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Discrimination of manics and depressives by the projective technique, handwriting analysis

Roscoe Sease Aull

DISCRIMINATION OF MANICS AND DEPRESSIVES BY THE PROJECTIVE TECHNIQUE, HANDWRITING ANALYSIS

BY

ROSCOE SEASE AULL, JR.

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"For the philosopher every theory is but an aid to memory, which permits men of a certain period of time, provided with a definite sum of knowledge within the register of their brains, to store it in such a manner that it is always available. To develop a scientific theory is to sort one's whole knowledge into pigeon holes or to file it according to some other system of registration."

Saudek

PREFACE

It is the aim of this study to use the analytical approach to the problem via the simplest basic, empirical, objective and quantitative terms possible. Let it also be borne in mind that we are aware of the fact that personality or diagnosis cannot be described adequately by any single method. This seems, in the author's opinion, to be ignored by many investigators as observed in the literature. Many articles are written and presented in such a manner that attempt to convince the reader that the technique being described is a revolutionary procedure that can replace a half dozen other techniques. It is not this author's intention that this simple experiment will revolutionize the field of psychometrics or graphology. The purpose is one mainly of research and it is hoped that someday it may, in some small way, help other investigators to fit this information into the great mosaic of psychological processes.

We must not forget that no theory to date is adequate for the whole truth of the actual facts of life

and that most likely none of the theories prevalent today in the realm of science will escape refutation one day by the observation of new facts and phenomena.

The author is indebted to the Psychology Department at the University of Richmond, and especially to the late Dr. Stanley Skiff, for direction and guidance in completing this study. Acknowledgment is made also to the members of the Psychology Department, Medical Staff, Library Staff and patients of St. Elizabeth's Hospital in Washington, D. C., and of the Central State Hospital (for Negroes) in Petersburg, Virginia, whose generous cooperation made this research possible.

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INTRODUCTION

Graphology is one of the oldest of psychological methods, but despite its long history it has not yet been established as an exact scientific technique. This existing situation is not so unique if we stop to consider that most other methods of personality analysis are not without flaws either. Perhaps when personality itself is better understood and consistently defined, graphology will be able to make more rapid advances. Conflict in the development of consistent graphological techniques is a main cause also in the struggle for scientific acceptance. Two major problems seem to face the graphologists today. The first is the need of verification of so-called laws and principles which can be accepted as valid only after they have been checked and rechecked under strictest control. The second is the need for development of new devices to further more adequate research along the lines of modern psychology.

From the nature of the material sought and the techniques and devices that have been developed so far,

it has been observed by the author that it is no easy matter to establish validity and reliability in handwriting interpretation.

The distinctive nature of handwriting function, together with the fact that every handwriting is unique and never duplicated by another, has led psychologists to concentrate on observation of it in the hope that some system may be developed that will offer clues to the hidden regions of the personality.

Handwriting, as a projective technique, has some distinct advantages over most other techniques. First it creates no strange test situation for the subject. A pen and paper are most familiar objects to all subjects. In other projective techniques the subject is frequently confronted with unfamiliar objects and/or the request for seemingly unnatural responses, all of which tends to alter the subject's attitude and approach in the test situation. A simple request to write necessary data or fill in blanks is a very conventional and expected chore for most subjects when in a situation of examination. So the ease of procurement of the sample is another distinct advantage. Handwriting also offers a fixed permanent record for examination and comparison at any time, and offers the opportunity to study

samples from most any age category in the development of the personality (in the form of old letters, documents, school work that may be stored somewhere, written script over a period of years at a place of occupation, etc.). Another excellent advantage of handwriting analysis is that it gives objective signs, provided techniques and devices can be adequately developed, in a clinical field where we are too often compelled to work with subjective impressions.

The need for tools to diagnose via reliable personality tests now seems to have become the psychologist's most important task. To be reliable these tests must not be founded on variable, controllable, or verbal material but on morphology, physiology, expressive movements and other unconscious uncontrollable factors possessed by the individual. Among such tests handwriting analysis seems to promise possible validation. Also, as we all know, personality itself has not been simplified to the extent that it can be evaluated by any single method. It seems, according to some recognized reports in the literature that among the expressive movements,[1] handwriting is one of the most uncontrolled and therefore most informative ones. According

1. Allport, G.W. and Vernon, P.E.: Studies in Expressive Movement. New York: The Macmillan Company, 1933, p. 177.

to Wolff[2] consistency appears despite deliberate attempts to change its form. Unit and organization of movement seems to exist independent of training. Each person has his own peculiar and individual way of graphic expression which changes only as the personality changes.[3] Allport and Vernon[4] concluded that one's expressive activities seem not to be disassociated and unrelated to one another, but rather to be organized and well patterned. They also state that expressive movements, being unconscious, are completely independent of conscious intentions. Handwriting is one's gesture fixed on paper for handy reference by anyone at any time. The importance of gestures can be shown by an orchestra conductor who conveys intention and controls a group solely by gestures. We can suppress some forms of expressive movements by volition but it is not possible to suppress them all at all times.[5] Werner Wolff[6] refers to graphic expressive

2. Wolff, W.: Diagrams of the Unconscious. New York: Grune and Stratton, 1948, p. 123.

3. Diethelm, O.: Personality concept in relation to graphology. A. Research Nerv. & Ment. Dis. 14: 278-286, 1933.

4. Allport, G.W. and Vernon, P.E.: Op. Cit., p. 7.

5. French, W.L.: The Psychology of Handwriting. New York: G. P. Putnam's Sons, 1922, p. 9.

6. Wolff, W.: Op. Cit., p. 177.

movements as "diagrams of the unconscious". He states that since these unconscious patterns are modified by psychosomatic changes of the organism, such as elations, depressions, and seizures, graphic movements are evidenced as a reflection of the psychosomatic processes.

