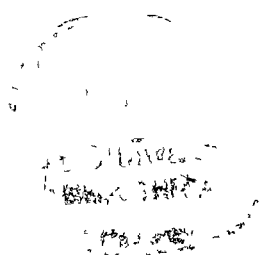


INTROVERSION-EXTRAVERSION AND NEUROTICISM AND A PROPOSED
RELATIONSHIP TO ID, EGO AND SUPEREGO

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CURRICULUM STUDIORUM

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INTRODUCTION

The British psychologist, Hans Eysenck, has built an empire of research based on hypotheses derived from relationships among constructs. These concepts are anchored to measurable properties in the empirical world. One of his hypotheses has linked the biologically based constructs of introversion, extraversion and neuroticism to the Freudian psychological apparatus of id and superego through the process of social conditioning. Although Eysenck has operationally defined his three constructs in terms of physiological and questionnaire measures, only recently has there been some attempt to similarly measure all three aspects of the Freudian system.

This report is concerned with the investigation of the relationship among the measured personality variables of introversion, extraversion, neuroticism and id, ego and superego functioning within the framework of Eysenck's theory. Although the ego construct is not explicitly mentioned in the hypothesis, certain implications necessitate its inclusion in the study. To the writer's knowledge, this will be the first time that Eysenck's hypotheses concerning the total relationship will be tested directly. An attempt to establish a relationship between these two systems would be consistent with the recent trend of clinicians and ego psychologists to discuss patients in terms of the dynamic interplay of personality variables.

The thesis is divided into four chapters. The first, a review of the literature, is concerned with a discussion of Eysenck's two dimensional theory, the theoretical considerations which led to the hypotheses relating the variables and finally, some limiting conditions affecting the original theory and the hypotheses derived from this theory. The chapter on the experimental design includes identification of the variables under consideration, formulation of the null hypotheses, description of the tests and of the sample, and procedures used in the selection of the sample and the administration of the tests. A brief section is devoted to the special statistical operations employed. The results are presented in the third chapter and are discussed in the fourth. Results are considered in terms of Eysenck's theory; the psychoanalytic interpretation for high and low scores on the dependent variable; and the limitations of the testing instruments. This is followed by a brief summary and suggestions for further research. A summary of the raw data is included in the appendix.

CHAPTER I

REVIEW OF THE LITERATURE

In the socialization of Western European and American youth, sexual and aggressive behavior are considered two of the most consistently punished forms of action and, according to Freudian theory, the most frequent sources of anxiety and repression. Mowrer, Dollard and Miller, and Eysenck are also concerned with the process of socialization and its effect on personality. Like Freud, Dollard and Miller and Mowrer concede that neurotic symptoms find their origin in childhood. Unlike Freud, however, they do not allocate all neurosis to this period nor do they focus upon unconscious causes of symptoms, but rather, consider neurosis to be the result of learning. Mowrer's speculations concerning the anxiety-filled individual differ from those of Dollard and Miller and have resulted in a separate theory of neurosis.

Acknowledging a link between the psychoanalytic model and the learning theory model made by these theorists, Eysenck examines Mowrer's theory of neurosis and that of Dollard and Miller in terms of his own theoretical framework and uses Freudian terminology to express the resultant hypotheses.

In the following pages Eysenck's dimensional framework of personality will be considered, a review of the theory

upon which is based the relationship between the three Freudian functions and Eysenck's three personality variables will be given and a final section will handle some extenuating conditions placed on the original hypotheses. A brief summary will lead into the statement of the problem specific to the report.

1. Introversion-Extraversion and Neuroticism.

Carl Jung¹ suggested a dichotomy which accounted for two major orientations of personality--introversion and extraversion. Introversion described an individual oriented toward the inner, subjective world; extraversion, an individual who was directed to the external, objective world. Jung, introducing the factor of neuroticism into the picture, claimed that the characteristic neurosis of the extravert was hysteria, whereas that of the introvert was psychasthenia (more recently renamed dysthymia).

These speculations were adopted by Eysenck and extended into a controversial framework of personality. Basing himself on the Pavlovian concept of inhibition-excitation

¹ C.G. Jung, Psychological Types, New York, Random House, 1923, xxii-654 p.

and on Hullian behavioral constructs, Eysenck^{2,3} stated that individuals differed in cortical potential and could be placed on a continuum ranging from extremely strong inhibitory potential to extremely strong excitatory potential. He hypothesized that individuals with strong excitatory and weak inhibitory potentials would condition well and eventually develop introverted behavior traits. Under equal environmental pressure, individuals with weak excitatory and strong inhibitory potentials would condition poorly and would develop traits characteristic of the extraverted personality. Most individuals would be intermediate with respect to conditionability and with respect to the introversion-extraversion balance. In the cases of neurotic breakdown, introverts would develop dysthymic disorders; extraverts would develop hysteric disorders.

Testing out his theory in the perceptual field, Eysenck⁴ found significant differences in the expected direction between dysthymics and hysterics on figural after-effects.

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

3 -----, "Classification and Problem of Diagnosis", in H.J. Eysenck (ed), Handbook of Abnormal Psychology, An Experimental Approach, New York, Basic Books, 1961, p. 27.

4 -----, "Cortical Inhibition, Figural After-Effect and the Theory of Personality", p. 94-106.

The "critical" experiments on conditioning by Franks^{5,6} and numerous studies⁷ testing other aspects of the theory have generally supported Eysenck's predicted differences in behavior between introverts and extraverts with both normal and neurotic subjects. Studies^{8,9,10} which failed to find or questioned the proposed relationship between introversion-extraversion and conditionability have been pointed out as inadequate¹¹

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

6 -----, "Personality Factors and the Rate of Conditioning", British Journal of Psychology, Vol. 48, Part 2, May 1957, p. 119-127.

7 H.J. Eysenck, "Extraversion and the Acquisition of Eyeblink and GSR Conditioned Responses", Psychological Bulletin, Vol. 63, No. 4, April 1965, p. 258-270.

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

9 Harvey A. Sweetbaum, "Comparisons of the Effects of Introversion-Extraversion and Anxiety on Conditioning", Journal of Abnormal and Social Psychology, Vol. 66, No. 3, March 1963, p. 249-254.

10 P.O. Davidson, R.W. Payne and R.B. Sloane, "Cortical Inhibition, Drive Level and Conditioning", Journal of Abnormal Psychology, Vol. 71, No. 4, August 1966, p. 311-314.

11 H.J. Eysenck, "Scientific Methodology and the Dynamics of Anxiety and Hysteria", British Journal of Medical Psychology, Vol. 32, Part 1, March 1959, p. 56-63.

or have been explained in terms of limiting conditions^{12,13} placed on the theory.

Although it was the type of constitutional-neurological make-up that initially determined individual differences in conditionability, it was the type of learning, particularly early social learning that behaviorally categorized an individual as introvert or extravert. In terms of the recent distinction between the genotypical and phenotypical aspects of personality, the term "extravert"

[...] may be applied a) to a person in whom the excitation-inhibition balance is tilted in the direction of high inhibition and low excitation (the constitutional extravert) or b) it may refer to a person who is behaving in an extraverted manner (a behavioral extravert).¹⁴

The relationship between the two types of extraversion is positive but not perfect as environment apparently determines the way constitutional factors will be expressed. The behavioral or phenotypical personality, best described by the formula $P_b = P_c \times E$, is considered the result of the interaction

¹² Eysenck, "Extraversion and the Acquisition of Eyeblink and GSR Conditioned Responses", p. 258-270.

¹³ -----, "Reminiscence, Drive and Personality Revision and Extension of a Theory", British Journal of Social and Clinical Psychology, Vol. 1, Part 2, June 1962, p. 127-141.

¹⁴ H.J. Eysenck and G.S. Claridge, "The Position of Hysterics and Dysthymics in a Two Dimensional Framework of Personality Description", Journal of Abnormal and Social Psychology, Vol. 64, No. 1, January 1962, p. 54.

between the constitutional personality and the environment. The traits of this type of personality such as impulsivity and sociability are tapped by such questionnaires as Eysenck's Maudsley Personality Inventory.¹⁵

The complimentary dimension, neuroticism (N), was also conceived as a continuum. Individuals along this continuum ranged from the very stable person to the extremely unstable, neurotic type. Subsequent evidence to the contrary,^{16,17} Eysenck¹⁸ considered neuroticism as varying independently and hence orthogonal to extraversion. A later statement¹⁹ seemed to indicate that, at the constitutional level, neurotic extraverts (hysterics and psychopaths) would be more extraverted than stable extraverts and that neurotic introverts (dysthymics) would be more introverted than stable introverts. Yielding to criticism levied at his choice of

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

16 Sigal, et al., Op. Cit., p. 143-148.

17 H.P. Hilbrand, "A Factorial Study of Introversion-Extraversion by Means of Objective Tests", unpublished doctoral dissertation presented to the University of London, 1953, quoted by Vernon Hamilton, "Conflict Avoidance in Obsessionals and Hysterics and the Validity of the Concept of Dysthymia", Journal of Mental Science, Vol. 103, No. 430, January 1957, p. 674.

18 H. J. Eysenck, The Structure of Human Personality, London, Methuen, 1953, xiii-348 p.

19 Eysenck and Claridge, Op. Cit.,

clinical groups as criterion groups for introversion and extraversion, Eysenck²⁰ has criticized the use of categorical diagnosis of neurotic disorders and has advocated the definition of the individual on two continua--neuroticism and introversion-extraversion. He has continued to depict his two dimensions as orthogonal.

As with introversion and extraversion, Eysenck²¹ gave to neuroticism a biological basis, related it to the autonomic nervous system and considered it as a form of drive, the strength of which depended upon differential responsiveness to autonomic stress. This concept of N as a drive factor and its relationship to conditionability has been criticized as vague and inconsistent.²²

Although there has been some recent criticism to the contrary,^{23,24} Eysenck²⁵ has reaffirmed his stand of no

20 H.J. Eysenck, Crime and Personality, Boston, Houghton-Mifflin Co., 1964, p. 43.

21 -----, "Cortical Inhibition, Figural After-Effect and the Theory of Personality", p. 94-100.

22 R.A. Champion, "Some Comments on Eysenck's Treatment of Modern Learning Theory", British Journal of Psychology, Vol. 52, Part 2, May 1961, p. 167-173.

23 Kenneth W. Spence and Janet Taylor-Spence, "Relation of Eyelid Conditioning to Manifest Anxiety, Extraversion and Rigidity", Journal of Abnormal and Social Psychology, Vol. 68, No. 2, February 1964, p. 144-149.

24 Sweetbaum, Op. Cit., p. 249-254.

25 H.J. Eysenck, "A Reply to McPherson's Comments on the Aberdeen Conditioning Studies", British Journal of Psychology, Vol. 57, Parts 3 and 4, November 1966, p. 419-421.

correlation between neuroticism and conditionability, provided, he qualified, no special steps were taken to make the conditioning situation particularly stressful.

The derivatives of the original theory and the qualifications criticism has forced upon it may be somewhat ambiguous, yet, as one of the few explanatory frameworks for behavior, the theory has stimulated a great deal of research. One area of investigation is based on the expectation that a consistent reaction to certain social stimuli can be predicted on the basis of an individual's level of extraversion and neuroticism.

2. Socialization and Personality - A Theory.

The relationship between behavior in adulthood and early training in socialization is generally acknowledged yet little understood. Although longitudinal studies on child development have been carried out, most investigations have been conducted with clinical groups. Eysenck²⁶ has remarked the lack of systematic information in this area.

Early psychoanalytic investigations attributed emotional problems in later life to childhood training in socialization. The anxiety fundamental to repression was

²⁶ H.J. Eysenck, The Dynamics of Anxiety and Hysteria, New York, Praeger Inc., 1957, xiv-311 p.

originally created by parents in punishing strongly motivated behavior--behavior associated with acts of a sexual or aggressive nature. Such punishment helped to create the conscience but the impulse which led to the original act became a stimulus for later anxiety. Investigations²⁷ of the intangible process of repression, carried out primarily through recall of unpleasant childhood experiences, led to disappointing results. Repression was too closely related to motivation and language, both of which were little understood themselves. A new more solid framework was required.

