

THE UNIVERSITY OF OKLAHOMA
GRADUATE COLLEGE

A COMPARATIVE STUDY OF THE INHIBITION PROCESS IN
DELINQUENT AND NON-DELINQUENT FEMALES

A DISSERTATION
SUBMITTED TO THE GRADUATE FACULTY
in partial fulfillment of the requirements for the
degree of
DOCTOR OF PHILOSOPHY

BY
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Norman, Oklahoma
1958

A COMPARATIVE STUDY OF THE INHIBITION PROCESS IN
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ACKNOWLEDGEMENTS

The author expresses his appreciation to the members of his committee, Dr. H. A. Angelino, Dr. A. H. Heilman, Dr. W. B. Ragan, and Dr. M. O. Wilson, for their assistance in the completion of this study. Special appreciation is expressed to Dr. P. T. Teska for his guidance and counselling throughout all phases of the author's graduate program.

Special acknowledgement is given Mrs. Mae Weedman and her staff at Girls' Town and Mr. Joe Lawter and his faculty at Franklin School for their cooperation in supplying the subjects used in this study. The author is particularly indebted to Miss Mary Ann Mathias for her assistance in all phases of the study.

Words are inadequate to express my indebtedness to my wife, Del, for her confidence, patient understanding, and invaluable assistance, without which the completion of this study could not have been accomplished.

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CHAPTER I

INTRODUCTION

The ability to inhibit plays an important part in the social adjustment of an individual. The effective handling of impulses and the inhibition of impulsive behavior are fundamental to over-all social adjustment. Inhibition has been variously defined. In common usage the term inhibition refers to an individual's ability to check behavior. English and English list the following definitions for inhibition:

1. restraining or stopping a process from continuing, or preventing a process from starting although the usual stimulus is present; or the hypothetical nervous state of process that brings about the restraint.
2. a mental condition in which the range and amount of behavior is curtailed, beginning or continuing a course of action is difficult, and there is a peculiar hesitancy as if restrained by external agency.¹

The psychoanalytic usage given by English and English is:

¹Horace B. English and Ava Champney English, A Comprehensive Dictionary of Psychology and Psychoanalytical Terms (New York: Longmans, Green and Co., 1958), p. 262.

3. The process whereby an instinctual process is prevented from coming into consciousness by the activity of the superego.¹

All of the above definitions refer to behavior that is being curtailed through some delaying process. Through the ability to delay an impulse, an individual is able to modify responses, making these responses more socially adjustable. To function adequately in our society, an individual must acquire the ability to delay the immediate gratification of needs. The ability to delay the immediate gratification of needs can be thought of as an individual's learning to handle his impulses effectively.

The term inhibition as used in this study refers to an individual's ability to delay responding for any reason.

English and English list the following definitions of impulse:

1. an act performed without delay, reflection, voluntary direction, or obvious control by the stimulus. --Although the act is triggered by the stimulus, the determining factor is the person's state or condition.
2. an act determined by the id; an instinctual act.²

The first definition reflects the classical meaning of impulse. The second meaning, listed by the authors as the psychoanalytical usage, refers to instinctual acts which are determined by the force of the id and which are delayed by the superego.

¹Ibid.

²Ibid., p. 255.

The term impulse as used in this study refers to acts which are triggered by both internal and external stimuli and determined by the person's state or condition.

In this study the terms inhibition process and response delay are used interchangeably and refer to the process by which an individual delays responding for any reason.

In any individual there is a multiplicity of forces at work. The primary biological drives act upon the individual and demand immediate gratification. Through cultural contacts an individual learns the consequences of certain types of behavior. Our culture does not allow the immediate and unrestrained gratification of certain drives. To function adequately in our society, a person must learn to delay impulses and to delay the immediate gratification of needs. Response delay, which develops during the socialization process, helps make it possible for an individual to divert urges, drives, and desires into socially acceptable behavior. Socialization has been defined as:

1. the process whereby a person (especially a child) acquires sensitivity to social stimuli (especially the pressures and obligations of group life) and learns to get along with, and to behave like, others in his group or culture; the process of becoming a social being; or the result of those processes.¹

2. the process of becoming habituated (or conditioned) to symbolic action.²

¹Ibid., p. 508.

²Philip Lawrence Harriman, The New Dictionary of Psychology (New York: The Philosophical Library, 1947), p. 308.

The above definitions imply that socially acceptable behavior is the result of learning. An infant will demand the immediate alleviation of bodily discomforts and the immediate gratification of his needs. An older child learns to delay gratification of his needs. A period of delay allows the learned consequences of certain types of infantile behavior patterns to modify the older child's behavior. Thompson characterizes the level of socialization of the very young child in the following manner:

The very young child is socially maladroit. His frustration tolerance is negligible, his needs are immediate, and his perceptual response abilities for harmonious social interaction are minimal (when judged by adult standards).¹

As a child matures, he learns to substitute delayed gratification and long term goals for immediate gratification and short term goals. Although the shift in the gratification of needs and in the immediacy of goals accompanies maturation, many adults attempt to gratify their needs immediately with little concern for the social consequences of their actions. According to Thompson, behavior with little concern for social consequences typifies social immaturity.² In some adults fear of the social consequences of their actions may be so strong that a response is delayed indefinitely.

¹George G. Thompson, Child Psychology (New York: Houghton Mifflin Company, 1952), p. 482.

²Ibid., p. 484.

Through responding to immediate goals, a young child acts out his desires and needs. Through delayed gratification of needs, a more mature individual must inhibit impulses. Apparently needs and desires that cannot be handled overtly must be handled in some other manner. The fulfillment of needs often takes the form of wish-fulfilling fantasy.

Maturity and M

M on the Rorschach, the human movement response, is commonly thought of as being a measure of a person's inner life or of portraying the person's wish-fulfilling fantasy. As the ability to delay responding develops, there appears to be a corresponding increase in an individual's ability to perceive human movement in the Rorschach. Meili-Dworetzki stated:

M is, in virtually all investigations, shown as distinctly increasing with chronological age.¹

Ames, et al. reported that six year olds were the first age group in which more than fifty per cent of the subjects produced at least one M response.²

¹Gertrude Meili-Dworetzki, "The Development of Perception in the Rorschach," in Bruno Klopfer, Developments in the Rorschach Technique, Vol. II, Fields of Application (Yonkers-on-Hudson, N. Y.: World Book Company, 1956), p. 179.

²L. B. Ames et al., Child Rorschach Responses: Developmental Trends from Two to Ten Years (New York: Paul B. Hoeber, Inc., 1952).

Meaning of M

Authorities on the Rorschach have given the M response varied meanings, such as creativeness, imagination, inner living, wish-fulfilling fantasy, introversion, and the ability to delay impulses. Rorschach considered the M response to have the same psychological value as a dream. In relation to Rorschach's interpretation of the M response, Piotrowski states:

Rorschach assumed that the psychological value of his movement response was essentially the same as that of the dreams; and he therefore concluded that the productivity of the M increased with the inhibition of overt motor behavior although some other factors, especially intelligence, also contributed to the number and quality of the M.¹

Beck describes the meaning of the M response in terms of wish fulfilling fantasy. Beck states:

The M response, as Rorschach understands it, really reproduces movements or activities that the subject is carrying on within his mental life. Since these mental activities are those in which we should like to engage in the outer world but cannot, or dare not, they are our wish-fulfilling activities. Thus they are our fantasy life.²

Piotrowski reports M as an expression of deeply embedded psychological tendencies to follow a prototypal role rather than as representing a role in fantasy. Piotrowski states:

¹Zygmunt A. Piotrowski, Perceptanalysis (New York: The Macmillan Company, 1957), p. 126.

