RELATIONSHIP OF A PERSONALITY QUESTIONNAIRE AND THE
CLASSICAL METHOD OF GRAPHO-ANALYSIS IN MEASURING
PERSONALITY TRAITS OF STUDENTS IN
DIFFERENT FIELDS OF STUDY

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THESIS

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By

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CHAPTER I

INTRODUCTION

Since Hull and Montgomery's study (9) in 1919, handwriting analysis has been looked upon by most American psychologists as a pseudo-science. A changing trend in methodology among the psychologists of this country, however, along with several disclosing experiments (4, 7, 14) has brought about further investigation into the validity and experimental feasibility of this phenomenon.

The theoretical foundation of handwriting analysis, according to Perl (15), lies in two experimentally proven statements. First, handwriting is a product and a permanent record of a person's highly individualized motions; and secondly, there is an intricate and interpretable relationship between an individual's motions and his emotions.

Allport and Vernon (1), who devoted several chapters of their book, Studies in Expressive Movement, to graphology, presented three assumptions: (a) Personality is consistent; (b) Movement is expressive of personality; and (c) Gestures and other expressive movements of an individual are consistent with one another.

Generally speaking, there are two schools of graphology, each differing in its methodological approach. What has
been termed "classical" graphology is the method utilized by the students of Michon (21), one of the pioneers in graphology, when it first became scientifically oriented during the last century. This method calls for the diagnosis of the various "signs" in a handwriting specimen and the personality variables related to these signs. A second methodology is sometimes referred to as a "dynamic" grapho-analysis and is often principally Gestaltic in theoretical origin. Bruck (3) states that handwriting is basically a Gestalt phenomenon. Crepleux-Jamin (6) views handwriting as a "total harmony."

Regardless of the methodology involved, the primary aim of grapho-analysis is to predict behavior by identifying various personality variables said to be evidenced by an individual's script. Since the beginning of this century, a large amount of the research involving handwriting analysis has consisted of verification of validity and reliability of grapho-analysis as applied to the identification of various personality traits within the individual. Although the validity and reliability of grapho-analysis have yet to be fully proven, some studies have yielded striking results (14). The majority of research and experimentation has concerned the relationship between the individual's script and his personality. Little, if any, data has been gathered on the relationship between the script of a group of individuals homogeneous in interests, aptitude, and behavior, and their "global" or common personality. Robbins (16) found that by
administering the Guilford-Zimmerman Temperament Survey to a group of students majoring in a particular field (a group of individuals homogeneous in interest and aptitude), he could obtain a particular personality variable common to that group. Group traits, therefore, seem to exist to some degree.

Statement of the Problem

Experimental evidence has been gathered to show that handwriting analysis correlates to some degree with personality. Thus handwriting analysis can be used much like a personality questionnaire in assessing an individual's personality. Recent findings (16) suggest that a personality questionnaire, the Guilford-Zimmerman Temperament Survey, may also be used in identifying and isolating a particular personality variable common to a particular group.

The purpose of this study is to investigate the possibility that the handwriting analysis of a particular group of individuals with homogeneous interests and abilities (mathematics majors, music majors, psychology majors, and education majors) could likewise identify and isolate a particular personality variable common to these individuals. The basis of this investigation rests upon the assumption, validated by Robbins, that there exists a significantly different personality trait for each group of individuals of the various scholastic departments.
Related Studies

As stated earlier, there exist two methodologies in grapho-analysis. The classical method was historically the first to be utilized in a scientific manner, and consists of diagnosing particular character traits. As this method was first utilized by Michon (21) in the latter part of the 19th century, it was quite rigid in its interpretation of the various "signs." Later, however, "... Michon's theory was enlarged and to an extent revised by his pupil, Jules Crepieux-Jamin" (21). Although Crepieux-Jamin made Michon's method somewhat more flexible in its interpretation, he did not refute the theory that personality was revealed by certain shaped letters or "signs" in an individual's script.