In their exposition of the problem of neurosis, Dollard and Miller²⁸ and Mowrer²⁹ have attempted to relate learning theory and psychoanalytic theory. The motivating role of anxiety in the Freudian system is very similar in conception to the drive producing conditioned autonomic responses in learning theory. For Mowrer and for Dollard and Miller, neurosis could be initiated as the result of a conflict between the child and the persons who would attempt to socialize him. Socially approved behavior patterns were

27 R.R. Sears, Survey of Objective Studies of Psychoanalytic Concepts, New York, Edward Bros. Co., 1951.

28 John Dollard and Neal E. Miller, Personality and Psychotherapy, New York, McGraw-Hill, 1950, viii-488 p.

29 O. Hobart Mowrer, Learning Theory and Personality Dynamics, New York, Ronald Press, 1950, viii-776 p.

acquired by the child through some immediate physical or verbal punishment. This punishment constituted the unconditioned stimulus and was designed to produce new drives (the secondary drives of fear and anxiety) which would compete with original impulses (the primary drives of sex and aggression) and finally elicit new responses. However, punishment did not always have the same effect:

In one type of situation punishment may be designed merely to block certain types of solutions and to encourage the learning of other, socially acceptable ones. This is likely to be true, for example, of habits of eating and elimination. In other areas, however, the punishment may be designed to block solutions to drives more or less completely, as in the case of sexuality and aggression.³⁰

Although in agreement with this view on the predisposition to neurosis, the direction taken by neurosis as described by Dollard and Miller in terms of learning theory is similar to that given by Freud³¹ in terms of psychoanalytic theory. In the description of transference neurosis, the ego becomes dominated by the superego at the expense of the id. What Freud referred to as id corresponded roughly to the

³⁰ O. Hobart Mowrer (ed.), Psychotherapy Theory and Research, New York, Ronald Press, 1953, xviii-700 p., quoted by H.J. Eysenck, "A Dynamic Theory of Anxiety and Hysteria", Journal of Mental Science, Vol. 101, No. 442, January 1955, p. 29.

³¹ Sigmund Freud, "Neurosis and Psychosis" (1924), in Ernest Jones (ed.), Sigmund Freud, Collected Papers, London, The Hogarth Press, Vol. 2, 1950, p. 250-251.

primary drives as defined by learning theorists;³² the superego was a product of the social conditioning responsible for the production of the secondary drives of fear and anxiety; the ego was that part of the personality which mediated solution learning.

Questioning Dollard and Miller's view of the role of repression in neurosis, Mowrer presented an alternative point of view as a resynthesis of the Freudian concepts:

[...] neurosis arises, not when an excessively severe superego develops and overpowers the ego, thus forcing a repudiation or repression of the id forces, but rather when the ego, which is initially under the complete sway of the id remains essentially id-dominated and directs repressive action against the superego.³³

Like Dollard and Miller, he did not postulate Freudian unconscious causes for neurotic symptoms but regarded them as learned acts. He saw neurosis as the result of two types of learning--conditioning and problem solving. The former involved the autonomic nervous system and resulted in involuntary reactions such as attitudes and feelings; the latter involved the central nervous system and resulted in response patterns called acts or habits. He conceived the acquisition of social responses as mediated by conditioning and considered

32 O. Hobart Mowrer, "Neurosis, Psychotherapy and Two-Factor Learning Theory", in O. Hobart Mowrer (ed.), Psychotherapy Theory and Research, New York, Ronald Press, 1953, p. 145.

33 Ibid.

this process as training. Since an individual learned a conditioned response because he was pressured to do so and not because he wanted to, this conditioning was compared to Freud's reality principle.

Essentially in agreement with Mowrer's thinking, Eysenck³⁴ superimposed Mowrer's ANS (autonomic nervous system) based theory of social conditioning upon his own cortically based theory of conditioning as related to introversion-extraversion. Due to the proposed differences in conditionability, introverts would tend to be highly socialized, extraverts would tend to be weakly socialized and ambiverts would be intermediate with respect to socialization. This would apply in similar manner to the neurotic introvert and to the neurotic extravert. In addition, being more autonomically reactive, these individuals would be more prone to neurotic disorders.

A variety of investigations on the behavior of these groups has been conducted. With respect to the attitudes of these groups, Eysenck has stated:

³⁴ H.J. Eysenck, "A Dynamic Theory of Anxiety and Hysteria", Journal of Mental Science, Vol. 101, No. 442, January 1955, p. 28-51.

Extraverts, on the whole, should have attitudes favoring the overt expression of aggressive and sexual impulses, whereas introverts should have attitudes strongly supporting those ethical and moral agencies and conceptions which act in such a way as to inhibit overt and aggressive behavior.³⁵

In the same publication he has supported his statement by citing studies on the differences between these groups in humour and in social attitudes. Another study³⁶ found extraverts to be significantly more prone to automobile accidents than were introverts.

Examining Dollard and Miller's and Mowrer's theory in the light of his own findings and in terms of Mowrer's hypothesis on social conditioning, Eysenck observed that Dollard and Miller in conceptualizing neurosis as superego-dominated were dealing, not with neurosis, but with introverted symptoms; Mowrer, in dealing with id-dominated behavior appeared to be dealing with extraverted symptoms. He summarized:

What we have called excessive degree of socialization due to strong conditionability these writers have called superego; what we have called insufficient degree of socialization due to weak conditionability these writers call id.³⁷

³⁵ Eysenck, The Dynamics of Anxiety and Hysteria, p. 217.

³⁶ Bernard J. Fine, "Introversion-Extraversion and Motor Vehicle Driver Behavior", Perceptual and Motor Skills, Vol. 16, No. 1, February 1963, p. 95-100.

³⁷ Eysenck, The Dynamics of Anxiety and Hysteria, p. 221-222.

The problem, then, is simply derived from a summary of Eysenck's statements and is based on his own theoretical formulations. Id-dominated behavior, in this case, attitudes favoring the overt expression of sexual and aggressive activity, would be expected of extraverts and neurotic extraverts. Conversely, superego-dominated behavior, hence inhibition of the overt expression of sexual and aggressive attitudes, and in addition, overt expression of moralistic attitudes would be expected of the introvert and the neurotic introvert. Individuals intermediate with respect to introversion and extraversion would be expected to be neither id- nor superego-dominated in their behavior.

For reasons which are obvious, in most studies of this type direct measurement of sexual and aggressive behavior must be replaced by measurement of expressed attitudes to stimuli of this nature.

3. Socialization and Personality - Related Evidence.

The difficulties encountered in the study of psychoanalytic concepts via methods of recall and the trend in behavior theory to anchor concepts as precisely as possible to measurable properties in the empirical world influenced the investigation of more precise relationships. In the 1940's and 1950's, a series of studies based on acceptance of the fact that stimuli of a sexual and aggressive nature did

create anxiety, ignored, for a time, psychoanalytic interpretation of results. Most of these studies investigated the area of perceptual defense³⁸ and provided a bulk of information on reaction to sexual and aggressive words and pictures.^{39,40} The demonstration of differential recognition thresholds for tachistoscopically presented neutral and emotionally toned words and a preoccupation with criticism of this theory concerned the majority of the earlier studies. A later attempt⁴¹ explained results by involving unconscious mechanisms of psychoanalytic theory. Subsequently, evoking the Dollard-Miller analysis, the perceptual defense hypothesis was described in terms of behavior theory principles based upon avoidance conditioning and punishment.⁴²

³⁸ L. Postman and J.S. Bruner, "Multiplicities as a Determinant of Perceptual Behavior", Journal of Experimental Psychology, Vol. 39, No. 3, June 1947, p. 369-377.

³⁹ C.W. Eriksen, "Perceptual Defense as a Function of Unacceptable Needs", Journal of Abnormal and Social Psychology, Vol. 46, No. 4, October 1951, p. 557-564.

⁴⁰ P.T. Shannon, "Clinical Patterns of Defense as Revealed in Visual Recognition Thresholds", Journal of Abnormal and Social Psychology, Vol. 64, No. 4, May 1962, p. 370-377.

⁴¹ G.S. Blum, "An Experimental Reunion of Psychoanalytic Theory with Perceptual Vigilance and Defense", Journal of Abnormal and Social Psychology, Vol. 49, No. 1, January 1954, p. 94-98.

⁴² C.W. Eriksen and C.T. Browne, "An Experimental and Theoretical Analysis of Perceptual Defense", Journal of Abnormal and Social Psychology, Vol. 52, No. 2, March 1956, p. 224-230.

Other investigators^{43,44} using projective measures for the most part, attempted to manipulate anxiety over sex experimentally and, in this way, investigated reactions to sexually relevant stimuli. The general conclusion for this set of studies seemed to be that the sexual stimuli resulted in anxiety which inhibited the expression of sexually relevant responses.⁴⁵

The relevance of these studies to personality theory has been of recent interest to psychologists who have interpreted these findings within the framework of a repression-sensitization dimension of personality. Sensitizers might be described as those individuals who exhibited lowered thresholds (vigilance) for emotionally toned words and pictures; repressors would include those who exhibited a relatively elevated threshold (defense) for such material. Clinically, the former were obsessive-compulsive; the latter, hysterics.

⁴³ R.A. Clark, "The Projective Measurement of Experimentally Induced Levels of Motivation", Journal of Experimental Psychology, Vol. 44, No. 6, December 1952, p. 391-399.

⁴⁴ B. Martin, "Expression and Inhibition of Sex Motive Arousal in College Males", Journal of Abnormal and Social Psychology, Vol. 68, No. 3, March 1964, p. 307-312.

⁴⁵ D. Byrne and J. Sheffield, "Response to Sexually Arousing Stimuli as a Function of Repressing and Sensitizing Defenses", Journal of Abnormal and Social Psychology, Vol. 70, No. 2, April 1965, p. 114-118.

Although older studies⁴⁶ used clinical groups, recent works have assigned scores along this continuum using an R-S scale⁴⁷ based on selected items from the Minnesota Multiphasic Personality Inventory. Unlike Eysenck's introversion-extraversion continuum, this dimension has a less sophisticated basis--it has been defined in terms of characteristic responses to anxiety evoking stimuli. There is some speculation that the present scale is a measure of defense mechanisms.

The more recent investigations on the R-S continuum have used the scale to locate extreme groups and to investigate verbal and written reaction to sexual and aggressive stimuli. Results, as outlined by Byrne and Sheffield,⁴⁸ generally supported predictions. Repressors denied and sensitizers admitted feelings of anxiety. Sensitizers responded to sexual stimuli with greater verbalized anxiety than did repressors and appreciated more the grosser forms of humor. Some of these studies have paralleled Eysenck's investigations with the I-E continuum. Hysterics, for example, preferred

⁴⁶ R.S. Lazarus, C.W. Eriksen and C.P. Fonda, "Personality Dynamics and Auditory Perceptual Recognition", Journal of Personality, Vol. 19, No. 4, June 1951, p. 471-482.

⁴⁷ Don Byrne, "The Repression-Sensitization Scale: Rationale, Reliability and Validity", Journal of Personality, Vol. 29, No. 3, September 1961, p. 334-349.

⁴⁸ Byrne and Sheffield, Op. Cit., p. 115.

sex humor whereas dysthymics preferred cognitive humor. Investigators of the R-S continuum have gleaned interpretations for their findings from the areas of learning, motivation and psychoanalytic theory.

Inglis,⁴⁹ through his interpretation of the findings on perceptual defense in terms of the Eysenckian dimensions, has provided a link between the R-S dimension and the I-E and N dimensions. Although this dimension was not mentioned, he did outline the studies on perceptual defense and perceptual vigilance to which the original R-S dimension was related.

According to Inglis, an individual's reaction to stimulus cues, such as those of a sexual and aggressive nature found in the studies on perceptual defense, is a function of several factors familiar to learning theory, among them "habit strength" and "drive status". The latter depended upon the quality of the stimulus and upon the susceptibility factors within the individual. Differential avoidance reactions to anxiety-producing stimuli was related to the interaction to be expected between "situations of differential stress and differential individual susceptibility

⁴⁹ J. Inglis, "Abnormalities of Motivation and Ego Functions", in H.J. Eysenck (ed.), Handbook of Abnormal Psychology. An Experimental Approach, New York, Basic Books, 1961, p. 262-277.

to stress". The dimension along which individual differences existed was the introversion-extraversion dimension.

Briefly then, in a situation of low external stress, individuals at the NI end of the continuum (hence introverts and more so neurotic introverts) would, characteristically initiate immediate and strong avoidance activity to stimuli of a sexual and aggressive nature. In terms of test performance, neurotic introverts and introverts would demonstrate perceptual defense. Individuals at the NE end of the continuum (hence extraverts and more so neurotic extraverts) would initiate little avoidance activity and would therefore exhibit vigilance in their perceptual reaction to such stimuli.

Under high external stress, Inglis claimed the vigilance and defense roles were reversed. Introverts and more so neurotic introverts would be unable to initiate and maintain successful avoidance activity and would manifest perceptual vigilance. Extraverts and more so neurotic extraverts would initiate a strong avoidance reaction and would manifest perceptual defense.

Inglis indicated that the method of mediating stress characteristically adopted by individuals at the extremes of the continuum of extraversion and neuroticism was maladaptive. In psychoanalytic terminology, such individuals would be considered lacking in "ego strength"--the concept currently

in use to characterize the personality's resources for coping with stress, both internal and external. To be truly effective the ego must be stronger than the id or the superego which are the parts of the personality creating the internal tensions.⁵⁰ Consequently, an individual with an id-dominated or a superego-dominated ego would be considered maladjusted or neurotic.

If, as Eysenck has claimed, neurotic extraverts and stable extraverts are id-dominated and neurotic introverts and stable introverts are superego-dominated, then all four groups would necessarily be defective in ego strength. In this context, it is difficult for the writer to visualize the introversion-extraversion and the normal-neurotic dimensions as orthogonal--hence, to accept, in theory, Eysenck's contention that any group of extreme introverts or of extreme extraverts could be considered "normal" or "stable".