²Samuel J. Beck, Rorschach's Test, Vol. I (New York: Grune and Stratton, 1950), p. 92.

The M represent the conception of life according to which the individual makes his adjustment to reality. The M stand for the most individual and integrated strivings which dominate the individual's life. Thus the M indicate traits stabilizing the relation between the individual and his environment.¹

While there may be a difference of opinion among authorities regarding the meaning of M, this controversy does not affect the use of M in this study. The only aspect of M that this study considers is the relationship of M to response delay. This study is designed to investigate the relationship between the frequency of M responses in relation to various measures of impulse delay.

This experiment does not propose to study the interpretation or meaning of the M response. Meaning cannot be assigned to M when M is taken separately in the Rorschach record. In order for M to have meaning diagnostically, the human movement response must be studied in relation to the total Rorschach protocol. The only aspect of M considered in this study is the relationship between M productivity and the ability to inhibit.

M and Response Delay

Rorschach treated the human movement response as his most important and most original contribution to the experimental study of personality. Rorschach stressed the condition that a kinesthetic sensation accompany the response and

¹Piotrowski, op. cit., p. 140.

the content of the response be an object imagined in actual movement. Rorschach was greatly influenced by the work of M. John Mourly Vold. Vold experimented for a quarter of a century, checking the relationship between the interference with free movement during sleep and the amount of movement in the night dreams of the sleeper. Vold's theory, that kinesthetic imagery is positively correlated with inhibited muscular activity, was accepted by Rorschach. When discussing the meaning of the M response, Rorschach brought attention to the delay process as being correlated with the ability to produce human movement responses. In a discussion of Rorschach's interpretation of M, Piotrowski stated:

The keystone to Rorschach's theory relating to the movement response is the principle that there is incompatibility of a negative correlation between overt behavior and fantasy or "inner living."¹

Several studies have been designed in an attempt to verify the relationship between the variables of response delay and the production of M on the Rorschach. Recent studies by Biere and Blacker² and Meltzoff, Singer, and Korchin³ have supported the view that the restraining or inhibiting of external movements tends to result in the production of M.

¹Ibid., p. 126.

²J. Biere and E. Blacker, "External and Internal Stimulus Factors in Rorschach Performance," Journal of Consulting Psychology, XX (1956), 1-7.

³J. Meltzoff, J. L. Singer, and S. J. Korchin, "Motor Inhibition and Rorschach Movement Responses," Journal of Personality, XXI (1951), 22-47.

Apparently some delay in response is necessary for the production of M. Several recent experimental studies have found more M responses among subjects who respond quickly to cognitive and motor inhibition tasks. Singer and Spohn found that subjects in their high M group could write a phrase more slowly than could subjects in their low M group.¹ Levine and Meltzoff reported that high M subjects were better able to handle a cognitive inhibition time task than were low M subjects.² Cognitive inhibition time was defined as the length of time required for a subject to inhibit a learned word associate and respond with a new word.

Shipola and Taylor studied the reactions of subjects to ink blots under both free and pressure situations. A significant relationship was found between productivity of M and freedom from pressure to respond quickly. The results indicated that M responses were related to delayed reaction times. The authors concluded that M responses are delayed responses, that M responses reflect control of immediate impulsive reactions, and the slow deliberate person will give more M responses than the fast impulsive person.³ Biere and Blacker

¹J. L. Singer and H. E. Spohn, "Some Behavioral Correlates of Rorschach's Experience Type," Journal of Consulting Psychology, XVIII (1954), 1-9.

²M. Levine and J. Meltzoff, "Cognitive Inhibition and Rorschach Human Movement Responses," Journal of Consulting Psychology, XX (1956), 119-122.

³Elsa Shipola and Vivian Taylor, "Reactions to Ink Blots under Free and Pressure Conditions," Journal of Personality, XXI (1953), 22-47.

performed an experiment which investigated the relationship between movement responses, color responses, and reaction time to the Rorschach cards. In their conclusions, the authors considered the M response to require an internal modification of the stimulus, which necessitates a longer reaction time.¹

Since the forces which motivate and modify behavior are complex, apparently it is necessary that there be some delay in response for these forces to come into operation. Delaying a response necessitates a time lag between the individual's first impulse to respond and the eventual overt response. It is probably that there is an optimum delay period. It may be that the person who responds either too slowly or too quickly is less able to handle impulses than is the person who responds within some optimum period.

An optimum initial response time has not been designated for the Rorschach. Beck reported a central time for the first response to be around twenty seconds and that children sometimes respond instantly or within five seconds. Beck stated that a lack of inhibition seems to be the critical factor in the very fast response.² The very slow response also may indicate inadequate handling of impulses.

¹Biere and Blacker, op. cit., 1-7.

²Samuel J. Beck, Rorschach's Test, Vol. II, A Variety of Personality Pictures (New York: Grune and Stratton, 1947), p. 52.

The person who delays responding for a very long period of time may require the additional time to sort out and to handle his impulses. As an individual responds to stimuli, impulses are aroused. Apparently some time is required for an individual to control impulses. It may be that a person who can handle impulses effectively will respond within an optimum delay period whereas a person who cannot handle impulses effectively will respond either very quickly or very slowly.

Attempts to Measure Inhibition

Several different tests have been used in attempting to measure the variable of response delay. Some of these tests, such as the test of Cognitive Inhibition Time, measure the actual time required to inhibit an inappropriate response and to substitute an appropriate one. It is possible that the cognitive inhibition test measures delay not only at the cognitive level but also at the motor and perceptual levels. Other tests, such as the mirror-image N on the Digit Symbol subtest of the Wechsler-Bellevue Intelligence Scale, may be either passed or failed according to the subject's ability to inhibit a learned, inappropriate response. Mistakes on the mirror-image N test could have their origin at the perceptual, motor, or cognitive level.

Cognitive inhibition time is a measure of the length of time it takes an individual to inhibit a learned word associate and respond with a new word. Paired word associates

such as black-white, boy-girl are given to the subject. The subject learns to respond with the second word when the first word is presented. After learning has occurred, the subject is instructed to respond with any word other than the learned associate. In order to do so, the subject must inhibit the learned response and substitute a new response. Cognitive inhibition time is the time which elapses between the presentation of the stimulus word and the response. It is possible that people with a short cognitive inhibition time can discard a once-adequate-but-now-inadequate pattern of responding and adjust quickly to a new situation.

The digit Symbol subtest is a test in which the subject is required to associate certain symbols with numerals. The symbol for the numeral 2 is a mirror-image, or reverse, N. In order to respond correctly, the subject must reproduce this reverse N in the reversed fashion as presented. It has been found that some subjects reproduce the reverse N as a regular, or non-reverse, N. The full significance of this error will be discussed later. This error in reproduction lowers the subject's level of performance on the Digit Symbol subtest. Wechsler suggests that low scores on the Digit Symbol subtest are caused by some sort of associative inflexibility in the subject.¹

¹David Wechsler, The Measurement of Adult Intelligence. 3rd ed. (Baltimore: Williams and Wilkins Company, 1944).

Previous Studies of M and Inhibition

Many recent studies centering around the Rorschach human movement response (M) have provided experimental support for the theoretical position which considers impulse delay and fantasy to be related processes. Levine and Meltzoff, in an experiment using 93 neuropsychiatric patients divided into two groups on the basis of high M (2 or more) and low M (less than 2), found statistically significant relationships between cognitive inhibition time and the ability to perceive human movement in the Rorschach.¹

Other studies have shown that M is related to the ability to inhibit an activity at the motor level. Singer and Spohn, in an experiment using 50 schizophrenic subjects, divided their subjects into groups according to M. The high M and low M groups were then given a motor inhibition task which consisted of writing the phrase, New Jersey Chamber of Commerce, as slowly as possible. The subjects' random movements were observed in the waiting room prior to the administration of the motor inhibition task. Comparisons were made between groups, and the results supported the hypothesis that the subjects with high M would be considerably less active in the waiting room prior to the testing situation.²

A later study by Meltzoff and Litwin indicated a

¹Levine and Meltzoff, op. cit., 119-122.