Graphology, like any other technique, cannot forge itself into a valid standard tool in isolation. It needs continuous checking with the clinical picture and matter of course acceptance in clinical team work to determine how much it can contribute and where it can contribute most. Experimentation by one approach frequently leads to findings useful to other approaches.

The most pressing problem in clinical graphology today is to determine objectively what elements are most useful as objective indicators and how much emphasis is to be placed on each. Any measuring tool is good to the extent to which it allows a beginner to use it. We often hear the statement, "The projective device is as good as the examiner". The author is of the opinion that if a tool is only good to one who has had so much experience that he can almost operate without it, it is of not much practical value.

Before launching into the objectives of this study it would be well to look at the overall development of graphology.

II

HISTORICAL SURVEY

Aristotle once observed[7] "spoken words are the symbols of mental experience and written words are the symbols of spoken words. Just as all men have not the same speech sounds, so all men have not the same writing". Another early observer was Tranquillus,[8] historian of the first twelve Caesars. Speaking of the personal script of Augustus, he noted that Augustus did not space his words nor carry over to the next line any excess letters. Instead, he placed them under the final words, tying them to it with an extra stroke. Another Roman emperor, Justinian, recorded in his memoirs[9] the observation that individuals' handwriting changes with ill health and age.

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7. Roman, K.: Handwriting. New York: Pantheon Books, Inc. 1952, p. 3.

8. Ibid.

9. Ibid.

One of the first recorded systematic attempts to study the relationship between handwriting and character was made in Italy at the beginning of the seventeenth century when Alderisius Prospero[10] studied handwriting. Next came Camillo Baldo[11] a physician, who published a treatise presenting a method for judging the nature of a writer by his letters. These studies fell into oblivion.

During the eighteenth century curiosity about the relations of handwriting stirred the poets and philosophers. They were fascinated as they discovered frequently occurring links between handwriting and character. After studying many scripts they came up with sharp observations of significant accuracy.

Development of Graphology in France:

During the eighteen hundreds, Flandrin and Michon of Paris spent their lives studying handwriting. Flandrin studied minute details and designated "elements" of handwriting and regarded each of these as a "sign" to be interpreted as an outward index of an inner attribute. Some

10. Ibid.

11. Baldo, C.: Idiographia (Judging the nature and quality of a writer from his letters.) Bolgna, 1644.

thirty years later Michon published his system of handwriting analysis,[12] coining the name "Graphology". Michon was referred to by later workers as a mere "interpreter of signs". J. Crepieux-Jamin,[13] a successor of Michon, broke away from this "school of fixed signs". He shifted the emphasis from the "elements" to the "over-all aspects", stressing the point that handwriting must be perceived as a whole, to which each trait contributes in varying degree and with differing emphasis. His concept, closely resembling the Gestaltist point of view, developed into a theory of "resultants" produced by a combination and interaction of many elements.

At the suggestion of Crepieux-Jamin, Alfred Binet,[14] founder of modern methods of testing, examined the reliability of handwriting analysis. Affirmative results with respect to graphic indices of intelligence brought new prestige to graphology.

12. Michon, J. H.: Systeme de Graphologie. Paris, 1875

13. Crepieux-Jamin, J.: L'Ecriture et le Caractere. Paris, 1888.

14. Binet, A. L.: La graphologie et ses revelations sur le sexe, l'age et l'intelligence. L'Annee Psychol. 10: 179-210, 1904.

Development of Graphology in Germany:

French investigators held first place in theoretical and applied graphology during the nineteenth century. Towards the end of the century the Germans began to take the lead. The work of physiologists and psychiatrists constituting methodical investigations began the first penetrating insights regarding the phenomenon of writing. Preyer[15] demonstrated the consistent similarity of the writing patterns produced by use of different body members -- that is, the right hand, the left hand, the mouth and the toes. The concept that handwriting is really "brain writing", a centrally organized function, was formulated by Preyer in 1895.

Meyer[16] studied writing movements and concluded that handwriting is determined not by the anatomy or strength of hand, but by "psychomotor energies". Underlining what he considered the three main factors of writing movement (extension, speed and pressure), Meyer regarded unity of expression as the decisive factor of psychomotor functioning.

15. Preyer, W.T.: Zur Psychologie des Schreibens. Hamburg, 1895.

16. Meyer, G.: Die wissenschaftlichen Grundlagen der Graphologie. 4th ed. Jena, 1943.

He conducted experiments[17] with psychotic patients in states of mania, elation and depression attempting to demonstrate a relationship between writing, movement, and emotion.

