

JUDGING THE PROVISION-EXPLORATION
FROM DAP ONWARDS

Thesis presented to the School of
Graduate Studies of the University
of Ottawa as partial fulfillment of
the requirements for the degree of
Doctor of Philosophy.



Ottawa, Canada, 1973

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ACKNOWLEDGMENTS

This thesis was prepared under the supervision of Professor Gilles Chagnon, M.Ps., of the Faculty of Psychology of the University of Ottawa.

The writer is also indebted to the fifty persons who kindly accepted to act as judges for the experiment, and to those who, directly or indirectly, contributed to this research.

CURRICULUM STUDIORUM

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INTRODUCTION

The purpose of this study is to explore the skill involved in the task of classifying DAP drawings in terms of a predetermined criterion: intorversion-extraversion. (Skill, hereafter, refers to a judge's ability to accomplish the proposed task with the sole help of his past training and experience). The main problem is formulated in the following dual question:

Is the detection of introversion-extraversion by the analysis of the performance of subjects on the Draw-a-Person Test¹ feasible, and, if so, what skill is involved in the successful completion of this task?

The main concern of the experiment is with the instrument: JUDGES. It is not an attempt to validate the DAP as an instrument to measure introversion-extraversion. Consequently, the hypotheses formulated in the present study are either related to the feasibility of the proposed clinical task or to ways of improving the performance of psychodiagnosticians, whenever they are faced with that particular task. This project is in keeping with the type

¹ K. Machover, Personality Projection in the Drawing of the Human Figure, Springfield, Illinois, Charles C. Thomas, 1949, ix-181 p.

of research proposed by Black,² the aim of which is to evaluate the feasibility, effectiveness and social consequences of skills and techniques currently used and applied in daily clinical practice.³

In the present experiment, a first approach is devoted to the feasibility of the proposed clinical task: the successful classification, by judges, of DAP drawings in terms of the criterion: introversion-extraversion. At the same time, two secondary questions are investigated:

- a) is the degree of clinical experience of the judges a significant variable in the performance of the task?
- b) is the task more easily done with the addition of a 'moderator variable', namely, neuroticism as measured by the Eysenck Personality Inventory?

In a second approach, the criteria used by the successful judges are investigated independently in terms of their alleged relation with introversion-extraversion. The hypotheses in that approach are, therefore, totally dependent on part of the results of the first approach, namely, the criteria used by the successful judges.

2 A.H. Black, Report to the Science Council on Research in Psychology, in The Future of Canadian Psychology: A Report Prepared by the Canadian Psychological Association for the Science Council of Canada, 1971, 336 p.

3 Idem, ibid., p. 91

A third approach is devoted to the investigation of the inferences which can be made from Eysenck's formulation concerning introversion-extraversion, inferences as to what can be expected in the output of subjects drawing a person. The results of the second and third approaches should contribute to improving the efficiency of accomplishing the proposed clinical task.

The first chapter contains a review of relevant studies, including experiments which explored the skills required for a variety of clinical tasks, experiments which linked introversion-extraversion to drawing techniques, a brief discussion of Jung's and Eysenck's formulations concerning introversion-extraversion, and the theoretical hypotheses of this project. The second chapter is devoted to the formulation of the null hypotheses, to the experimental design and to the statistical procedures. In the third chapter, the results are reported and discussed.

CHAPTER I

REVIEW OF THE LITERATURE

The first section of this chapter contains studies which investigate, directly or indirectly, the skills involved in tasks often encountered in the clinical psychologist's current practice. In the second section, studies, which attempt to relate introversion-extraversion (thereafter symbolized by IE) to characteristics of the graphic expression, are reported. A third section is devoted to a discussion of IE, with particular emphasis on Jung's and Eysenck's theoretical formulations; the latter's is basic to the third approach in this project. Finally, hypotheses are formulated in their literary form.

1. Studies of Clinical Skills.

Few studies have attempted to explore and analyse clinical skills. Some have arrived at the conclusion that judges could or could not accomplish a specific and previously defined task, while analysing the performance of subjects on drawing techniques. Others were mainly concerned with the reliability of judgments derived from drawing techniques, without paying much attention to the judge's clinical skills. Still others made a thorough investigation of clinical skills without necessarily relating

them to drawing techniques or to other modalities of graphic expression.

Albee and Hamlin⁴ attempted to determine whether global or insightful impressions by clinicians, who are experienced in projective methods, have significant reliability and validity. The task consisted in judging adjustment of subjects from their drawings. They concluded that clinical psychologists can make reliable judgments of "global adjustment." They also found that non-clinical psychologists, not experienced in projective techniques, can make as reliable judgments. The level of competence of the judges did not play a significant part in doing the task successfully. In a second study, the same authors⁵ found additional support for their previous findings of significant reliability and validity of judgments of adjustment. A study by Lehner and Gunderson,⁶ in which graphic indices were rated, confirmed the capacity of judges to be reliable. Yet

⁴ G.W. Albee and R.M. Hamlin, An Investigation of the Reliability and Validity of Judgments of Adjustment Inferred from Drawings, in Journal of Clinical Psychology, Vol. 5, No. 4, 1949, p. 389-392.

⁵ Albee and Hamlin, Judgment of Adjustment from Drawings: The Applicability of Rating Scale Methods, in Journal of Clinical Psychology, Vol. 6, no. 4, 1950, p. 363-365.

⁶ G.F. Lehner and E.K. Gunderson, Reliability of Graphic Indices in a Projective Test (The Draw-a-Person), in Journal of Clinical Psychology, Vol. 8, No. 2, 1952, p. 125-128.

another study by Tolor and Tolor,⁷ led to the conclusion that, with Machover's Draw-a-Person Test,⁸ (thereafter symbolized by DAP), clinicians can discriminate between more popular and less popular children, as determined by a sociometric measure. However, Silverstein and Robinson,⁹ and Little and Sneiderman,¹⁰ in their studies, arrived at conclusions which deny the competence of judges. Little and Sneiderman concluded that clinicians are usually less able than they believe, to make valid statements about patients, on the basis of tests. These authors found that eminent clinicians performed only slightly above chance.

Another series of studies shed further light on the question of clinical skills. These all used the technique of the Semantic Differential (thereafter symbolized by S.D.)

7 A. Tolor and B. Tolor, Judgement of Children's Popularity from their Human Figure Drawings, in Journal of Projective Techniques, Vol. 19, No. 2, 1955, p. 170-176.

8 Machover, op. cit..

9 A.B. Silverstein and H.A. Robinson, The Representation of Orthopedic Disability in Children's Figure Drawings, in Journal of Consulting Psychology, Vol. 20, No. 5, 1956, p. 333-341.

10 K.B. Little and E.S. Sneiderman, Congruencies Among Interpretations of Psychological Tests and Anamnestic Data, in Psychological Monographs, Vol. 73, No. 6, 1959, (whole of No. 476).

11 C.E. Osgood, J. Suci and P.H. Tannenbaum, The Measurement of Meaning, Urbana, University of Illinois, 1958, 342 p.

to have judges rate drawings in terms of a predetermined criterion. In a first study, Zutterman¹² requested clinicians to rate the self-concept of subjects from their drawings. The results indicated that it is possible for clinicians to differentiate various spheres of the actual self, from their H-T-P drawings. Beauchesne¹³ followed the same design as Zutterman's, but using only twenty-five of his ninety-two subjects. In addition, she had the task done by eight untrained judges. Her results were that only three judges obtained significant results, but none of these were reliable in their ratings. The only judge who confirmed the hypotheses of her study, displayed reliable ratings on only two scales of the S.D.. The only judge who satisfied the criterion of reliability, did not obtain significant results. Although this study seems to suggest that the level of competence of the judges plays a significant part in the performance of the proposed task, when its results are compared to the previous study, its impact is considerably diminished by the lack of reliability of the judges' ratings; indeed, the only reliable judge could not

12 P.C. Zutterman, Self-Concept and Levels of Consciousness as Judged on the H-T-P, Interim Report (unpublished), presented to the Faculty of Psychology and Education, University of Ottawa, Ontario, 1966, ix-86 p.

13 M. Beauchesne, Rapport entre Soi Phénoménologique et Soi Projeté dans les Dessins du H-T-P, Interim Report (unpublished), presented to the Faculty of Psychology and Education, University of Ottawa, Ontario, 1967, viii-84 p.

perform the task successfully. In a second study, Zutterman¹⁴ asked three judges to rate, on the S.D., Adorno's levels of psychic functioning,¹⁵ from the H-T-P of his same sample of ninety-two subjects. The judges performed the task in such a way that the hypothesized tendencies were confirmed.

In an attempt to verify Zutterman's hypotheses with anonymous and non-anonymous subjects, Dupont¹⁶ requested three clinicians to rate their H-T-P on the S.D.. His results indicate that it is possible for clinical psychologists to perceive various levels of the actual self from the H-T-P drawings, but only for the anonymous group. The feasibility of accomplishing the task defined in that study was demonstrated only when anonymous subjects were

¹⁴ P.C. Zutterman, H-T-P Drawings, Their Meaning and the Levels Hypothesis, unpublished Doctoral Thesis, presented to the Faculty of Psychology and Education, University of Ottawa, Ontario, 1967, ix-165 p.

¹⁵ T.W. Adorno, E. Fronkel-Brunswick, D.J. Levinson and R. Sandfor, The Authoritarian Personality, New York, Wiley, 1950, p. 3-5.

¹⁶ G.R. Dupont, Le H-T-P: La Dimension Anonymat/Non Anonymat et l'Hypothèse des Niveaux, Interim Report (unpublished), presented to the Faculty of Psychology, University of Ottawa, Ontario, 1968, xii-144 p.

used. In a second study, Dupont¹⁷ set out to determine if clinical psychologists (N=3) were able, and if so, to what extent, to perceive (still using the S.D.) the actual self and different levels of consciousness of the actual self, from each of the H-T-P drawings of 'neurotic' (non-anonymous) subjects. The results demonstrated that the judges successfully completed the task of perceiving the actual self, but failed to perceive different levels of consciousness of the actual self. As for the latter task, Dupont concluded that either the subjects did not project different levels of consciousness in their drawings or the clinicians were unable to detect them.¹⁸

Up to now, eleven studies involved with clinical skills have been reported. Some of them directly set out to verify the validity and/or reliability of judgments of both trained and untrained judges. Although the last five studies reported were not primarily concerned with the skill required to perform a specific clinical task, part of their results made their authors conclude that trained judges could perform the task of rating H-T-P drawings

17 Dupont, Dessins du H-T-P: Concept de Soi et Niveaux de Conscience chez des Sujets Nevroses dans une Situation de Diagnostic, unpublished Doctoral Dissertation, Presented to the Faculty of Psychology, University of Ottawa, Ontario, 1971, xvi-222p.

18 Idem, ibid., p. 221.

correctly, when using the technique of the S.D.. The overall conclusion seems to be that, for the tasks so far presented, trained judges can perform successfully and significantly better than untrained ones.

A last series of experiments by Chapman,¹⁹ and by Chapman and Chapman,^{20 21} set out to study the possible influence of alleged 'illusory correlations' in the clinical task of diagnostic testing. (The concern of the Chapmans' studies is the same as in the present experiment - they directly attempted to explore the skill displayed by judges when performing a specific task). In the first study, the author talks of an illusory correlation as being the result of a systematic error in reports of observations of a supposed correlation between the occurrences of two classes of events.

The term 'illusory correlation' is proposed for the report by observers of a correlation between two classes of events which, in reality,

19 L.J. Chapman, Illusory Correlation in Observational Report, in Journal of Verbal Learning and Verbal Behavior, Vol. 6, No. 1, 1967, p. 151-155.