²Singer and Spohn, op. cit., 1-9.

direct relationship between affective control and M. Seventy subjects were chosen from a college population and divided into groups on the basis of high and low M. The Jones Laughing Record was played to all the subjects; the subjects were instructed not to laugh at the record. The assumption was made that a direct relationship would be found between the amount of M and the ability to control laughter. It was found that the high M subjects were more able to refrain from laughing.¹

Levine, Glass, and Meltzoff, in an experiment using 198 out-patient veterans with a wide range of psychiatric diagnoses, reported a significant relationship between reversing the mirror-image N on the Wechsler and producing M on the Rorschach. Ninety-eight N reversers were chosen from a total of 274 veterans who had been tested in an out-patient setting. One hundred control subjects were selected by choosing the next case in alphabetical order to the reverser. All subjects chosen for comparison had been administered the Rorschach. The reverser and the non-reverser groups were compared on the variable of the amount of M produced in the Rorschach. It was found that the non-reverser group produced significantly more M than did the reverser group.

An analysis of the error in reproducing the mirror-image N suggested several possibilities. The authors reported

¹ Julian Meltzoff and Dorothy Litwin, "Affective Control and Rorschach Human Movement Responses," Journal of Consulting Psychology, XX (1956), 463-465.

the following possibilities for the mistake.

Individuals who make this error may not make a necessary adjustment in an habituated motor response. This stimulus may be perceived correctly, but the error reflects poor inhibition of the motor act of writing the familiar N. On the perceptual level, S may permit closure to take place too rapidly so that the normal N is actually perceived. On the cognitive level, S may respond as if there is no difference between the stimulus as given and the normal N. At each level, the error may be considered a function of an insufficient delay or control of a response tendency.¹

The authors hypothesized that reversers would have poorer scores on a test of cognitive inhibition time. Twenty-seven reversers and 49 non-reversers were used to test the relationship between reversing the mirror-image N and cognitive inhibition time. Before measuring cognitive inhibition time, the authors measured word association time. Word association time was measured as the time required by each subject to respond to paired word associates without the variable of cognitive inhibition being introduced.

The procedure for the Word Association Test was as follows: The subjects were read a list of ten paired word associates. The subjects were required to learn the list of word associates, the criterion for learning being one correct recitation without error. After learning had occurred, word association time was measured as the mean response time for the subject to respond with the learned word associate.

¹M. Levine, H. Glass, and J. Meltzoff, "The Inhibition Process, Rorschach Human Movement Responses, and Intelligence," Journal of Consulting Psychology, XXI (1957), 41-45.

The same list of ten word associates was used to measure cognitive inhibition time. After the subjects had learned the word associates and measures of word association time were taken, the subjects were instructed to respond to the stimulus words with any word other than the learned associate. Cognitive inhibition time was measured as the mean time required to respond to the original stimulus words with any word other than the learned associate.

No significant difference was found between the reversers and non-reversers in mean word association time; however, in comparing the reverser and non-reverser groups on the variable of cognitive inhibition time, a significant difference was reported. The non-reversers responded more quickly than did the reversers.

Summary of Related Studies

Several experiments have reported findings which support the theory that impulse delay and the ability to produce M on the Rorschach are related processes. The results of the related studies have been consistent in showing that subjects who could delay an impulse produced more M than did subjects who could not delay an impulse. Several tests which purported to measure impulse delay were used in the related studies. Measures of cognitive inhibition time, motor inhibition, affective control, and random movement were all found to be related to the ability to produce M on the Rorschach.

Studies by Singer and his co-workers have reported findings pertaining to two main population samples. Several studies have been conducted using subjects with various psychiatric diagnoses. Other studies have reported findings from college populations. Gaps in the research done so far suggest studies using different population samples and using experimental designs which would allow for control of intellect and other variables.

Purpose of This Study

It was the purpose of this study to test the hypothesis that inability to delay responses may be an important factor in delinquent behavior. The problem of juvenile delinquency is one which merits continuous research. Many studies have been made of the relationship of home and neighborhood conditions to delinquency. Other studies have attempted to enumerate character traits of delinquents. Studies have generally tended to follow two main trends, investigations of the causal factors of delinquency and attempts to understand the personality of the end result (the delinquent).

While delinquents may be characterized as a maladjusted group, they do not necessarily represent a severely disturbed group. Studies reporting the personality traits of delinquents show the delinquent to be emotionally immature and less competent socially than the general population. The Gluecks characterize the delinquent in the following manner:

We have observed that they are to a much greater degree socially assertive, defiant, and ambivalent to authority; they are more resentful of others, are far more hostile, suspicious, and destructive; they are more impulsive, vivacious, and decidedly more extrovertive in their behavior trends.¹

It may be that the delinquent's inability to adjust to society comes from a basic inability to handle impulses. Since the variable impulse delay appears to play an important role in social maturity, the inability to delay may be an important aspect of delinquent behavior. An individual may be delinquent because of an inability to delay impulsive behavior.

Another purpose of this study was to verify the relationship between measures of impulse delay and the ability to produce M, using an experimental design controlling the variable of intelligence.

The study reported by Levine, Glass, and Meltzoff (page 14) suggests additional experimentation in the area of response delay, M, and intelligence. The reported relationship between reversing the mirror-image N and the ability to produce M takes on new meaning when it is considered that the experimental groups differed significantly in intelligence. The authors reported the mean I.Q. of the reverser group to be 100.76 as compared with a mean I.Q. of 109.46 for the non-reverser group. The difference in I.Q. between

¹Sheldon Glueck and Eleanor Glueck, Unraveling Juvenile Delinquency (Cambridge: Harvard University Press, 1951), p. 240.

experimental groups was significant at the .0001 level of confidence. The reported difference in I.Q. between the experimental groups might account for the differences in the amount of M produced. In discussing the relationship between M productivity and intelligence, Piotrowski states:

Rorschach stressed the idea that the M are positively correlated with creative imagination and with the level of intelligence although the correlations need not be high. The new concept of the meaning of M leads to the same conclusion.¹

Thus the intent of this study was to determine experimentally if differences existed in the inhibition process of delinquent and non-delinquent females and to investigate the relationship between impulse delay and the ability to produce M within this population. In order to study the relationship between impulse delay and the ability to produce M, an experimental design was used which allowed for control of intelligence, chronological age, and social class.

¹Piotrowski, op. cit., p. 143.

CHAPTER II

STATEMENT OF THE PROBLEM

Several investigators have designed experiments to determine the relationship between impulse delay and the production of M on the Rorschach. The hypothesis that individuals who display a greater ability to inhibit an overt response will produce more human movement responses on the Rorschach test than individuals who do not display this ability, has been verified by many studies. Studies by Levine, Glass, Meltzoff, Singer, Spohn, and Herman have all been consistent in their findings regarding the above stated hypothesis. All of these studies have reported a significant relationship between impulse delay, or inhibition, and the amount of M produced on the Rorschach.

Most of the studies of the relationship of impulse delay and M have been similar in design. The investigators have used some measure of response delay, such as cognitive inhibition time, or some measure of the ability to inhibit a motor act, and have compared an individual's ability to perform on the variable of delay with the amount of M the individual produced on the Rorschach test. The relationship

between the variables impulse delay and amount of M produced has been tested, and the results have been consistent.