4. Summary and Basic Hypothesis.

Eysenck has acknowledged the similarities between the psychoanalytic model and the behavior model in the dynamics operating in anxiety and neurosis. Making use of Mowrer's conception of the mediating role played by conditioning in

⁵⁰ E. Paul Torrance, Mental Health and Constructive Behavior, Belmont, California, Wadsworth, 1965, p. 66.

creating anxiety over sexual and aggressive stimuli, he regarded the undersocialized, unconditionable individuals (extraverts and neurotic extraverts) as being id-dominated in their behavior and attitudes and the oversocialized, overconditionable individuals (introverts and neurotic introverts) as being superego-dominated.

Inglis, Eysenck's co-worker, has interpreted the findings of various investigations of sexual and aggressive behavior in terms of the reaction of Eysenck's extreme groups under conditions of low and of high external stress--a differentiation subsequently emphasized by Eysenck. With this modification in mind, it would be expected that, under low external stress, extraverts and neurotic extraverts would favor overt expression of sexual and aggressive attitudes whereas introverts and neurotic introverts would not give expression to such attitudes but, rather, would favor overt expression of moralistic attitudes.

CHAPTER II

EXPERIMENTAL DESIGN

The greater part of this chapter is concerned with a description of the procedure involved in conducting the experiment to test the basic hypothesis. In the first section the variables specific to this study are identified and statements of the null hypotheses are made. The second section includes, for each test, an outline of content, of scoring and of studies disclosing validity and reliability. A brief description of the sample is followed by a discussion of the selection of the nine experimental groups from the total sample on the basis of scores on the Maudsley Personality Inventory. The procedures for test administration and the statistical techniques used in analyzing the data are presented in the two remaining sections.

1. Identification of the Variables and Statement of the Null Hypotheses.

Introversion, extraversion, neuroticism, id, ego and superego, like the construct of intelligence, cannot be measured directly. They may, however, be operationally defined and their manifestations measured in this way. In this report, introversion, extraversion and neuroticism were operationally defined in terms of predetermined scores on

Eysenck's Maudsley Personality Inventory.¹ A score on extraversion and on neuroticism placed the individual into one of a number of groups varying in level of extraversion and level of neurosis. The procedure for selection of these groups will be discussed in a subsequent section.

The measure for the dependent variables id and superego was the Impulse Ego Superego Test.² Results were analysed in terms of mean scores on measures of id and superego. Since the three measures were interdependent, an analysis of the ego scores was included in the report. The four subtests which comprised this test measure four aspects of id, of ego and of superego functioning within the individual. Proving how well each item reflected each function as Freud conceived it is not within the scope of this study.

Considering the variables within this operational framework, the hypotheses may be stated in the null form:

1. There is no significant difference between mean id scores of introverts and extraverts as measured by each of the four subtests of the IES Test.
2. There is no significant difference between mean id scores of neurotic introverts and neurotic extraverts as measured by each of the four subtests of the IES Test.

1 Hereafter referred to as MPI.

2 Lawrence A. Dombrose and Morton S. Slobin, "The IES Test", Perceptual and Motor Skills, Vol. 8, No. 14, December 1968, p. 347-389. (Hereafter referred to as the IES Test.)

3. There is no significant difference between mean superego scores of introverts and extraverts as measured by each of the four subtests of the IES Test.
4. There is no significant difference between mean superego scores of neurotic introverts and neurotic extraverts on each of the four subtests of the IES Test.

2. The Maudsley Personality Inventory.

In the following paragraphs, the content and scoring, validity and reliability of the MPI are discussed.

Content and scoring.- The Maudsley Personality Inventory, developed by Eysenck as a verbal measure of two dimensions of personality, introversion-extraversion and neuroticism, consists of eighty items--twenty-four E (extraversion) scale, twenty-four N (neuroticism) scale and twelve buffer items. Two points are given for an item scored in the E direction or in the N direction and one point for a doubtful answer. A low E scale scorer is designated as introvert; a high E scale scorer, as extravert.

Validity and reliability.- Constructed on the basis of item and factor analysis,³ the questionnaire has, according

³ H.J. Eysenck, "The Questionnaire Measurement of Neuroticism and Extraversion", Revista di Psicologia, Vol. 54, 1956, p. 113-141, quoted by H.J. Eysenck, "The Differentiation Between Normal and Neurotic Groups on the Maudsley Personality Inventory", British Journal of Psychology, Vol. 50, Part 2, May 1959, p. 176-177.

to the author, adequate construct validity.⁴ He⁵ has reported a corrected split-half reliability for normal males and females of .83 for the E scale and .88 for the N scale and an internal consistency reliability of .74 for E and of .84 for N. Jensen,⁶ outlining the results of some twenty normative studies, considered the scale to have high construct validity and adequate reliability. He seemed satisfied that the two factors represented by the scales were generally found to be orthogonal and that the N scale showed considerable differentiating power. However, studies⁷ using the MPI to differentiate groups did not consistently support Eysenck's theory. Less reluctant to find fault with the scale than with his theory, Eysenck⁸ maintained that the E and N scales become somewhat correlated when clinical groups are used but remain orthogonal with normal subjects.

⁴ H.J. Eysenck, The Dynamics of Anxiety and Hysteria, New York, Praeger Inc., 1957, p. 77.

⁵ -----, "The Questionnaire Measurement of Neuroticism and Extraversion", quoted by Arthur R. Jensen, "The Maudsley Personality Inventory", Acta Psychologica, Vol. 14, No. 4, 1958, p. 113-141.

⁶ Arthur R. Jensen, "The Maudsley Personality Inventory", Acta Psychologica, Vol. 14, No. 4, 1958, p. 314-325.

⁷ John J. Sigal, Kolman H. Star and Cyril M. Franks, "Hysterics and Dysthymics as Criterion Groups in the Study of I-E", Journal of Abnormal and Social Psychology, Vol. 57, No. 2, September 1958, p. 146-147.

⁸ H.J. Eysenck and G.S. Claridge, "The Position of Hysterics and Dysthymics in a Two-Dimensional Framework of Personality Description", Journal of Abnormal and Social Psychology, Vol. 64, No. 1, January 1962, p. 46.

The shortcomings notwithstanding, the MPI has been used repeatedly by Eysenck, his co-workers and others testing his theory as a measure of his personality dimensions. It has been recently defended by Eysenck as a valid measure of the trait of extraversion at the behavioral level⁹ and of N as a drive factor.¹⁰

3. The IES Test.

Although a number of instruments^{11,12} have been devised for measuring a person's ego strength, to the writer's knowledge the IES Test is the only test in the literature that attempts to measure all three aspects of Freud's system.

This section includes a discussion of content and scoring, validity and reliability of the instrument.

Content.- The IES Test developed by Lawrence Dombrose and Morton Slobin presumably measures the relative

9 H.J. Eysenck, Experiments with Drugs, New York, Pergamon Press, 1963, p. 14.

10 -----, "A Factor Analysis of Selected Tests", in H.J. Eysenck (ed.), Experiments in Personality, New York, MacMillan, Vol. 2, 1960, p. 234-244.

11 F. Barron, "An Ego-Strength Scale Which Predicts Responses to Psychotherapy", Journal of Consulting Psychology, Vol. 17, No. 3, June 1953, p. 327-333.

12 R.N. Cassel, The Ego Strength Q Sort Test, Chicago, Psychometric Affiliates, 1958.

strengths of id, ego and superego in four aspects of an individual's functioning. Each of the four subtests provides a group of standard situations that will allow impulse, ego and superego to manifest themselves. These standard situations are items which, for the most part, are related to sexual and aggressive themes.

The first subtest, the Arrow-Dot (AD) consists of twenty-three graphic problems in which the subject draws a line from an arrow to a dot goal without breaking barriers as defined in the instruction manual. This test indicates the amount of impulse expression (I), control (E) or overcontrol (S) in behavior.

The second subtest, the Photo-Analysis (PhA) presents photographs of nine different men. Multiple choice responses to questions about the behavior and feelings of the men in the photographs are categorized in terms of the acting out of impulse (I), integrated or neutral interests (E) or moralistic concerns (S).

The Picture Story Completion test (PSC), similar to the Wechsler Adult Intelligence Scale subtest, is composed of thirteen sets of cartoons. In each set, two or three cartoons begin a story which the subject is to complete by choosing one of three alternatives. His score represents the degree to which he sees the environment as offering

potentials for impulse gratification (I), synthesizing activity (E) or censure and punishment (S).

The final subtest, Picture Title (PT), consists of twelve cards showing scenes similar to those found on the Thematic Apperception Test. Titles given by the subject to each picture are evaluated as I, E or S following objective instructions. In addition, a D score indicates a response so general in nature that it suggests some attempt to avoid psychological contact with the stimulus.

Scoring.- In general this test is easy to administer, takes approximately forty-five minutes to complete and has simple, objective scoring. A record form is provided where each item is scored I, E or S depending on the direction of the response. Each answer is given a weight of one. There is a total I, E and S score for each subtest. Explanations of what is a high or a low score and the psychoanalytic interpretation of each of these constructs is given in the manual. Subtests are scored independently and no hypothesis has been suggested as to the meaning of a combined score. Since the scores within each subtest are ipsotetic or experimentally dependent, intercorrelation analysis cannot be made.

Validity.- The original publication of the test outlined several studies supporting the validity of the instrument. Since that time several studies have been

published some of which did not support its utility. In the following paragraphs, mention will be made of those studies considered relevant to the present report.

Although the IES Test was designed originally for males, Golden's¹³ results indicated that the test could be appropriate for females. Rankin and Johnston¹⁴ found that, since certain subtests reflected significant differences in mean scores between males and females, it would be best to report results separately for each sex. Pickney¹⁵ in obtaining normative data on females provided the additional information that the scores of his female subjects resembled those of male inhibited neurotics. Rempel and Signori¹⁶ report that in a college population females were significantly more impulse prone than males.

13 D. Golden, Manifestations of Impulse, Ego and Superego in Elementary School Boys and Girls, unpublished doctoral dissertation presented to Western Reserve University, 1954, quoted by L.A. Dombrose and M.S. Slobin, "The IES Test", Perceptual and Motor Skills, Vol. 8, No. 4, December 1958, p. 363.

14 Richard J. Rankin and James O. Johnston, "Influences of Age and Sex on the IES Test", Perceptual Motor Skills, Vol. 15, No. 3, 1962, p. 775-778.

15 George A. Pickney, "Relative Strengths of Impulse, Ego and Superego in Female College Students", Perceptual and Motor Skills, Vol. 17, No. 2, October 1963, p. 340.

16 Henry Rempel and Edro I. Signori, "Further Research on the IES Photo-Analysis Subtest with Special Reference to Sex Differences", Perceptual and Motor Skills, Vol. 17, No. 1, August 1963, p. 295-298.

With respect to the effect of age on the IES Test scores for different groups, it was found that in adulthood, ego becomes relatively stranger than in adolescence¹⁷ but that there was a tendency for elderly subjects to show more impulsive and more superego behavior.¹⁸ Bortner¹⁹ found significant differences at the .05 and .01 level for three of the superego measures on the test between three institutionalized and three non-institutionalized groups of males. Another study²⁰ using psychotic and neurotic patients found that the total I score related significantly to various observable behavior subsumed under the heading of unrestrained, impulsive behavior.

In three of the most recent studies using the IES Test, the authors, following a procedure similar to that of the present study, first used some objective measure to

17 G. Charnes, The Relative Strengths of Impulse, Ego and Superego in Latency, Adolescence and Adulthood, unpublished doctoral dissertation presented to Western Reserve University, 1953, quoted by Dombrose and Slobin, Op. Cit., p. 362.

18 G.H. Ritz, The Relative Strengths of Impulse, Ego and Superego in Three Groups of Aged Males, unpublished doctoral dissertation presented to Western Reserve University, 1954, quoted by Dombrose and Slobin, Op. Cit., p. 362.

19 Raymond W. Bortner, "Superego Functioning and Institutional Adjustment", Perceptual and Motor Skills, Vol. 14, No. 3, June 1962, p. 375-379.

20 Bernard V. Verrill and Victor Costanza, "The IES Test and Ward Behavior", Journal of Clinical Psychology, Vol. 18, No. 3, July 1962, p. 295-297.

subdivide their population. Canestrari,²¹ testing the relation of measures of id, ego, superego and the form of spatial stimulus generalization gradients, found that subjects with high id and high superego scores exhibited broad generalization gradients; subjects with high ego scores exhibited little generalization. Differences among groups were significant. Bortner,²² working on the assumption that personality differences underlie school subject preference found differences significant at the .05 level in the expected direction on measures of ego and id. In a second study,²³ dividing his population according to preference for skill or chance determined outcomes, Bortner found that subjects divided in this way differed more on ego functioning than on perceptual-cognitive aspects of field dependence. In his interpretation, he considered the operation of other variables such as internal and external orientation and anxiety.

Although the results of these studies seemed promising, it would be incautious to make a general statement as to

21 Robert E. Canestrari, "Spatial Stimulus Generalization Gradients and Id, Ego and Superego Strength", Perceptual and Motor Skills, Vol. 19, No. 1, August 1964, p. 51-55.

22 Raymon W. Bortner, "School Subject Preference and the Structure of Value Systems", Perceptual and Motor Skills, Vol. 18, No. 3, June 1964, p. 741-747.