20 L.J. Chapman and J.P. Chapman, Genesis of Popular but Erroneous Psychodiagnostic Observations, in Journal of Abnormal Psychology, Vol. 72, No. 3, 1967, p. 193-204.

21 -----, Illusory Correlation as an Obstacle to the Use of Valid Psychodiagnostic Signs, in Journal of Abnormal Psychology, Vol. 74, No. 3, 1969, p. 271-281.

(a) are not correlated, or (b) are correlated to a lesser extent than reported, or (c) are correlated in the opposite direction from that which is reported.²²

In that experiment, variables affecting illusory correlation were studied using visually presented words as stimuli. The author found that words which have a strong associative connection are reported as correlated in their occurrence, when not actually correlated. He also found that illusory correlation also occurs between distinctive stimuli (e.g. long words in a list of ordinary ones).²³ These results made the author of this experiment conclude that it is very important to investigate the variables involved in reported observations of disconfirmed correlations between patients' symptoms and performance on diagnostic tests.²⁴ In a second study pursuing the matter of 'illusory correlations' further, Chapman and Chapman reported on six experiments,²⁵ in which judges observed the test protocols of patients with various symptoms, in an attempt to discover the characteristics of test performance that distinguish patients

22 L.J. Chapman, op. cit., p. 151.

23 Idem, ibid., p. 153-154

24 Idem, ibid., p. 155

25 L.J. Chapman and J.P. Chapman, Genesis of Popular but Erroneous Psychodiagnostic Observations, op. cit., p. 193-204.

with each symptom. Naive judges viewed forty-five DAP drawings randomly, paired with contrived symptom statements about the patients who drew them. The results showed that the phenomenon of 'illusory correlation' was definitely present and played a significant role in the performance of these clinical tasks. The authors warned that many clinical interpretations of the DAP may also have their genesis in illusory correlations arising from associative connection. This would not necessarily reflect personal defect as much as difficulties inherent in the clinician's task. They also suggest that clinicians should be aware that 'consensual validation' may reflect shared systematic error rather than shared accuracy.²⁶ The meanings of many test signs, as reported by clinicians, could easily be illusory correlations based on verbal associative connection of the test sign to the symptom, rather than on valid observations. In the last study of the series, Chapman and Chapman²⁷ set out to demonstrate how, in another clinical task, the phenomenon of illusory correlation persisted in the face of contradictory reality. The specific hypotheses of this last

26 L.J. Chapman and J.P. Chapman, op. cit., p. 204.

27 -----, Illusory Correlation as an Obstacle to the Use of Valid Psychodiagnostic Signs, op. cit., p. 271-280.

study were:

1. The 'popularity' of signs among practicing clinicians has little relationship to the objective clinical validity of the signs, as indicated by research evidence.

2. The most popular signs among practicing clinicians are the ones that have the strongest verbal associative connection to male homosexuality.

3. Naive observers, when presented with contrived Rorschach responses arbitrarily paired with statements of symptoms of the patient who gave each response, erroneously report observing that these same associatively based invalid signs occur as correlates of homosexuality.

4. The naive observers report these associatively based illusory correlations even when the materials are contrived so that other (clinically) valid correlations are present.²⁸

Practicing psychodiagnosticians, as well as naive observers, were used in that experiment. The results were that the invalid signs were reported as correlates of homosexuality more often than were the valid signs, which had objectively true correlations with the symptom.

Almost none of the thirty-two practicing psychodiagnosticians reported observing either of the two signs of male homosexuality that research findings indicate are clinically valid. Instead, they tended to agree with one another in reporting several signs that appear invalid in published research, but which have a high strength verbal associative connection to the symptom of homosexuality. The naive observers presented with contrived clinical materials reported similar erroneous observations.²⁹

28 Ibid, idem., p. 273.

29 Ibid, idem., p. 280.

Such findings are alarming and clearly show the need for more carefully planned research in this area. It would seem especially true for the area of projective techniques, which are more dependent on the examiners, and the degree of agreement between them, for their validity than more direct techniques.

In this first section, studies, which explore the skills and the variables involved in several clinical tasks, were reviewed. Given the social consequences of skills currently used and applied daily by psychodiagnosticians, the importance of this type of research is readily understandable. Yet, apart from the Chapmans' studies, none were directly involved in such research.

2. Drawing Techniques and IE.

In this section, studies which relate techniques of graphic expression to IE are reviewed.

In spite of the ambiguous and unclear evidence reported in the literature, drawing techniques continue to be popular and widely used in clinical milieus. Sundberg³⁰ found that the DAP is the second most frequently utilized projective technique in the hospitals, clinics and counseling services of the United States. This type of technique

³⁰ N. Sundberg, The Practice of Psychological Testing in Clinical Services in the United States, in American Psychologist, Vol. 16, No. 2, 1961, p. 79-83.

continues to offer promising rewards and the need for re-
search in this area is felt more and more. In an impressive
survey of the DAP, Roback³¹ states that, in spite of the
lack of conclusive studies in the area, there is a pressing
need to standardize scales to evaluate personality vari-
ables, using the DAP. Swensen³² made two comprehensive
reviews of the literature on the DAP. In his latest
review, he remarks:

Not much of the research reported in the earlier
review supported the Machover theory, nor had it
been designed to provide much evidence to indicate
the psychometric properties of the human figure
drawing as a measuring device. The research pub-
lished in the past ten years has been conducted at
a substantially higher level of sophistication, and
thus has provided more support for the Machover
theory, and for the use of the human figure drawings
as a diagnostic instrument.³³

Although several experiments studied drawing tech-
niques and more specifically, set out to test Machover's³⁴
numerous hypotheses, few studies were devoted to the

31 H.B. Roback, Human Figure Drawings: Their
Utility in the Clinical Psychologist's Armamentarium for
Personality Assessment, in Psychological Bulletin, Vol. 70,
No. 1, 1968, p. 1-19.

32 C.H. Swensen, Empirical Evaluations of Human
Figure Drawings: 1957-1966, in Psychological Bulletin,
Vol. 70, No. 1, 1968, p. 20-44.

33 Idem, ibid., p. 20.

34 K. Machover, Personality Projection in the
Drawing of the Human Figure, Springfield, Illinois, Charles
C. Thomas, 1949, ix-181 p.

possible relation between the techniques of graphic expression and IE, and none to the exploration of the skill involved in detecting IE from them.

The choice of the location of the drawing on the standard sheet (8½" x 11") is one characteristic which was linked to IE. Levy³⁵ formulated the following hypothesis:

Those whose drawings are on the left side of the page are frequently self-conscious or introverted.³⁶

However, this hypothesis has never been directly tested. Instead, researchers investigated Machover's³⁷ hypothesis which was similar to Levy's and which was summarized by Swensen as follows:

It is felt that a figure that is placed on the right side of the page indicates a subject who is environment-oriented, while a figure placed on the left side of the page suggests a subject who is self-oriented.³⁸

35 S. Levy, Figure Drawing as a Projective Test, in Projective Psychology, L.E. Abt and L. Bellack, ed., New York, Knopf, 1950, xvi-485 p.

36 Idem, ibid., p. 275-276.

37 K. Machover, op. cit..

38 C.H. Swensen, Empirical Evaluations of Human Figure Drawings, in Psychological Bulletin, Vol. 54, No. 6, 1957, p. 454.

In their studies, Gutman,³⁹ Goodman and Kotkov,⁴⁰ and Craddick⁴¹ found, indirectly, evidence against Machover's hypothesis. These authors did not really set out to check that hypothesis and their samples were never chosen in terms of IE. In addition, Machover's hypothesis contains a very vague and limited definition of IE. Dennis⁴² suggested that placement of the drawing on the standard sheet might be the result of cultural determinants.

...it seems likely that not all of the variance present in drawings will be accounted for by individual differences in temperament and personality. There may be determinants of drawing position which are cultural and which have little if any relationship to personality. Culture determines the position on a page at which a person begins to write.⁴³

Dennis used the DAP in his experiment and was led to conclude that placement of the drawing on the page seemed to

39 B. Gutman, An Investigation of the Applicability of Human Figure Drawings in Predicting Improvement in Therapy, Doctoral Thesis (unpublished), New York University, 1952, quoted by H.B. Roback, op. cit., p. 10

40 B. Kotkov and M. Goodman, The Draw-A-Person Tests of Obese Women, in Journal of Clinical Psychology, Vol. 9, No. 4, 1953, p. 362-364.

41 R. Craddick, Draw-A-Person Characteristics of Psychopathic Prisoners and College Students, in Perceptual and Motor Skills, Vol. 15, No. 1, 1962, p. 11-13.

42 W. Dennis, Handwriting Convention as Determinants of Human Figure Drawings, in Journal of Consulting Psychology, Vol. 22, No. 4, 1958, p. 293-295.

43 Idem, ibid., p. 293.

be determined by the handwriting conventions of various cultural groups. However, this author warned that his results are not definitive and that the factors which determine placement remain obscure.

Wallach and Gahm⁴⁴ hypothesized that graphic expansion can be either a 'reflection' of a tendency to social extraversion or a safe way to express inhibited tendencies, (social introversion).

We may label these 'reflections' and 'displacement' functions respectively - emphasis on the first being more congenial to the general idea that personality expresses itself in a consistent manner at all levels; emphasis on the second, to the idea that personality may express covertly or implicitly tendencies that are contrary to overt conduct.⁴⁵

These authors also suggested that the level of anxiety experienced by the subject is a key factor in determining his adoption of a genuine behaviour ('reflection') or of a compensatory behaviour. 'Displacement' is the name which they chose to depict this adoption, by a subject, of a compensatory behaviour. They had their subjects scribble while listening to soft music. Extraversion and anxiety were

⁴⁴ M. Wallach and R. Gahm, Personality Functions of Graphic Constriction and Expansiveness, in Journal of Personality, Vol 28, No. 1, 1960, p. 73-88.

⁴⁵ Idem, ibid., p. 74-75.

measured with the Eysenck Personality Inventory⁴⁶ (thereafter symbolized by EPI) and with the Extraversion Scale of the Minnesota T-S-E-Inventory.⁴⁷ The results warranted the following conclusions:

- a) Anxious social extraverts displayed more graphic expansion than non-anxious social introverts.
- b) Anxious social extraverts displayed more graphic constriction than non-anxious social extraverts.
- c) Non-anxious extraverts displayed more graphic expansion than the non-anxious introverts.
- d) Anxious extraverts displayed more graphic constriction than anxious introverts.⁴⁸

The validity of these conclusions is difficult to refute. First, the high correlation between the Neuroticism Scale of the EPI and the Taylor Manifest Anxiety Scale⁴⁹ indicates that, as for neuroticism and extraversion, anxiety

⁴⁶ H.J. Eysenck, The Questionnaire Measurement of Neuroticism and Extraversion, in Rev. Psicol., Vol. 54, No. 1, 1956, p. 113-140.

⁴⁷ C. Evans and T.R. McConnell, Minnesota T-S-E Inventory, revised edition, Princeton, Educational Testing Service, 1957.

⁴⁸ M. Wallach and R. Gahm, op. cit., p. 86-87.

⁴⁹ J.A. Taylor, A Personality Scale of Manifest Anxiety, in Journal of Abnormal and Social Psychology, Vol. 48, No. 2, 1953, p. 285-290.

and extraversion are orthogonal factors.⁵⁰ Therefore, the extravert could be anywhere on the continuum of anxiety and the anxious extravert does not necessarily express himself as does the non-anxious extravert through the modality of graphic expression. Secondly, the use of a moderator variable (in this case, anxiety) to specify IE, has since been proved essential to the demonstration of significant relationships between IE and their corresponding variables as displayed in overt behaviour. Alexander and Schiffman⁵¹ have shown that their hypothesis - the extravert prefers paintings with people in them - could not be proved without the use of a moderator variable. That study demonstrated that while non-neurotic extraverts prefer paintings with people in them, and non-neurotic introverts prefer paintings without people in them, the relation is reversed for the neurotic sample. The effect of this in the global sample is to eliminate the relation altogether. A subsequent study by

⁵⁰ H.J. Eysenck and S.B.G. Eysenck, On the Unitary Nature of Extraversion, in Acta Psychologica, Vol. 26, No. 4, 1967, p. 383-390.