Levine, Glass, and Meltzoff sampled an out-patient veteran population with a wide range of psychiatric diagnoses. Levine and Meltzoff sampled a group of neuropsychiatric patients. Singer and Spohn used schizophrenic subjects for their study. Singer and Herman reported a comparable study using schizophrenic subjects. Meltzoff and Singer sampled a college population and reported a direct relationship between affective control and M. The relationship between an individual's ability to delay a response and the amount of M produced by the individual has been reported for two main population groups: individuals with various psychiatric diagnoses and a bright, college population.

This study was concerned with the inhibition process of another population sample--delinquent females. The purpose of this study was to determine experimentally whether the inhibition process of the female delinquent differed from that of the non-delinquent female. The study was also designed to determine experimentally whether or not the variables of impulse delay and the ability to produce M were related within each of these two populations in the same manner as reported for other populations. The experimental design of this study permitted control of I.Q., chronological age, and social class.

This study used two measures of response delay:

(1) the mirror-image N of the Digit Symbol subtest of the Wechsler Bellevue Intelligence Scale, and (2) cognitive inhibition time. The subjects were given the Rorschach to determine the number of M responses produced. Word association time was measured to determine if any differences in reaction time were present between groups.

In order to determine statistically if differences in the inhibition process between these two groups exist, the following hypotheses were tested.

1. There is no significant difference in mean word association time, cognitive inhibition time, or the amount of M produced between the delinquent and non-delinquent groups.

2. There is no significant difference in mean word association time, cognitive inhibition time, or the amount of M produced between the delinquent reversers and non-delinquent reversers.

3. There is no significant difference in mean word association time, cognitive inhibition time, or the amount of M produced between the delinquent non-reversers and the non-delinquent non-reversers.

4. There is no significant difference in mean word association time, cognitive inhibition time, or the amount of M produced between reverser groups and non-reverser groups.

5. There is no significant difference in mean word association time, cognitive inhibition time, or the amount of M produced between the delinquent reversers and delinquent

non-reversers.

6. There is no significant difference in mean word association time, cognitive inhibition time, or the amount of M produced between the non-delinquent reversers and non-delinquent non-reversers.

7. There is no significant difference in the number of reversers between the total delinquent and non-delinquent population sampled.

CHAPTER III

PROCEDURE OF THE STUDY

Subjects

Eighty subjects were used in this study. These subjects were selected on the basis of chronological age, I.Q., and socio-economic class. Forty subjects were selected from the delinquent female population of Girls' Town, State School for Delinquent Girls, Tecumseh, Oklahoma. These subjects comprised the "delinquent" group referred to in this study. Forty subjects were selected from the girls enrolled in Franklin Vocational School in Oklahoma City, Oklahoma. These subjects comprised the "non-delinquent" group referred to in this study. Girls with a police record were not included in the non-delinquent group.

Three variables were controlled in the selection of subjects. The variables of socio-economic class, chronological age, and I.Q. were equated between groups.

Socio-economic class was measured using the "index of Status Characteristic" method of measuring social class, described by Warner et al.¹ Social class status was deter-

¹Lloyd W. Warner, Marchia Meeker, and Kenneth Eells, Social Class in America (Chicago: Science Research Associates, 1949), pp. 121-175.

mined from information derived from four characteristics: (1) Occupation of parents, (2) Source of income of parents, (3) House type, (4) Dwelling area. The four status characteristics were rated on a seven point scale which ranged from "1"--very high status value, to "7"--very low status value. These rating scores were then combined into a single numerical index by assigning each one a weight and then securing a total score of the separate scores. For this study, a total weighted score of 51 and above resulted in the classification of low social class. All of the subjects used in this experiment were classified as low socio-economic class.

Chronological age was equated between the delinquent and non-delinquent groups. The chronological age of the delinquent group ranged from 155 to 209 months, with a mean chronological age of 182.13 and a standard deviation of 15.08 months. The chronological age of the non-delinquent group ranged from 147 to 209 months, with a mean chronological age of 182.08 and a standard deviation of 16.07 months.

All of the subjects selected for the experiment fell within an I.Q. range of 80 to 100. I.Q. was measured using the California Short-Form Test of Mental Maturity.¹ The range of I.Q. for the delinquent group was from 82 to 100, with a mean I.Q. of 91.4 and a standard deviation of 4.57. The range of I.Q. for the non-delinquent group was from 80

¹California Short-Form Test of Mental Maturity (Los Angeles: California Test Bureau, 1957).

to 100, with a mean I.Q. of 91.5 and a standard deviation of 5.56.

The delinquent and non-delinquent groups were subdivided into two groups of 20 subjects each. This subdivision was made on the basis of the mirror-image N of the Digit Symbol subtest of the Wechsler Bellevue Adult Intelligence Scale.¹ Within each group, twenty subjects who reproduced the mirror-image N correctly were selected. These subjects comprised the non-reverser groups within the delinquent and the non-delinquent groups. Within each group, twenty subjects who reversed the mirror-image N were selected. These subjects comprised the reverser groups within the delinquent and non-delinquent groups. The mean chronological ages and I.Q.'s for the four groups are shown in Table 1.

TABLE 1
MEAN CHRONOLOGICAL AGE AND I.Q. FOR
THE FOUR EXPERIMENTAL GROUPS

Group	C.A.	S.D.	I.Q.	S.D.
Delinquent Reversers	182.05	15.96	91.5	5.82
Delinquent Non-reversers	182.25	13.87	91.2	4.08
Non-delinquent Reversers	182.00	14.40	91.9	5.53
Non-delinquent Non-reversers	182.15	17.72	92.3	5.60

¹David Wechsler, The Measurement of Adult Intelligence (3rd ed.; Baltimore: Williams and Wilkins, 1944).

The experimental design allowed comparisons to be made between delinquent and non-delinquent groups and between reverser and non-reverser groups.

The delinquent population was chosen from a total of 167 girls who had been committed to Girls' Town, a state operated school for delinquent girls, Tecumseh, Oklahoma. All of the girls had been adjudged delinquent and sentenced to the school by county judges of the state of Oklahoma.

The 167 girls in Girls' Town ranged in age from 12 to 18 years. The I.Q. range was from 46 to 132, with a mean I.Q. of 89. These reported I.Q. scores were obtained using the California Short-Form Test of Mental Maturity.¹ Apparently most of the girls came from the low socio-economic class as determined by the "index of Status Characteristic" method of determining social class, described by Warner et al.,² since it was necessary to rate only 42 girls on the index to find 40 who were classifiable in the low socio-economic rating.

The non-delinquent population was chosen from Franklin Vocational School, Oklahoma City, Oklahoma. The non-delinquent subjects were chosen from grades 7 through 11. There was a total of 475 students enrolled in the school at the time the sample was taken. Of these 475 students, 65 per

¹California Short-Form Test of Mental Maturity, op. cit.

²Warner et al., op. cit., pp. 121-175.

cent were male and 35 per cent female. The age range of the school was from 12 to 21 years. The mean I.Q. of the entire school population was 86.0.