When the Deutsche graphologische Gesellschaft was founded, Klages became leader of German graphology. He established laws and principles of graphology and expressive movement based mainly on his own metaphysical theory of personality.[18] The basic law of expression, Klages states, is that each expressive movement "actualizes" the tensions and drives of the personality. He points out that there is a relation to different media of movement, that is speech, facial expression and handwriting. They have a common "form level" (Formniveau), which is judged according to the general "rhythm" of an individual's movement. According to Klages, rhythm is "an indefinable something" that can be understood only by "intuition". This form level doctrine was not accepted by other countries. At the present time evaluation of handwriting primarily on the basis of rhythm is no longer acceptable to most graphologists. Klages helped

17. Meyer, G.: Vorschule der gerichtlichen Schriftvergleichung. 3rd ed. Jena, 1940.

18. Klages, L. R.: Ausdrucksbewegung und Gestaltungskraft. Leipzig, 1913.

to raise graphology to a scientific level but at the same time he superficially repressed points of view and investigative trends that ran counter to his own.

At the turn of the present century Hirt[19] studied handwriting and attempted to measure pressure and speed in normal and mentally disturbed persons. Klages was antagonistic to such experimental psychology and strenuously objected to induction based on clinical observation, the use of psychometric techniques being an inadequate approach according to him. Due to his prestige, Klages persuaded most leading graphologists not to participate in clinical and experimental work. Thus cooperation between graphology and medicine ceased for awhile.

Pophal,[20] a neurologist, studied the physiology of writing on the basis of findings made earlier by Wachholder.[21] Pophal established a typological system clarifying personality on the basis of essential differences in types of motor

19. Hirt, Emil: Untersuchungen uber das Schreiben und die Schrift. Psychologische Arbeiten, VI: 531-664, 1914.

20. Pophal, Rudolf: Grundlagen der bewegungsphysiologischen Graphologie. Leipzig, 1939.

21. Wachholder, Kurt: Willkurliche Haltung und Bewegung. Munich, 1928.

behavior as reflected in motor patterns of handwriting. He demonstrated two types -- one is found in persons whose motor processes show a functional dominance of the phylogenetically younger part of the brain (cortex or pyramidal area); while the other one demonstrates persons whose motor activity is controlled predominantly by older parts of the brain (the extra-pyramidal area).

Development of Graphology in Switzerland:

Since about 1920 Swiss graphologists have made significant advances under the leadership of Pulver and Schlag. Rejecting Klages' form level theory, Pulver[22] stressed the biological self. Pulver[23] pointed to new possibilities in the interpretation of graphological features and did pioneer work in demonstrating how both conscious and unconscious drives are projected in the writing pattern.

In Switzerland, regarding the use of projective techniques, graphology enjoys the highest prestige, even over the Rorschach.

Development of Graphology in Hungary:

Hungarian graphology began around 1920 and developed

22. Pulver, Max: Trieb und Verbrechen in der Handschrift. Zurich, 1934.
23. Pulver, Max: Der Intelligenzausdruck in der Handschrift. Zurich, 1949.

independently of the German and French schools. It is significant here that psychologists in University positions as well as psychological and psychiatric clinicians furthered the study of handwriting. They used graphological analyses to supplement information obtained by clinical methods and other psychological techniques. Scientifically trained graphologists collaborated in clinical practice and research. Thus these controlled observations facilitated the validation of graphological findings.

The Hungarian Graphological Association was founded around 1920 and the efforts of individual graphologists were correlated and guided by the Association so that results obtained had a collective significance. At the present moment the Russian Iron Curtain prevents us from being aware of any recent developments in Hungarian graphology.

Development of American and British Graphology:

June Downey[24] studied handwriting as an aspect of expressive movement at a time when trait psychology predominated. She approached the problem by using the matching method, comparing judgments based on writing with findings based on gait, gesture, carriage, etc.

24. Downey, June E: Graphology and the Psychology of Handwriting. Baltimore, 1919.

Allport and Vernon[25] based their investigations upon three basic assumptions: first, that personality is consistent; second, that movement is expressive of personality, and third, that the gestures and other expressive movements of an individual are consistent with one another. These basic assumptions constitute the foundation for all practical attempts to diagnose personality on the basis of external movements. They used experimentation and statistical tools not overlooking the fact that consistency of expressive activity lies not only in the correlation of measures but in their meaningful interrelation as well. Their results led to two conclusions -- first, a considerable degree of uniformity appears in a repetitive performance just as manifestations of habit or repeated gestures are consistent; and second, there is an internal consistency in all movements of an individual.

25. Allport, G.W. and Vernon, P.E.: Op. Cit., p. 12.

III

RELATED LITERATURE

A review of the literature has revealed point pressure and amount of writing space consumed to be the most frequently used criteria of depressive and manic tendencies, as far as handwriting analysis is concerned.

It was Max Pulver[26] who pointed out that handwriting is not flat and two dimensional, but a three dimensional formation having height, breadth, and depth in the writing space. The first two dimensions, height and breadth, are obvious. The third dimension, depth, is the pressure which gives the relief effect to the writing. Furthermore, Pulver considered these dimensions as expressive of the symbolism which unconsciously influences actions as demonstrated in the works of Freud and Jung.