23 -----, "Personality Differences in Preferences for Skill and Chance-Determined Outcomes", Perceptual and Motor Skills, Vol. 18, No. 3, June 1964, p. 765-772.

the validity of the total test. Each subtest might be valid for some situations and not for others. Reviewers^{24,25} of the test considered the validity sufficiently favorable to warrant further research. Signori²⁶ quotes a statement by Pawlik and Cattell²⁷ suggesting that the psychoanalytic descriptions of id, ego and superego seem to match the three broad factor patterns in personality tests and that the IES Test might constitute a simpler means of evaluating these components.

Reliability.- In the manual Dombrose and Slobin reported a median test-retest reliability of about .60 and a median internal consistency reliability of .55 computed on a sample of thirty male psychotherapy outpatients over a period of thirty to sixty days. As pointed out by Crites,²⁸ the authors did not fairly evaluate their reliability as the subjects' reactions would be expected to fluctuate markedly.

24 John C. Crites, "Test Reviews", Journal of Counselling Psychology, Vol. 9, No. 4, Winter 1962, p. 369-372.

25 Walter Katkowsky, "The IES Test", in O.K. Buros (ed.), The Sixth Mental Measurement Yearbook, Highland Park, New Jersey, Gryphon Press, 1965, p. 219-221.

26 E.I. Signori, "The IES Experiment: Some Additional Perspective", Perceptual and Motor Skills, Vol. 24, No. 1, February 1967, p. 191-193.

27 K. Pawlik and R.B. Cattell, "Third Order Factors in Objective Personality Tests", British Journal of Psychology, Vol. 55, Part 1, February 1964, p. 1-18.

28 Crites, Op. Cit., p. 369-372.

4. Description of the Sample.

The subjects in this study were female students attending the St. Joseph Teachers College in Montreal. The college is a co-educational institution offering a four-year course and a special one-year program for college graduates, both of which lead to a Bachelor of Education degree. At the time of testing the college also offered a special two-year 'B' diploma course designed for females who wished to teach elementary school. Most of the students particularly in the four-year program and in the diploma course were English speaking Catholics, many of whom came from working class homes and were first generation Canadians.

The MPI was administered to all available female students, 206 out of a possible 325. A distribution of E scale and N scale scores for this group is contained in Appendix 1. Of these 206 students the IGS Test was given to a sample of ninety, the details of this sample will be described in the following section. Table I provides a breakdown of the participating female subjects.

5. Selection of the Sample.

Subjects were categorized according to their score on the E scale and on the N scale of the MPI. This procedure was used rather than dividing on the N scale within each

Table I.-

Breakdown by Course and Year of Female Subjects Taking MPI
and IES Test.

Course and Year	<u>MPI</u> N: 286	<u>IES Test</u> N: 90
"B" diploma	100	30
B.Ed. year 1	97	28
2	36	15
3	17	5
4	12	6
B.Ed. graduate	24	6

E group because it afforded an opportunity to equate N scores. Laslo and Yates,²⁹ in using this method, pointed out Eysenck's suggestion that introverts and extraverts would not differ in drive if their N scores were equated.

In this report, a person was considered to be an introvert if her E score was at or lower than one standard deviation below the mean E score for the total sample and her N score fell in the lower third of the N scores for the total sample. In terms of cut-off scores, this would mean an E scale score of eighteen and below and an N scale score of twenty-three and below. She would be considered an extrovert if her E score was at or greater than one standard deviation above the mean of the total sample and her N score was in the lower third of the sample, hence, an E scale score of thirty-seven and above and an N scale score of twenty-three and below. An ambivert was an individual whose E score fell within one standard deviation on either side of the mean, therefore between nineteen and thirty-six on the E scale. If the subject's N score fell in the upper third, hence thirty-three and above, of the N scores for the total sample, she would be considered "neurotic". The middle third of the N scores, including scores between

29 Aubrey J. Yates and Judith I. Laslo, "Learning and Performance of Extraverts and Introverts on the Pursuit Rotor", Journal of Personality and Social Psychology, Vol. 1, No. 1, January 1965, p. 79-84.

twenty-four and thirty-two, would be considered a median N group. Table II summarizes the MPI cut-off scores and indicates the number of subjects in each of the nine groups thus formed.

The mean scores and cut-off scores for the extreme groups used in this study compared favorably to those reported in the literature. Means and standard deviations for extreme groups were compared to those reported by Eysenck,³⁰ Jensen,³¹ and Yates and Laslo³² in Table III. Eysenck used cut-off scores of sixteen and thirty on the E scale; Yates and Laslo used twenty-six and thirty-seven; the present report used eighteen and thirty-seven.

Once the nine groups were set up, ten subjects were chosen from each group. When random choice was possible in this selection, a table of random numbers was used. From the data available in Table II it can be seen that randomization was restricted, if not impossible, in the extreme groups. The IES Test was administered to the ninety subjects chosen in this manner.

30 H.J. Eysenck, "The Differentiation Between Normal and Various Neurotic Subjects on the Maudsley Personality Inventory", British Journal of Psychology, Vol. 50, Part 2, May 1959, p. 176-177.

31 Jensen, Op. Cit., p. 314-325.

32 Yates and Laslo, Op. Cit., p. 81.

Table II.-
MPI Cut-Off Scores and Number of Subjects in
 Each of the Nine Groups.

Group	<u>MPI</u> Cut-Off Scores	N
Introvert	18	37
Low N	23	12
Med. N	24-32	14
High N	33	11
Ambivert	19-36	203
Low N	23	76
Med. N	24-32	65
High N	33	62
Extravert	37	46
Low N	23	17
Med. N	24-32	19
High N	33	10

Table III.-

Means and Standard Deviations for Extreme Groups on MPI Scales
from Published Data and Present Report.

Study	N	E Scale		N Scale	
		Mean	S.D.	Mean	S.D.
Eysenck					
Dysthymics	84	17.86	10.02	38.18	10.84
Hysterics	58	24.91	9.26	30.82	11.84
Jensen					
Dysthymics	25	21.00	11.96	36.80	10.48
Hysterics	27	25.22	9.96	28.82	12.76
Yates/Laslo					
Normal Is	10	20.60	6.51	23.70	3.42
Normal Es	10	39.90	2.70	23.60	2.11
Present Report					
Normal Is	10	12.80	3.19	17.10	6.81
Normal Es	10	40.20	1.90	15.20	3.85
"Neurotic" Is	10	11.40	3.13	41.40	4.41
"Neurotic" Es	10	40.80	2.96	38.60	3.29

6. Procedure in the Administration of Tests.

The MPI was administered to the population during a period of two weeks in eight group sessions. Forty minutes of a scheduled lecture period was given over to the testing. In a brief talk to each group prior to the testing, the examiner asked cooperation and informed the students that the individual results would be confidential. The instructions for the MPI were then read aloud as the subjects followed on their printed copies. A period of four months elapsed before a retest could be organized.

Five groups of students, approximately twenty at a sitting, took a group form³³ of the IES Test within a period of two weeks. The retest was given within a month of the last sitting. The originator of the group form, found no significant differences for two groups of college students between the individually administered IES Test and his form. The group test for this study was constructed according to the author's instructions. Using the materials and instructions of the individual form wherever possible, the group tests were structured so that the test material could be projected onto a screen using an opaque projector. Subjects recorded

³³ James O. Johnston, A Group Form of the IES Test, unpublished Master's thesis presented to the University of Oklahoma, 1963, iv-47 p.

their own responses on a specially constructed answer sheet. A trial run was conducted with twenty students so that difficulties could be ironed out. The only alteration made was for the Photo Analysis and Picture Story Completion tests on the answer sheet. In Johnston's sheet, a student consistently choosing an id response, for example, would always be circling the first position. For the present study, the positions were randomized so that a choice of an I response would entail circling an alternate position for each item.

7. Organization and Statistical Treatment of the Data.

To facilitate subsample calculations and to permit examination of interaction of the elements within each set, an analysis of variance technique was used in the statistical treatment of the data.

Three three-by-three tables were set up for each of the four IES tests. The first table consisted of mean id scores obtained by each of the nine groups; the second, of mean ego scores and the third of mean superego scores. Bartlett's Test of Homogeneity of Variance³⁴ worked out for each set of data produced chi squares which were for the most part, as evidenced in Table IV, well below the critical

³⁴ Allen L. Edwards, Experimental Design in Psychological Research, New York, Rinehard & Co., 1950, p. 195-197.

Table IV.-

Results for Bartlett's Test of Homogeneity for I, E, and S
Scores of Nine Groups in Each Subtest of the IES Test.

Subtest Scores	Chi Square*	Corrected Chi Square
Arrow Dot		
Id	9.742	9.358
Ego	6.223	5.978
Superego	4.565	4.384
Picture Story		
Id	7.023	6.745
Ego	5.852	5.621
Superego	21.109	20.274
Photo Analysis		
Id	6.018	5.781
Ego	5.073	4.873
Superego	9.761	9.377
Picture Title		
Id	10.275	9.868
Ego	16.168	15.529
Superego	11.364	10.914

* Chi square required for significance for 8 df
 at .05 = 15.507
 at .01 = 20.090

values required for significance. Nevertheless, the analysis of variance was carried out in the two instances where the corrected chi squares were slightly above the critical value.

Following the procedure for the fixed model according to Winer,³⁵ twelve analyses of variance were carried out. Wherever F was significant, t tests were employed to uncover significant differences between means in each set. Since the tripartite results of Tukey's test of significance would have been too involved for the type of information desired here, a t test for small samples was used:

$$t = \frac{\bar{X} - \bar{X}_1}{\sqrt{\frac{x^2 + x_1^2}{(N_1 + N_2) - 2} \left(\frac{1}{N_1} + \frac{1}{N_2} \right)}}$$

The first section of the following chapter includes a summary table for each analysis of variance and a matrix of significant t 's when F was significant.

³⁵ B.J. Winer, Statistical Principles in Experimental Design, New York, McGraw Hill, 1962, p. 228-239.

CHAPTER III

PRESENTATION OF RESULTS

Results of the reliability study for the MPI and for each of the IES subtests will be presented in the first section of this chapter. In subsequent sections, the statistical analysis of the results for each of the four subtests of the IES Test will be presented in tabular form with brief commentary on each set of data. A statement of the acceptance or rejection of the null hypotheses will be followed by a brief focus on other significant differences particularly relevant to the discussion of the results in the following chapter.

It should be reiterated here that, since individual id, ego and superego scores on each subtest are interdependent, mean scores will necessarily be interdependent. Consequently, a very high mean id score for one group would generally rule out very high mean ego or mean superego scores for that group. In addition, a mean score which is indicated as significantly lower than another in a comparison does not necessarily imply a low or negligible score.

1. Test-Retest Reliability.

One hundred and thirteen students chosen from all levels other than the fourth year were retested with the MPI. Intra-individual fluctuation was determined by the extent of

agreement between test and retest score on the E scale and on the N scale for each subject. Agreement on the E scale ranged between .23 and 1.00 with a mean of .84. On the N scale, mean agreement was .81 with a range between .41 and 1.00.

A random sample of twenty-two students was retested on the IES Test. The proportion of agreement between I, E and S test scores and I, E and S retest scores respectively for each individual was the method employed for determining reliability for each subtest. Results on the Arrow Dot test indicated a mean agreement of .42 for I, .84 for E, and .71 for S scores. A mean agreement of .58 for I, .73 for E, and .94 for S was obtained on the Picture Story Completion test and on the Photo Analysis test, .80 for I, .83 for E, and .89 for S. The retest on the Picture Title test yielded agreement of .81 for I, .79 for E, and .98 for S.

2. The Arrow Dot Test.

From the raw data for the AD test indicated in Appendix 2, a matrix of means for id scores, for ego scores and for superego scores obtained by the nine groups was set up. Table V contains these three matrices. A summary of the sums of squares, estimates of variance and F ratios in the analysis of variance for main effects for each set of scores is found in Table VI. Since there was no evidence against

Table V.-

Matrix of Means for Id, for Ego, for Superego Scores of Nine Groups on the Arrow Dot test.

	Mean Id Scores			
	I	A	E	Total
Low N	64	83	51	198
Med. N	32	63	77	172
High N	59	78	37	174
Total	155	224	165	544

	Mean Ego Scores			
	I	A	E	Total
Low N	146	135	167	448
Med. N	181	160	141	482
High N	163	138	180	481
Total	490	433	488	1411

	Mean Superego Scores			
	I	A	E	Total
Low N	13	12	11	36
Med. N	14	15	11	40
High N	8	14	13	35
Total	35	41	35	111

Table VI.-

Analysis of Variance of Id, of Ego, of Superego Scores of Nine Groups on the Arrow Dot test.

