI. A factor analysis of the data revealed that the PGR measures and the MMPI results

were defined by two different factors. But this does not imply that there exists no relationship between the two measures. In the first place, the study emphasized only conditioning and extinction of the galvanic skin response. There are other methods of using the psychogalvanometer which might have proven more meaningful. Secondly, factorial linear independence does not preclude statistical independence. In other words, although the two measures form components of two different factors, there may still exist a meaningful relationship between them. A description of this relationship is the purpose of the study.

The MMPI is one of the most widely accepted paper and pencil tests of personality in use today. Anastasi (1) calls it, "a major event in the recent history of personality testing."

One of the distinctive features of the MMPI is its construction for use in differential diagnosis. The form used in this study provides scores on nine clinical scales (hypochondriasis, depression, hysteria, psychopathic deviate, masculinity-femininity, psychasthenia, schizophrenia, mania, and social introversion-extroversion). It also provided scores on four validity scales (7, L, F, K).

The source of most of the evidence for the validity of the MMPI has been its agreement with final clinical diagnosis of new psychiatric admissions. The agreement has been in terms of various kinds of clinic cases, which is more difficult than simple classification as to normal or abnormal. Even where a high score on the MMPI was not followed by a corresponding diagnosis, there was evidence that the trait was present to an abnormal degree (11, 12).

The authors of the manual of the MMPI report reliabilities, for both



normal and abnormal adults which range from the fifties to the low nineties (11). But a study of the split-half reliabilities of college students reports lower coefficients. The following are the coefficients listed: Hs, 78; D, 58; Hy, 47; Pd, 46; Kf, 73; Pa, -05; Pt, 81; Sc, 79; Ma, 55 (5).

This casts doubt upon the present suitability of the individual categories of the MMPI for differential diagnosis. Wheeler and Little (19), summarizing the results of a factor analysis of the MMPI categories, report that the goal of using the MMPI for measuring specific clinical syndromes has not been achieved. But one distinct factor, according to these authors, was the so called "neurotic triad" (hypochondriasis, depression, and hysteria). Clinically, many workers use these three scales in combination for better diagnosis. Reusch (17) has used the mean of the neurotic triad as a neurotic score (N), in an attempt to derive a more objective measure. Welsh (18), in a study on anxiety diagnosis, found that anxiety neurotics were high in the neurotic triad, with a peak on the D scale, and a secondary peak on the Pt scale. Therefore, in order to take this into account and better diagnose different degrees of severity of anxiety, he developed an anxiety index:

$$AI = \frac{Hs + D + Hy}{3} - \frac{(D + Pt) - (Hs + Hy)}{2}$$

Because of these clinical and statistical findings, it was decided that the PGR results be correlated, not only with the three scales of the neurotic triad individually, but also with them in the above mentioned combinations. Thus, measures which are reported to have meaning clinically, were subjected to statistical analysis. Since this study was conducted on a sample of normal,

male college students; the question arises as to what is to be considered normal. One of the criteria of normality was the individual's MMPI profile. But some of the individuals included in the study as normals had T scores on one or two of the categories of the MMPI which were close to the cut-off point of a T score of 70. It was felt that this was permissible since college students, as a group, have mean scores on some of the categories of the MMPI which are significantly higher than the standardized means in general use. It seems that college students are freer to check items which indicate unfavorable tendencies, than are other groups in the population (5).

In support of this, Goldstein (6) and Clark (2), in independent studies, both report significantly higher means for college samples.

## CHAPTER II

### PURPOSE

The purpose of this thesis is to assess the relationship between the psychogalvanic responses of normal subjects to emotionally toned words and the T score rank of these individuals on certain categories of the MMPI. In other words, it is an examination of the relationship between a measure which differentiates among individuals in terms of personality traits (the different categories of the MMPI), and one which differentiates between individuals in terms of physiological reactivity (the PGR responses.)