Michon's method of grapho-analysis (the classical method), as revised by Crepieux-Jamin, achieved a great amount of public and scientific acceptance during the first two decades of this century (21). Following the experiment performed by Hull and Montgomery (9), the psychologists and psychiatrists began to doubt the validity of this method of handwriting analysis. Almost simultaneously a changing climate of opinion began to ensue within the behavioral sciences. The trend was toward the observance of human behavior as being "global" and "molar" and more than a composite of the environment surrounding that organism. Gestalt psychology began to grow in popularity and acceptance.
Klages (10, 11, 12, 13) is often considered the first to break away from Michon's theory and insist that "... handwriting is a Gestalt phenomenon" (3, p. 284). He applied positive and negative meanings to various handwriting characteristics in order to more fully consider the individual's total Gestalt. Sonneman (19) and Goldzieher-Roman (17) are two more leading theorists concerned with utilizing a more dynamic or Gestaltic approach to handwriting analysis.

While the majority of the behavioral scientists have chosen the dynamic system in preference to the "classical" method, the greatest part of the lay populace knows only of handwriting analysis as it exists to the classical theorists. Among the graphologists who are classically oriented and who have written non-professional or semi-professional books for purposes of informing the average citizen on handwriting analysis are Holt (8), Bunker (4), and Falcon (7). The fact that the classical method is a highly simplified form of grapho-analysis in comparison to the Gestalt method may account for its wide acceptance among the lay populace. Even though this reason may or may not be the causal factor, the overall effect has been the production of a generally "classical" oriented population.

Experiments utilizing both the classical and the Gestalt form of grapho-analysis are numerous, particularly in Europe. There are essentially three experimental methods commonly used in any type of handwriting analysis (2).
1. The sorting method is a process in which a graphologist examines a group of scripts and sorts them into two categories.

2. The matching method is a process in which a judge attempts to match a group of personalities with their script.

3. The blind ranking of a group of scripts on certain personality traits by a group of naive judges and the correlation of these rankings with scaled personality-trait values on the basis of a validating criterion is another method.

The use of these procedures, however, has been largely limited to individuals. Falcon (7), Castelnuovo-Tedesco (5), and Saudek (18) utilized these three experimental methods. In all of these experiments the dependent variable was obtained from working with numerous individuals not sharing a common interest. Little or no work has been done in the area of grouped data obtained by handwriting analysis and pertaining to the identification of a personality characteristic common to a specific group.

Recent findings (16) suggest that a personality questionnaire such as the Guilford-Zimmerman Temperament Survey may be used in identifying and isolating a particular personality variable that is common to a specific group. In Robbins' study (16) it was hypothesized that in a group of individuals who share a common aptitude and interest there will be manifested a particular personality trait characteristic of that group and different from other groups of
individuals with dissimilar interests. Although his hypothesis was not completely proven, some significant results were obtained demonstrating the presence of a separate but common personality trait for each group.

The inter-group differences appeared to show a logical relationship between a pattern characteristic of a particular major group and the need satisfaction which would probably be found in the study field or in related occupations (16, p. 13).

Sternberg (20) produced results similar to Robbins when investigating the personality patterns of college students majoring in different fields. He utilized the Kuder Preference Record, the Allport-Vernon Study of Values, and the Minnesota Multiphasic Personality Inventory in a study consisting of 270 white male students—thirty from each of nine areas of interest. The results obtained indicated a positive relationship between the common personality pattern of a particular group and the major field of study.

These two studies illustrate the feasibility of identifying a single general personality variable as it exists in a homogeneous group utilizing personality questionnaires. If both handwriting analysis and personality questionnaires seek basically similar goals (the identification of various personality characteristics), why would it not be possible to use handwriting analysis in identifying and isolating a particular personality trait within various homogeneous groups? No experiments investigating the identification of various group personality traits by the use of handwriting analysis have appeared to date.
Statement of the Hypothesis

The following hypotheses were formulated:

1. Each department will show a significantly different personality characteristic on the Guilford-Zimmerman Temperament Survey.