A better understanding of the population from which Franklin School draws its students can be obtained from the findings of a socio-economic class questionnaire compiled by the faculty of Franklin School. The results of the faculty study indicated that the following conditions were present within the total school population:

1. 65 per cent of the students come from broken homes.
2. 30 per cent of the families receive Aid to Dependent Children checks.
3. 20 per cent of the fathers are unemployed.
4. 42 per cent of the fathers are day laborers.
5. 8 per cent of the fathers are semi-skilled laborers.
6. 3 out of 10 homes have no toilet facilities.
7. 2 out of 10 homes have no running water.
8. 72 per cent of the families rent their homes.
9. 25 per cent of the families own their own homes. (In some cases this percentage includes families living in temporary shacks built on city property.)¹

Instruments of Measure

Ten paired word associates were used as the stimulus material for measuring word association time and cognitive

¹Franklin School Faculty, "A Social Class Study of Franklin Students" (unpublished research, 1958).

inhibition time. The ten word associates were chosen from Rapaport's Word Association Test. The ten word associates used in this study were:

1. love-hate
2. father-mother
3. party-fun
4. suicide-death
5. house-home
6. bite-teeth
7. hat-coat
8. drink-water
9. book-read
10. tobacco-smoke¹

Rapaport describes the first six stimulus words of this series: love, father, party, suicide, house, and bite, as being traumatic stimulus words.

The Rorschach Psychodiagnostic Plates were used as the stimulus material for measuring the subject's ability to perceive human movement.²

The Experimental Task

Each subject was seen individually. The word assoc-

¹Davis Rapaport, Diagnostic Psychological Testing, Vol. II (Chicago: The Year Book Publishers, 1949), pp. 13-84.

²Herman Rorschach, Psychodiagnostic Plates (New York: Grune and Stratton, 1942).

iation test was administered first with the following instructions:

I am going to read you a series of words in pairs of two. Then I am going to go back through the list and say the first word of each pair and I want you to say the second word. For example, if the first time through I should read the words black-white, and then go back and say black, I would want you to say white. Do you understand the instructions?

The above procedure was followed until the subject had responded with the correct associate for all ten words in one trial without error. At this time the subject was given the following instructions:

Now this time through I want you to do exactly as you did that time only I want you to say your word as quickly as you can after I say mine, because I am going to time you.

This procedure was followed and the time was recorded for each response. The mean response time was used as the measure of word association time for each subject.

After the completion of the word association test, the test of cognitive inhibition time was given. It consisted of the same stimulus material given with the following instructions:

This time through we are going to do something a little bit different. When I say my word, I want you to answer with any word other than the word you just learned to give. You remember our example before was black-white. This time if I should say black, I would want you to answer with any word other than white. Just say the first word that comes to your mind after I say my word. Do you understand the instructions? Remember now, respond with any word other than the word you learned to give.

The stimulus words were then presented to the subject,

and the time between stimulus word and response was recorded as the measure of cognitive inhibition time for the subject.

The Rorschach plates were then presented to the subject. Beck's instructions for presenting the plates were used. These instructions are:

You will be given a series of ten cards, one by one. The cards have on them designs made up out of ink blots. Look at each card, and tell the examiner what you see on each card, or anything that might be represented there. Look at each card as long as you like; only be sure to tell the examiner everything that you see on the card as you look at it. When you have finished with the card, give it to the examiner as a sign that you are through with it.¹

Several of the subjects returned the first card after giving only one response. When the first card was returned after a single response, the card was again presented to the subject with the following additional instructions:

Most people see more than one thing. Look at it a big longer.²

Treatment of the Data

The word association time was computed for each subject as the mean time required to respond to the ten stimulus words. These numbers were then totaled, and the mean word association time for each experimental group was computed.

A modified mean cognitive inhibition time was computed for each subject. In some cases it was necessary to modify

¹Samuel J. Beck, Rorschach's Test, Vol. I (New York: Grune and Stratton, 1950), p. 2.

²Ibid., p. 4.

the mean cognitive inhibition time on certain stimulus words. Some subjects blocked on certain stimulus words for a long enough period of time so that the mean of his ten responses no longer represented the best measure of central tendency. In cases where blocking caused a distorted pattern of responses, the extreme times were eliminated and a modified mean response time computed. The modified mean scores were then totaled, and the cognitive inhibition time for each experimental group was computed. Blocking occurred with approximately the same frequency in both the delinquent and non-delinquent group.

The Rorschach protocols were scored using Beck's scoring system.¹ The scoring of the responses was checked by two other Rorschach examiners. An analysis of the M responses showed that approximately half of the subjects produced no M. Forty-three subjects produced M as compared with 37 who produced no M. Because of this distribution of M, it was decided to classify the subjects into two categories, M and No-M.

It was necessary to determine the homogeneity of variance of the two basic population samples before computing the significance of the differences in word association time and cognitive inhibition time. Homogeneity of variance was computed using the F ratio between the maximum and minimum

¹Ibid., pp. 1-210.

variance, following a formula for this ratio reported by Walker and Lev.¹ The groups were found to be homogeneous. Calculation of the $\underline{F}$ ratio between the delinquent group and the non-delinquent group resulted in an $\underline{F}$ of 1.1, which was not significant when compared to the table value of 2.07 needed for significance at the .05 level of confidence. Calculation of the $\underline{F}$ ratio between reverser and non-reverser groups resulted in an $\underline{F}$ of 1.03, which was not significant when compared to the table value of 2.07 needed for significance at the .05 level of confidence.²

To determine the significance of differences in word association time and cognitive inhibition time, the analysis of variance technique was used. Chi square was used to determine the significance of differences in the amount of M produced between groups.

¹Helen M. Walker and Joseph Lev, Statistical Inference (New York: Henry Holt and Company, 1953), p. 192.

²Ibid., p. 462.

CHAPTER IV

THE RESULTS

A total of eighteen comparisons between groups was made by testing the six null hypotheses on the variables of word association time, cognitive inhibition time, and amount of M produced. Testing of the seventh hypothesis on the variable of reversing the mirror-image N resulted in the nineteenth comparison reported. For this study the required level of statistical significance was set at .05.¹

The results in testing the first hypothesis, which compared the delinquent and non-delinquent groups, are given for the variable of word association time in Table 2, for the variable of cognitive inhibition time in Table 3, and for the variable of the amount of M in Table 4.

In the test of the first hypothesis, no statistically significant differences were found between the two groups on any of the three variables tested. Hypothesis one was sustained on the variables of word association time, cognitive inhibition time, and amount of M produced.

¹Henry E. Garrett, Statistics in Psychology and Education (New York: Longmans, Green and Company, 1950), p. 244.

TABLE 2

ANALYSIS OF VARIANCE OF DELINQUENT AND NON-DELINQUENT
GROUPS ON THE VARIABLE OF WORD ASSOCIATION TIME

Source of variation	Sum of squares	Degrees of freedom	Mean square	F
Among the means of conditions	.1085	1	.1085	1.47*
Within conditions	5.7613	78	.0739	

*Table value: 3.98 at .05 level of confidence.

TABLE 3

ANALYSIS OF VARIANCE OF DELINQUENT AND NON-DELINQUENT
GROUPS ON THE VARIABLE OF COGNITIVE INHIBITION TIME

Source of variation	Sum of squares	Degrees of freedom	Mean square	F
Among the means of conditions	.0405	1	.0405	.093*
Within conditions	33.4894	78	.4340	

*Table value: 3.98 at .05 level of confidence.

TABLE 4

COMPARISON OF 40 DELINQUENT AND 40 NON-DELINQUENT
FEMALES ON THE VARIABLE OF M

Group	N	M Responses		df	Chi ²	P
		M	No-M			
Delinquent	40	20	20	1	.20	.70
Non-delinquent	40	23	17			

The results in testing the second hypothesis are given for the variable of word association time in Table 5, for the variable of cognitive inhibition time in Table 6, and for the variable of amount of M produced in Table 7.