The phenomenal growth of psychosomatic medicine is just one example of the current emphasis placed upon the search for important inter-relationships between psychological and physiological reactions of man. For that reason, it was felt that a study which employed a psychological and physiological indicators both of which are accepted in the field as being very promising instruments, should be of definite value.

No specific hypothesis has been stated in this study. Rather, the purpose is defined as a description of the relationship between the two measures. But it is felt that the value of this study lies in the fact that it can serve as a starting point for further research in this area. If some of the general facts can be carefully stated and examined, more specific hypotheses can be derived and tested.

The question may be raised regarding the reason why only normals were used

in the sample tested, since using such a homogeneous group reduced the possibility of finding significant relationships. The reasons for the specific use of normals were the following. First, the scarcity of studies which employed the PGR to investigate broad personality traits among normals. Secondly, since a similar study correlating the PGR results of neurotics with their scores on the MMPI is soon to be published, it was felt that this study would supplement the results of the other study (12).

In doing this study, the experimenter was, in reality, comparing the physiological reactions of normals to categories on the MMPI which are, at least in name, measures of abnormal reactions, e.g., hysteria, hypochondriasis, etc. Therefore the question arises as to whether the results are in any way meaningful. But it is the opinion of many authorities in the field that neurosis is basically an exaggeration of the normal processes. For that reason the categories of the MMPI employed in this study were the three which comprise the so called, "neurotic triad" (hypochondriasis, depression, and hysteria). These three categories were correlated with the PGR results individually, and in the above mentioned combination of the neurotic triad (N) and the anxiety index (AI). The derivation of these two measures might be open to criticism from a statistical point of view. But one of the purposes of this thesis is to subject these measures, which are claimed to be meaningful clinically, to further statistical analysis; and to determine whether or not they prove to be meaningful in this respect.

Finally, the use of the MMPI categories with the PGR results of normals is encouraged by Hathaway and McKinley when they state in their manual for the MMPI that, "although the scales are named according to the abnormal manifestations of the symptomatic complex, they have all been shown to have meaning

within the normal range" (11).

The symptomatic complex referred to by Hathaway and McKinley is usually considered as being the result of a complex emotional disturbance. Similarly, when a "normal" frame of reference is employed, the difference from individual to individual on the MMPI can be considered to be the result of complex emotional reactions. Emotional reactions are associated with autonomic activity, and the psychogalvanometer has long been considered an indicator of autonomic activity.

## CHAPTER III

### METHOD, APPARATUS, PROCEDURE

#### APPARATUS:

The galvanometer used in this study was of the moving coil type. To insure constant current passing through the subjects (Ss) when the galvanometer was balanced, regardless of the basic resistance, a "closed" type bridge circuit was employed. Therefore, one of the most important factors in GSR was controlled, the amperage through the S. The current used was 160 microamperes.

Photographic recording was used. Seconds were indicated by a flashing light regulated by a synchronous motor. The galvanometer light was on continually. Stimuli were indicated by another light operated by hand. The electrodes consisted of finger cups filled with .1 normal saline solution, into which the fingers of the subject were submerged. This minimized the effects of sweating, since sweating did not make an appreciable increase in the volume of salt solution in the circuit.

The magnitude of each response was recorded in terms of a mm. deflection from the basic level of resistance. From these measures, changes in ohms resistance (or ohms conductance) could be determined and referred to the basic resistance values.

#### THE STIMULUS LIST:

The subjects were tested in a quiet room, kept at room temperature, from about 1 PM to 5 PM. When each subject was settled and in circuit with the

psychogalvanometer, he was told that a list of words would be read to him. He was to respond to each word with the first word that came to his mind. Each subject was presented with a list of 16 "emotional" words. After each "emotional" word, a neutral word was inserted to allow S to reach a state of physiological quiescence before the presentation of the next emotionally toned word. Before the actual testing was begun, 3 or 4 buffer words were presented to S in order to establish a reasonable constant basic resistance.