Source	Sum of Squares	df	Variance Estimate	F	P
For Id scores					
Columns	92.68	2	46.34	3.52	>.05
Rows	13.98	2	6.99	.53	N.S.
Interaction	149.39	4	37.35	2.89	>.05
Within Sets	1064.80	81	13.15		
For Ego scores					
Columns	69.76	2	34.88	2.61	N.S.
Rows	11.62	2	5.81	.44	N.S.
Interaction	166.78	4	41.69	3.11	>.05
Within Sets	1083.50	81	13.38		
For Superego scores					
Columns	.80	2	.40	.33	N.S.
Rows	.46	2	.23	.87	N.S.
Interaction	2.34	4	.59	.46	N.S.
Within Sets	102.50	81	1.27		

against the hypothesis of homogeneity of variance, the estimate of within variance for each set could be used as an estimate of the population variance for that set. Differences between means which were found to be significant at .01 and .05 by *t* are contained in Table VII.

As indicated in the three matrices of means, the majority of responses were answered in the ego direction, with very few responses in the superego direction. The results of the *F* test for the id scores indicated that variation in extraversion (columns) carried with it systematic variation in the id scores. Since the *F* for interaction variance was significant beyond the .05 point both for the id and for the ego scores, it would seem that changing *N* level had different effects depending upon the *E* group with which it was associated. The analysis of variance for superego scores yielded no significant *F*.

The *t* tests revealed the mean id scores for the A low *N* group to be significantly greater at the .05 level than the mean id score for either the I medium *N* or the E high *N* group. In addition, the A high *N* mean id score was greater at the .05 level than the mean id score for the I medium *N* group. Over and above the variance due to the columns and the rows, certain variations in id scores could be attributed to the combination effect of *E* and *N* acting together. Significant differences might be attributed to the

Table VII.-

Significant Differences Beyond .01 and .05 by t Between
Groups for Id Scores on Arrow Dot test.

Group	Means	IlowN 64	AlowN 83	ElowN 51	ImedN 32	AmedN 63	EmedN 77	IhighN 59	AhighN 78	EhighN 37
IlowN	64									
AlowN	83				X					X
ElowN	51									
ImedN	32		X						X	
AmedN	63									
EmedN	77									
IhighN	59									
AhighN	78				X					
EhighN	37		X							

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fact that a particular E group is combined with one level of N rather than another.

A similar interaction was indicated in the E scores, where the t technique revealed only one difference between means ($E_{highN} - A_{lowN}$) significant beyond the .05 level.

None of the four hypotheses stated in chapter two could be rejected on the basis of the results for the nine groups on the AD test. It would seem that in this subtest, the ambiverts had significantly higher id scores than either introverts or extraverts.

3. The Picture Story Completion Test.

The matrix of means for each set of scores is presented in Table VIII. The analysis of variance for the mean id and mean ego and mean superego scores is summarized in Table IX. All F's proved to be insignificant and hence, no t tests were required.

None of the four null hypotheses could be rejected on the basis of the results of the nine groups on the PSC test. It could be noted, however, the three high N groups had consistently higher mean id scores than did any of the low or medium N groups.

Table VIII.-

Matrix of Means for Id, for Ego, for Superego Scores of Nine Groups on the Picture Story Completion test.

Mean Id Scores				
	I	A	E	Total
Low N	30	25	28	83
Med. N	25	30	32	87
High N	30	32	41	111
Total	93	87	101	281

Mean Ego Scores				
	I	A	E	Total
Low N	76	77	65	218
Med. N	69	64	65	198
High N	56	68	59	183
Total	201	209	189	599

Mean Superego Scores				
	I	A	E	Total
Low N	24	31	37	92
Med. N	37	36	33	106
High N	36	39	30	105
Total	97	106	100	303

Table IX.-

Analysis of Variance of Id, of Ego, of Superego Scores of Nine Groups on the Picture Story Completion test.

Source	Sum of Squares	df	Variance Estimate	F	P
For Id scores					
Columns	3.29	2	1.65	.43	NS
Rows	15.29	2	7.65	2.01	NS
Interaction	3.78	4	.95	.25	NS
Within Sets	308.30	81	3.81		
For Ego scores					
Columns	6.75	2	3.38	.61	NS
Rows	10.55	2	5.28	.95	NS
Interaction	19.32	4	4.83	.87	NS
Within Sets	447.70	81	5.53		
For Superego scores					
Columns	1.00	2	.50	.24	NS
Rows	3.66	2	1.83	.86	NS
Interaction	12.54	4	3.14	1.46	NS
Within Sets	173.30	81	2.14		

4. The Photo Analysis Test.

Similar to the procedure with the AD test, four tables are again presented: the table of matrices; the analysis of variance; and the table of significant t's. The analysis of variance resulted in significant F ratios for id and for ego scores but not for superego scores.

For the mean id scores, the variance between columns was significant beyond the .01 point indicative of systematic variation in these scores with variation in level of E. Inspecting the matrix of means, the mean id scores were highest for the E groups at each level of N. The t tests revealed the mean id score of the E high N group to be significantly greater at the .01 level than each of the three I groups and each of the three A groups. The mean score for the E medium N group was significantly greater (beyond .05) than that of either I low N or A low N.

The variance between rows was also significant beyond the .01 point. The total means in Table X indicated an increase in id scores with increasing N. Although this trend was most evident in the E groups, the three I medium N and the three A medium N groups had similar scores which scores were greater than the mean score of any of the I and the A low N groups. The t tests revealed that the mean id score for the E high N group was significantly greater (beyond .01) than the mean score of any of the three low N groups and two of the

Table X.-

Matrix of Means for Id, for Ego, for Superego Scores of Nine Groups on the Photo Analysis test.

	Mean Id Scores			
	I	A	E	Total
Low N	33	33	37	103
Med. N	41	41	53	135
High N	41	40	71	152
Total	115	114	161	390

	Mean Ego Scores			
	I	A	E	Total
Low N	93	89	94	276
Med. N	83	81	76	240
High N	81	87	71	239
Total	257	257	241	755

	Mean Superego Scores			
	I	A	E	Total
Low N	53	56	49	158
Med. N	56	58	51	165
High N	58	53	37	148
Total	167	167	137	471

Table XI.-

Analysis of Variance of Id, of Ego, of Superego Scores of Nine Groups on the Photo Analysis test.

Source	Sum of Squares	df	Variance Estimate	F	P
For Id scores					
Columns	48.06	2	24.03	6.27	>.01
Rows	40.59	2	20.30	5.30	>.01
Interaction	25.35	4	6.44	1.42	NS
Within Sets	310.00	81	3.83		
For Ego scores					
Columns	5.69	2	2.85	.70	NS
Rows	29.62	2	14.81	3.62	>.05
Interaction	11.38	4	2.95	.72	NS
Within Sets	371.65	81	4.09		
For Superego scores					
Columns	20.00	2	10.00	2.05	NS
Rows	4.86	2	2.43	.50	NS
Interaction	9.14	4	2.29	.45	NS
Within Sets	397.10	81	4.90		

Table XII.-

Significant Differences Beyond .01 and .05 by t Between
Groups for Id Scores on Photo Analysis test.

Group	Means	IlowN 33	AlowN 33	ElowN 37	ImedN 41	AmedN 41	EmedN 53	IhighN 41	AhighN 40	EhighN 71
IlowN	33						X			X*
AlowN	33						X			X*
ElowN	37						X			X*
ImedN	41									X*
AmedN	41									X*
EmedN	53	X	X	X						X
IhighN	41									X*
AhighN	40									X*
EhighN	71	X*	X*	X*	X*	X*	X*	X*	X*	

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* Beyond .01 level of significance.

Table XIII.-

Significant Differences Beyond .01 and .05 by t Between
Groups for Ego Scores on Photo Analysis test.

Group	Means	IlowN 93	AlowN 89	ElowN 94	ImedN 83	AmedN 81	EmedN 76	IhighN 81	AhighN 87	EhighN 71
IlowN	93						X			X*
AlowN	89						X			X
ElowN	94						X			X
ImedN	83									
AmedN	81									
EmedN	76	X	X	X						
IhighN	81									
AhighN	87									X
EhighN	71	X*	X	X					X	

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*Beyond .01 level of significance.

medium N groups and significantly greater beyond .05 than the E medium N group mean. The E medium N group, in turn, was greater beyond .05 level, than the mean score of each of the three low N groups.

In summary, an increase in level of E and an increase in level of N effected an increase in mean id scores, the most significant increase being in the E medium N group and in the E high N group.

For the ego scores, a significant F beyond the .05 point for the variance between rows indicated systematic variation in ego scores with variation in N level. The mean ego scores of each of the three low N groups was significantly greater beyond .05 than the mean ego scores of either the E medium N group or the E high N group.

Although the mean S scores did not differ significantly the three introvert groups had higher superego scores than the three extravert groups.

The first, third and fourth hypotheses stated in chapter two could not be rejected on the basis of the results in the Photo Analysis test.

The second hypothesis of no significant difference between mean id scores of neurotic introverts (I high N) and neurotic extraverts (E high N) was rejected beyond the .01 level in the direction expected by the theory. Not only had the E high N group greater mean id scores than the I high N

group but it also had significantly greater mean id scores than the E low N group and the E medium N group.

5. The Picture Title Test.

Following the pattern of the other three subtests, the results for the PT test are presented in three tables. Significant F ratios were found for all three sets of scores.

Since the F for the variance between columns for the id scores was significant beyond the .01 point, these scores would be expected to vary with variation in level of E. Like the id scores of the Pha test, the mean id scores are highest at each N level. Similarly, in the t tests, the mean scores for the E high N group proved to be significantly greater beyond the .01 level than each of the three I and each of the three A groups. This was also true of the E medium N group whose mean score was greater beyond the .01 level of significance than the mean for each I and each A group with the exception of I medium N. The remaining E group, the E low N group, obtained a mean score greater beyond the .05 level than the mean of the I low N of the I high N and of the A low N groups. As can be seen from Table XIV, the I medium N group had the same type of relationship with these three groups in terms of mean id scores.

To summarize, the high E group effected an increase in mean id scores at each N level and the mean id score

Table XIV.-

Matrix of Means for Id, for Ego, for Superego Scores of Nine Groups on the Picture Title test.

	Mean Id Scores			
	I	A	E	Total
Low N	28	31	37	96
Med. N	39	30	47	116
High N	28	28	54	110
Total	95	89	138	322

	Mean Ego Scores			
	I	A	E	Total
Low N	42	39	40	121
Med. N	39	47	34	120
High N	22	37	27	86
Total	103	123	101	327

	Mean Superego Scores			
	I	A	E	Total
Low N	35	32	21	88
Med. N	24	27	18	69
High N	50	39	19	108
Total	109	98	58	265

Table XV.-

Analysis of Variance of Id, of Ego, of Superego Scores of Nine Groups for the Picture Title test.

Source	Sum of Squares	df	Variance Estimate	F	P
For Id scores					
Columns	47.62	2	23.81	10.54	>.01
Rows	7.02	2	3.51	1.55	NS
Interaction	16.12	4	4.03	1.78	NS
Within Sets	183.20	81	2.26		
For Ego scores					
Columns	9.86	2	4.93	1.67	NS
Rows	26.46	2	13.23	4.47	>.05
Interaction	10.88	4	2.72	.92	NS
Within Sets	239.70	81	2.96		
For Superego scores					
Columns	48.02	2	24.01	8.00	>.01
Rows	25.35	2	12.68	4.23	>.05
Interaction	16.45	4	4.11	1.37	NS
Within Sets	242.90	81	3.00		

Table XVI.-

Significant Differences Beyond .01 and .05 by t Between
Groups for Id Scores on Picture Title test.

Group	Means	IlowN 25	AlowN 31	ElowN 37	ImedN 39	AmedN 30	EmedN 47	IhighN 28	AhighN 28	EhighN 54
IlowN	26			X	X		X*			X*
AlowN	31						X*			X*
ElowN	37	X					X	X	X	X*
ImedN	39							X	X	X*
AmedN	30						X*			X*
EmedN	47	X*	X*	X		X*		X*	X*	
IhighN	28			X	X		X*			X*
AhighN	28			X	X		X*			X*
EhighN	54	X*	X*	X*	X*	X*		X*	X	X*

* Beyond .01 level of significance.

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Table XVII.-

Significant Differences Beyond .01 and .05 by t Between
Groups for Ego Scores on Picture Title test.

Group	Means	IlowN 42	AlowN 39	ElowN 40	ImedN 39	AmedN 47	EmedN 34	IhighN 22	AhighN 37	EhighN 27
IlowN	42						X*	X*		X*
AlowN	39							X*		
ElowN	40							X		
ImedN	39							X*		X*
AmedN	47						X	X*		X*
EmedN	34	X*				X		X*		
IhighN	22	X*	X*	X	X*	X*	X*		X	
AhighN	37							X		
EhighN	27	X*			X*	X*				

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* Beyond .01 level of significance.

Table XVIII.-

Significant Differences Beyond .01 and .05 by t Between
Groups for Superego Scores on Picture Title test.

Group	Means	IlowN 35	AlowN 32	ElowN 21	ImedN 24	AmedN 27	EmedN 18	IhighN 50	AhighN 39	EhighN 19
IlowN	35			X*			X*	X		X*
AlowN	32			X			X	X*		X*
ElowN	21	X*	X					X*	X	
ImedN	24							X*		
AmedN	27							X*		
EmedN	18	X*	X					X*		
IhighN	50	X	X*	X*	X*	X*	X*			X*
AhighN	39			X*			X*			X*
EhighN	19	X*	X*					X*		

* Beyond .01 level of significance.