TABLE 5

ANALYSIS OF VARIANCE OF THE FOUR EXPERIMENTAL GROUPS
ON THE VARIABLE OF WORD ASSOCIATION TIME

Source of variation	Sum of squares	Degrees of freedom	Mean square	F
Among the means of conditions	.1408	3	.0469	.03*
Within conditions	5.7209	76	.0753	

*Table value: 2.74 at .05 level of confidence.

TABLE 6

ANALYSIS OF VARIANCE OF THE FOUR EXPERIMENTAL GROUPS
ON THE VARIABLE OF COGNITIVE INHIBITION TIME

Source of variation	Sum of squares	Degrees of freedom	Mean square	F
Among the means of conditions	2.3209	3	.7736	1.86*
Within conditions	31.5774	76	.4154	

*Table value: 2.74 at .05 level of confidence.

TABLE 7

COMPARISON OF 20 DELINQUENT REVERSERS AND 20 NON-
DELINQUENT REVERSERS ON THE VARIABLE OF M

Group	N	M Responses		df	Chi ²	P
		M	No-M			
Delinquent reversers	20	12	8	1	0	.95
Non-delinquent reversers	20	13	7			

Table 5 shows the variance between all four experimental groups on the variable of word association time. The reported F of .03 was insignificant. Since there was no significant difference shown between all groups on the variable of word association time, there was no significant difference between the means of the delinquent reverser and non-delinquent reverser groups.¹ Therefore, the second hypothesis was sustained on the variable of word association time.

Table 6 shows the variance between all four experimental groups on the variable of cognitive inhibition time to be statistically insignificant. Since there was no significant difference among all of the groups, there was no significant difference between the means of the delinquent reverser and non-delinquent reverser groups. Therefore, the second hypothesis was sustained on the variable of cognitive inhibition time.

¹Ibid., p. 278.

Table 7 reports an insignificant Chi square between the delinquent reverser and non-delinquent reverser groups on the variable of the amount of M produced. Therefore, the second hypothesis was sustained on the variable of the amount of M produced.

The second hypothesis was sustained on the variables of word association time, cognitive inhibition time, and the amount of M produced.

The results in testing the third hypothesis, which compared the delinquent non-reverser and the non-delinquent non-reverser groups, have already been given for the variable of word association time in Table 5, and have already been given for the variable of cognitive inhibition time in Table 6. The results which compared these two experimental groups on the variable of the amount of M produced are presented in Table 8.

TABLE 8

COMPARISON OF 20 DELINQUENT NON-REVERSERS AND 20 NON-DELINQUENT NON-REVERSERS ON THE VARIABLE OF M

Group	N	M Responses		df	Chi ²	P
		M	No-M			
Delinquent Non-reversers	20	8	12	1	.10	.80
Non-delinquent non-reversers	20	10	10			

Since Table 5 reported no significant difference among all experimental groups on the variable of word association time, there was no significant difference between the means of the delinquent non-reverser and the non-delinquent non-reverser groups on this variable.

Since Table 6 reported no significant difference among all experimental groups on the variable of cognitive inhibition time, there was no significant difference between the means of the delinquent non-reverser and the non-delinquent non-reverser groups on this variable.

Table 8 showed no significant differences in the amount of M produced by the delinquent non-reverser and the non-delinquent non-reverser groups.

The third hypothesis was sustained on the variables of word association time, cognitive inhibition time, and the amount of M produced.

The results in testing the fourth hypothesis, which compared the reverser and non-reverser groups, are given for the variable of word association time in Table 9, for the variable of cognitive inhibition time in Table 10, and for the variable of the amount of M produced in Table 11.

In the test of the fourth hypothesis, no statistically significant differences were found between the two groups on any of the three variables tested; however, the F of 3.39 on the variable of cognitive inhibition time approached significance.

TABLE 9

ANALYSIS OF VARIANCE OF REVERSER AND NON-REVERSER
GROUPS ON THE VARIABLE OF WORD ASSOCIATION TIME

Source of variation	Sum of squares	Degrees of freedom	Mean square	F
Among the means of conditions	.1460	1	.1460	1.98*
Within conditions	5.7238	78	.0734	

*Table value: 3.98 at .05 level of confidence.

TABLE 10

ANALYSIS OF VARIANCE OF REVERSER AND NON-REVERSER GROUPS
ON THE VARIABLE OF COGNITIVE INHIBITION TIME

Source of variation	Sum of squares	Degrees of freedom	Mean square	F
Among the means of conditions	1.4151	1	1.4151	3.39*
Within conditions	32.4832	78	.4165	

*Table value: 3.98 at .05 level of confidence.

TABLE 11

COMPARISON OF 40 REVERSERS AND 40 NON-REVERSERS
ON THE VARIABLE OF M

Group	N	M Responses		df	Chi ²	P
		M	No-M			
Reverser	40	25	15	1	1.87	.20
Non-reverser	40	18	22			

The differences in cognitive inhibition time, although not significant, indicated that the reversers responded with a shorter inhibition time than did the non-reversers. The relationship of the four experimental groups on the variable of cognitive inhibition time is shown in Table 12 which gives the modified mean cognitive inhibition time for each group.

TABLE 12
MODIFIED MEAN COGNITIVE INHIBITION TIMES
OF THE FOUR EXPERIMENTAL GROUPS

Group	CIT time in seconds
Delinquent reverser	2.96
Delinquent non-reverser	3.02
Non-delinquent reverser	2.80
Non-delinquent non-reverser	3.27

The Chi square of the amount of M produced by the reverser and non-reverser groups shows a trend toward the reverser groups producing more M on the Rorschach than the non-reverser groups.

Hypothesis 4 was sustained on the variables of word association time, cognitive inhibition time, and the amount of M produced. A trend was noted in favor of the reverser group having a shorter cognitive inhibition time and produc-

ing more M than the non-reverser group.

The results in testing the fifth hypothesis, which compared the delinquent reverser and the delinquent non-reverser groups, have already been reported for the variable of word association time in Table 5, and have already been reported for the variable of cognitive inhibition time in Table 6. The results which compared these two groups on the variable of the amount of M produced are presented in Table 13.

TABLE 13
COMPARISON OF 20 DELINQUENT REVERSERS AND 20 DELINQUENT
NON-REVERSERS ON THE VARIABLE OF M

Group	N	M Responses		df	Chi ²	P
		M	No-M			
Delinquent reverser	20	12	8	1	.94	.70
Delinquent non-reverser	20	8	12			

Table 13 shows no significant difference in the amount of M produced by the delinquent reverser and delinquent non-reverser groups. It is noted here that the reverser group tended to produce M whereas the non-reverser group tended to produce no M.

The fifth hypothesis was sustained on the variables of word association time, cognitive inhibition time and the

amount of M produced.

The results in testing the sixth hypothesis, which compared the non-delinquent reverser and the non-delinquent non-reverser groups have already been reported for the variable of word association time in Table 5, and for the variable of cognitive inhibition time in Table 6. The results which compared these two groups on the variable of the amount of M produced are presented in Table 14.

TABLE 14
COMPARISON OF 20 NON-DELINQUENT REVERSERS AND 20 NON-DELINQUENT NON-REVERSERS ON THE VARIABLE OF M

Group	N	M Responses		df	Chi ²	P
		M	No-M			
Non-delinquent reverser	20	8	12	1	.10	.80
Non-delinquent non-reverser	20	10	10			

Since Table 5 shows no significant difference among all experimental groups on the variable of word association time, there was no significant difference between the means of the non-delinquent reverser and non-delinquent non-reverser groups on this variable.

Since Table 6 shows no significant difference among all experimental groups on the variable of cognitive inhibition time, there was no significant difference between the

means of the non-delinquent reverser and the non-delinquent non-reverser groups on this variable.

Table 14 shows no significant difference in the amount of M produced by the non-delinquent reverser and the non-delinquent non-reverser groups.