The stimulus list used was the same as the one used in the Herr-Kobler study. The emotional words, in order of presentation were: sick, high, love, afraid, sin, closed, hospital, ashamed, sex, open, pain, God, sweetheart, trouble, church, and breast. The verbal responses as well as the reaction times were recorded. The total testing period required 20 to 30 minutes.

#### SUBJECTS:

The sample was composed of male college students who volunteered for the study. Since some of the subjects obtained were older students taking summer school courses at the university, the mean age of the group was somewhat higher than would be obtained from a random sample of college students. The mean age of the final sample used was 24.7 years and the standard deviation was 7.74 years.

#### PROCEDURE:

The psychogalvanic reactions of the 34 male subjects were tested. The photographic records were developed and checked. If the measure of physiological reactivity to any one or more of the emotionally toned words was interfered with by some extraneous reaction, e.g., coughing, deep breath, etc., the record was rejected. Of the total number of PGR records, 20 were retained as being

valid. The mm. deflection to each one of the emotionally toned words was measured by hand for best accuracy. The Haggard transformation was then used for each of the emotionally toned words to make the responses of the different individuals comparable. As was mentioned above, the formula for the transformation was the following:

$$Sc = \frac{\log \text{ resistance change} + K}{\text{level of basal resistance}} \times 10.$$

The booklet form of the MMPI was then administered to those subjects from whom valid PGR records were obtained. The results were scored, and the summary profiles obtained. Of the 20 records one showed very extreme scores and was rejected to fulfill the criterion of normality in the study. The remaining 19 records were incorporated into the final statistical analysis.

The means and standard deviations of the 16 emotional words of the PGR list were obtained. Since the same stimulus list was used in both studies, a comparison of similarities and differences was made between the responses obtained in this study and the responses of the normal subjects in the Herr-Kobler study.

The means and standard deviations of all the categories of the MMPI profile were also obtained. These results were compared with the results obtained by Clark (2) in his study on the average profiles of college students.

Finally the responses to each of the emotionally toned words of the stimulus list, and the ratio score derived by Herr and Kobler, were correlated with the MMPI results. As was mentioned earlier, the ratio score was found to distinguish neurotics from normals. It is a ratio of words which evoked larger responses from neurotics, to words which evoked larger responses from normals. The final score is a ratio of the words high, closed, open, and God (presented



in the order 2, 6, 10, 11, 12) to the words sick, sweetheart, trouble, and church (presented in the order 1, 13, 14, 15).

The total PGR data were correlated with the three categories of the MMPI comprising the neurotic triad (hypochondriasis, depression, and hysteria.) The PGR data were also correlated with a mean of the neurotic triad (N), and the anxiety index developed by Welsh:

$$AI = \frac{(Hs + D + Hy)}{3} (D + Pt) - (Hs + Hy)$$

It was decided to use the rank difference method of correlation. The reasons for using the rank difference method of correlation were the following: First, the convenience in using this method, and second, the possibility of lack of similarity of distribution between the two variables. The Haggard transformation of the PGR scores resulted in a somewhat negatively skewed distribution. The distribution of the MMPI data was also somewhat negatively skewed, therefore one might consider the assumption of similar distributions satisfied. But to generalize to the shape of a distribution from such a small sample is a dangerous statistical procedure. Therefore, to be safe, since the rank difference method makes no assumptions about the distribution (4), it is employed in this study.

## CHAPTER IV

### RESULTS AND CONCLUSIONS

The final treatment of the data began with the computation of the means and standard deviations of the responses to the emotionally toned words of the stimulus list (Table 1). The main purpose of this was to compare these results with the results obtained from the normal group in the Herr-Kobler study (Table 2). The most striking difference between the two groups is the over all greater responsiveness of the subjects used in this study. The mean Haggard score for every word in the stimulus list is considerably higher in the present group than it was in the Herr-Kobler group. One of the explanations of this may be the fact that the relationship between the experimenter and subject in this study was such that it aroused greater emotional responsivity on the part of S than did the relationship between E and S in the Herr-Kobler study. Another possibility is that there were differences between the group which resulted in the differences in responsivity.