Writing pressure is a complex phenomenon. Like all other features of handwriting, it is basically determined by the personality of the writer and not by the tool he

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26. Pulver, Max: Op. Cit.

employs, so says Roman[27] and others. Earlier graphologists equated writing pressure with volitional energy. Nowadays, the tendency to exert heavy pressure in writing is not attributable to possession of sheer muscular power. Jacoby[28] studied this relationship by examining the writing pressure of shoe factory workers and observed that the workers who exhibited the greater muscular strength invariably wrote with no more than average pressure. Roman[29] also investigated the pressure factor in writing and her results showed that muscular strength has no bearing on the degree of pressure exerted in writing.

Regarding the criterion of writing space consumed, it is one of the elements of handwriting that can be subjected to precise, objective and quantitative measurement. The choice of writing space consumed as a criterion was chosen because it was mentioned frequently in the literature as an indicator of a general state of mania or depression.

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27. Roman, K: Op. Cit. p. 125.

28. Jacoby, H.J.: Analysis of Handwriting. London: J. M. Dent, 1940, p. 104.

29. Roman, K.: Studies in the variability of handwriting. J. Genet. Psychol. 49: 139-160, 1936.

Werner Wolff[30] reported from a study of handwriting samples made in states of mania and depression (concerning the same group) that regular decreases in size occurred in states of depression. He observed that these fluctuations did not appear in normal states of mind. This suggests the support of a relationship between graphic movement, its proportions and its degree of consistency and personality. He also stated that we can distinguish different phases in writings of those in a depressed state of mind, expressed by change in size of the writing. Wolff also observed signatures written in a state of mania and of depression and concluded that the outgoing and active behavior coincides with an extension of the movement, while the depressed and passive behavior coincides with a contraction of movement.

Diethelm[31] expresses the same thought with "display of activity is indicated by size of writing" (which may be interpreted that one would tend to expect manics generally to write larger than depressives). Roman[32] states that liberal

30. Wolff, W.: Das Unbewusste der Handschrift im Experiment. Die Umschau 40: no. 28, 1936.

31. Diethelm, O.: Op. Cit.

32. Roman, K.: Handwriting. New York: Pantheon Books, Inc., 1952, p. 166.

spacing indicates an expansive mood or personality. Marum[33] specifically mentioned observed symptoms of depression in handwriting and small size of the writing was one of the symptoms observed. Muhl[34] reported that she observed changes in mental patients' handwriting before other overt changes occurred, "especially in cyclic disturbances and it was possible to determine when the patient was coming out of a depression before he showed any noticeable change". Unfortunately Dr. Muhl did not specify exactly which single indicators in the handwriting predicted this valuable information but "change in size of writing" and "change in pressure" both were mentioned in her report as significant signs. Gehl and Kutash[35] reported that large writing "may signify mania" and depressed performance was noted by underproduction of the size of the writing.

Scheimann[36] reported that "wide spacing between

33. Marum, O.: Character assessment from handwriting. J. Ment. Sci. 91: 22-42, 1945.

34. Muhl, A.M.: Report on 23 years of research in handwriting. Med. Woman J. 55: 27-31, 1948.

35. Gehl, R.H. and Kutash, S.B.: Psychiatric aspects of a graphomotor projection technique. Psychiatric Quart.23: 539-547, 1949.

36. Scheimann, E.J.: Comparison of psychodiagnostic findings of graphology and hand psychology. J. Nerv. Ment. Dis. 107: 269-275, 1948.

flexion of the lines of the hand and broad letters written far apart (the result of which would be the consumption of a large amount of space) is indicative of released tendencies". (This may or may not specifically mean manic tendencies.)

Levinson[37] reports that the handwriting of manics is collectively larger than that of depressives. Saudek[38] stated that the "expanse of the handwriting is evidence of the pathos of the psychic activity".

Sonneman[39] stated that the "graphic picture of mania is not of conflict but of inconsistency and with corresponding euphoric increases in the size of the handwriting".

The other criterion, point pressure, is also one of the elements of handwriting that can be subjected to precise, objective and quantitative measure. This criterion also enjoys a fair amount of support in the literature as an indicator of a general state of mania or depression.

To begin with, Saudek[40] reports that all experiments

37. Levinson, T.S.: Dynamic disturbances in the handwriting of psychotics. Am. J. Psychiat. 97: 102-135, 1940.

38. Saudek, R.: The Psychology of Handwriting. London: Allen and Unwin, 1925, p. 32.

39. Sonneman, U.: Handwriting Analysis. New York: Grune and Stratton, 1950, p. 173.

40. Saudek, R.: Das Zentrale Nervensystem und der Schreibakt. Jahrb. Charakterologie 6: 277-303, 1929.

carried out to date with the aid of instruments registering the writing pressure contradict the assumption that pressure can be easily altered. He goes on to say that past experiments prove that the writing pressure is one of the most individually typical features of handwriting.