2. The personality characteristics obtained by the Guilford-Zimmerman Temperament Survey and grapho-analysis will correlate to a significantly positive degree.

Definition of Terms

There are certain terms which need to be defined for this study.

1. Personality traits will be defined as the factors measured by the Guilford-Zimmerman Temperament Survey and designated as

   G - General Activity—A high score indicates strong drive, energy, and activity.

   E - Emotional Stability—A high score indicates optimism and cheerfulness.

   P - Personal Relations—A high score indicates tolerance and understanding of other people and their human weaknesses.

2. Classical graphological criteria are the various signs found in the script and designated as diagnostically significant by Bunker in his book, Handwriting Analysis: The Art and Science of Reading Character by Grapho-Analysis. The three classical graphological criteria used in this study are
Generous Variable—Generosity is manifested by long finals found at the end of some words.

Enthusiasm Variable—This variable is manifested by long, sweeping strokes over the "t" in a script.

Optimism Variable—Cheerfulness is manifested by an upward slant of the script when written on unruled paper.

Source of Data

The data were obtained from eighty male and female students enrolled at North Texas State University. Forty of the students were enrolled in advanced standing courses at the graduate level while forty were of undergraduate standing at the senior level. Twenty students were chosen from each of four areas of study—mathematics, music, education, and psychology. The Guilford-Zimmerman Temperament Survey and certain handwriting variables designated as clinically significant by Bunker (⁴) were utilized in this study. Data obtained from the Registrar's Office were used in selecting the subjects and in determining the ratio to be involved in each department.

Limitations

1. This study will be confined to personality traits measured by the Guilford-Zimmerman Temperament Survey and by the classical graphological criteria described by Bunker (⁴).

2. This study will be limited in the area of grapho-analysis to the classical method of interpretation as it has been defined.
3. The results obtained can be valuable only for the purpose of identifying and relating personality traits peculiar to the selected fields of major study examined.

Procedure

One class was chosen from each of the four fields investigated in this study (mathematics, music, education, and psychology). In each class the students were given a sheet of unruled paper on which a sentence was mimeographed, and they were told to sign their names and write the sentence in the space provided. The Guilford-Zimmerman Temperament Survey was then administered.
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CHAPTER II

METHOD

Subjects

Eighty male and female students in advanced and graduate courses at North Texas State University were used as subjects. These subjects were chosen from four major fields of study—mathematics, psychology, education, and music. Each of the four groups contained twenty subjects. The number of males and females in each group was one control factor and differed in each group depending upon the proportion of males to females within each major field of study. Records in the Registrar's Office were studied to determine the number of junior, senior, and graduate students majoring in each of the four fields used in this study. A percentage of males and females in each of the fields was determined and these data were used as the basis for selecting the subjects.

The mathematics group contained five females and fifteen males, the psychology group five females and fifteen males, the education group eleven females and nine males, and the music group contained seven females and thirteen males. All of the subjects were of senior or graduate standing. Subjects from this level were chosen because according to literature (2, 4)
thirty per cent of all college students change their major field of study at least once and seventy per cent of these changes are made during or immediately after the freshman year.

Procedure

One class of at least twenty-five students was chosen from each of four major departments on the basis of its advanced standing. As another qualification the four classes chosen consisted of students majoring in those four fields of study.

The four groups consisted of two graduate classes (music and education) and two undergraduate classes of senior standing (psychology and mathematics). Each class contained twenty-five to thirty-five students. In each class the students were given pencils and a sheet of unruled paper on which a sentence was mimeographed and were told to sign their names and to write the sentence in the space provided. The Guilford-Zimmerman Temperament Survey was then administered. The purpose of the study was explained, as it was felt that this would have no significant effect on the results. The procedure of having the subjects copy a sentence instead of having them write extemporaneously was followed because it seemed to parallel best the technique used in classical grapho-analysis. According to Frederick (3), "... many handwriting specialists may be laboring under a false
impression that they are picking up cues from the handwriting which really stem from other sources, principally the content of the material." To follow a purely classical procedure the "signs" alone must be interpreted.