But in spite of these differences, there is still a great deal of similarity in responsiveness between the two groups. These similarities can be most clearly shown in Table 3, which illustrates the rank order of the words of both groups. The words are ranked according to their mean Haggard scores, the word with the lowest mean Haggard score getting a rank of 1, and the word with the highest mean Haggard score getting a rank of 16. An examination of Table 3 reveals that the relative rank of the different words of the stimulus list

TABLE I

MEANS AND STANDARD DEVIATIONS OF THE PSYCHOGALVANIC REACTIONS OF THE  
SS USED IN THE PRESENT STUDY TO THE 16 EMOTIONALLY  
TONED WORDS

WORD	MEAN	S D
Sick	393	132
High	408	114
Love	507	126
Afraid	443	163
Sin	503	190
Closed	434	254
Hospital	419	233
Ashamed	493	247
Sex	501	202
Open	293	183
Pain	420	287
God	467	227
Sweetheart	466	191
Trouble	441	211
Church	393	253
Breast	516	189
Mean	443	N = 19

TABLE II

MEANS AND STANDARD DEVIATIONS OF THE PSYCHOGALVANIC REACTIONS OF THE  
NORMAL Ss USED IN THE HERR-KOBLER STUDY TO THE 16 EMOTIONALLY  
TONED WORDS

WORD	MEAN	S D
Sick	338	151
High	258	137
Love	468	178
Afraid	348	133
Sin	386	158
Closed	214	124
Hospital	240	132
Ashamed	317	193
Sex	403	173
Open	126	94
Pain	218	137
God	258	178
Sweetheart	360	209
Trouble	308	202
Church	231	155
Breast	394	198

TABLE III

RANK ORDER OF THE MEAN HAGGARD SCORES OF EACH OF THE 16 EMOTIONALLY  
TONED WORDS USED IN THE HERR-KOBLER STUDY AND THE  
PRESENT STUDY

RANK	WORD (HERR-KOBLER STUDY)	WORD (PRESENT STUDY)
1	Open	Open
2	Church	Closed
3	Sick	Pain
4	High	Church
5	Hospital	Hospital
6	Pain	High
7	Closed	God
8	Trouble	Trouble
9	Afraid	Ashamed
10	Sweetheart	Sick
11	God	Afraid
12	Ashamed	Sweetheart
13	Sex	Sin
14	Sin	Breast
15	Love	Sex
16	Breast	Love

NOTE: The words are ranked from the lowest mean Haggard score to the highest mean Haggard score.

remains reasonable constant for the groups of both studies. The rank difference correlation between the two groups is .852.

Therefore, there does seem to be considerable agreement between the two studies regarding the relative responsivity of the subjects to the different words in the stimulus list. In other words, generalizing from the two studies, it can be stated that certain words, like sex, sin, love, and breast, are more highly emotionally toned than are words like open, church, high, hospital and pain.

It would seem that there is considerable value in having data which substantiates the various degrees of emotionality of the different words in the list. Knowing this would be especially helpful in instances where a particular subject would be either unusually over-responsive or unusually under-responsive to a particular word on the list. An example would be a subject who gave a relatively big response to a word like open or church, or a relatively small response to a word like breast or love. In such instances, further probing into the association aroused by this word might prove a rich source of information. Furthermore, one might have the subject rank the words according to the degree of emotional strength which he thought they had. Then the subject's ranking could be compared to the ranking based upon the magnitude of psychogalvanic reactions. The amount of agreement between the two rankings might then be related to the level of awareness with which the subject reacted emotionally.