The sixth hypothesis was sustained on the variables of word association time, cognitive inhibition time, and the amount of M produced.

A total of 146 delinquents and 107 non-delinquents were administered the Digit Symbol Subtest before 40 of each group were found meeting the criteria of chronological age, I.Q., and socio-economic class used in the selection of subjects. The results of testing the seventh hypothesis, which compared 146 delinquent and 107 non-delinquent females on the variable of reversing the mirror-image N, are reported in Table 15.

TABLE 15

COMPARISON OF 146 DELINQUENT AND 107 NON-DELINQUENT FEMALES ON REVERSING THE MIRROR-IMAGE N OF THE WECHSLER BELLEVUE ADULT INTELLIGENCE SCALE

Group	N	Reversers	Non-Reversers	df	Chi ²	P
Delinquent	146	75	71	1	1.79	.20
Non-delinquent	107	45	62			

Table 15 shows no significant difference in the number of N-reversers among the total number of delinquent and non-delinquent girls tested with the Digit Symbol Subtest. It is noted that a greater percentage of delinquents tended to reverse the mirror-image N than did non-delinquents. The seventh hypothesis was sustained.

No statistically significant differences were found between any of the experimental groups on any of the experimental variables. Therefore, the seven null hypotheses of this study were all sustained.

CHAPTER V

DISCUSSION OF RESULTS

In general, this study was concerned with a comparison of the inhibition process among delinquent and non-delinquent females. Specifically, the study was designed to measure the differences in cognitive inhibition time and the ability to produce human movement responses on the Rorschach between groups of delinquent and non-delinquent females. This study was also designed to determine the relationship between response delay and the ability to produce human movement responses on the Rorschach. In order to determine whether differences did exist between the delinquent and non-delinquent groups, their responses on a test of word association time, a test of cognitive inhibition time, and the Rorschach were compared. In order to determine whether differences did exist between subjects within each group who reversed the mirror-image N and subjects within each group who did not reverse the mirror-image N, the responses of reverser and non-reverser groups were compared on the variables of word association time, cognitive inhibition time, and amount of M produced.

Two main questions were posed in this study:

(1) Do delinquent and non-delinquent females differ significantly in their ability to inhibit impulses?

(2) Are the variables of impulse delay and the ability to produce M in the Rorschach related within this population sample in the same manner as reported for other population samples?

In order to answer these questions experimentally, it was necessary to control variables which were thought to be related to the experimental variables. Since intelligence had been found to be related to the ability to produce M, intellect was controlled by selecting all subjects from an I.Q. range of 80 to 100 with the mean I.Q. of each sub-group equal. Since experience plays such an important role in certain adjustmental situations, it was necessary to control chronological age. Chronological age was controlled by selecting all subjects from a chronological age range of 12 to 18 years with the mean chronological age of each sub-group equal. Since social class has been found to be related to various personality aspects, it was necessary to control social class in the experiment. All the subjects used in this study came from the low socio-economic class.

In testing the two main questions posed in this study, seven hypotheses were tested. The testing of the seven hypotheses resulted in nineteen comparisons between groups. Six hypotheses were formulated and tested with regard to the

three variables of word association time, cognitive inhibition time, and the amount of M produced. The seventh hypothesis was formulated to test the variable of reversing the mirror-image N of the Wechsler-Bellevue Intelligence Scale between the entire delinquent and non-delinquent population sampled.

In seeking to determine whether delinquents and non-delinquents differed in the ability to delay impulses, forty delinquent and forty non-delinquent females were tested in the variables of word association time, cognitive inhibition time, and the amount of M produced in the Rorschach. Results of these comparisons are shown in Tables 2, 3, and 4. The results indicated no significant differences between the delinquent and non-delinquent groups on any of the three variables tested. There were no significant differences between the delinquent and non-delinquent groups in their word association time, cognitive inhibition time, or in the amount of M produced on the Rorschach. It is noted that the two groups were confounded on the variable of reversing the mirror-image N.

To determine whether reversing the mirror-image N was contributing to the negative results found in the comparison of the delinquent and non-delinquent groups, comparisons were made between the delinquent and non-delinquent reverser groups and the delinquent and non-delinquent non-reverser groups. Comparisons were first made between delinquent reverser and

non-delinquent reverser groups on the variables of word association time, cognitive inhibition time, and the amount of M produced. The results of these comparisons are shown for word association time in Table 5, for cognitive inhibition time in Table 6, and for the amount of M produced in Table 7. The results of these comparisons indicated no significant differences between the delinquent reverser and the non-delinquent reverser groups on the three-variables tested.

To further determine whether reversing the mirror-image N was contributing to the negative results found in the comparison of the delinquent and non-delinquent groups, comparisons were made between the delinquent non-reverser and the non-delinquent non-reverser groups. The results of these comparisons are shown for word association time in Table 5, for cognitive inhibition time in Table 6, and for the amount of M produced in Table 8. The results of these comparisons indicated no significant differences between the delinquent non-reverser and non-delinquent non-reverser groups on the three variables tested.

To determine whether the variables of impulse delay and the amount of M produced were related in this population sample as reported for other population samples, forty reversers and forty non-reversers were tested on the variables of word association time, cognitive inhibition time, and the amount of M produced in the Rorschach. The results of these comparisons are shown for word association time in Table 9,

cognitive inhibition time in Table 10, and for the amount of M produced in Table 11. No significant differences were found between reverser and non-reverser groups on any of the three variables tested. Although an analysis of variance between the reverser and non-reverser groups on the variable of cognitive inhibition time produced an insignificant F , a trend was noted which approached significance.

Inspection of Table 12 shows that the reverser groups tended to respond more quickly than non-reverser groups on cognitive inhibition time. The mean response time for the reverser groups was 2.88 seconds as compared to a mean response time for the non-reverser groups of 3.15 seconds. This trend, although not statistically significant, was inconsistent with findings reported by previous studies. In previous studies reverser groups have tended to have a longer cognitive inhibition time than have non-reverser groups.

An inspection of Table 11 shows that reversers tended to produce more M than did non-reversers. The results, although not statistically significant, again were in the reverse direction from all previous studies. Previous studies had indicated that reversers tended to produce fewer M on the Rorschach than did non-reversers.

It is noted that the two reverser groups were confounded on the variable of delinquency. To determine whether the variable of delinquency was contributing to the results found in the comparison of the reverser groups, comparisons

were made between the delinquent reverser and delinquent non-reverser groups. Comparisons were first made between the delinquent reverser and delinquent non-reverser groups on the variables of word association time, cognitive inhibition time, and the amount of M produced. The results of these comparisons are shown for word association time in Table 8, for cognitive inhibition time in Table 9, and for the amount of M produced in Table 13. The results of these comparisons indicated no significant differences between the delinquent reversers and the delinquent non-reversers on any of the variables tested. Inspection of Table 12 and Table 13 shows a consistent pattern that reversers tended to respond more quickly in cognitive inhibition time and to produce more M than did non-reversers.

To further determine whether delinquency was contributing to the results found in the comparison of the reverser groups, comparisons were made between the non-delinquent reverser and the non-delinquent non-reverser groups. The results of these comparisons are shown for word association time in Table 8, for cognitive inhibition time in Table 9, and for the amount of M produced in Table 14. The results of these comparisons indicated no significant differences between the non-delinquent reverser and the non-delinquent non-reverser groups on the three variables tested. Inspection of Table 12 again shows a consistent pattern that reversers tend to respond more quickly on cognitive inhibition

time.