⁵¹ I.E. Alexander and H. Schiffman, Behavioral Correlates of Jungian Personality Types, final report on grant number MH 10357, submitted to the National Institute of Mental Health, 1968, mimeographed, quoted by K.J. Shapiro and I.E. Alexander, Extraversion-Introversion, Affiliation and Anxiety, in Journal of Personality, Vol. 37, No. 3, 1969, p. 387-388.

Shapiro and Alexander⁵² confirmed these findings and led its authors to the following conclusion:

The introduction of moderator variables in personality research has helped to clarify the situation somewhat. When investigators began to use other personality variables to moderate E-I, predicted relationships emerged which were obscured previously.⁵³

The question of the moderator variable to qualify IE is considered an important one and is investigated further in the design of the present research.

To the author's knowledge, only two other studies have explored IE in relation to drawing techniques. Wildman, Wildman II and Smith⁵⁴ hypothesized that graphic expansion and constriction are indicative of extraversion and introversion, respectively. Their results failed to support the advanced hypothesis. However, that experiment shows weakness in its design and this could account for the obtained results; their sample was rather small and the introverts and extraverts, composing the groups, were chosen by two ward attendants, who worked in the section of the hospital where these patients were interned. The

52 Shapiro and Alexander, op. cit., p. 387-406.

53 Idem, ibid., p. 387.

54 R.W. Wildman, R.W. Wildman II and R.D. Smith, Expansiveness-Constriction on the H-T-P as Indicators of Extraversion-Introversion, in Journal of Clinical Psychology, Vol. 23, No. 4, 1967, p. 493-494.

objectivity of such a procedure is doubtful and the conclusions arrived at less credible. Jacobson and Handler⁵⁵ set out to investigate the effects of stress on DAP drawings, and the relation between anxiety and IE. Among their conclusions, they state the following:

The F values for the IE differences were not significant. An analysis of individual indexes using the sign test indicated that there were no consistent reactions to stress, except that E's tended to draw larger figures and I's drew smaller figures.⁵⁶

These results were interpreted as being in contradiction with those of Wallach and Gahm.⁵⁷

The studies reviewed in the above section linked, directly or indirectly, IE with characteristics of the graphic expression. On the whole, their results are not definitive; at times, they are contradictory. Their main weakness seems to stem from a lack of a common and objective definition of IE, which, in most cases, is used as a synonym of sociability. However, the stress put, by some of them, on the use of a moderator variable in personality studies, may turn out to be an important contribution.

⁵⁵ H.A. Jacobson and L. Handler, Extraversion-Introversion and the Effects of Stress on the Draw-a-Person Test, in Journal of Consulting Psychology, Vol. 31, No. 4, 1967, p. 433.

⁵⁶ Idem, ibid., p. 433.

⁵⁷ M. Wallach and R. Gahm, op. cit., p. 73-88.

3. The Concept of Introversion-Extraversion.

In this section, the concept of IE is reviewed briefly through an exposé of both Jung's and Eysenck's formulations of IE. Eysenck's assertions are reviewed in greater detail, as they form the basis for some of the hypotheses of the present research. In addition, this section might be of value in arriving at a more objective definition of IE which has repeatedly been confused with sociability, social efficiency or social keenness.

Carl G. Jung⁵⁸ was the first personality theorist to formalize the concepts of IE. He considered them as major dimensions of the normal personality. He described the introvert as an individual who displays a definite tendency to interiorize psychic energy, so that his interest is subjective rather than being determined by the objective stimuli of his milieu; his motivation is subjective.

Introversion means a turning inward of the libido whereby a negative relation of subject to object is expressed. Interest does not move towards the object but recedes toward the subject. Everyone whose attitude is introverted thinks, feels and acts in a way that clearly demonstrates

⁵⁸ Carl G. Jung, Psychological Types, New York, Random House, 1923, xxii-654 p.

that the subject is the chief factor of motivation while the object at most receives only a secondary value (...). When introversion is habitual, one speaks of an introverted type.⁵⁹

At the other end of the continuum, the extravert has a definite tendency to exteriorize psychic energy. He is, therefore, more dependent on, and motivated by, the objective environment.

Extraversion means an outward turning of the libido. With this concept, I denote a manifest relatedness of subject to object in the sense of a positive movement of subjective interest towards the object. Everyone in a state of extraversion thinks, feels and acts in relation to the object, and moreover in a direct and clearly observable fashion, so that no doubt can exist about his positive dependence upon the object. In a sense, therefore, extraversion is an outgoing transference of interest from the subject to the object (...). Should the state of extraversion become habitual, the extraverted type appears.⁶⁰

The introvert's motivation and behaviour is clearly determined by subjective factors, while external, objective determinants are responsible for the extravert's habitual mode of behaviour. This theoretical formulation of Jung resulted in several studies in which their authors attempted to link IE to physiological processes, cognitive and perceptual behaviour, sociocultural phenomena, as well as

59 C.G. Jung, op. cit., p. 567.

60 Idem, ibid., p. 542-543.

physical and psychopathological disorders. However, in the thirties, the results reported in these areas were ambiguous and inconclusive. Collier and Emch⁶¹ attributed the obscure results of the thirties to the considerable confusion among researchers, who did not seem to be able to agree on the definition of IE. Either they ignored Jung's provisional definition, or redefined IE according to personal theoretical preferences. The concepts of IE continued, however, to reappear in the psychological literature, and especially in factorial studies. In the fifties, due mostly to Eysenck's voluminous work, the concepts of IE regained their place of importance in personality research. Eysenck,⁶² in a comprehensive review of factorial studies of personality, made the following evaluation:

(...) although the picture is not as clear as one might wish (...) its main outline is becoming more and more definite (...) At the type level, i.e., at the level where concepts are based essentially on the intercorrelations between traits, three main dimensions appear to have been established; Neuroticism, Extraversion-Introversion, and Psychoticism.⁶³

Not only have the concepts of IE always been controversial

61 R. Collier and M. Emch, Introversion-Extraversion The Concepts and Their Clinical Use, in American Journal of Psychiatry, Vol. 94, 1938, p. 1045-1075.

62 H.J. Eysenck, The Structure of Human Personality, New York, John Wiley and Sons, 1953, xix-348 p.

63 Idem, ibid., p. 318.

and highly productive of research, but as the picture becomes clearer, authors attribute more and more importance to them as major dimensions of personality.

H.J. Eysenck has been one of the most prolific researchers in the area of IE. In his carefully planned factorial analyses, he was able to extract two major and independent factors, which he named Introversion-Extraversion and Neuroticism-Stability.⁶⁴ Following this research, Eysenck published two volumes, one in which he implemented on his dimensional theory,⁶⁵ and the other, in which he reviewed contemporary research on the structure of human personality.⁶⁶ Another consequence of his work was the construction and validation of the Maudsley Personality Inventory (MPI)⁶⁷ and of the Eysenck Personality Inventory (EPI).⁶⁸ Eysenck's theory is based on Jung's theoretical premisses, Pavlov's

64 H.J. Eysenck, Dimensions of Personality, London, Routledge and Kegan Paul, 1947, xi-308 p.

65 -----, The Scientific Study of Personality, London, Routledge and Kegan Paul, 1952, xiii-320 p.

66 -----, The Structure of Human Personality, New York, John Wiley and Sons, 1953, xix-348 p.

67 -----, The Maudsley Personality Inventory, London, University of London Press, 1959.

68 H.J. Eysenck and S.B.G. Eysenck, Manual of the Eysenck Personality Inventory, London, University of London Press, 1964.

concepts of 'inhibition-excitation',⁶⁹ and Hull's concept of 'reactive inhibition'.⁷⁰ It implies that the cortical potentials of individuals fall on a continuum: at one end are those who display excessive inhibitive potential, while at the other end are those who display an excessive excitatory potential. Following this line of thought, Eysenck hypothesized that individuals who display strong excitatory potentials and weak inhibitive potentials condition more easily than those for whom the situation is reversed. The former should be introverted, the latter, extraverted. His three basic hypotheses constitute an accurate summary of his theory.

The first hypothesis:

Whenever any stimulus-response connection is made in an organism (excitation), there also occurs simultaneously a reaction in the nervous structures mediating this connection which opposes its recurrence (inhibition).⁷²

69 I.P. Pavlov, Conditioned Reflexes: An Investigation of the Physiological Activity of the Cerebral Cortex, London, Oxford University Press, 1927, xv-430 p.

70 C.L. Hull, Principles of Behaviour, New York, D. Appleton-Century (1943), 7th impression, 1966, xxii-422 p.

71 H.J. Eysenck, Cortical Inhibition, Figural After-Effect and Theory of Personality, in Journal of Abnormal and Social Psychology, Vol. 51, No. 1, 1955, p. 94-106.

72 Idem, ibid., p. 96.

The second hypothesis:

Human beings differ with respect to the speed with which reactive inhibition is produced, the strength of reactive inhibition and the speed with which reactive inhibition is dissipated. These differences themselves are properties of the physical structures involved in the evocation of responses.⁷³

The third hypothesis:

Individuals in whom reactive inhibition is generated quickly, in whom strong reactive inhibitions are generated and in whom reactive inhibition is dissipated slowly are thereby predisposed to develop extraverted patterns of behaviour and to develop hysterical disorders in cases of neurotic breakdown; conversely, individuals in whom reactive inhibition is generated slowly, in whom weak reactive inhibitions are generated and in whom reactive inhibition is dissipated quickly, are thereby predisposed to develop introverted patterns of behaviour and to develop dysthymic disorders in cases of neurotic breakdowns.⁷⁴

The part of the third hypothesis which attempts to predict the possible pathological conditions of the introverted and extraverted types, is not relevant to the present study.

This theoretical formulation provoked considerable interest. This is not surprising if one considers that it makes possible the study of a personality trait, by linking it with physiological correlates. It permits researchers to attain a much higher degree of objectivity, since the

⁷³ H.J. Eysenck, op. cit., p. 96.

⁷⁴ Idem, ibid., p. 97

instruments which measure physiological phenomena are usually far less influenced by the 'human subject' variable, which can easily contaminate the results of other types of instruments. Among the important studies which have attempted to verify Eysenck's hypotheses, is the work of Franks on conditioning.^{75 76} His results confirmed the existence of a definite relationship between IE and the 'inhibition-excitation' balance. Eysenck also found the same relationship when he related IE with three different physiological reactions; the phenomenon of figural after-effect, the acquisition of eyeblink responses, and the GSR conditioned responses.^{77 78} Eysenck and Eysenck brought additional support to the 'inhibition-excitation' balance hypothesis and the greater conditionability of the introvert, by linking

⁷⁵ C.M. Franks, Conditioning and Personality: A Study of Normal and Neurotic Subjects, in Journal of Abnormal and Social Psychology, Vol. 52, No. 2, 1956, p. 143-151.

⁷⁶ -----, Personality Factors and the Rate of Conditioning, in British Journal of Psychology, Vol. 48, second part, 1957, p. 119-127.

⁷⁷ H.J. Eysenck, Cortical Inhibition, Figural After-Effect and Theory of Personality, op. cit., p. 94-106.

⁷⁸ -----, Extraversion and the Acquisition of Eyeblink and GSR Conditioned Responses, in Psychological Bulletin, Vol. 63, No. 4, 1965, p. 258-270.