Next to be considered are the MMPI results. Table 4 lists the means and standard deviations of the MMPI categories for the subjects used in this study. Table 5 lists the means and standard deviations of the MMPI categories for the

TABLE IV

MEANS AND STANDARD DEVIATIONS OF THE MMPI CATEGORIES  
FOR THE GROUP USED IN THE PRESENT  
STUDY

CATEGORY	MEAN	S D
T	50.00	00.00
L	44.74	5.83
F	50.78	4.58
K	55.16	5.99
Hs	46.15	5.29
D	52.53	6.92
Hy	60.63	5.24
Pd	57.89	7.61
Mf	58.10	7.81
Pa	56.95	5.32
Pt	46.21	6.71
So	47.84	5.65
Ma	52.26	7.42
Si	36.42	3.87

N = 19

TABLE V

MEANS AND STANDARD DEVIATIONS OF MMPI CATEGORIES REPORTED BY CLARK (2)

CATEGORY	MEAN	S D
Hs	52.54	8.25
D	53.05	9.96
Hy	56.26	7.68
Pd	55.90	9.99
Mf	58.03	11.61
Pa	51.22	7.59
Pt	54.55	9.27
Sc	55.45	9.27
Si	56.59	10.14

male college students tested in the study by Clark (2). In general, the means of the different categories derived from the group used in this study indicate a normal sample. The most surprising aspect revealed by a comparison of the two groups is related to the categories Hs, Pt, Sc, and Si. The respective mean T scores of these four categories were the following: Hs, 46.15; Pt, 46.21; Sc, 52.26; Si, 36.42. This is somewhat unusual, since with a college sample one would expect the mean T scores to be somewhat above 50. The explanation for this may lie in the fact that the small sample used ( $N = 19$ ) was not representative of the total college population.

Next to be considered are the results of the rank difference correlations between the FCR results and the MMPI categories. Table 6 lists all the inter-correlations computed.



TABLE VI

TABLE OF RANK DIFFERENCE CORRELATIONS BETWEEN FOR RESULTS AND  
CERTAIN MMPI CATEGORIES

	Hs	D	Hy	N	AI
Sick	-.107	.210	-.163	.017	.092
High	.093	.162	-.114	.000	-.021
Love	-.205	.198	.061	.046	-.171
Afraid	.136	.112	.009	.088	-.082
Sin	-.302	.049	-.091	-.168	.004
Closed	-.228	-.067	.160	.126	-.304
Hospital	-.375	.048	.161	-.174	-.242
Ashamed	-.204	.055	.116	.001	-.171
Sex	-.360	.077	-.367	-.280	-.078
Open	-.161	.043	-.146	.009	-.021
Pain	-.276	-.119	-.096	-.249	-.171
God	-.1429*	-.064	-.166	-.239	-.144
Sweetheart	-.212	.105	-.009	-.025	-.114
Trouble	-.142*	-.077	-.130	-.300	-.104
Church	-.294	-.076	-.102	-.368	-.005
Breast	-.321	-.099	-.067	.289	-.197
Ratio Score	.334	.214	.049	.438*	-.100

N=19

\* Significant at the 10% level of confidence.

In this study the correlations obtained were compared to the 10% level of significance, primarily because none of the correlations were significant at the 5% level or the 1% level. It is felt that the use of such a low level of significance is permissible since the correlations were interpreted as indicating very general trends rather than definite, specific relationships.

The results tabulated in Table 6 indicate that only three correlations of the 85 computed are significant at the 10% level of confidence. The correlations between Hs and trouble ( $r = -.442$ ), between Hs and God ( $r = -.429$ ), and the Mean of the neurotic triad and the PGR ratio score ( $r = .438$ ). The following correlations approach the 10% level of significance: Hs and hospital ( $r = -.375$ ), Hs and sex ( $r = -.367$ ), (N) and church ( $r = -.368$ ). Therefore no conclusive generalizations can be made concerning any specific relationship between the PGR results and the MMPI categories used.