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increased with each successive E group as the level of N increased.

The analysis of variance for the mean ego scores resulted in an F between rows significant beyond the .05 point. Variation in ego scores was therefore related to variation in N level. An examination of the total means in the matrix of means indicated that mean ego scores decreased with increase in N and that the lowest mean ego scores fell in the I high N group and in the E high N group. Each of the three low N and each of the three medium N groups had mean scores significantly greater at .01 and .05 levels than the mean score for I high N; three of these groups, I low N, A medium N and I medium N had mean scores greater beyond .01 than did the E high N group. It would seem, then, that increasing N level, particularly in the I groups and in the E groups, resulted in a decrease in mean ego scores.

The Picture Title test was the only subtest in which groups could be distinguished on the superego score. A significant F beyond the .01 point for the variance between columns indicated a systematic relationship between superego scores and level of E. The F for the variance between rows, significant beyond the .05 point, provided some confidence that N levels, as such, had a real bearing on the superego scores.

Examining the relationship between columns, there was an increase in mean superego scores with decreasing E in each of the low N groups and each of the high N groups. As indicated in the table of t's, the mean score of each of four groups--I high N, I low N, A low N and A high N was significantly greater than each of the means for the three E groups. The mean for the I high N group was significantly greater than the mean of seven other groups.

Comparing means between the rows, the matrix of means indicated that the lowest mean superego scores were found in the medium N level, followed by those in the low N level; the highest mean scores were in the high N level.

In summary, mean superego scores increased in the low N and high N groups with decrease in level of E. The three E groups and the three medium N groups had, generally, the lowest mean superego scores.

Each of the four null hypotheses was rejected on the basis of the results on the Picture Title test. The extravert group and the neurotic extravert group had significantly greater id scores than the introvert group and the neurotic introvert group respectively. The introvert group and the neurotic introvert group scored significantly higher mean superego scores than did the extravert group and the neurotic extravert group respectively. In addition, the neurotic extravert group had significantly greater mean id scores

than the extravert group; similarly, the neurotic introvert group had significantly greater mean superego scores than did the introvert group.

In brief summary, it might be stated that the four null hypotheses could not be rejected on the basis of the results on two of the four subtests--the AD test and the PSC test. Significant differences in the AD test revealed, however, that ambiverts had higher mean id scores than either introvert or extraverts. In both the PhA and PT tests mean id scores increased with increase in level of extraversion and with level of neuroticism. However, in the PhA test only the second null hypothesis could be rejected as compared with rejection of all the null hypotheses with respect to the PT test. In both tests, mean id scores for the neurotic extravert groups were significantly greater than mean id scores for the extravert groups. Similarly, in the PT test, the mean S score of the neurotic group was significantly higher than the mean S score for the introvert group.

CHAPTER IV

DISCUSSION OF RESULTS

The discussion of results will be conducted in three parts. The first part will deal with interpretation in terms of the Eysenkian position; the second, with the psychoanalytic interpretation of id, ego and superego scores provided by the authors of the IES Test; the third, with a critical examination of this test in terms of the results of the study.

1. Discussion Within the Eysenkian Framework.

The results, as presented in the previous chapter, have adequately substantiated Eysenck's basic claim that extraverts would be more id-dominated and less superego-dominated than introverts and that neurotic extraverts would function in a similar manner with respect to neurotic introverts. Any implication from his theory that neurotic extraverts and stable extraverts would be equally id-dominated or that neurotic introverts and stable introverts would be equally superego-dominated has not been substantiated by the differences between groups in this study.

As remarked in the presentation of results, in the PhA and PT tests mean id scores increased with increase in level of E and increased also with level of N particularly in the three extravert groups. Similarly, mean superego scores

increased with decrease in level of E and increase in N level particularly in the three introvert groups. This pattern prompted the question of whether or not degree of introversion or extraversion was proportional to the degree of neuroticism in a normal population. Eta calculated for the regression of E on N and of N on E was positive but, in each case, low, .31 and .38 respectively. Although this attempt to substantiate a suggestion first put forth by Hamilton,¹ was disappointing, the results of the MPI for the present population would not necessarily prove that such a hypothesis would not be tenable.

The discussion of results might be approached in terms of the more recent explanation of the behavior expected of the four extreme groups in situations of high and of low stress. Differential reactions under these conditions have, as mentioned in a previous chapter, been clearly exposed by Inglis. He explained intensity of avoidance to anxiety in terms of a composite continuum comprising, in turn, neurotic extraverts (NE), stable extraverts (SE), stable introverts (SI), and neurotic introverts (NI).

In Figure 1, mean id scores were plotted for the four extreme groups in each subtest. Superimposed on each derived

¹ Vernon Hamilton, "Conflict Avoidance in Obsessionals and Hysterics and the Validity of the Concept of Dysthymia", Journal of Mental Science, Vol. 103, No. 430, January 1957, p. 673.

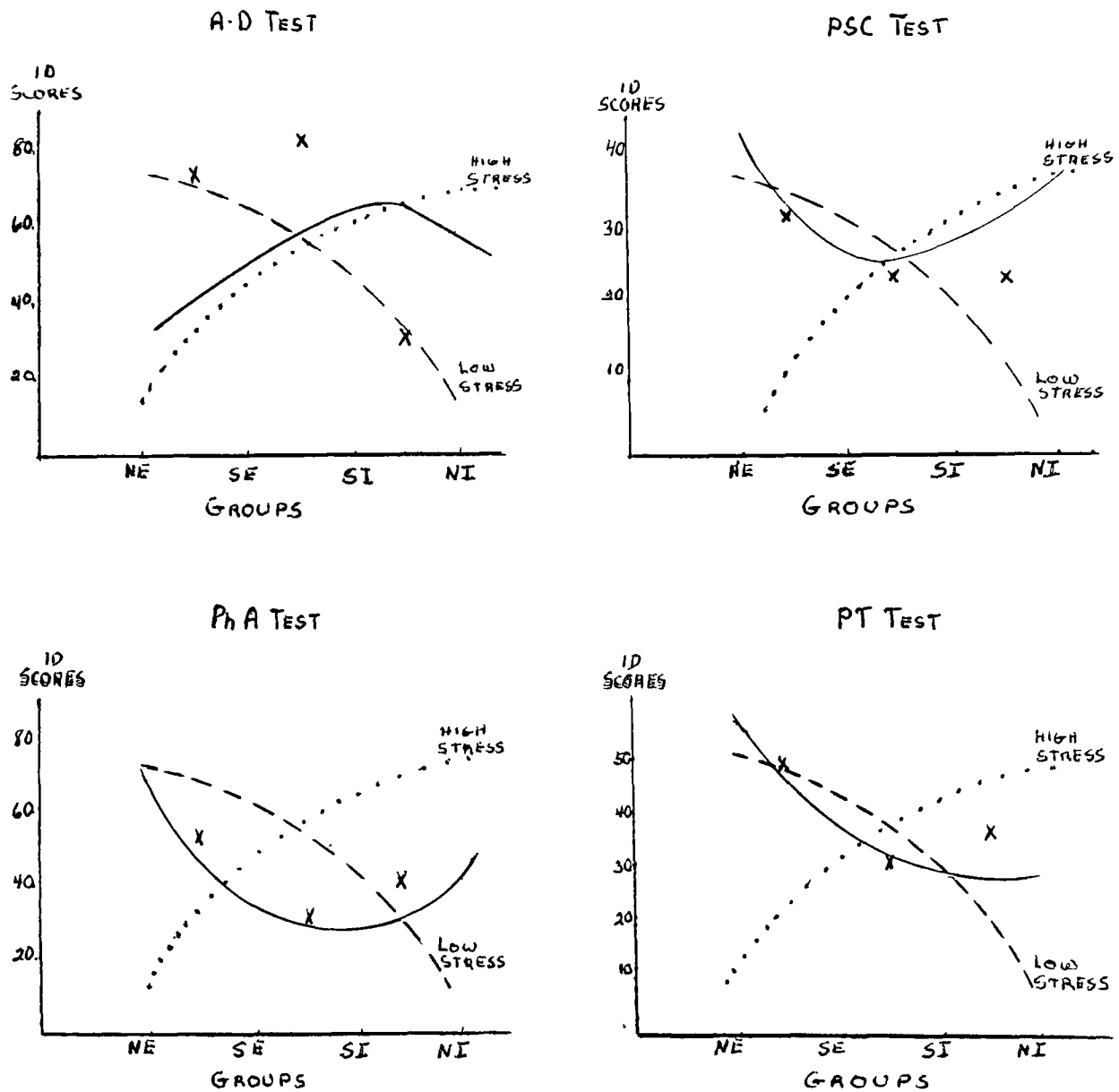


Figure 1.- Distribution of Mean Id Scores for Extreme Groups on Each Subtest of the IES Test.

curve are two curves which would represent, in rough form, Inglis's² expectations in situations of low stress (dashed line) and situations of high stress (dotted line). For example, in situations of low stress, the neurotic extravert would be expected to manifest least avoidance reaction to threatening stimuli and, consequently, in terms of this study would obtain a significantly higher id score than the neurotic introvert. Crosses (X) on each figure indicate the position of the three middle groups. Since there was no attempt to make the test situation threatening, results in this study, would be expected to conform to the low stress curve.

In an examination of the curves it must be kept in mind that significant differences between mean id scores of the four extreme groups were found only in the Pha and PT tests. The closest resemblance to the low stress curve was found for the curve in the PT test, although there was a tendency to increase at the NI end of the continuum. Curves for the PSC, the Pha and the PT tests resembled the low stress curve at the lower end of the continuum. Generally, however, there was an increase in id scores at the NI end of the continuum, resulting in a distended U curve. This results in a simulation of the high stress curve at that end. Groups

2 James Inglis, "Abnormalities of Motivation and Ego Function", in H.J. Eysenck (ed.), Handbook of Abnormal Psychology, An Experimental Approach, New York, Basic Books, 1961, p. 264.

at the extraverted end of the continuum reacted as under low stress; groups at the introverted end reacted as under high stress.

Based on the data specific to this study, it would seem that the same test situation was one of low stress for extraverts and neurotic extraverts and one of high stress for introverts and neurotic introverts. This might indicate that there were not only differential responses to stressful situations in the area of social conditioning but also differential conceptions of what was high and what was low stress. An alternative explanation might be that id scores of constitutional rather than behavioral introverts might fall more in line with Eysenck's expectations. Again, the unexpected rise in id scores of the introverted groups might be a function of the items on the IES Test.

Although the curve for the id scores on the AD test would have been most irregular had the middle groups been considered, the curve formed by the scores of the four extreme groups resembled the high stress curve. An examination of the results for this test will be made in the last section.

Inglis's response curves dealt with avoidance reaction to anxiety producing stimuli and not with the alternative reaction demanded by a forced choice measure such as the IES Test. Assuming that in a low stress situation introverts and neurotic introverts would choose superego

responses significantly more often than would the extraverts and neurotic extraverts, superego scores were plotted (Figure 2) for the Pha and PT tests. Results were in the direction "expected". The striking similarity between the low stress curve and the curve for the Pha superego scores would seem to indicate that investigation might well focus on the type of individual who, in our culture, would wish to avoid a superego response.

Assuming the IES Test did elicit anxiety, another explanation could possibly fit the picture. Differences in scores among groups may simply have been indicative of willingness to verbalize anxiety, rather than differences in anxiety. A recent study³ qualitatively analysing the responses of repressors and sensitizers to sexual and aggressive stimuli revealed that sensitizers (equated by Inglis to NE's in the low stress situation) responded with greater verbalization of their conflict between anxiety and enjoyment of this material than did the repressors.

In summary, Eysenck expected that extraverts, little affected by social conditioning, would be freer to express impulse than introverts. The expressions of the highly conditioned introvert would be guided by conscience. When little

3 D. Byrne and J. Sheffield, "Response to Sexually Arousing Stimuli as a Function of Repressing and Sensitizing Defenses", Journal of Abnormal and Social Psychology, Vol. 70, No. 2, April 1965, p. 114-118.