IE to two other physiological responses.^{79 80} In both cases, the greater conditionability of the introvert was unequivocally demonstrated. Three other significant studies, Haslam,⁸¹ Smith,⁸² and Siddle, et al.,⁸³ reinforced the plausibility of Eysenck's hypotheses. These authors investigated the 'inhibition-excitation' balance hypothesis by using yet other physiological modalities. They, too, obtained significant results confirming the hypothesis. The

79 S.B.G. Eysenck and H.J. Eysenck, Physiological Reactivity to Sensory Stimulation as a Measure of Personality, in Psychological Reports, Vol. 20, 1967, p. 45-46.

80 -----, Salivary Response to Lemon Juice as a Measure of Introversion, in Perceptual Motor Skills, Vol. 24, 1967, p. 1047-1053,

81 D.R. Haslam, Individual Differences in Pain Threshold and the Concept of Arousal, unpublished doctoral thesis, Bristol University, 1966, quoted by J.A. Gray, Strength of the Nervous System, Introversion-Extraversion, Conditionability, and Arousal, in Behaviour Research and Therapy, Vol. 5, 1967, p. 151-169.

82 S.L. Smith, The Effect of Personality and Drugs on Auditory Threshold when Risk-Taking Factors are Controlled, quoted by J.A. Gray, op. cit., p. 151-169.

83 D.A.T. Siddle, R.B. Morrish, K.D. White and G.L. Mangan, A Further Study of the Relation of Strength Sensitivity and Reactivity of the Nervous System to Extraversion, in Journal of Experimental Research in Personality, Vol. 3, No. 4, 1969, p. 264-267.

authors^{84 85 86} who did not succeed in establishing the proposed relationship or who seriously questioned the theory, were severely criticized because of inherent weaknesses in their studies,⁸⁷ or because of their subjective and erroneous interpretations of the theory itself.^{88 89}

Several studies, therefore, have demonstrated that the introvert conditions more easily than the extravert. By relating IE to several physiological responses, a definite relation was established between IE and the 'inhibition-excitation' balance. Eysenck's basic hypotheses have been

⁸⁴ J.J. Sigal, H.H. Star, and C.H. Franks, Hysterics and Dysthymics as Criterion Groups in the Study of Introversion-Extraversion, in Journal of Abnormal and Social Psychology, Vol. 57, No. 2, 1958, p. 143-148.

⁸⁵ H.A. Sweetbaum, Comparisons of the Effects of Introversion-Extraversion and Anxiety on Conditioning, in Journal of Abnormal and Social Psychology, Vol. 66, No. 3, 1963, p. 249-254.

⁸⁶ P.O. Davidson, R.W. Payne and R.B. Sloane, Cortical Inhibition, Drive Level and Conditioning, in Journal of Abnormal Psychology, Vol. 71, No. 4, 1966.

⁸⁷ H.J. Eysenck, Scientific Methodology and the Dynamics of Anxiety and Hysteria, in British Journal of Medical Psychology, Vol. 32, first part, 1959, p. 56-63.

⁸⁸ -----, Extraversion and the Acquisition of Eyeblink and GSR Conditioned Responses, op. cit., p. 258-271.

⁸⁹ -----, Reminiscence, Drive and Personality Revision and Extension of a Theory, in British Journal of Social and Clinical Psychology, Vol. 1, second part, 1962, p. 127-141.

repeatedly supported and criticisms against them were weak and never substantiated.

Before going on to the final section, in which the hypotheses of the present study are formulated, Eysenck's provisional definitions of the extravert and of the introvert are given. Both definitions were used in the experimental design of the present study.

The typical extravert is sociable, likes parties, has many friends, needs to have people to talk to, and does not like reading or studying by himself. He craves excitement, takes chances, often sticks his neck out, acts on the spur of the moment, and is generally an impulsive individual. He is fond of practical jokes, always has a ready answer, and generally likes change; he is carefree, easygoing, optimistic, and likes to 'laugh and be merry'. He prefers to keep moving and doing things, tends to be aggressive and lose his temper quickly; altogether his feelings are not kept under tight control, and he is not always a reliable person.

The typical introvert is a quiet, retiring sort of person, introspective, fond of books rather than people; he is reserved and distant except to intimate friends. He tends to plan ahead, 'looks before he leaps', and distrusts the impulse of the moment. He does not like excitement, takes matters of everyday life with proper seriousness, and likes a well-ordered mode of life. He keeps his feelings under close control, seldom behaves in an aggressive manner, and does not lose his temper easily. He is reliable, somewhat pessimistic, and places great value on ethical standards.⁹⁰

⁹⁰ S.B.G. Eysenck and H.J. Eysenck, The Validity of Questionnaire and Rating Assessments of Extraversion and Neuroticism, and their Factorial Stability, in British Journal of Psychology, Vol. 54, No. 1, 1963, p. 52.

4. The Theoretical Hypotheses.

Three series of questions are now formulated; each series corresponds to one specific approach to the solution of the main problem: is the detection of IE by the analysis of the performance of subjects on the DAP feasible, and, if so, what skill is involved in the successful completion of that task?

The purpose of the first approach is to check the feasibility of the proposed clinical task: the classification of DAP drawings in terms of IE. There are one main and two secondary hypotheses.

I. The First Approach.

1.1 - The main hypothesis:

By inspection of DAP drawings, judges can determine consistently if a drawing was done by an extravert or by an introvert.

1.2 - The secondary hypotheses:

1.2.1 - The efficiency in doing the proposed clinical task is positively related to the judge's clinical experience.

1.2.2. - The utilization of a 'moderator variable' (neuroticism) facilitates the successful completion of the clinical task.

II. The Second Approach.

The hypotheses of the second approach are dependent on the results of the first approach (main hypothesis). They are formulated by using the criteria of the 'best judge', the one who was the most successful in detecting IE. Therefore, it is now appropriate to report the results on which the choice of the best judge was based. The score of the best judge was found to correspond to a level of significance of $p = .08$ (Binomial Test⁹¹). The criteria suggested by the 'best judge' are DAP characteristics which are likely to differentiate between introverts and extraverts.

- 2.1 - A subject is likely to be extraverted if his DAP drawing contains the characteristic: happy facial expression.
- 2.2 - A subject is likely to be extraverted if his DAP drawing contains the characteristic: graphic expansion.
- 2.3 - A subject is likely to be extraverted if his DAP drawing contains the characteristic: impression of movement.
- 2.4 - A subject is likely to be extraverted if his DAP drawing contains the characteristic: limbs extended from the body axis.
- 2.5 - A subject is likely to be extraverted if his DAP drawing contains the characteristic: superfluous details.

91 S. Siegel, Nonparametric Statistics for the Behavioural Sciences, New York, McGraw-Hill, 1956, vii-312 p., p. 36.

- 2.6 - A subject is likely to be extraverted if his DAP drawing contains the characteristic: marked deviation in the placement of the drawing on the standard sheet.

A subject is likely to be introverted when his DAP drawing contains the opposite or the absence of the above characteristics.

III. The Third Approach.

The hypotheses of this third approach stem from Eysenck's theory which states that the extravert is less sensitive to conditioning. Therefore, the extravert should display less temperance and control in his habitual behaviour. If the type of behaviour elicited by the DAP makes possible the discrimination between introverted and extraverted subjects, and if Eysenck's conditioning hypothesis holds true, the following hypotheses can be formulated:

- 3.1 - When a DAP final production gives the impression of haste and impulsiveness, its author is an extravert.
- 3.2 - When a DAP final production shows a marked deviation from expected size by displaying a high degree of graphic expansion or constriction, its author is an extravert.
- 3.3 - When a DAP final production shows a marked deviation in placement on the standard sheet, its author is an extravert.
- 3.4 - When a DAP final production shows superfluous, decorative or fashion details, i.e. details not required by the task of drawing a person, its author is an extravert.

In this first chapter, studies thought relevant to the present research were reviewed. One group of studies was directly or indirectly concerned with the skills involved in various clinical tasks. Both the lack and importance of this type of research were evident. Another group of studies dealt with IE and characteristics of the graphic expression. Most of these reported ambiguous results. A third section was devoted to a brief review of the concept of IE. Jung's and Eysenck's formulations were reported and discussed. Finally, a last section contained the theoretical hypotheses which are experimentally formulated and tested in the following chapter.

CHAPTER II

EXPERIMENTAL DESIGN

In the first part of this chapter, the experimental hypotheses are formulated. There are three groups of hypotheses, each group corresponding to one of three approaches to the problem under scrutiny - is the detection of IE by the analysis of the performance of subjects on the DAP feasible, and, if so, what skill is involved in the successful completion of that task?

Another part contains the operational definitions, the description of the subjects and their task, and a discussion of the instruments used in this research. Then follows a description of the judges and of the tasks which they were asked to perform.

The last section contains a discussion of the statistical procedures applied to the data of this study.

1. Hypotheses of the First Approach.

This first group of hypotheses contains one main question: are judges able to perform successfully the clinical task of classifying DAP drawings in terms of IE? It also contains two secondary questions: are more experienced

judges more efficient at doing the same task and does the utilization of a moderator variable (neuroticism) facilitate the successful completion of the task?

The hypotheses are now stated in their null form.

A. Hypotheses related to the main question (feasibility of the clinical task).

1.1 - There is no significant difference between the observed frequencies (proportion of correct judgments) of the nine "best judges", in task no. 1, and the theoretical frequencies (proportion of correct judgments expected from a haphazard procedure).

1.2 - There is no significant difference between the observed frequencies (proportion of correct judgments) of the "best judge", in task no. 1, and the theoretical frequencies.

B. Hypotheses related to the secondary questions (levels of experience and the moderator variable).

1.3 - There is no significant difference between the mean score of the clinicians, the semi-naive judges and the naive judges.

1.4 - There is no significant difference between the mean scores of the naive and semi-naive judges, who effected judgments on the 15 DAP drawings common to both tasks no. 1 and no. 2, taking the moderator variable into consideration, and the mean scores of the naive and semi-naive judges, who effected judgments on the same drawings, but without taking the moderator variable into consideration.

2. Hypotheses of the Second Approach.

The reason for testing the hypotheses of the second approach is to check the validity of the criteria proposed by the judges, who were the most successful at detecting IE. The results might contribute to an increase in efficiency when performing the proposed clinical task. The hypotheses are formulated below in their null form.

2.1 - Happy facial expression.

There is no significant difference between the mean score of extraversion (EPI) obtained by subjects, who drew a person with a happy facial expression, and the mean score of extraversion (EPI) of those who drew a person with a sad or angry facial expression.

2.2 - Graphic expansion.

There is no significant difference between the mean score of extraversion (EPI) of subjects, who displayed graphic expansion in their DAP, and the mean score of extraversion (EPI) of those who displayed graphic constriction in their DAP.

2.3 - Movement.

There is no significant difference between the mean score of extraversion (EPI) of subjects, who drew a person in such a way as to give the impression of movement, and the mean score of extraversion (EPI) of those who drew a person in such a way as to give the impression of rigid positioning.

2.4 - Position of the limbs relative to the body axis.

There is no significant difference between the mean score of extraversion (EPI) of subjects, who drew a person with the limbs extended away from the body axis, and the mean score of extraversion (EPI) of those who drew a person with the limbs close to the body axis.

2.5 - Superfluous, decorative or fashion details.

There is no significant difference between the mean score of extraversion (EPI) of the subjects, who added superfluous, decorative or fashion details in their DAP, and the mean score of extraversion (EPI) of those who restricted themselves to the essential details requested in the task of drawing a person.

2.6 - Deviation in the placement of the drawing on the standard sheet.