But there are some interesting factors related to the Hs category of the MMPI. Two of the 16 PGR stimulus words (God and trouble) had a minus correlation with the Hs category which was significant at the 10% level of significance. Furthermore, 14 of the 16 PGR stimulus words had a minus correlation with Hs. This indicates at least a suspicion of a relationship between the psychological components measured by the Hs category and the physiological reactions measured by the PGR reactions to the stimulus words. The relationship would appear to be a negative one. In other words, the higher an individual would score on the Hs category of the MMPI, the lower he would be expected to respond on the psychogalvanometer. This would seem to indicate that the more hypochondriacal symptoms an individual acquires, the less physiologically responsive he becomes.

Another interesting fact to note concerning the Hs category of the MMPI is that although there is some indication that it correlated negatively with the PGR stimulus words, it has a positive correlation with the PGR ratio score which approaches the 10% level of significance. But actually this is as it should be if the Herr-Kobler conclusions are consistent. Since, according to these authors, the higher the ratio score, the greater the indication of neurotic symptoms. Furthermore, this is not inconsistent with the possibility of a negative correlation between Hs and the individual PGR stimulus words, because the ratio score depends, not upon the absolute magnitude of the responses of an individual to the PGR stimulus list, but upon the ratio of certain words within the list to each other.

Certainly it seems that the relationship between the Hs category of the MMPI and psychogalvanic reactions bears further investigation, especially regarding an attempt to establish more significant results. This end might be accomplished either by increasing the sample used or using a more heterogeneous sample.

The correlation of .438 between the PGR ratio score and the mean of the neurotic triad lends further weight to the contention that the higher the ratio score, the greater the indication of neurotic symptoms. The significance of this relationship would probably also be increased if a larger or more heterogeneous sample were used.

There are no correlations even approaching significance between the PGR stimulus words and the Anxiety Index. The statistics used in computing the anxiety index are very crude. Therefore, although it may have clinical value in making gross differentiations among individuals, it did not prove meaningful in this study. The use of a rather homogeneous sample may explain partly the

lack of relationship in this case. Therefore, the hope of using this study to find statistical corroboration for a measure which was claimed to be useful clinically, proved unfruitful.

## CHAPTER V

### SUMMARY

The purpose of this study was to describe the relationship between a measure which differentiates between individuals in terms of personality traits (the different categories of the MMPI), and one which differentiated between individuals in terms of physiological reactivity (psychogalvanic reactions). The sample tested was one of normal, male college students.

The procedure involved measuring the psychogalvanic reactions of 34 subjects to a list of 16 emotionally toned words. The scores of the different S's were made comparable by using the Haggard logarithmic transformation. The booklet form of the MMPI was then administered to the 20 S's from whom a valid PGR record was obtained.

The results were treated in the following manner. Since the same stimulus list was used in this study as was used in the Herr-Kobler study, the mean Haggard scores of the two groups for the 16 emotional words, were compared. It was found that the absolute magnitude of responsivity to all the words was considerably higher in this study than it was in the Herr-Kobler study. But the relative responsiveness to each of the words, as compared to the total list remained highly consistent in both studies. The Rank Difference Correlation between the two groups was  $+ .852$ .

Next, the three categories of the MMPI which comprise the so called "neurotic triad" (hypochondriases, depression, and hysteria) were correlated

with the PGR results. A mean of the "neurotic triad" (N) and an anxiety index were also correlated with the PGR results.

In general, there were no highly significant relationships between the PGR results and the MMPI categories. But there was an indication of a negative relationship between the Hs category of the MMPI and the PGR results. Furthermore, the Hs category and the ratio score of the PGR results correlated positively at a level approaching significance. Finally, there also was an indication of a positive relationship between the ratio score of the PGR results and the mean of the "neurotic triad" (N). The relationship between the Anxiety Index and the PGR results proved insignificant in the study.

Probably the greatest shortcoming of this study was the use of such a small sample, especially since it was a very homogeneous group. Regarding the homogeneity of the group, the expressed purpose of this study was to use a normal sample. But if a larger normal sample were used, some of the relationships would probably have proven more significant. And of course, the greater variability of a more heterogeneous group would also probably have resulted in relationships which were more significant. But this study does suggest some further research, especially regarding the Hs category of the MMPI and the ratio score of the PGR reactions.