As Sonneman[41] points out, there are basically three lines of writing pressure: of the lower arm against the table; of the fingers against the writing implement; and of the writing implement against the paper that can be distinguished. The last one named was chosen for this experiment because it is the only one that will yield tangible and visible results with a minimum amount of equipment and special conditions.

Before citing references supporting the view that increased point pressure be considered as an indicator of a general state of depression, it would be well to consider Wolff's view.[42] He states that "writing pressure can be a reflection of actual behavior or of compensation. Some persons use pressure as an experience of actual energy. Others with a lack of energy may express their wish for an energetic personality and their pressure is a compensation for a missing trait". Wolff's logic here seems to account, in part, for the

41. Sonneman, U.: Op. Cit., p. 41.

42. Wolff, W.: Diagrams of the Unconscious. New York: Grune and Stratton, 1948, p. 268.

conflicting views regarding the interpretation of writing pressure as an indicator. References in the literature seem to favor the view that increased pressure is a reflection of increased activity so this experiment is carried out with this assumption in mind.

Gehl and Kutash[43] specifically refer to a handwriting sample of a depressed person and describe it as "marked by light pressure".

Diethelm[44] says that "pressure in writing is related to an excited state of mind and is directly proportional to same". Ruesch and Finesinger[45] tabulated measures of point pressure of various personalities and the Manic-Depressives, Depressed, all fell into the two levels of least pressure. There were four levels in all. There were, however, no Manic-Depressives, Manic, subjects included in this table. Marum[46]

43. Gehl, R.H. and Kutash, S.B.: Op. Cit.

44. Diethelm, O.: Op. Cit.

45. Ruesch, J., and Finesinger, J.E.: Muscular tension on psychiatric patients. Pressure measurements on handwriting as an indicator. Arch. Neurol. & Psychiat. 50: 439-449, 1943.

46. Marum, O.: Op. Cit.

specifically makes reference to thin, timid, and irregular pressure as a symptom of depression.

Victor[47] refers to pressure as "a projection of life energy". Pulver[48] conceives writing pressure as a "discharge of libido". Here the concept of libido refers not merely to the psychosexual energy but rather to the total psychic energy. Roman[49] brings in another variable, speed, but generally agrees that a person who writes with heavy pressure (and speedily) displays considerable vital energy.

Regarding specific investigations concerning the measurement of point pressure, there have been various quantitative techniques used.

Point pressure has been studied by microscopic examination of the width of the line written on paper by Saudek[50] and Osborn[51]. Other investigators such as Bills

47. Victor, Frank: Handwriting, A Personality Projection. Springfield, Charles C. Thomas, 1952, p. 167.

48. Pulver, Max: Symbolik der Handschrift. ed. 3. Zurich and Leipzig, 1940.

49. Roman, K.: Op. Cit. p. 241.

50. Saudek, R.: Experiments with Handwriting. London, Allen & Unwin, 1928, p. 143.

51. Osborn, A.S.: Questioned Documents. ed. 2, Albany, Boyd Printing Co., Inc., 1929, p. 14.

and Brown[52] and Allport and Vernon[53] have made use of the simple method (as is used in this present study) of having the subject write on a stack of thin sheets of paper with carbon between every sheet -- all of which is attached to a clipboard. The measure of point pressure was merely a count of the number of clearly legible carbon copies with no broken lines. Also various types of balances connected with a recording kymograph or with a tambour have been used by Kraeplin,[54] Gross,[55] Goldscheider,[56] Enke,[57] Meumann,[58] Freeman,[59] and Vernon.[60] Drever[61] and Roman[62] made use of

52. Bills, A.G. and Brown, C.: The quantitative set. J. Exper. Psychol. 12: 301, 1929.

53. Allport, G.W. and Vernon, P.E.: Op. Cit., p. 191.

54. Kraeplin, E.: Eine Schriftwage. Psychol. Arb.1: 20, 1895.

55. Gross, A.: Untersuchungen uber die Schrift Gesunder und Geisteskranker. J. Psychiat. Neurol. 2: 450, 1899

56. Goldscheider, A.: Zur Physiologie und Pathologie der Handschrift. Arch. f. Psychiat. 24: 503, 1892.

57. Enke, W.: Die Psychomotorik der Konstitutionstypen. Ztschr. f. ang. Psychol. 36: 237, 1927.

58. Meumann, E.: Vorlesunger zur Einfuhrung in die experimentelle Padagogik. ed. 2, Leipzig, W. Engelmann, 1913, vol.2

59. Freeman, F.N.: An experimental analysis of the writing movement, Psychol. Monograph 17, Princeton,N.J., Princeton University Press, 1914, no. 4.

60. Vernon, P.E.: New instrument for recording handwriting pressure. Brit. J. Educa. Psychol. 4: 310-316, 1934.

61. Drever, J.: The analytical study of the mechanism of writing. Proc. Roy. Soc. Edinburgh, 34: 230, 1913.

62. Roman, K.: Studies in the variability of handwriting. J. Genet. Psychol. 49: 1939-160, 1936.

a stylus which slid into an outer tube connected with a tambour. Bills[63] and Stroud[64] replaced the tambour by a piston connected with flexible coil wire. They also made use of a stylus within which a point slid up and down against a pneumatic system attached to a tambour for measuring point pressure.