There is no significant difference between the mean score of extraversion (EPI) of subjects, who showed a marked deviation in the placement of the drawn person on the standard sheet, and the mean score of extraversion (EPI) of those who did not show such a marked deviation.

3. Hypotheses of the Third Approach.

The hypotheses of the third approach stem from Eysenck's theoretical formulation which suggests that the introvert is more readily conditioned and is, therefore, more conventional, temperate and persistent in his behaviour than is the extravert. The testing of these hypotheses

might also result in increased efficiency when performing the proposed clinical task. They are stated below in their null form.

3.1 - Graphic expansion/constriction.

There is no significant difference between the mean score of extraversion (EPI) of subjects, who displayed a high degree of graphic expansion or constriction, and the mean score of extraversion (EPI) of those who displayed a moderate degree of graphic expansion.

3.2 - Superfluous, decorative or fashion details.

See hypothesis 2.5, second approach.

3.3 - Deviation in the placement of the drawing on the standard sheet.

See hypothesis 2.6, second approach.

3.4 - Overall production which gives the impression of impulsiveness.

There is no significant difference between the mean score of extraversion (EPI) of the subjects, who drew a person in such a way as to give the impression of impulsiveness, and the mean score of extraversion (EPI) of those whose final production of the drawn person does not give this impression, but rather one of a carefully drawn person.

4. Operational Definitions.

In an attempt to precise the exact meaning of various terms used in this study, the following operational definitions were formulated.

- i) Introverted subject: a subject who has obtained a result equal to, or less than, the 30^o centile on the IE scale of the EPI.

- ii) Extraverted subject: a subject who has obtained a result equal to, or more than, the 85^o centile on the IE scale of the EPI.
- iii) Neurotic subject: a subject who has obtained a result equal to, or more than, the 70^o centile on the N scale of the EPI.
- iv) Score of a judge: a number representing the sum of the same drawings correctly classified twice by that judge (test and re-test).

(The score obtained by a judge, divided by the number of drawings to be classified in a given task, becomes the proportional result of the said judge).
- v) The "best judges": judges who have obtained a proportional result of at least .61. This implies that 11 of 18 drawings were classified correctly on two occasions for task no. 1, 16 of 26 drawings for task no. 2.
- vi) The "best judge": the judge who has obtained a proportional result of .72. (On two occasions, 13 of 18 drawings were classified correctly for task no. 1).
- vii) Happy facial expression: drawing of a person whose face shows a smile or gives the impression of contentment and satisfaction. (Criterion arrived at, following agreement between three judges).
- viii) High degree of graphic expansion or constriction: Scores of graphic expansion corresponding to at least the 70^o centile, and scores of graphic constriction corresponding to the 30^o centile or less. (Criterion arrived at, with the use of a polar planimeter).
- ix) Movement: when the final production of the DAP gives the judge the impression of action. (Agreement between three judges).
- x) Limbs extended from body axis: when the extremities of the limbs of the drawn person are not in contact with the body, and/or give the impression of being directed outward. (Criterion arrived at, following agreement between three judges).

- xii) Superfluous, decorative or fashion details:
a detail which neither is essential nor requested by the task of drawing a person (usually clothed), e.g. a cigarette, a cane, an umbrella, a necklace, etc.. In the same manner, a detail which adds to the decor, e.g. a second person, a tree, a bench, etc.. (Criterion arrived at, following agreement between three judges).

- xiii) Deviation in the placement of the drawing on the standard sheet: a drawing which shows a marked deviation from the centre of the standard sheet (with a slight deviation to the left). (Criterion arrived at, following agreement between three judges).

- xiiii) Impulsiveness: when the final production of the DAP gives the judge the impression of haste or neglect, e.g. inadequate quality of line, lack of organization, lack of proportion between the parts, etc.. (Criterion arrived at, following agreement between three judges).

5. The Subjects.

For the first approach, eighty-eight subjects (N=88) participated voluntarily in the experiment. They were all female students and were registered in the three year programme offered at the School of Nursing of the Ottawa General Hospital (age range between 19 and 26; mean age $22\frac{1}{2}$). For the design related to the second and third approaches, fifty-seven nursing students (N=57) were added to the original sample. They were also voluntary participants and were attending the Vanier Regional School of Nursing, Ottawa, Ontario. To determine if these two groups could be treated as one sample, mean scores, standard deviations and a t-test

were computed, using their EPI results. The mean scores of the original group and of the Vanier group were 12.96 and 12.42, respectively; the t-test did not show any significant difference between the two groups and, therefore, they were treated as one sample. Seven subjects (N=7) were subsequently taken out of the sample, because of their incomplete productions of the DAP (more than the feet and the hands were omitted from their drawing of the person). The final sample was, therefore, composed of 138 subjects.

6. The Instruments.

In this section, the reader will find a description of the administration procedures followed with the subjects. In addition, the instruments used to isolate the relevant variables are discussed. The EPI, which is the main tool of the present research, is the object of a more complete treatment.

The Draw-a-Person Test,¹ Eysenck's EPI,² and

1 K. Machover, Personality Projection in the Drawing of the Human Figure, Springfield, Illinois, Charles C. Thomas, 1949, ix-161 p.

2 H.J. Eysenck and S.B.G. Eysenck, Eysenck Personality Inventory, EITS Manual, in Educational and Industrial Testing Service, San Diego, California, 1968, 27 p.

Cattell's 16PF³ were administered in that order to the 88 subjects included in the first approach. Two weeks later, the same procedure was repeated with the same subjects. The only purpose for extracting the second-order factor IE, from the 16PF, was to reinforce the validity of the IE factor obtained with Eysenck's EPI. This would take place if a significant relationship were to be found between the two measures of IE.

The EPI, however, remains the main tool of the present experiment to isolate IE. The main reasons for this choice will be given later.

The DAP and the EPI were administered on one occasion only, to the 57 subjects added in the second and third approaches.

Among possible drawing techniques, the DAP was chosen for the following reasons: the DAP is a technique which is popular and very frequently utilized in North American clinical milieus (see chapter I, p. 11); the DAP is economical, both in terms of cost and time, and is easily administered.

³ R.B. Cattell, et al., The Sixteen Personality Factor Questionnaire, Champaign, Illinois, I.P.A.T., 1949.

The EPI was the tool chosen to isolate IE in this experiment. First, this instrument is intimately related to Eysenck's theory of IE, a theory which has inspired the hypotheses formulated in the third approach. In addition, several factorial studies have confirmed the EPI validity; they are quoted in the EPI Manual,⁴ as well as studies which have demonstrated its reliability. The EPI is easily administered and subjects find it easy to do. This last characteristic is advantageous and important from the subjects' point of view. Their motivation, while taking the test, is less likely to deteriorate than when they are submitted to inventories containing a great number of items.

The EPI measures personality in terms of two orthogonal dimensions which Eysenck has named "Introversion-extraversion" and "Neuroticism-stability".⁵ Twenty-four questions were allotted to each of these dimensions and were chosen following item analyses and factorial studies. The task of the subject was simply to answer "yes" or "no" to

⁴ H.J. Eysenck and S.B.G. Eysenck, op. cit., p. 14-17.

⁵ Idem, ibid., p. 5.

each of the questions. In addition, the author inserted a Lie Scale in his test, to insure that subjects answered questions sincerely and did not try to answer in what they perceived as being the most socially acceptable way, thereby trying to show a favourable image to the Examiner. A score of 5 or more on the L-Scale would seriously jeopardize the validity of the entire test.⁶ Eysenck also states that the EPI is an improvement on his former MPI (Maudsley Personality Inventory),⁷ although the correlation between the two instruments is sufficiently high as to apply to the EPI the results of studies made with the MPI. As for the improvements, the author completely revised the items and also succeeded in eliminating the slight correlation which existed between the two dimensions measured by the MPI, and now, by the EPI.⁸ It was concluded that the validity and the reliability of the EPI were well established and that this instrument could be used with confidence in the present experiment. In addition, there are no studies, as far as

6 H.J. Eysenck and S.B.G. Eysenck, op. cit., p. 20

7 H.J. Eysenck, The Maudsley Personality Inventory, London, University of London Press, 1959.

8 H.J. Eysenck, and S.B.G. Eysenck, Eysenck Personality Inventory, op. cit., p. 5.

can be established, which have cast serious doubts on the advantageous characteristics of the EPI.

In the above section, the procedures followed with the subjects were mentioned. The tools used were the main object of the section, particularly the EPI, the main instrument with which the IE variable was isolated. Justifications for the choices made were put forward, and the qualities of the instruments emphasized.

7. The Judges.

A discussion now follows, concerning the fifty judges who voluntarily participated in this experiment.

In the first approach, forty-nine judges attempted the clinical task: ten clinical psychologists, nineteen psychology students in their second year of a M.A. programme, and twenty individuals, among the author's acquaintances, who have not received any formal training in psychology. These three groups correspond to the clinicians, to the "semi-naive" judges and the "naive" judges, respectively. The clinicians have had at least five years of clinical experience and were all familiar with the administration and interpretation of drawing techniques. The semi-naive judges,

all students of the Faculty of Psychology of the University of Ottawa, were registered in the course (among others) of "Projection in Drawings". When these judges were presented with the clinical task, the course in question was near its completion and consequently, the term "semi-naive" applied to this group, implies that each one had been sensitized to the analysis of drawing techniques, without, however, having had any experience with these techniques in a clinical milieu. The naive judges were individuals who were totally unfamiliar with drawing techniques.

Having described the judges who participated in this experiment, the clinical tasks which they were submitted to are now described fully in the following section.

8. The Clinical Tasks Effected by the Judges.

In Task No. 1, eighteen drawings of a person were presented to each judge composing the first three sub-groups, (5 clinicians, 12 semi-naive and 10 naive). These eighteen drawings had been made by 18 neurotic subjects (see: Operational Definitions, p. 39), 9 introverts and 9 extraverts. The drawings were mixed up before each presentation, except for the first one, which remained the same, on top of the pile. Each judge was thus exposed to the same initial stimulus. Each judge was presented with Eysenck's provisional definitions of the extravert and of the introvert

(see Chapter I, p. 29). He was instructed to read them and to consult them during the task, if he so desired. Then, each judge was given the following verbal instructions:

Here are drawings which have been made by introverts and extraverts. However, all these subjects are neurotic, as they all obtained a score of at least the 70th centile on the Neuroticism Scale of the Eysenck Personality Inventory. You are asked to classify these drawings, to put them into two piles in terms of extraversion-introversion. You will then be asked what criteria you have used to put some of the drawings on the extraversion side and the others on the introversion side. There is no time limit in which you have to do this task.

To mention the score obtained by the subjects on the Neuroticism Scale was the method chosen to introduce the moderator variable which qualifies IE, in Task No. 1. In Task No. 2, twenty-six drawings were presented to each judge composing three sub-groups (5 clinicians, 7 semi-naive and 10 naive), but without using the moderator variable to qualify IE. The subjects who made these twenty-six drawings, some neurotic, others not, were chosen according to the same criteria of IE as those in Task No. 1. There were 13 extraverts and 13 introverts. The same verbal directions were given to each judge, but without the passage relevant to the moderator variable.

In order to check the possible effect of the moderator variable, only the drawings which appeared in both tasks (N=15) were retained. Also, in an attempt to increase the homogeneity of the judges, the clinicians were taken out of

the group. Thus, twenty-two judges (N=22) were submitted to Task No. 1, seventeen (N=17) to Task No. 2, all of whom were naive and semi naive judges.