Statistical Treatment

To test the first hypothesis that each of the four departments will show a significantly different personality characteristic on the Guilford-Zimmerman Temperament Survey, an analysis of variance was run utilizing Fisher's $F$ test. The .05 level of significance was used as the criterion of acceptance.

In order to determine if each of the four departments possessed any of the five significant traits to a significant degree, Fisher's $t$ test was utilized. When the results were obtained, the classical grapho-analysis criteria were chosen. The grapho-analysis criteria used were selected from a list compiled by Bunker (1). To choose the criteria, reference was made to the Guilford-Zimmerman manual of instructions (5) in order to determine the behavioral characteristics making up the various traits. A high $E$ score obtained by education majors, for instance, "... indicates optimism and cheerfulness" (5, p. 23). The variable "optimism" was then located in Bunker's list and the grapho-analysis criteria noted. In this case optimism was said to be manifested by an upward slant of the handwriting. A handwriting variable was thus chosen for each department.
A correlation was done in order to test the second hypothesis that the personality characteristics obtained by the Guilford-Zimmerman Temperament Survey and grapho-analysis will correlate to a significantly positive degree. Within each department handwriting scores of the twenty subjects were compared with their Guilford Zimmerman C-scores. The handwritings were rated by the use of an arbitrary five-point scale indicating that the factor being assessed was present to 1, an exceptionally low degree; 2, a very low degree; 3, a moderate degree; 4, a very high degree; and 5, an exceptionally high degree. Matched with these were the C-scores obtained on the Guilford-Zimmerman Temperament Survey. The C scale ranges from a score of one to a score of ten.
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CHAPTER III

RESULTS

Of the ten traits comprising the Guilford-Zimmerman Temperament Survey five were found to differ significantly at the .05 level of significance. Those significantly different traits were G - General Activity, E - Emotional Stability, F - Friendliness, P - Personal Relations, and M - Masculinity.

It was stated in the first hypothesis that each department will show a significantly different personality characteristic on the Guilford-Zimmerman Temperament Survey. In order to negate the null hypothesis that the departments will not possess significantly different personality traits each department would have to show a significantly higher score than the other three departments on one of the five traits, either G, E, F, P, or M.

Reference to Table I illustrates that three of the departments were higher than the others on one of the five traits, but not to a significant degree (.05 level). Many of the departments were significantly higher than two of the others, but not all three.
TABLE I

THOSE TRAITS OF THE GUILFORD-ZIMMERMAN TEMPERAMENT SURVEY
WITH THE HIGHEST MEAN SCORES, AND THE AMOUNT OF
SIGNIFICANT DIFFERENCE (.05 LEVEL)
AMONG THE FOUR GROUPS STUDIED

<table>
<thead>
<tr>
<th>Traits and Variance Among Fields</th>
<th>Music (Group 1)</th>
<th>Psychology (Group 2)</th>
<th>Education (Group 3)</th>
<th>Math (Group 4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trait with highest mean*</td>
<td>P</td>
<td>P</td>
<td>E</td>
<td>G</td>
</tr>
<tr>
<td>Significantly higher than (.05 level)</td>
<td>None of the groups</td>
<td>Group 4, but not 1 and 3</td>
<td>Groups 1, 2, but not 4</td>
<td>Groups 1, 2, but not 3</td>
</tr>
</tbody>
</table>

* P = Personal Relations, E = Emotional Stability, and
G = General Activity.

Since the four departments tested did not show separate and significantly different personality traits, the null hypothesis was accepted. The first research hypothesis was rejected.