## BIBLIOGRAPHY

1. Anastasi, A., Psychological Testing. New York, Macmillan Co., 1954.
2. Clark, J. H., "The Interpretation of the MMPI Profiles of College Students: Mean Scores for Male and Female Groups." J. Soc. Psychol., 1954, 40, 319-321.
3. Darrow, C. W., "The Equation of the Galvanic Skin Reflex Curve." 1. "The Dynamics of the Reaction in Relation to Excitation Background." J. Gen. Psychol., 1937, 16, 285-309.
4. Dixon, W. J., and Massey, F. J., Introduction to Statistical Analysis. New York, McGraw-Hill Book Co., Inc., 1951.
5. Gilliland, A. R., and Colgin, R., "Norms, Reliability, and Forms of the MMPI." J. Consult. Psychol., 1951, 15, 435-438.
6. Goldstein, L. D., "Regional Differences in MMPI Responses among Male College Students." J. Consult. Psychol., 1954, 18, 437-441.
7. Haggard, E. A., "Experimental Studies in Affective Processes." 11. "On the Quantification and Evaluation of Measured Changes in Skin Resistance." J. Exper. Psychol., 1945, 35, 46-56.
8. Haggard, E. A., "On the Application of Analysis of Variance to GSR Data." 1. "The Selection of an Appropriate Measure." 11. "Some Effects of the Use of Inappropriate Measures." J. Exper. Psychol., 1949, 39, 378-392, 861-867.
9. Hathaway, S. R., and McKinley, H. C., The Minnesota Multiphasic Personality Inventory Manual. (Revised) New York, Psychological Corporation, 1951.
10. Hathaway, S. R., and McKinley, H. C., "The Identification and Measurement of the Psychoneurosis in Medical Practice: The MMPI." J. Amer. Med. Assn., 1943, 122, 161-167.
11. Herr, V. V., and Kobler, F. J., "A Psychogalvanometric Test of Neuroticism." J. Abnorm. Soc. Psychol., 1953, 48, 410-417.
12. Herr, V. V., and Kobler, F. J., "Unpublished Research." Loyola University, Chicago, 1957.
13. Holtzman, W. H., and Bitterman, M. E., "Adjustment to Stress: A Factorial Study of Selected Measures." American Psychologist, 1954, 9, 395.

14. McLeary, R. A., "The Nature of the Galvanic Skin Response." Psychol. Bull., 1950, 47, 97-117.
15. Paintal, A. S., "A Comparison of the Galvanic Skin Responses of Normals and Psychotics." J. Exper. Psychol., 1951, 41, 425-428.
16. Personal Communication, Rev. V. V. Herr, S.J., Loyola University, Chicago.
17. Ruesch, J., "Psychophysiological Relations in Cases with Head Injuries." Psychosom. Med., 1945, 7, 158-168.
18. Welsh, G. S., "An Anxiety Index and an Internalization Ratio for the MMPI." J. Consult. Psychol., 1952, 16, 65-72.
19. Wheeler, W. M., Little, K. B., and Lehner, G. F. J., "The Internal Structure of the MMPI." J. Consult. Psychol., 1951, 15, 134-141.
20. Woodworth, R., and Schlossberg, H., Experimental Psychology. New York, Henry Holt and Co., 1954.



APPROVAL SHEET

The thesis submitted by Stanley J. Cabanski has been read and approved by three members of the Department of Psychology.

The final copies have been examined by the director of the thesis and the signature which appears below verifies the fact that any necessary changes have been incorporated, and that the thesis is now given final approval with reference to content, form, and mechanical accuracy.

The thesis is therefore accepted in partial fulfillment of the requirements for the Degree of Master of Arts.

19 March 1952  
Date

Robert C. Nuolay  
Signature of Adviser