63. Bills, A.G.: The influence of muscular tension on the efficiency of mental work, Am. J. Psychol. 38: 227, 1927.

64. Stroud, J.B.: Apparatus for measuring muscular tension, J. Exper. Psychol. 14: 184, 1931.

IV

THE PROBLEM AND DEFINITION OF TERMS

Before stating the problem per se, let us consider that in any graphological study two common approaches may be considered. One is the intuitive, which is subjective and not objective and quantitative enough to forge into standard tools for use by others. The other is the analytical approach which generally includes empirical and objective items which are more readily adaptable as standard tools for further study and for use by others.

As was mentioned before, it is the author's intention that this study be via the analytical approach in simple, empirical, objective and quantitative terms.

The problem in a concise statement is: Is it possible to discriminate between manics and depressives by using handwriting analysis with amount of writing space consumed and point pressure as specific measurable criteria?

Regarding the manic and depressives mentioned in the problem statement, it is meant the discrimination of the manic

and depressive phases of the primary diagnosis, Manic-Depressive Psychosis. According to the most recent and most complete study of Manic-Depressive Psychosis, that of Bellak,[65] the manic phase is characterized by flights of ideas and psychomotor and emotional excitement. These symptoms may be combined in any degree of severity, and the seriousness of disturbance in one area need not be accompanied by a correspondingly severe disturbance in the other areas. Bellak states that the depressive phase is marked by difficulty of thinking, psychomotor retardation and emotional depression.

It is not assumed here that this simple experiment attempts to question the accuracy of the accepted psychiatric diagnoses. The point is to determine whether the manics can be discriminated from the depressives in a group of known, psychiatrically diagnosed, hospitalized subjects, using the projective technique, handwriting analysis.

65. Bellak, Leopold: Manic-Depressive Psychosis and Allied Conditions. New York: Grune and Stratton, 1952, p. 7.

V

DESCRIPTION OF PROCEDURE

1. Procurement of Samples:

The subjects, psychiatrically diagnosed hospitalized persons with the diagnoses, Manic-Depressive, Manic, and Manic-Depressive, Depressed, were asked by the author to voluntarily give a sample of their writing. Along with the request for the sample each subject received a brief straightforward explanation as to the purpose of the writing. Only the subjects who voluntarily gave their sample were used. No subject was coaxed or forced in any way to give a sample.

The samples were obtained from persons currently hospitalized at St. Elizabeth's Hospital in Washington, D. C., and from the Central State Hospital (for Negroes) at Petersburg, Virginia.

There are twenty manics in one group and twenty depressed persons in the other group. Each subject in the one group is matched with another subject in the other group. They are matched according to age (within five years), sex (each

subject is matched in the other polar group with another of the same sex), color (each subject is matched in the other polar group with another of the same color) and education (each subject is matched with another subject of relatively equal education -- one or two years difference in each case with one exception, which is a difference of three years).

The lower limit of education was chosen as the third grade because it was reported by Alten[66] that this was the school level at which a constant crystallized mode of writing was attained. The age limit, twenty to fifty years of age, was selected so as to allow for fully developed "automatic writing", as Muhl[67] refers to it, and not to go so far into older age groups which would likely include samples possibly contaminated with other major signs indicative of physical deterioration or usual physical ailments such as arthritis.

2. Materials Used:

The material consisted of a standard ball-point pen, the same pen being used for all samples; use of a standard typewriter-size paper of the same brand; use of the same brand

66. Alten, E.H.: Psychology of handwriting and its importance to the physician. Med. Rec. 150: 71-74, 1939.

67. Muhl, A.M.: Automatic writing as an indication of the fundamental factors underlying the personality. J. Abn. & Soc. Psychol. 17: 162-183, 1922-23.

of graph paper; use of the same brand of carbon paper; and use of the same brand of carbon-copy sheets. All of this was clipped together each time onto a masonite clipboard to provide a consistent writing surface for all samples.

By commercial brand names, the top sheet of writing paper was "Old Deerfield Bond"; graph paper was American Pad & Paper Company, Holyoke, Massachusetts; the carbon paper was Typex Carbon Paper, Carter's Ink Company, Boston; the carbon copy sheets were Universal Typewriter Papers, Second Sheets; and the pen was Wearever, with several refills being used which were also the proper make and identical with the original point.

3. Methodology:

Each subject was asked to write his name at the top of the sheet. This positively identified each sample so as to eliminate any possible errors in matching the samples at the time of final inspection and interpretation. Next, each subject was asked to copy a standard sentence from an index card which was handed to him to hold as he wished. When the sentence was completed, the subject was then asked to write the sentence over again. The purpose of this was to make sure of getting at least one perfect sample of the writing.