A total of 146 delinquents and 107 non-delinquents were given the Digit Symbol Subtest of the Wechsler-Bellevue Intelligence Scale before 40 of each group were found meeting the criteria of chronological age, I.Q., and socio-economic class used in the selection of subjects. To determine whether a greater proportion of delinquents than non-delinquents would reverse the mirror-image N, a comparison was made between the two groups on this variable. The results of this comparison are shown in Table 15. No significant differences were found in the number of delinquent and non-delinquent females who reversed the mirror-image N.

In summary, no significant differences were found between delinquent and non-delinquent groups on the variables of word association time, cognitive inhibition time, or on the amount of M produced. It is probable that since these groups were so evenly matched in intelligence, chronological age, and in social class, they represented a homogeneous group regardless of the variable of delinquency. It may be that within the low socio-economic class there is very little difference between the individual who is termed delinquent and the individual who is not. Individuals from the lower social class may sometimes be classified as delinquent because of the conditions found in their environment and not always because of deviate behavior.

No statistically significant differences were found between reverser and non-reverser groups; however, a consistent trend was found which indicated that the reversers responded with a shorter cognitive inhibition time and tended to produce more M on the Rorschach. Previous studies have been consistent in reporting statistically significant differences which are opposed to the trend found in this study. Previous studies have shown that subjects who reversed the mirror-image N on the Wechsler tended to have longer cognitive inhibition time than did non-reversers and to produce less M on the Rorschach than did non-reversers.

In previous studies the reversing of the mirror-image N has been interpreted as a lack of the ability to inhibit an impulsive response. This mistake has also been associated with inflexible behavior patterns in that subjects are less able to respond adequately in a new situation. It may be that within the lower socio-economic class the reversing of the mirror-image N has a completely different meaning. The response of copying the reversed N correctly may reflect a fear of making an erroneous response. The response of reversing the N, on the other hand, could reflect an ability to respond without the intense fear of an erroneous response. If reversing the mirror-image N does have the above meanings in the low socio-economic class, it would follow that reversers might be more free to respond quickly to a test of cognitive inhibition time, might relate better with people

whom he would see as less threatening, and might produce more M on the Rorschach test.

The conclusions of this study are:

1. Delinquent and non-delinquent females did not differ significantly in relation to measures of inhibition.
2. In both a delinquent and a non-delinquent population, with I.Q. controlled, significant differences in M productivity and cognitive inhibition time were not found to be present.
3. The variables of response delay and the ability to produce M on the Rorschach were not found to be related in the same manner within the population sampled as had been previously recorded for other population samples.
4. Within the lower socio-economic class, the individuals who reversed the mirror-image N on the Wechsler-Bellevue Intelligence Scale tended to have shorter cognitive inhibition time and to produce more M on the Rorschach than did subjects who did not reverse the N.

CHAPTER VI

SUMMARY AND CONCLUSIONS

The purpose of this study was to examine the differences which existed in the inhibition process of groups of delinquent and non-delinquent females. The study was also designed to allow a comparison of delinquent and non-delinquent subjects who possessed the ability to delay an impulsive response as compared to subjects who did not have this ability. This study of the inhibition process of delinquent and non-delinquent females was designed to provide answers to the following questions:

1. Do delinquent and non-delinquent females differ significantly in their ability to inhibit impulses?
2. Are the variables of impulse delay and the ability to produce M in the Rorschach related within this population sample in the same manner as reported for other population samples?

Eighty subjects were used in this study. Forty subjects were selected from the delinquent female population of Girls' Town, State School for Delinquent Girls, Tecumseh, Oklahoma. These girls were matched in I.Q., chronological

age, and socio-economic status with forty subjects selected from the girls enrolled in Franklin Vocational School in Oklahoma City, Oklahoma. The two experimental groups were subdivided using the mirror-image N on the Wechsler Bellevue Intelligence Scale. This subdivision comprised reverser and non-reverser groups within the delinquent and non-delinquent groups.

The experimental task consisted of administering a Word Association Test, a Cognitive Inhibition Test, and a Rorschach to each subject individually. The four experimental groups were compared on the measures of word association time, cognitive inhibition time, and M productivity.

Null hypotheses were tested in relation to the differences between the inhibition process of delinquent and non-delinquent females. No statistically significant differences were found between the delinquent and non-delinquent groups on the variables of word association time, cognitive inhibition time, or the amount of M produced on the Rorschach.

Null hypotheses were tested in relation to the differences between the reverser and non-reverser groups on the variables of word association time, cognitive inhibition time, and the amount of M produced on the Rorschach. No statistically significant differences were found between reverser and non-reverser groups on any of the experimental variables. Trends were observed indicating that the reverser groups responded with a shorter cognitive inhibition time

than the non-reverser groups and the reverser groups produced more M on the Rorschach than the non-reverser groups.

Previous studies have shown consistent results in the direction of reverser groups responding with longer cognitive inhibition time and producing less M on the Rorschach than non-reverser groups. The results of this study were found to be in opposition to the results of previous studies regarding the relationship of reversing the mirror-image N and the ability to produce human movement on the Rorschach. No significant differences or consistent trends were found to be operating between the delinquent and non-delinquent groups on the variables of word association time, cognitive inhibition time, or the amount of M produced on the Rorschach.

The results of this study have demonstrated that on both a delinquent and non-delinquent population, when I.Q. is controlled, significant differences in cognitive inhibition time and M productivity did not appear. Unless veteran outpatients are greatly different from delinquents on measures of inhibition, or unless I.Q. accounts for the reported differences in M productivity and cognitive inhibition time, the results of this study cast some doubt on the use of the reverse N or cognitive inhibition time as measures of inhibition. It may be that the variables of N reversing, cognitive inhibition time, and M productivity, are all functions of intellect. This study supports the viewpoint that with I.Q. held constant, significant differences in the variables of

cognitive inhibition time and M do not exist.

In the conclusions of previous studies the impression is given that the ability to inhibit an overt response is extremely important in the productivity of M. This study casts some doubt on the relationship between the ability to delay and M productivity. The results of this study demonstrated that in both a delinquent and non-delinquent population with I.Q. controlled, differences on purported measures of inhibition were not found to be significantly related to M productivity.

The importance of inhibition in M productivity was pointed out by Rorschach and has been discussed in many studies of the inhibition process. Most of these discussions are couched as universals, i.e., that an increase in M productivity always accompanies the inhibition of overt responses, regardless of the population sample. It may be that the relationship between inhibition and M productivity does not exist in all types of populations, since this study found no significant relationship between the variables in a lower socio-economic class, dull, delinquent and non-delinquent population.

It may be that within the low socio-economic class there is very little difference between the individual who is termed delinquent and the individual who is not. Although the delinquent has been characterized as being impulsive, unstable, resentful of others, hostile, suspicious, and as

having trouble relating to others, these personality traits may not differentiate the delinquent from the non-delinquent in the low socio-economic class.

Since the results of this study have demonstrated that no measurable differences in inhibition and M productivity were found between delinquent and non-delinquent females of the low social class, the educational implications of this study are clear. Delinquent and non-delinquent students do not have to be treated differently in regard to the personality traits reflected by the experimental variables of this study. The fact that a student has a police record or has been classified as delinquent does not mean that this student will be less apt to be able to inhibit impulsive actions or have more trouble relating with others than a non-delinquent student.

The results of this study suggest further research in the area of impulse delay and inhibition. Further research is needed to:

1. check the validity of cognitive inhibition time as a measure of impulse delay.
2. find different tests which would measure impulse delay.
3. check the effect of intelligence on measures of inhibition and M productivity. An experimental design with groups of dull, normal, and bright subjects, using a battery of tests of the inhibition process would clarify the relationship of intelligence, inhibition, and M productivity.

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