In the design of the second and third approaches, in which eight hypotheses were to be verified, three judges (clinicians) were used. Their task was the classification of drawings (N=138) into three categories, in terms of the signs which prompted six of the eight hypotheses to be verified. These six signs of the drawings correspond to the criteria proposed by the "best judge", when he performed the clinical task of detecting IE in the DAP. These same criteria were also proposed by the nine "best judges", in nearly all cases. Therefore, each of these signs could prove to be useful in classifying DAP drawings in terms of IE. The other two signs proposed as criteria for IE, stem from Eysenck's theoretical formulation. Thus, the three judges, participating in the second and third approaches, had to classify 138 drawings into three piles. One pile contained the drawings in which one of the six signs is definitely manifested; the second pile contained the drawings in which that same sign is barely displayed or not at all, and the third pile consisted of drawings about which the judges were in doubt and could not place in either of the other two piles. The drawings were classified six times by each judge; each time in terms of

one sign. The agreement between the three judges determined the number of drawings retained in the analysis (the drawings which were classified in the two extreme categories by the three judges were part of the analysis; those in the "doubtful" category were rejected).

In the above section, the tasks effected by the judges were described in detail. They had to classify drawings according to definite directions, and in terms of specified characteristics.

9. The Polar Planimeter

The Polar Planimeter was used to obtain measures of graphic expansion. With this instrument, scores of surface area (CM^2) were derived for each drawing. This was done by following the line of the contour of each drawing, with the needle at the extremity of the arm of the Planimeter. A correlation of 0.90 (Pearson r) was obtained between two series of measurements done by the same person (intra-judge reliability), and another one of 0.90 was obtained between two series of measurements done by two different persons, inter-judge reliability). It was difficult, therefore, to doubt the precision of measurements thus obtained.

10. The EPI (E) and the 16PF (E).

This section contains a discussion of the reliability of the measurements obtained from the Extraversion scale of the EPI, the chosen instrument with which IE was isolated. In addition, the relation between the Extraversion factor derived from Eysenck's EPI and the Extraversion second-order factor derived from Cattell's 16PF, is commented upon.

A correlation of 0.80 (Pearson r) was obtained between two series of extraversion scores. These two series correspond to two administrations of the EPI (a lapse of two weeks was allowed between administrations), to the original sample of eighty-eight subjects. The mean scores were 12.96 and 12.63, respectively. The standard deviations were also nearly identical: $\sigma = 3.49$ and $\sigma = 3.82$. Following the calculation of a t -test, it was concluded that there was no significant difference between the two series of scores and that the reliability of the measure used to isolate IE had been adequately demonstrated in this experiment.

The relation between the E scores of the EPI and the E scores of the 16PF was more difficult to analyse. A correlation of 0.65 (Pearson r) was found between these two series of scores. This correlation does support the validity of Eysenck's test as a measure of IE. However, although both

measures have much in common, the E factors measured by both seem to have a qualitative difference. This would explain why the correlation obtained is not higher. This reasoning agrees with the somewhat divergent views of the two authors. Cattell has a tendency to consider manifest social competency as a synonym of extraversion, while Eysenck views extraversion as being closely related to physiological hereditary givens.

11. Statistical Procedures.

This section contains a discussion of the statistical procedures used to verify the hypotheses of this research.

Two statistical techniques were used in the first approach: the binomial test⁹ and the Kruskal-Wallis one-way analysis of variance by ranks.¹⁰ These nonparametric techniques are particularly suited to the data of the first approach (scores of the judges). Untenable assumptions do not have to be made concerning the distribution of the scores in the corresponding universe, or concerning the real

⁹ S. Siegel, Nonparametric Statistics for the Behavioural Sciences, New York, McGraw-Hill, 1956, vii-312 p., p. 36-42.

¹⁰ Idem, ibid., p. 184-194.

numerical value of such scores. In addition, this type of procedure allows for more reliable results, when it is employed with small samples, which is the case in the first approach.

To ascertain the feasibility of succeeding in the clinical task, the binomial test was applied to the scores (18 judgments) of the nine "best judges" and to the score of the "best judge". Using this procedure, it was possible to determine whether the observed frequencies in the sample were similar, or not, to the theoretical frequencies obtained haphazardly. The null hypothesis stated that there would be no difference between the two situations. In the sample, each case is in either one of two classes (IE); the proportion of cases in each class is equivalent to $P = \frac{1}{2}$ (random observations). For samples in which $N \leq 25$, one has access to a table of values, reproduced in Siegel.¹¹ This table of values gives the probabilities associated with different values of the binomial distribution, when $P=Q=\frac{1}{2}$ ($P=Q$ = number of cases in one class).

The Kruskal-Wallis one-way analysis of variance by ranks was used to verify the hypotheses of the first approach, related to the levels of competence of the judges and to the moderator variable. This technique was used to determine if

11 S. Siegel, op. cit., p. 250.

the sum of the ranks in each sample (scores of judges expressed in ranks) is so different that the samples are not part of the same universe.

It can be shown that if the k samples actually are from the same population or from identical population, that is, if H_0 is true, then H , the statistic used in the Kruskal-Wallis test (...), is distributed as chi square with $df = k-1$.¹²

The formula used reads as follows:

$$H = \frac{12}{N(N+1)} \sum_{j=1}^k \frac{R_j^2}{n_j} - 3(N+1) \quad 13$$

When several scores are identical, Kruskal and Wallis suggest a correction which was done by using the following formula, which becomes the denominator of the previous one:

$$1 - \frac{\sum T^2}{N^3 - N} \quad 14$$

Then, another table of values had to be consulted in Siegel.¹⁵ This table gives the significance of the H value.

For the second and third approaches, the calculations were made with the E scores derived from Eysenck's EPI, and no longer with scores of judges. The t -test became an appropriate technique. It was possible to assume with

12 S. Siegel, op. cit., p. 185.

13 Idem, ibid., p. 185

14 Idem, ibid., p. 188

15 Idem, ibid., p. 249.

confidence that such E scores are normally distributed and have a real numerical value. Point biserial correlation coefficients were subsequently derived from the t-tests. This procedure is strongly recommended by Cohen,¹⁶ who states that while the t-test provides a basis for inference about the status of the null hypothesis in the population, it is also a function, not only of the magnitude of the effect in the sample, but also of the size of the sample.¹⁷ He suggests the following formula:

$$r_{pb} = \sqrt{\frac{t^2}{t^2 + df}} \quad 18$$

The reader will recall that each hypothesis of the second and third approaches, in its null form, stated that there is no significant difference between the mean score of extraversion (EPI) of two groups of subjects, of which one group displayed a given sign in the DAP, and the other which did not, or which displayed its opposite.

16 J. Cohen, Some Statistical Issues in Psychological Research, in Handbook of Clinical Psychology, (B.B. Wolman, ed.), New York, McGraw-Hill Book Co., 1965, xv-1596 p., p. 95-121.

17 Idem, ibid., p. 103.

18 Idem, ibid., p. 104.

In this last section, the statistical procedures used to verify the hypotheses of the present research were described and briefly discussed. In the next and final chapter, the results of this experiment are reported.

CHAPTER III

RESULTS AND DISCUSSION

There are four sections in this last chapter. The first three contain a series of results and a discussion relevant to them. In the first section, the results of the first approach are reported; this is followed by a brief discussion. The same procedure is adhered to in the second and third sections, which contain the results of the second and third approaches. In the last section, the author attempts to reach a global conclusion and makes suggestions for further research.

1. The Results of the First Approach.

a) The Main Hypotheses. - The first hypothesis stated that there would not be a significant difference between the proportional results of the nine "best judges" and the proportional results obtained on the basis of chance. These judges obtained a score of 11 out of 18 possible correct judgments. In the value table of the Binomial Test (Table D, reproduced in Siegel¹), the level of significance corresponding to such a result is 0.48 for the two-tailed

¹ S. Siegel, Nonparametric Statistics for the Behavioural Sciences, New York, McGraw-Hill, 1956, p. 250.

test, when $N \approx 25$. Therefore, the null hypothesis cannot be rejected and the conclusion follows that if IE manifests itself in the type of behaviour elicited by the DAP, the nine "best judges" could not detect it, and thus were not able to complete the proposed clinical task successfully. Just as good results could have been obtained if a haphazard procedure had been followed.

A second hypothesis stated that there would be no significant difference between the proportional results of the "best judge" and the proportional results obtained on the basis of chance. The "best judge" obtained a score of 13 out of 18 possible correct judgments. The level of significance corresponding to such a result is 0.08 for the two-tailed test, when $N \approx 25$. Although this result is not adequate enough to justify the rejection of the null hypothesis, a closer scrutiny of the criteria used by the "best judge" to detect IE seems warranted. It was the object of the second approach to relate, one by one, each criterion to IE.

b) The Secondary Hypotheses. - A first secondary hypothesis stated that there would be no significant difference between the mean scores obtained by three groups of judges, each group having achieved a different degree of clinical experience. The Kruskal-Wallis one-way analysis of

variance by ranks resulted in an H value corresponding to 1.07.² This was arrived at by inserting the appropriate values in the formula specified by Kruskal and Wallis (see Chapter II, p. 53).

$$H = \frac{12}{27(28)} \left[\frac{(66.5)^2}{5} + \frac{(148)^2}{12} + \frac{(163.5)^2}{10} \right] - 3(28)$$

$$H = 1.05$$

In order to arrive at a more accurate H value, a correction was made. This procedure is also suggested by Kruskal and Wallis in the case of scores corresponding to several identical ranks (see Chapter II, p. 53). This was done and the H value went from 1.05 to 1.07, an insignificant change. The Table of Critical Values of Chi Square (Table C, reproduced in Siegel³), shows that the H value must be at least equal to 5.99 (df = 2) in order to attain a 0.05 level of significance. In this situation, $H = 1.07 < 5.99$, which does not allow the rejection of the null hypothesis. The only possible conclusion is that, in the present study, the different levels of competence of the three groups of judges did not have a significant influence in the completion of the proposed clinical task.

² In Appendix I, the reader will find a table containing the scores of judges and their corresponding ranks, for each level of competence.

³ S. Siegel, op. cit., p. 249

The other secondary hypothesis concerned the addition of a moderator variable (neuroticism) to one of two proposed clinical tasks. Twenty-two judges (N=22) classified 15 drawings in terms of IE, with the knowledge that the fifteen authors of these drawings had all obtained a high score (70th centile or more) on the Neuroticism Scale of the EPI, while seventeen judges (N=17) were given the same task, without knowing that fact. As for the previous hypothesis, the Kruskal-Wallis one-way analysis of variance by ranks was computed.⁴ Again, the H value was derived by inserting the appropriate values in the prescribed formula.

$$H = \frac{12}{39(40)} \left[\frac{(513.5)^2}{22} + \frac{(266.5)^2}{17} \right] - 3(40)$$

$$H = 2.84$$

After effecting the correction for tied ranks, the H value barely changed from 2.84 to 2.96. The Table of Critical Values of Chi Square⁵ shows that the H value must be at least equal to 3.84 (df = 1), in order to achieve a 0.05 level of significance. In the present situation, $H = 2.96 < 3.84$, which does not allow the rejection of the null hypothesis. The conclusion follows that the addition of a moderator

⁴ In Appendix II, the reader will find a table containing the scores of judges and their corresponding ranks, for each task.

⁵ S. Siegel, op. cit., p. 249.

variable (in this study, a fact verbally communicated to one group of judges, immediately preceding their performance) did not facilitate the completion of the proposed clinical task. This conclusion, however, is restricted to the present study.

Although the results of the first approach were not significant, the proposed clinical task was accomplished fairly successfully by the "best judge". This was a strong incentive to continue the experiment and to wait for the results of the second and third approaches before attempting to reach definitive conclusions.