In order for the second hypothesis to be tested, it was necessary that each department be characterized by one of the Guilford-Zimmerman Temperament Survey traits so that by correlating the questionnaire data with handwriting analysis data it could be determined if both methods predicted similar behavior. The trait with the highest mean in Group 3 (education) was Emotional Stability. This trait occurred in education majors to a significantly higher degree than it did in Group 1 (music) and Group 2 (psychology). It was also more evident in education majors than in mathematics majors, but not to a significant degree. So, in the majority
of the cases, education majors were significantly higher on
E - Emotional Stability. The same was true for mathematics
majors (Group 4) in that they were significantly higher
in the majority of the cases on G - General Activity. For
psychology majors the trait with the highest mean was P -
Personal Relations. Psychology majors were significantly
higher on this trait than were mathematics majors, but they
were not significantly higher than education or music majors.
As P - Personal Relations was the trait with the highest mean
among the psychology majors, it was chosen to represent this
group even though it was not significantly different than
the majority. Music majors presented an even more difficult
problem in that they were not significantly higher than any
of the groups on any trait. They were, however, significantly
lower than Groups 2 and 4 (psychology and mathematics,
respectively) on M - Masculinity. As P - Personal Relations
was also the trait with the highest mean among the twenty
music majors, it was chosen to represent this department
for purposes of correlating the questionnaire data with
that data obtained by handwriting analysis. Masculinity was
not chosen as a representative trait for this group because
masculine or feminine behavior is very difficult to detect
in an individual's handwriting.

Correlation data are presented in Table II.
TABLE II

CORRELATION OF HANDWRITING ANALYSIS SCORES AND THE GUILFORD-ZIMMERMANN TEMPERAMENT SURVEY C-SCORES OF SUBJECTS MAJORING IN FOUR FIELDS

<table>
<thead>
<tr>
<th>Field</th>
<th>Variable Number*</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Correlation Coefficient</th>
</tr>
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<tr>
<td>Mathematics</td>
<td>1</td>
<td>3.00</td>
<td>.77</td>
<td>.24</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>5.60</td>
<td>2.33</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>1</td>
<td>2.05</td>
<td>.92</td>
<td>-.48</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>6.35</td>
<td>1.82</td>
<td></td>
</tr>
<tr>
<td>Psychology</td>
<td>1</td>
<td>3.15</td>
<td>.90</td>
<td>.02</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>5.35</td>
<td>2.37</td>
<td></td>
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<tr>
<td>Music</td>
<td>1</td>
<td>3.00</td>
<td>.83</td>
<td>.24</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>4.40</td>
<td>1.98</td>
<td></td>
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</table>

* Variables 1 and 2 are handwriting analysis scores and Guilford-Zimmerman C-Scores respectively.

Reference to Table II illustrates the correlation coefficients obtained when the handwriting analysis scores were compared with the Guilford-Zimmerman C-Scores. Recalling that the second hypothesis stated that the personality characteristics of the four groups on the Guilford-Zimmerman Temperament Survey and the handwriting analysis will correlate to a significantly positive degree, one can quickly ascertain from Table II that the null hypothesis was retained. Three of the correlations were
mildly positive while the highest coefficient was toward the negative extreme. The second research hypothesis was therefore rejected.
CHAPTER IV

DISCUSSION AND SUMMARY

Discussion

It was stated in Chapter I that the primary purpose of this study was to investigate the feasibility of using classical grapho-analysis in a group situation. More specifically it was proposed that classical handwriting analysis could determine a single personality characteristic common to a particular group of individuals just as could a standardized personality questionnaire. From the results of this study, this would not seem to be the case. The exact reasons for the failure of classical grapho-analysis to predict with any validity in this experiment are difficult to ascertain. It might prove enlightening, however, to begin with a discussion of the various pitfalls within the theory of classical handwriting analysis.

Grapho-analysis, as a scientific discipline, had its beginning during the age in the study of human behavior when the testable and the overt were considered the only conditions worthy of scientific investigation. How easy it might be to say that certain shapes and slants in an individual's script mean that particular characteristics are present in his personality. How easy it might also be to test such hypotheses. For instance, Sauder (8), one of the early
pioneers in this area, observed that several peculiar handwriting signs appeared in thirty per cent of the signatures of habitual thieves. He then undoubtedly made the logical assumption that these "signs" must indicate dishonesty. To test this assumption, Saudek obtained specimens of seventy-three handwritings from eighteen business firms and without knowing the writers diagnosed "dishonesty" in fourteen cases. In all of these he was correct.