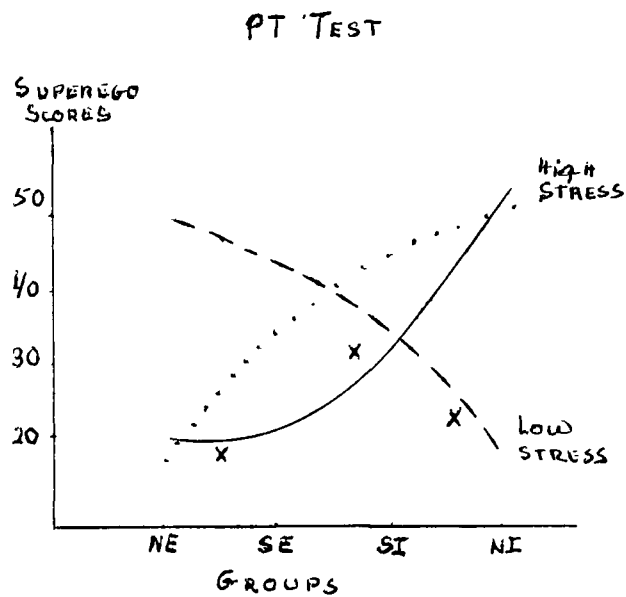
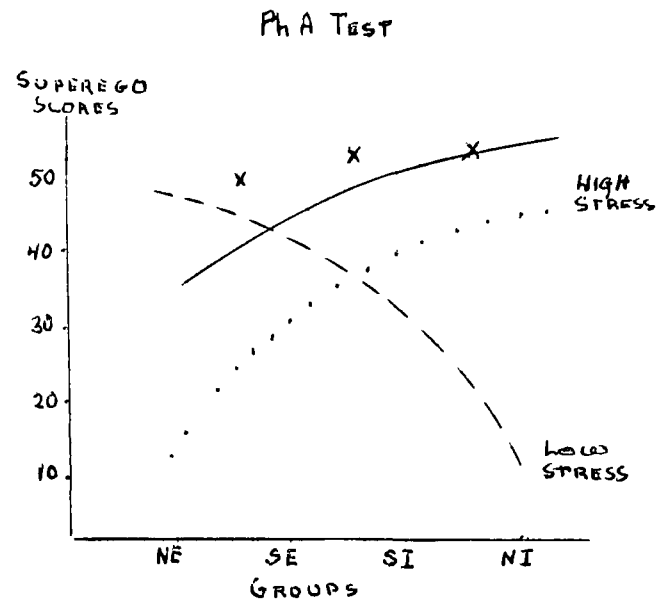


Figure 2.- Distribution of Mean Superego Scores for Extreme Groups on Two Subtests of the IES Test.

external stress was placed on the subjects, extraverts should then feel little or no anxiety when presented with material of a sexual and aggressive nature; introverts would feel some anxiety over the content. Assuming the applicability of N as a drive factor to the normal population, according to Inglis the neurotic introvert would avoid more than the introvert and the neurotic extravert would be expected to avoid even less than the extravert. In a situation of high stress, both groups presumably become so anxious that neurotic extraverts would now avoid the threatening stimulus whereas neurotic introverts would very inadequately avoid this stimulus. Results in this study can generally be explained in this way.

Certain trends in the results elicited other possible explanations such as differential conceptions of the tests as stressful or not stressful by extreme groups. Differences could also be indicative of willingness to verbalize anxiety rather than differences in amount of anxiety.

2. Discussion Within the Psychoanalytic Framework.

The discussion in terms of Dombrose and Slobin's psychoanalytic interpretation will be brief and will focus on significant results in the most productive tests. Since, as mentioned previously, mean scores are used and scores within

each group are not independent, no attempt will be made to explain group behavior as a dynamic interplay of the three forces.

In the PhA test, the neurotic extraverts who obtained significantly greater id scores than introverts, extraverts and neurotic introverts would, with characteristically greater vigor, pursue a fantasy life filled with material satisfying to the impulses such as unrealistic sexual gratification and hostile acts. The low N groups of introverts, ambiverts and extraverts would exercise ideational activity that reflects objective, unemotional behavior as evidenced by their very high ego scores.

The PT test, in permitting the subject to create a response of his own, secured more personal participation in expression of feelings and attitudes. The high id scores of the extraverts and the neurotic extraverts implied recognition, although not necessarily acceptance or approval of impulse needs within the self. A low id score indicated a rejection or denial of these forces. The low id scorers, introverts, neurotic introverts and neurotic ambiverts would be of this inclination.

A high superego score, according to the manual, revealed conscious feelings of being bad, unworthy or guilty. The neurotic introvert, more so than any other group would be prone to such feelings. This would be true, but to a

lesser extent, of the introverts, ambiverts, and neurotic ambiverts. The lowest superego scores, obtained by the three extraverted groups, would be indicative of relatively limited self evaluation.

Compared to the neurotic extraverts and the neurotic introverts, the high ego scores of the introvert and extravert groups indicated an acceptance of objective judgment in functioning. Not only were introverts and extraverts high on ego scores but also relatively high on superego and id scores respectively. Dombrose and Slobin⁴ cautioned that in this subtest it was possible to "fake" good ego functioning by simply responding in a systematic way. A low ego score, as obtained by neurotic introvert and neurotic extravert groups, could be interpreted as poor capacity to integrate impulses and conscience with objective judgment.

Since adolescents were found to be particularly prone to impulse expression, it was not surprising that the subjects in this study, many of them in their late teens, would score in the id direction. That a significant number would score in the superego direction would be less expected were it not for the rather homogeneous religious and ethnic background of the subjects tested.

⁴ Lawrence A. Dombrose and Morton S. Slobin, "The IES Test", Perceptual and Motor Skills, Vol. 8, No. 4, December 1958, p. 351.

3. Critique of the IES Test.

Subjects retested on the IES Test were asked for their opinion of the four subtests. Most considered the AD test a measure of intelligence and the remaining three subtests as investigating opinion and attitudes on current day problems.

The AD test has been likened to the Porteus Maze Test and has been found to be related to intelligence.⁵ It is not surprising that a college population would answer the bulk of the items in the most logical direction, the ego direction. Of eight honor students located in the sample, six scored over ninety per cent of the items in the ego direction, whereas five students who were considered academically slow answered less than sixty per cent of the items in the ego direction.

Scoring in the id direction would be considered the least intelligent way of responding. According to this interpretation, it would seem that in the AD test, the least "intelligent" groups would be the ambivert groups who obtained significantly high id scores; the most "intelligent" groups would be the extreme groups with id scores characteristically

⁵ R.J. Rankin and R.L. Wikoff, "The IES Arrow-Dot Performance of Delinquents and Nondelinquents", Perceptual and Motor Skills, Vol. 18, No. 1, February 1964, p. 207-210.

low and ego scores high. Such an explanation would be tenable were it not for the results on the PhA and PT tests where the situation was reversed with the extreme groups obtaining the highest id and superego scores. That the obtained group differences on the AD test may represent characteristic differences in intellectual capacity among introverts, extraverts and ambiverts would be difficult to defend since, from one point of view, intelligence is a function of the ego and, by definition, those whose behavior is determined by conscience or by impulses are likely to behave less intelligently.

Lack of significant results in the PSC test could be attributed to the possibility that this particular subtest was inappropriate for a female population.⁶ Differences between mean scores although not statistically significant were in the direction of Eysenck's hypothesis and indicated that some discrimination was possible. Adequate discrimination of the items themselves could have been hampered because the series of cartoons was projected on a screen. Another explanation rests on the possibility that the problem solving approach to the AD test created a mental set for many individuals to answer in the most "logical" direction, hence ego.

⁶ George A. Pickney, "Relative Strengths of Impulse, Ego and Superego in Female College Students", Perceptual and Motor Skills, Vol. 17, No. 2, October 1963, p. 340.

In the third subtest, the Pha, the trend of responses for id scores was in the direction predicted by the theory. Although the items were possibly no less obvious than those in the PSC the subjects, by this time, were more relaxed permitting on the part of the extraverts freer verbalization of impulse choice. Although the introvert groups generally made higher superego scores than the extravert groups, the reason significant differences were not found could have been a function of the test items, where in a number of cases, the superego response was obviously naive.

The fourth subtest, the PT test, permitted the greatest freedom to project attitudes and feelings and was probably the most appropriate for a college population. The one drawback in this test was the scoring which was necessarily more subjective than in the other three tests. Rescoring the same protocols resulted in eighty-five per cent agreement for the total scores. This test might, for the type of population used in this study, most adequately elicit impulse and superego behavior.

In conclusion the IES Test could be improved by a more refined selection of items, particularly the choices offered for the superego score; by an investigation of the usefulness of each test for various situations and populations. A better understanding of the dynamics involved in ego functioning would contribute to an analysis of what is really being measured by this instrument.

SUMMARY AND CONCLUSIONS

In the analysis of variance of id, ego and superego scores in the four subtests of the IES Test, the four null hypotheses were rejected on the basis of the results on the AD, the Pha and PT tests.

Significant differences were found between introverts and extraverts on id scores and on superego scores in the PT test in the direction proposed by Eysenck. Extraverts and more so, neurotic extraverts were more id-dominated than both introverts and neurotic introverts. On the other hand, introverts and more so, neurotic introverts proved to be more superego-dominated than extraverts and neurotic extraverts. In the Pha test, neurotic extraverts were significantly more id-dominated than extraverts, introverts and neurotic introverts.

An attempt was made to explain results in terms of Eysenck's expectations of the behavior of the four extreme groups in situations of low and of high stress. Id and superego functioning of extraverts and neurotic extraverts could be explained in terms of a low stress situation; whereas introverts and neurotic introverts paralleled behavior in a high stress situation. This was explained as a function of the population, differential conceptions of stress and of the tools.

The limitations of the present study suggested some considerations for future research into the interrelationships among these variables.

1. What appears to be a dominantly introverted or extraverted pattern in an individual is often a reflection of the circumstances to which he is attempting to adjust. Differentiating individuals on a constitutional measure of introversion and extraversion could effect different results on a measure of id, ego and superego.

2. Extreme extraverts and extreme introverts presumably choose consistent patterns of reacting towards their environment. The question again arises as to whether individuals characterized by such inflexible behavior can be considered as normal.

3. Randomization in the presentation of the IES subtests could preclude difficulties in response set.

4. Other valid and reliable measures of ego functioning could be used as supplements to the IES Test.

5. Administration of the IES Test under situations of low and of high stress would permit a more thorough investigation of Eysenck's position on differential reaction to external stress and on the relation between external stress and the "drive factor" in neurotic behavior.

6. An analysis of individual as well as group functioning would permit additional insights into a dynamic interaction which of its very nature is unique and personal.

For the purpose of this experiment the interaction of a limited number of variables was considered. The subjects bring to the testing situation other predispositions besides those to introverted, extraverted or neurotic behavior as measured by the MPI. These predispositions could be conceptualized in terms of variables such as aspiration level, selective intellectual functioning and value orientation. The interrelations among these variables are complex. However, one could not presume to explain dynamic functioning without adequate understanding and consideration of these variables.

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Variations in perceptual reaction to selected items from the "Blacky Pictures" were explained in terms of psychoanalytic theory.

Bortner, R.W., "Personality Differences in Preferences for Skill or Chance Determined Outcomes", Perceptual and Motor Skills, Vol. 18, No. 3, June 1964, p. 765-772.

Differences in decisions explained in terms of ego and superego strength.

-----, "School Subject Preference and the Structure of Value Systems", Perceptual and Motor Skills, Vol. 18, No. 3, June 1964, p. 741-747.

The first of a series of studies which used an objective measure to subdivide their population relating results on this measure to those on the IES Test. A similar procedure was followed in the present study.

-----, "Superego Functioning and Institutional Adjustment", Perceptual and Motor Skills, Vol. 14, No. 3, June 1962, p. 375-379.

Significant differences found between groups of institutionalized subjects on what is characteristically the weakest measure on the IES Test.

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A discussion of the scale. Of particular interest is the behavioral description of repressors and sensitizers.

Byrne, D. and J. Sheffield, "Response to Sexually Arousing Stimuli as a Function of Repressing and Sensitizing Defenses", Journal of Abnormal and Social Psychology, Vol. 70, No. 2, April 1965, p. 114-118.

This research paper includes a good summary of the various types of studies which have attempted to investigate individual differences in reaction to stimuli of a sexual and aggressive nature.

Canestrari, R.E., "Spatial Stimulus Generalization Gradients and Id, Ego and Superego Strength", Perceptual and Motor Skills, Vol. 19, No. 1, August 1964, p. 741-747.

Another study where significant differences are in the expected direction.

Champion, R.A., "Some Comments on Eysenck's Treatment of Modern Learning Theory", British Journal of Psychology, Vol. 52, Part 2, May 1961, p. 167-173.

Among other criticisms, claims Eysenck obscures his position on conditioning by stating that high drive in the dysthymic exists in the form of conditioned fears.

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"[...] Aged subjects showed more impulsive potential, more superego rigidity and less rational compromising behavior."

Clark, R.A., "The Projective Measurement of Experimentally Induced Levels of Motivation", Journal of Experimental Psychology, Vol. 44, No. 6, December 1952, p. 391-399.

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Concerned primarily with a theory of neurosis. Such things as phobias, anxiety, repression are discussed in terms of the "experimentally verified laws of learning". Referred to extensively by Eysenck.

Dombrose, Lawrence A. and Morton S. Slobin, "The IES Test", Perceptual and Motor Skills, Vol. 8, No. 4, December 1958, p. 347-389.

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Eysenck, H.J., "A Dynamic Theory of Anxiety and Hysteria", Journal of Mental Science, Vol. 101, No. 442, January 1955, p. 28-51.

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One of a series of verbal battles between Eysenck and his critics. In this very recent publication, he reaffirms his stand of no correlation between conditioning and neuroticism.

-----, "Classification and Problem of Diagnosis", in H.J. Eysenck (ed.), Handbook of Abnormal Psychology, New York, Basic Books, 1961, xv-816 p.