2. The Results of the Second Approach.

In the second approach, six hypotheses were tested. In each case, the mean E scores (EPI) of two groups of subjects were compared for possible significant difference. The groups were composed of subjects who markedly displayed a specific characteristic in their DAP, (Group X, in Tables I and II), and of those who displayed very little of the same characteristic, none of it, or its opposite (Group Y, in Tables I and II). For example, in the first two groups, the comparison was made between the mean E score of subjects who drew a person with a happy facial expression and the mean E score of subjects who drew a person with a sad or angry

facial expression. The first null hypothesis was formulated on that basis. The five other comparisons were made on the basis of the following DAP characteristics:

- graphic expansion versus graphic constriction
- movement versus rigid positioning
- limbs extended away from the body axis versus limbs close to the body axis
- superfluous, decorative or fashion details versus essential details requested by the task
- marked deviation in the placement of the drawing versus no marked deviation.

It will be recalled that the above characteristics were suggested by the "best judge" as criteria for detecting IE, in the first approach.

A glance at Table I, (on the next page) which contains the results of the second approach, shows that, in two cases, the null hypothesis may be rejected. A significant difference (at the .001 level) was found between the mean score of subjects who drew a person with a happy facial expression and the mean score of subjects who drew a person with a sad or angry facial expression. Three judges agreed that 64 subjects drew a person with a happy facial expression; of these, 40 ($p=.625$) obtained an E score equivalent to at least the 70th centile, while 49 ($p=.765$) obtained an E score equivalent to at least the 52nd centile.

Table I.-

Means (M), Standard Deviations (σ), Degrees of Freedom (df), Levels of Significance (t) and Point Biserial Coefficients (r_{pb}) Obtained from Comparing Two Groups (X and Y) on Each of Six DAP Characteristics.

	$\frac{X}{(N)}$	$\frac{Y}{(N)}$	M_x	M_y	σ_x	σ_y	df	t	r_{pb}
Facial Expression	64	43	14.12	10.69	3.19	3.82	105	4.97 ^{xx}	0.43
Graphic Expansion	38	41	13.81	12.14	3.09	3.84	77	2.09 ^x	0.22
Movement	31	65	12.80	12.69	3.63	3.95	94	0.13	0.01
Position of limbs	51	40	13.13	12.45	3.22	4.45	89	0.84	0.08
Superfluous details	22	97	13.31	12.77	4.44	3.26	117	0.65	0.05
Placement	36	83	12.80	12.16	3.28	3.92	117	0.84	0.08

xx Significant at the .001 level

x Significant at the .05 level.

Three judges agreed that 43 subjects drew a person with a sad or angry facial expression; of these 17 ($p=.395$) obtained an E score equivalent to the 34th centile or less, while 26 ($p=.605$) obtained an E score equivalent to the 52nd centile or less. Therefore, when centiles 70 and 34 are used as cut-off points, the total number of "hits" is equal to 57 of 107, ($p=.532$). When centile 52 is used as a cut-off point, the total number of "hits" is equal to 75 of 107, ($p=.714$). Such proportions definitely point to a positive relationship between the presence of a happy facial expression and extraversion. The point biserial correlation coefficients ($r_{pb}=0.43$) computed from the t-test confirmed the relationship. The reader will recall that computing the point biserial correlation coefficients from the t-tests is a procedure recommended by Cohen,⁶ in order to arrive at the magnitude of an established relationship. Therefore, the above results are interpreted as follows: there is a definite tendency for DAP drawings with a happy facial expression to have been done by extraverted subjects. As for DAP drawings with a sad or angry facial expression, their authors tend to be moderately or highly introverted.

6 J. Cohen, Some Statistical Issues in Psychological Research, in Handbook of Clinical Psychology, (B.B. Wolman, ed.), New York, McGraw-Hill Book Co., 1965, xv-1596 p., p. 95-121.

The other significant difference (at the .05 level) was found between the mean score of subjects who displayed graphic expansion in their DAP drawings and the mean score of subjects who displayed graphic constriction. Again, in this case, the null hypothesis could be rejected. The three judges agreed that 38 subjects displayed graphic expansion in their DAP drawings. Of these, 21 ($p=.552$) obtained an E score equivalent to at least the 70th centile, while 27 ($p=.710$) obtained an E score equivalent to at least the 52nd centile. The three judges agreed that 41 subjects displayed graphic constriction. Of these, 15 ($p=.365$) obtained an E score equivalent to the 34th centile or less, while 18 ($p=.439$) obtained an E score equivalent to the 52nd centile or less. Therefore, when centiles 70 and 34 are used as cut-off points, the total number of "hits" is equal to 36 of 79, ($p=.455$). When centile 52 is used as a cut-off point, the total number of "hits" is equal to 45 of 79, ($p=.569$). Although the difference between the means (as derived from the t-test) is significant, the above proportions and the point biserial correlation computed, ($r_{pb}=0.22$), point, in this case, to a much weaker tendency. However, the tendency does exist and should not be discarded as useless.

This second series of results (pertaining to the second hypothesis) tends to agree with those of Jacobson and

Handler,⁷ who found that extraverted subjects tended to draw larger figures while introverted subjects drew smaller ones. These results are also in agreement with those of Wallach and Gahm,⁸ who found that extraverts generally display a higher degree of graphic expansion than introverts, except when subjects, extraverts or introverts, are highly anxious. In such cases, the situation is reversed: anxious extraverts display more graphic constriction than anxious introverts. These authors explained this phenomenon as being the result of a compensatory behaviour.⁹

None of the results obtained through the testing of the other four hypotheses, were significant and the null hypotheses could not be rejected. Three of these last four characteristics (movement, position of limbs and superfluous details) might be better thought of as criteria of sociability, when they are encountered in DAP drawings. They proved to be unrelated to IE. As for the other characteristic, placement of the drawing, it might indeed be determined, wholly or partly, by cultural factors, rather than

7 H.A. Jacobson and L. Handler, Extraversion-Introversion and the Effects of Stress on the Draw-a Person Test, in Journal of Consulting Psychology, Vol. 31, No. 4, 1967, p. 433.

8 M. Wallach and R. Gahm, Personality Functions of Graphic Constriction and Expansiveness, in Journal of Personality, Vol. 28, No. 1, 1960, p. 73-88.

9 Idem, ibid., p. 74-75.

reflect specific personality variables, as Dennis suggested.¹⁰ Deviations in the placement of the drawing to the extreme right of the standard sheet is hardly ever seen in DAP drawings. At any rate, no relationship was found between placement and IE.

The "best judge", the one who came the closest to detecting IE successfully, proposed six criteria; of these, only two were found related to IE. Might the four unrelated criteria have interfered in his performance of the clinical task? The "best judge" is an experienced psychodiagnostician. When faced with one single, specific task, such as detecting IE from DAP drawings, the impressionistic approach might not be the best method to use, and too much competence could be a handicap rather than a help. In everyday clinical practice, the psychodiagnostician does not habitually analyse DAP drawings in terms of one dimension only, nor does he make predictions or take action on the basis of one result only. When analysing a DAP drawing, the psychodiagnostician attempts to arrive at a global configuration of traits which are typical of the subject; he does this with the help of other measures and data. Detecting IE from DAP drawings

¹⁰ W. Dennis, Handwriting Convention as Determinants of Human Figure Drawings, in Journal of Consulting Psychology, Vol. 22, No. 4, 1958, p. 293-295.

may involve a type of skill which is not necessarily in the repertoire of the experienced psychodiagnostician. This could explain why even the "best judge" was not completely successful in completing the proposed clinical task.

It is also possible that the detection of IE was made on the basis of only one or two criteria and that the other DAP characteristics also proposed as criteria were unwittingly retained because, when the judgments were made, they also appeared in most drawings of one pile, and in few or none of the other pile. Another possible reason that unrelated criteria were proposed, could be because of the frequent association made between extraversion and such traits as sociability, social efficiency, and social dependency. If this were the case, the phenomenon which Chapman and Chapman¹¹ named 'illusory correlation', might have been at play.

The main goal of this second approach was to shed more light on the skill involved in detecting IE from DAP drawings. The results of the second approach were reported and discussed. Two DAP characteristics were found to be

11 L.J. Chapman and J.P. Chapman, Genesis of Popular but Erroneous Psychodiagnostic Observations, in Journal of Abnormal Psychology, Vol. 72, No. 3, 1967, p. 193-204.

related to IE. Possible explanations were given, in the light of these results, for the failure of judges to successfully complete the proposed clinical task.

In the following section, the results of the third approach are reported.

3. The Results of the Third Approach.

The four hypotheses of this third approach stemmed from Eysenck's theory of IE. It states that the introvert and the extravert differ in their cortical inhibition/excitation potentials, and that this difference is reflected specifically in the greater conditionability of the introvert. The implication is that the behaviour of the introvert should be generally more moderate and temperate than the behaviour of the extravert.

The same procedure was followed as in the second approach, and comparisons were made between groups on four characteristics of DAP drawings:

- graphic expansion/constriction versus moderate expansion
- superfluous, decorative or fashion details versus essential details requested by the task
- marked deviation in the placement of the drawing versus no marked deviation
- the impression of impulsiveness versus the impression of a carefully drawn person.

Two of the four hypotheses related to the above characteristics were tested in the design of the second approach. These results are given again in Table II, with the results pertaining to the first and fourth hypotheses. In all cases, the difference between the groups were not significant, and the null hypotheses could not be rejected.

From these results, the only possible conclusion to be drawn is that, if the extravert is less moderate and less temperate in his behaviour than the introvert, it was not evident in the type of behaviour elicited by the DAP administered in the standard fashion. This finding does not necessarily invalidate the implications derived from the theory. The type of behaviour elicited by drawing techniques is not a physiological, automatic type of behaviour. Subjects might have behaved differently, had they initiated the drawing behaviour themselves. Furthermore, if several samples of their drawing behaviour had been obtained, they might have relaxed the controlled mode of behaviour in which they put themselves due to their perception of the testing situation. Whatever speculation might occur in an attempt to explain such results, it remains that the theoretical assertions tested here, although not supported by this section of the experiment, should be pursued and investigated in other more ingenious ways, especially when that

Table II.-

Means (M), Standard Deviations (σ), Degrees of Freedom (df), Levels of Significance (t) and Point Biserial Coefficients (r_{pb}) Obtained from Comparing Two Groups (X and Y) on Each of Four DAP Characteristics.

	$\frac{X}{(N)}$	$\frac{Y}{(N)}$	M_x	M_y	σ_x	σ_y	df	t	r_{pb}
Graphic Expansion/Constriction	79	57	12.94	12.31	3.59	3.98	134	0.96	0.08
Superfluous Details	22	97	13.31	12.77	4.44	3.26	117	0.65	0.05
Placement	36	83	12.80	12.16	3.28	3.92	117	0.84	0.08
Impulsiveness	20	23	14.40	12.82	3.63	2.89	41	1.54	0.22

particular theory has already been supported by several research studies.

In this section, the results of the third approach were reported and discussed briefly. None of the four hypothesized relationships were found to be significant. Tentative explanations were proposed for the lack of significant results.

4. Conclusion and Suggestions for Subsequent Research.

In the first approach, significant results could not be obtained: the clinical task of classifying DAP drawings in terms of IE was not completed with much success, the degree of experience of the judges did not have an influence on their performance, and the addition of a moderator variable did not contribute to increase the efficiency of the judges. These results, however, do not lead to the automatic conclusion that IE does not manifest itself in the type of behaviour elicited by the DAP. Although the judges were not successful, the results of the "best judge" were promising enough to prompt the pursuit of the investigation.

The proposed clinical task might have been a novel one, even for the competent psychodiagnosticians who habitually analyse drawings in a global way, rather than in terms of a specific dimension. This might also explain why more

experienced judges, in the conventional analyses of the drawings, did not obtain better results than did the semi-naive and the naive judges. Nevertheless, the characteristics of the drawings suggested by the "best judge" as criteria for detecting IE, were the point of departure of the second approach. It was believed that these criteria consistently appear in graphic productions and that one, many or all of them could be indicative of IE.