Just as the validity of the classical graphology has not been proven, it has also not been disproven. Investigators still appear on the scene with astounding results like Saudek's. As graphology grew older, it was increasingly influenced by Gestaltism. The trend was toward viewing the individual as a more complex organism. The simple interpretation of "signs" in a handwriting is now considered inadequate. "... the expressive value of handwriting cannot be decided by diagnosing single features" (9).

More than mere technical knowledge of what certain written characters mean is thought to be necessary. "... clinical training as such and awareness of personality dynamics is a more important factor in assessing personality than technical training and experience with minute cues for analyzing the graphic specimens" (4). Emphasis is now placed on the "total" individual. "If we are to attain the most adequate validation, the script as a whole and the personality as a whole must somehow be compared" (1).
More recently classical graphology has come under attack by various investigators as being a very poor method of scientific investigation. Bruck (2), for instance, states that

\[ \ldots \text{only the totality of forms and movements all together creates the impression which will eventually lead to the right diagnosis of the writer's personality. If we dissect this impression in detailed signs and characteristics and try to evaluate them separately, we will frequently arrive at a distorted image of the writer's personality (2, p. 284).} \]

This "dissection" of the handwriting into various signs has bothered several authors. Crépieux-Jamin (7) emphasized the fact that handwriting must be perceived as a whole when he made the statement that "\ldots the study of elements is to graphology as study of the alphabet is to the reading of prose."

Reiss (5) terms the classical method a purely molecular or "sign reading" approach. He warns that a molecular treatment of variables can sometimes lead to a "cookbook" methodology. Speaking in terms of theory, it is not difficult to see the relationship between a molecular, "cookbook" type of grapho-analysis and the entity concept of personality which often ruins any objective study in human behavior. In a sense part of the theoretical framework of classical grapho-analysis would seem to owe its existence to its foundation in the entity concept.

It was mentioned in Chapter 1 that the study from which the present experiment received its impetus was the work
done by Robbins (6). Robbins found when administering the **Guilford-Zimmerman Temperament Survey** that several departments at a major university tended to exhibit single and different personality characteristics. It was subsequently hypothesized in the present experiment that grapho-analysis could also identify a particular personality characteristic common to a specific group. When the **Guilford-Zimmerman Temperament Survey** was given to the four groups (psychology, education, mathematics, and music majors) of twenty subjects each, a particular personality characteristic failed to materialize as occurred in Robbins' study. Robbins found psychology, education, accounting, and music majors to be significantly high in one of the ten **Guilford-Zimmerman Temperament Survey** traits. In the present study, none of the four groups were significantly higher on any one trait, although they tended to be higher (see Table I). Of the three departments that were used in both studies, only psychology was high on the same trait (*P* - Personal Relations) in both instances.

The discrepancies in findings between these two studies could be due to a number of factors. Robbins selected his subjects by administering the **Guilford-Zimmerman Temperament Survey** to thirty students in each department and then through the use of a table of random numbers, picking twenty to be used in the experiment. In the present experiment it was felt that a more representative sample could be obtained if
the ratio system of selection was used. Whereas most of the departments contain about twenty-five per cent females, the education department has over sixty per cent. In attempting to arrive at a single, common personality factor, a disproportionate amount of one sex would probably tend to bias the results.

Almost fifty per cent of the subjects (music and education majors) in the present study were of graduate standing. Approximately one-half of that fifty per cent would be classified as being of advanced graduate standing. Robbins asserts that subjects at the sophomore level and above were chosen for his study. Choosing subjects from the advanced graduate level as was done in the present study may have affected the results enough to cause a variance between the two studies. In the education class, from which a representative sample was drawn for this study, a large percentage were middle-aged adults. Adults with years of experience and a well-established means of security can hardly be compared with college-aged individuals.