The paper was previously prepared in a planned stack and clipped to a masonite board. The top sheet was of typewriter-size bond. There was a fresh unused carbon between every sheet of paper under the top sheet. The second sheet was a sheet of graph paper, ruled to twenty squares per inch. This carbon-copy-on-graph-paper provided a stencilled copy for quantifying the size of the writing. The method for measuring the size of the writing was to count the number of squares of graph paper copy occupied by the script (of a previously chosen, consistently-perfect-on-all-samples) phrase in a continuous sequence on one line. A "square unit" of measure was obtained by counting the number of occupied horizontal squares and multiplying it by the number of vertical squares occupied. Since this produced a relatively large number, it was reduced metrically by moving the decimal two places to the left so as to obtain a relatively small number for statistical uses. This small number is referred to in the data as the "area index". Under the top sheet there were a total of eight sheets of paper, with fresh carbon paper between each sheet. This writing surface was consistently presented to every subject and they used the same ball-point pen with which to write.

A ball-point pen was used because it furnished a

consistently durable stencilling point for producing carbons. As is well understood, it is almost impossible to keep any regular pencil sharpened to a consistently sharp point during even the writing of one sample. Also if the ink type pen were used, the nib would be flexible and, depending upon the angle at which it were held, it would not stencil the same number of carbon copies with the same amount of pressure. The amount of pressure was measured in each sample by merely counting the number of clearly-legible-with-no-broken-lines copies that stencilled through the stack.

All samples were completed before any observation was begun. It was noted at this time that not all samples included perfect wording, spelling, spacing and all written on one line. So as to be measuring the same comparative writing, the phrase, "is the time for" was chosen as the item to be measured because this was the only phrase that was consistently perfect and written consecutively all on one line in all the samples obtained. For reliability and since the same sentence appeared twice on each sample, both identical phrases were measured and these two measurements were averaged together to get a mean value for the size of the writing for each subject's sample.

VI

OBSERVED RESULTS

A descriptive list of subjects used in this study appears on the following page. It is to be noted that the depressed member of the matched pair appears in the left-hand column and the manic member appears in the right-hand column. The subjects are identified according to age, sex, color and education in exactly that order. To interpret the code -- for instance in depressed sample #1, it is listed as 44-M-W-6, meaning 44 years old, Male, White, 6th grade education. Pairs of samples, numbers 1 through 11, were obtained at St. Elizabeth's Hospital and numbers 12 through 20 were obtained from Central State Hospital.

On the pages following the list of subjects are the combined data for observed results of the study and the calculations of the critical ratios for each criterion (i.e. point pressure and writing area consumed). The tables for observed raw measurements are shown in the appendix.

The critical ratio for comparison of areas of depressed and manic samples was calculated to be .218. The

critical ratio for comparison of point pressures of depressed and manic samples was calculated to be 1.72.

LIST OF SUBJECTS USED

Sample #	DEPRESSED	MANIC
1	44-M-W-6	47-M-W-8
2	41-M-C-10	37-M-C-7
3	44-M-W-8	50-M-W-8
4	26-F-C-10	25-F-C-9
5	47-M-W-12	50-M-W-11
6	43-F-C-5	42-F-C-6
7	40-F-C-12	45-F-C-11
8	46-F-W-10	48-F-W-12
9	50-M-W-6	50-M-W-8
10	44-M-C-16	47-M-C-14
11	48-F-W-15	48-F-W-14
12	22-F-C-8	23-F-C-9
13	43-F-C-7	44-F-C-7
14	28-M-C-4	24-M-C-3
15	43-M-C-6	46-M-C-6
16	33-F-C-5	37-F-C-6
17	39-F-C-7	37-F-C-7
18	29-F-C-7	28-F-C-7
19	32-M-C-5	27-M-C-7
20	43-F-C-7	42-F-C-5

The subjects are classified in the above list according to their age, sex, color and education in exactly that order. To illustrate the simple code -- sample #1, depressed, is listed as 44-M-W-6, which is to be interpreted as 44 years old, Male, White, 6th grade education.

COMBINED DATA FOR OBSERVED RESULTS

Sample #	DEPRESSED AREA INDEX	DEPRESSED PRESSURE	MANIC AREA INDEX	MANIC PRESSURE
1	5.1	4	18.7	5
2	12.2	4	9.3	4
3	13.7	4	5.2	4
4	7.3	3	6.8	4
5	10.4	5	7.2	6
6	7.1	4	6.6	4
7	5.8	3	17.1	5
8	10.5	3	6.5	4
9	9.1	4	6.1	3
10	5.4	3	4.6	4
11	4.7	3	5.0	3
12	5.1	3	4.2	3
13	5.2	3	5.5	4
14	6.3	2	8.1	2
15	2.2	3	3.9	3
16	5.1	3	2.9	3
17	3.0	1	7.6	5
18	6.5	4	5.2	1
19	12.2	3	5.1	4
20	8.0	2	14.5	4

DEPRESSED

Mean Area Index = 7.245
Mean Pressure = 3.20

MANIC

Mean Area Index = 7.505
Mean Pressure = 3.75

STATISTICAL ANALYSIS FOR COMPARISON OF AREAS

DEPRESSED MANICS

STANDARD DEVIATION, $\sigma = \sqrt{\frac{\Sigma (dm)^2}{N}}$

S.D. = 3.07 S.D. = 4.203

STANDARD ERROR, $SE = \frac{\sigma}{\sqrt{N-1}}$

(for small sample -- when N < 30)