How can the failure of the moderator variable to increase the efficiency of the judges, in the detection of IE, be explained? It will be recalled that some authors had strongly recommended the use of a moderator variable as a means to clarify otherwise obscure relationships.

The introduction of moderator variables in personality research has helped to clarify the situation somewhat. When investigators began to use other personality variables to moderate E-I, predicted relationships emerged which were obscured previously...

The general prediction that extraverts will prefer paintings with people in them and introverts paintings without people in them has no support until the E-I population is divided by a neuroticism moderator.¹²

¹² K.J. Shapiro and I.E. Alexander, Extraversion-Introversion, Affiliation, and Anxiety, in Journal of Personality, Vol. 37, No. 3, 1969, p. 387-388.

The results of this first approach do not necessarily contradict this assertion. The drawings which were presented to the judges were all done by 'neurotic' subjects. Some judges knew that fact, others did not. This was the chosen way of inserting the moderator variable in the present study. Judges could have been presented with drawings done by 'neurotic' subjects and with drawings done by 'non neurotic' subjects. This latter way of inserting the moderator variable now seems more promising and could be adopted in subsequent studies. Had this been done in the present research, the hypothesized relationships might have appeared in more cases.

The fact that two DAP signs were found related to IE, constitutes a step forward in the exploration of the skill involved in the detection of IE from the graphic expression. It has definite advantages for the DAP user, providing that he is aware of the relative magnitude of these relationships and is well acquainted with the concepts of IE and with the underlying theoretical premisses.

Another suggestion is to relate IE to the DAP characteristics suggested by the "best judge", in groups of two or three, e.g., it is possible that the characteristic of

'superfluous details' becomes indicative of extraversion only when coupled with the characteristic of 'limbs extended away from the body axis'.

Finally, the results of the third approach are more difficult to interpret. Non significant results open the door to much possible speculation. The most likely explanation for the disappointing results centers around the meaning and interpretation of what Eysenck calls the "greater conditionability" of the introvert. Although easily demonstrated with physiological modalities, it now appears much more difficult to show, when applied to the type of behaviour elicited by the DAP. For example, given a specific introvert, which, for him, is more the result of conditioning? When his DAP shows a high degree of graphic expansion, a moderate degree of graphic expansion, or a high degree of graphic constriction? The hypotheses of the present study were formulated on the basis of the second possibility. It now seems that this could be wrong. Other studies might take this into consideration when relating IE to graphic behaviour.

Subsequent studies could also set out to compare the concept of extraversion to the concept of sociability, with the purpose of clarifying the distinction which must be made between the two. Both terms have been confused and used interchangeably.

In this third and final chapter, the results of the present study were reported and discussed. Significant results were reported in two instances ('happy facial expression' and 'graphic expansion' related to IE). Although the null hypotheses could be rejected in these two cases, the magnitude of the relationship was not as high as expected; in the first case, there was a strong tendency towards the predicted relationship ('happy facial expression') but only a moderate one in the second case ('graphic expansion'). In addition, suggestions were made which could be applied to subsequent research in the same area.

The object of this experiment (as for the Chapmans' studies) has been to explore the skill involved in a pre-determined clinical task. As Black¹³ pointed out, the need to know about the effectiveness and consequences of applying various skills to the solution of human problems is an urgent one, and in view of that, other common clinical tasks will have to be scrutinized and brought to the test of controlled experiments. The author of the present study hopes to have, however slightly, contributed to the objective.

13 A.H. Black, Report to the Science Council on Research in Psychology, in The Future of Canadian Psychology: A Report Prepared by the Canadian Psychological Association for the Science Council of Canada, 1971, p. 91-92.

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Abraham, A., Le dessin d'une personne (le test de Machover), Editions Delachaux et Niestlé, Neuchatel (Suisse), 1963, p. 79-102.

In this section, the author talks about the dynamics of expressive behaviour. These theoretical considerations were influential in the choice of the clinical task and in the formulation of hypotheses.

Allport, G.W., Pattern and Growth in Personality, New York, Holt, Rinehart and Winston, 1961, p. 460-494.

This chapter contains an exposé on expressive behaviour. Many studies resulted from the theoretical premisses exposed in it. The book itself is a classic in the study of personality. The content of this chapter also helped in the choice of the clinical task and in the formulation of hypotheses.

Black, A.H., Report to the Science Council on Research in Psychology, in The Future of Canadian Psychology: A Report Prepared by the Canadian Psychological Association for the Science Council of Canada, 1971, p. 90-94.

This section describes four types of research. The fourth type includes studies aimed at assessing the feasibility, effectiveness, and social consequences of applying a particular form of technology to the solution of some social problem. The present study is in keeping with this objective.

Carrigan, P.M., Extraversion-Introversion as a Dimension of Personality: A Re-Appraisal, in Psychological Bulletin, Vol. 57, No. 5, 1960, p. 329-360.

A review of the literature (from 1923 to 1960) concerning the dimension of IE. The author's comments and criticisms are to the point.

Chapman, L.J., Illusory Correlation in Observational Report, in Journal of Verbal Learning and Verbal Behaviour, Vol. 6, No. 1, 1967, p. 151-155.

Chapman, L.F. and Chapman, J.P., Genesis of Popular but Erroneous Psychodiagnostic Observations, in Journal of Abnormal Psychology, Vol. 72, No. 3, 1967, p. 193-204.

Chapman, L.J., and Chapman, J.P., Illusory Correlation as an Obstacle to the Use of Valid Psychodiagnostic Signs, in Journal of Abnormal Psychology, Vol. 74, No. 3, 1969, p. 271-280.

These three articles contain a series of experiments involving various clinical tasks in which the phenomenon of illusory correlation is at play. These two authors are among the pioneers who studied the skills involved in current clinical practice. The present study is an effort in the same direction.

Eysenck, H.J., Dimensions of Personality, London, Routledge and Kegan Paul, 1947, xi-308 p.

The author reports factorial studies done with several psychological tests administered to (10,000) ten thousand subjects. From these studies, two orthogonal factors were extracted: 'Introversion-Extraversion' and 'Neuroticism-Stability'. More specifically, a description of the nature of the IE factor is to be found on pages 51 to 61.

-----, The Structure of Human Personality, London, Methuen, 1953, p. 286-317.

This chapter contains a review of several independent studies which have related personality variables to physiological dimensions. The results generally support Eysenck's theory.

-----, Cortical Inhibition, Figural Aftereffect, and Theory of Personality, in Journal of Abnormal and Social Psychology, Vol. 51, No. 1, 1955, p. 94-106.

Eysenck's theory of IE in a nutshell. His formulation was the basis for the hypotheses of the third approach.

-----, The Biological Basis of Personality, Springfield, Illinois, Charles C. Thomas, 1967, Chapters II and III.

With the considerations contained in these two chapters, the author clarifies and reinforces his theory. It is a complement to his previous works.

Roback, H.B., Human Figure Drawings: Their Utility in the Clinical Psychologist's Armamentarium for Personality Assessment, in Psychological Bulletin, Vol. 70, No. 1, 1968, p. 1-19.

Review of the literature concerning the studies done with the DAP from 1949 to 1967. The author makes appropriate comments and criticisms.

Shapiro, K.J. and Alexander, I.E., Extraversion-Introversion, Affiliation and Anxiety, in Journal of Personality, Vol. 37, No. 3, 1969, p. 387-406.

This study shows how the use of a moderator variable to qualify IE is indispensable for obtaining meaningful results. IE and other personality variables must be studied in a precise context, according to these authors. In the present study, a moderator variable was also used.

Swensen, C.H., Empirical Evaluation of Human Figure Drawings, in Psychological Bulletin, Vol. 54, No. 6, 1957, p. 431-466.

-----, Empirical Evaluation of Human Figure Drawings: 1957-1966, in Psychological Bulletin, Vol. 70, No. 1, 1968, p. 20-44.

These two articles cover the studies done with the DAP from 1949 to 1966. The author includes several theoretical considerations of his own, which are very appropriate.

Wallach, M.A. and Gahm, R.C., Personality Functions of Graphic Constriction and Expansiveness, in Journal of Personality, Vol. 28, No. 1, 1960, p. 73-88.

This study also uses a moderator variable to qualify IE. Results otherwise obscure became meaningful. It also influenced the procedure of this research.

APPENDIX 1

Table III.- Scores and corresponding ranks obtained by clinicians (N=5), semi-naive judges (N=12) and naive judges (N=10), following their performance on the proposed clinical task (Task no. 1).

Clinicians		Semi-naive		Naive	
Scores	Ranks	Scores	Ranks	Scores	Ranks
8	9	6	3	9	13
13	27	11	21	9	13
6	3	12	25	12	25
7	6.5	9	13	10	17
11	21	12	25	10	17
		6	3	11	21
		6	3	11	21
		9	13	8	9
		10	17	11	21
		6	3	7	6.5
		8	9		
		9	13		
R_1 66.5 ^a		R_2 148 ^a		R_3 163.5 ^a	

a Sum of ranks

APPENDIX 2

Table IV.- Scores and corresponding ranks of judges (N=22) who did the clinical task including the moderator variable, and of judges (N=17) who did the clinical task without the aforesaid variable.

Task with mod. variable		Task without mod. variable	
Scores	Ranks	Scores	Ranks
7	16.5	9	27.5
9	27.5	6	7.5
11	37.0	11	37.0
9	27.5	9	27.5
11	37.0	6	7.5
6	7.5	4	1.0
5	2.5	7	16.5
9	27.5	6	7.5
9	27.5	7	16.5
5	2.5	7	16.5
7	16.5	6	7.5
7	16.5	6	7.5
8	22.0	6	7.5
7	16.5	9	27.5
11	37.0	9	27.5
9	27.5	7	16.5
9	27.5	6	7.5
10	33.5		
11	37.0		
7	16.5		
10	33.5		
7	16.5		
R_1 513.5 ^a		R_2 266.5 ^a	

a Sum of ranks

APPENDIX 3

ABSTRACT OF

Judging Introversiion-Extraversiion From DAP Drawings

Few attempts have been made to explore the skills required and currently used in clinical practice. Some authors indirectly reached the conclusion that psychodiagnosticians could or could not execute specified clinical tasks successfully. Only two authors (Chapman and Chapman) directly set out to study the psychodiagnostician "at work". In a series of experiments, they succeeded in isolating the phenomenon of "illusory correlation" and demonstrated its occurrence in a variety of specified clinical tasks.

The present study was an attempt to explore the skill involved in the task of classifying DAP drawings in terms of a criterion - IE.

In the first part of the experiment, judges of different levels of competence attempted to classify DAP drawings in terms of IE. In one of the two tasks, a moderator variable was included. In the second part, the criteria proposed by the most successful judge were investigated independently. In the third part, hypotheses stemming from Eysenck's formulation of IE were studied in relation to drawing behaviour.

The tools used were the EPI, the DAP and the 16PF, which were administered to student nurses (N=88, for the first approach; N=138, for the second and third approaches). For the first approach, forty-nine judges attempted the classification of DAP drawings in terms of IE. In the second and third approaches, three judges classified drawings in terms of the presence or absence of specified criteria.

The results confirmed only two of the hypotheses. In these two cases, a relationship was found between IE and criteria suggested by the "best judge" (happy facial expression and graphic expansion), even although the judges were unable to successfully complete the proposed clinical task.

This experiment not only emphasizes the need for more research to evaluate the feasibility, effectiveness and social consequences of skills currently used in daily clinical practice, but also shows the need for extreme caution when interpreting the results of techniques which research has not yet proved valid.