The correlation coefficients obtained in testing the second research hypothesis are rather interesting. Although it was hypothesized that the correlations would be high and in the positive direction, the highest coefficient obtained was a -.48. This was in the education group where E - Emotional Stability was the outstanding trait. The handwriting variable that was supposed to predict emotional stability seemed to predict just the opposite with a moderate degree of
correlation. A possible explanation for this may be found in some of the previously mentioned criticisms against the classical methodology.

Several individuals (2, 5, 9) have stated the opinion that graphology is much more valid and reliable if it adopts a more dynamic methodology such as a Gestalt approach. By doing this the investigator is acknowledging the fact that human behavior, or even a small facet of the total, is a highly complex and interacting force. When the classical method of grapho-analysis is employed it tends to measure only one facet of the total. In the present study, education majors tended to be high on E - Emotional Stability. Guilford and Zimmerman have stated that a high score on E - Emotional Stability indicates optimism and cheerfulness. Bunker (3) states that optimism and cheerfulness are manifested in the upward slant of a writer's script on an unruled paper. Emotional stability is not characterized by optimism alone, although it may be a good indicator when taken in relation to other variables. The upward slant of an individual's script may also be a good indicator of cheerfulness, but it cannot be said to predict a condition as complex as emotional stability. The analysis of handwriting is as much a projective technique as the House-Tree-Person Test. Graphology needs a more dynamic approach than the classical method can give it.
There were several limitations in the present study which may have affected the results to some degree. The reliability of a correlational coefficient is sometimes in direct relationship to the number of subjects involved in the experiment. The number of subjects (twenty) in each of the four departments is considered somewhat inadequate, but this limitation is due to the unavailability of teacher and student time within certain departments. Thirty in each department may have provided a more representative sampling as well as a more accurate correlation coefficient.

A limitation which may have affected the entire study was the inexperience of the experimenter in grapho-analysis. The present study could present some interesting facts if it were replicated by an individual experienced in graphology and using the dynamic method rather than the classical method.

Summary

Recent findings (6) suggest that a personality questionnaire, the Guilford-Zimmerman Temperament Survey, may be used in identifying a particular personality variable common to a particular group. The primary objective of the present study was to investigate the possibility that the handwriting analysis of a particular group of individuals (psychology, mathematics, education, and music majors) could isolate and identify a particular personality variable common to these individuals, as would a personality questionnaire. The basis of this study rests upon the assumption, investigated
by Robbins, that there exists a significantly different personality trait for each group of individuals of the various scholastic departments.

It was hypothesized that

1. Each department would show a significantly different personality characteristic as assessed on the Guilford-Zimmerman Temperament Survey.

2. The personality characteristics obtained by the Guilford-Zimmerman Temperament Survey and by grapho-analysis would correlate to a significantly positive degree.

The scores obtained on the Guilford-Zimmerman Temperament Survey from the four departments were subjected to an analysis of variance, Fisher's $F$ test, to determine if any of the ten traits differed significantly, and Fisher's $t$ test to determine the degree of significance between the four groups. Each of the four departments was found to be high on a certain trait (psychology, $P$ - Personal Relations; education, $E$ - Emotional Stability; music, $P$ - Personal Relations; and mathematics, $G$ - General Activity). By reference to Guilford and Zimmerman's description of each trait, and by Bunker's (3) list of graphological interpretations, handwriting correlates were found for each trait ($E$ - Emotional Stability, upward slant of script; $P$ - Personal Relations, long finals in body of script; and $G$ - General Activity, long sweeping stroke over $t$).
An arbitrary five-point scale was developed for scoring the degree to which the handwriting variable was present in the particular script (one, very low degree to five, very high degree). This scale was correlated in each department with the Guilford-Zimmerman C-scores which range from one to a high of ten. Both hypotheses were rejected.
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