S.E. = .7043 S.E. = .9642

CRITICAL RATIO, $T = \frac{M_1 - M_2}{\text{S.E. difference}}$,

where S.E. difference $= \sqrt{(SE_1)^2 + (SE_2)^2}$

S.E. difference = 1.194

T = .218

STATISTICAL ANALYSIS FOR COMPARISON OF PRESSURES

DEPRESSED MANICS

STANDARD DEVIATION, $\sigma = \sqrt{\frac{\Sigma(d_m)^2}{N}}$

S.D. = .8717798 S.D. = 1.090871

STANDARD ERROR, $SE = \frac{\sigma}{\sqrt{N-1}}$

(for small sample -- when $N < 30$)

S.E. = .1999 S.E. = .2500

CRITICAL RATIO, $T = \frac{M_1 - M_2}{\text{S.E. difference}}$,

where S.E. difference = $\sqrt{(SE_1)^2 + (SE_2)^2}$

S.E. difference = .3201

T = 1.72

VII

SUMMARY AND CONCLUSION

Statistical analyses of the results indicate that a difference in writing pressure of manics and depressives will be maintained in 92 out of 100 future samples. The critical ratio of the sizes of the writing of manics and depressives indicates that any difference in the two groups is due to little more than chance.

It is to be noted that the range of the size of the writing of the manics was quite large. Perhaps if the size of the writing of manics alone, while in various levels of mania, was observed, there might be a significant difference in the size of the writing. Upon inspection of the mean values of the area indices of the manics and depressives, one is able to see at a glance that the mean plus and minus three standard deviations of the area of the manics totally engulfs the corresponding range of the area of the depressives and one would not expect to note any difference in the two groups.

According to the results of this study there is a moderate difference in the amount of point pressure exerted in the writing of manics and depressives and no difference in the size of the writing of the two polar groups.

APPENDIX

OBSERVED PRESSURES

Sample #	DEPRESSED	MANIC
1	4	5
2	4	4
3	4	4
4	3	4
5	5	6
6	4	4
7	3	5
8	3	4
9	4	3
10	3	4
11	3	3
12	3	3
13	3	4
14	2	2
15	3	3
16	3	3
17	1	5
18	4	1
19	3	4
20	2	4

Samples numbered 1 thru 11 were obtained at St. Elizabeth"s Hospital and those numbered 12 thru 20 were obtained from Central State Hospital.

*RAW MEASUREMENTS OF OBSERVED AREAS

Sample #	DEPRESSED		MAFIC	
1	552	462	1512	2222
2	1224	1224	972	884
3	1404	1326	472	567
4	600	858	670	690
5	792	1280	708	741
6	720	693	660	650
7	495	657	1558	1862
8	1040	1056	600	704
9	1024	793	620	590
10	630	450	408	510
11	450	486	531	472
12	495	528	460	380
13	464	576	440	666
14	670	580	770	847
15	220	220	324	462
16	480	530	210	360
17	300	300	806	711
18	490	804	560	476
19	1128	1305	343	684
20	650	945	1332	1562

*These measurements are in "square units" which were obtained by multiplying the number of horizontal graph paper squares consumed by the number of vertical graph paper squares consumed.

OBSERVED MEAN AREAS

Sample #	DEPRESSED	MANIC
1	507	1867
2	1224	928
3	1365	519
4	729	680
5	1036	723
6	707	655
7	576	1710
8	1048	652
9	908	605
10	540	459
11	468	502
12	512	420
13	520	553
14	625	809
15	220	393
16	505	290
17	300	758
18	645	518
19	1217	514
20	797	1447

These values are the means for the raw measurements shown on previous page.

MEAN AREAS CORRECTED TO "AREA INDEX" *

Sample #	DEPRESSED	MANIC
1	5.1	18.7
2	12.2	9.3
3	13.7	5.2
4	7.3	6.8
5	10.4	7.2
6	7.1	6.6
7	5.8	17.1
8	10.5	6.5
9	9.1	6.1
10	5.4	4.6
11	4.7	5.0
12	5.1	4.2
13	5.2	5.5
14	6.3	8.1
15	2.2	3.9
16	5.1	2.9
17	3.0	7.6
18	6.5	5.2
19	12.2	5.1
20	8.0	14.5

*Since the mean of the raw measurements was such a large number, unsuitable for statistical purposes, the decimal was moved over two places to the left. This corrected figure is referred to in the text as the "AREA INDEX".

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VITA

The author was born in Washington, D. C. on 25 January, 1922. He attended Congress Heights Grammar School for eight years, graduating in 1935. Next he attended Eastern High School in Washington, D. C., graduating in 1939. For three years he attended the University of Richmond, 1939 to 1942, before going into military service. He returned to the University of Richmond after four years in the Navy and received his B. A. in Chemistry in 1947. He enrolled in the Graduate School of the University of Richmond in 1949 to do graduate work in chemistry. Later he became interested in psychology and decided to work for an M. A. in psychology. When the required classwork was finished he began his research for this thesis. Since 1952 he has taught Mathematics, General Science and Physics in Suitland High School at Suitland, Maryland.