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

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Verrill, Bernard V. and Victor Costanza, "The IES Test and Ward Behavior", Journal of Clinical Psychology, Vol. 18, No. 3, July 1962, p. 295-297.

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Torrance, E. Paul, Mental Health and Constructive Behavior, Belmont, California, Wadsworth Publishing Co., 1965, x-432 p.

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Yates, Aubrey J. and J. J. Laslo, "Learning and Performance of Extraverts and Introverts on the Pursuit Rotor", Journal of Personality and Social Psychology, Vol. 1, No. 1, January 1965, p. 79-84.

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APPENDIX 1

DISTRIBUTION OF MPI E SCALE AND N SCALE SCORES

APPENDIX 1

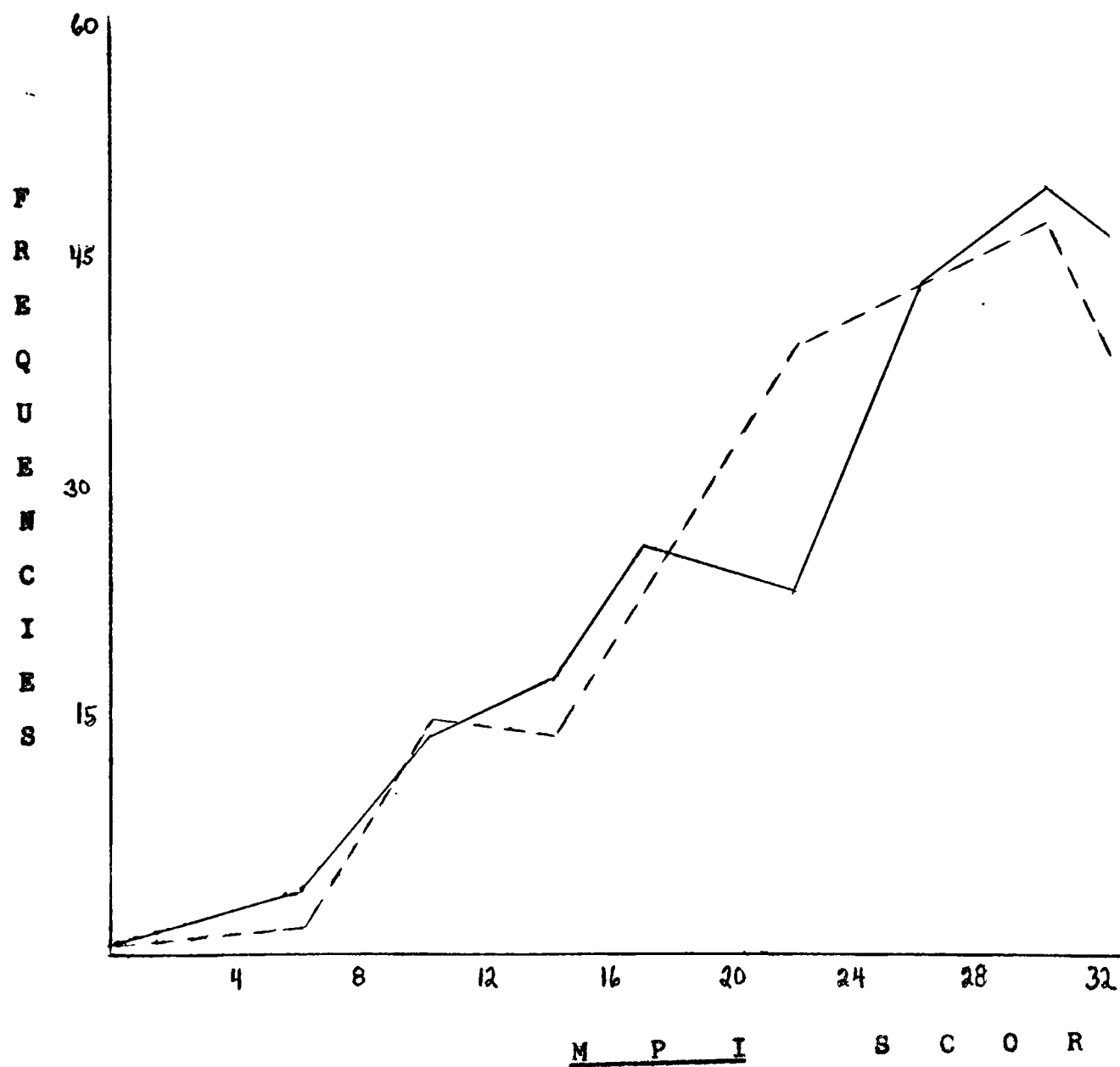


Figure 3.- Distribution of E Scale and N S for MPI.

APPENDIX 2

RAW SCORES OBTAINED BY NINETY SUBJECTS
ON THE IES TEST

APPENDIX 2

Table XIX.-

Raw Scores Obtained by Ninety Subjects
on the IES Test.

Group	A-D			PSC			PhA			PT		
	I	E	S	I	E	S	I	E	S	I	E	S
IlowN												
1	8	13	1	5	6	2	6	8	3	2	5	2
2	9	13	1	1	9	3	5	9	4	3	4	4
3	5	18	0	4	8	1	5	9	4	3	3	4
4	0	22	1	5	4	4	4	10	4	3	3	5
5	8	15	0	2	10	1	0	12	6	1	7	3
6	7	12	4	3	8	2	3	9	6	3	4	3
7	10	12	1	3	6	4	5	6	7	2	5	4
8	9	7	2	2	9	2	0	11	7	3	5	2
9	5	16	2	2	9	2	3	9	6	6	3	2
10	3	18	1	3	7	3	2	10	6	2	3	6
AlowN												
1	12	10	1	7	2	4	2	11	5	5	3	3
2	0	22	1	2	8	3	3	6	9	0	9	2
3	4	19	0	4	7	2	2	10	6	4	2	4
4	11	12	0	1	10	2	7	8	3	2	4	5
5	8	14	1	2	7	4	4	11	3	6	1	3
6	10	11	2	2	9	2	3	10	5	4	3	4
7	9	12	2	0	8	4	1	7	10	1	5	3
8	13	9	1	2	8	3	4	5	9	4	3	4
9	5	17	1	1	10	3	3	12	3	1	4	3
10	11	9	3	1	8	4	4	9	3	4	5	1
ElowN												
1	6	17	0	1	10	2	2	9	7	5	3	3
2	1	22	0	4	7	2	3	12	3	4	1	3
3	1	22	0	2	8	3	5	9	4	2	7	1
4	1	21	1	1	11	1	3	10	5	3	6	0
5	3	19	1	1	11	1	3	14	1	4	6	1
6	6	17	0	3	2	8	4	10	4	3	6	0
7	14	7	1	1	6	6	3	10	5	4	1	3
8	2	18	3	3	5	5	3	8	7	4	3	3
9	10	11	2	6	3	4	5	6	7	3	1	3
10	7	13	3	6	2	5	6	6	6	3	4	3

Table XIX.- (Cont'd.)

Raw Scores Obtained by Ninety Subjects
on the IES Test.

Group	A-D			PSC			PhA			PT		
	I	E	S	I	E	S	I	E	S	I	E	S
ImedN												
1	9	14	0	7	3	3	7	8	3	4	4	2
2	4	15	4	1	5	7	2	12	4	3	4	4
3	2	21	0	3	4	6	2	9	7	6	4	1
4	2	20	1	5	4	4	3	9	4	5	5	0
5	1	22	0	1	10	2	3	7	8	2	4	5
6	4	16	3	0	10	3	6	5	7	3	1	6
7	4	14	2	2	9	2	4	10	4	2	4	3
8	2	21	0	2	8	3	7	9	2	3	3	1
9	2	17	3	1	7	5	3	8	7	3	5	2
10	1	21	1	2	9	2	2	6	10	6	5	0
AmedN												
1	7	15	1	2	9	2	6	8	4	1	5	4
2	3	20	0	3	7	3	3	9	6	1	4	6
3	3	19	1	1	9	3	4	11	3	2	7	2
4	9	13	1	6	4	3	5	10	3	4	4	1
5	10	12	1	3	5	5	0	8	10	4	4	2
6	2	21	0	1	7	5	4	10	4	4	2	5
7	10	13	0	6	4	3	5	5	8	3	7	0
8	3	18	2	3	6	4	4	6	8	5	1	4
9	9	13	1	3	5	5	4	8	6	5	4	2
10	7	16	0	2	8	3	6	6	6	1	9	1
EmedN												
1	9	12	2	8	5	0	6	6	6	5	5	1
2	6	17	0	3	6	4	1	8	9	1	3	2
3	2	21	0	2	10	1	4	10	4	4	4	3
4	2	19	2	1	10	2	4	9	5	5	3	1
5	12	10	1	3	6	4	8	7	3	3	5	3
6	2	17	3	3	5	5	4	6	8	2	2	0
7	11	11	1	3	3	7	6	7	5	6	2	2
8	12	10	1	2	9	2	6	7	5	7	2	1
9	12	10	1	5	4	4	10	6	2	6	4	1
10	9	14	0	2	7	4	4	10	4	3	4	4

Table XIX.- (Cont'd.)

Raw Scores Obtained by Ninety Subjects
On the IES Test.

Group	A-D			PSC			PhA			PT		
	I	E	S	I	E	S	I	E	S	I	E	S
IhighN												
1	4	19	0	3	6	2	3	6	9	3	3	5
2	9	14	0	3	4	4	3	4	6	2	1	3
3	0	23	0	3	7	3	2	6	10	5	1	3
4	11	11	1	1	8	4	5	9	4	5	1	6
5	3	19	1	2	7	4	3	9	6	3	4	4
6	3	20	0	3	7	3	0	9	9	2	3	3
7	7	14	2	6	2	5	7	7	4	2	4	5
8	6	17	0	5	4	4	4	14	0	3	1	4
9	13	7	3	4	6	3	6	7	5	5	1	4
10	3	19	1	6	3	4	3	10	5	1	1	9
AhighN												
1	5	15	3	3	6	4	3	10	5	2	4	2
2	12	9	2	3	8	2	3	11	4	3	5	3
3	11	10	2	2	7	4	4	7	7	3	6	2
4	5	16	2	0	9	4	5	9	4	2	5	4
5	10	12	1	2	8	3	7	8	3	4	1	6
6	9	13	1	4	5	4	0	12	6	1	7	2
7	11	12	0	4	3	6	4	7	7	5	3	2
8	2	19	2	1	10	2	5	9	4	1	1	8
9	11	12	0	2	6	5	3	7	8	2	1	8
10	2	20	1	2	6	5	6	7	5	5	4	2
EhighN												
1	3	19	1	3	5	5	7	8	3	5	6	0
2	7	13	3	5	4	4	10	4	4	5	3	2
3	1	22	0	5	4	4	8	7	3	5	3	3
4	2	20	1	2	9	2	7	6	5	7	1	1
5	6	17	0	2	8	3	4	9	5	6	2	2
6	6	15	2	5	6	2	5	10	3	5	2	3
7	3	18	2	4	7	2	8	4	6	3	3	5
8	3	19	1	6	4	3	7	8	3	6	3	1
9	3	18	2	5	6	2	8	8	2	6	2	0
10	3	19	1	4	6	3	7	7	3	6	2	2

APPENDIX 3

ABSTRACT OF

Introversion-Extraversion and Neuroticism and a Proposed
Relationship to Id, Ego and Superego

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Introversion-Extraversion and Neuroticism and a Proposed Relationship to Id, Ego and Superego¹

Individual differences in conditionability and in autonomic reactivity have been conceptualized by Hans Eysenck as giving rise to two dimensions of personality, extraversion and neuroticism, respectively. The more easily an individual forms conditioned responses, the more introverted his behavior; the more autonomically labile he is, the more prone to neurosis. Environmental pressure to socialize sexual and aggressive impulses is fairly intense and consistent in our society. Having acknowledged a link between his own theory and psychoanalytic theory, Eysenck went on to state that id-dominated behavior would be expected of extraverts and neurotic extraverts and that superego-dominated behavior would be expected of introverts and neurotic introverts.

The present research attempted to study the relationship among six variables. Nine groups, varying in three levels of extraversion and of neuroticism, were formed according to predetermined cut-off scores on the MPI. Ten subjects were chosen at random from each of these nine groups.

¹ Helen Vasos, Master's thesis presented to the Faculty of Psychology of the University of Ottawa, Ontario, 1968, ix-97 p.

These ninety subjects were tested on the four subtests of the IES Test to determine id, ego and superego responses to test content of a sexual and aggressive nature. Data were analysed by the analysis of variance technique.

The null hypotheses of no significant difference between extreme groups on measures of id and superego could be rejected on the basis of results on two subtests (Photo Analysis and Picture Title) of the IES Test. Significant differences at the .01 and .05 levels in the expected direction were found between mean id and mean superego scores of introverts and extraverts and of neurotic introverts and neurotic extraverts. In general, an increase in extraversion and an increase in neuroticism effected an increase in mean id scores; a decrease in level of extraversion and an increase in level of neuroticism effected an increase in mean superego scores. Results were discussed in terms of differential ability to verbalize anxiety and to perceive and respond to stress and as a function of level of extraversion and level of neuroticism and, finally, in terms of the test items.

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