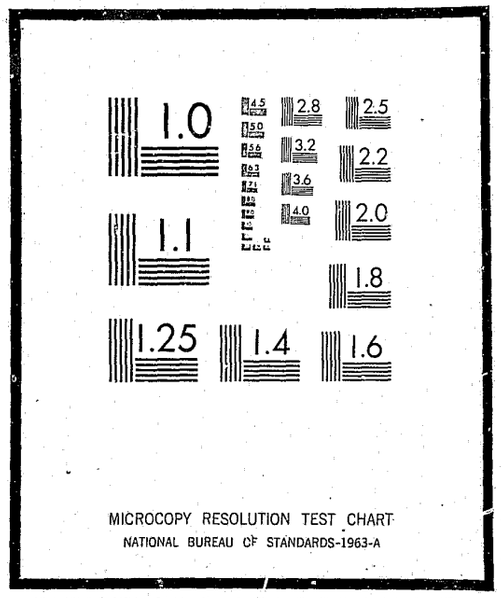


69-14,104

SCOTT, Sheila Mann, 1926-
EFFECTS OF POSITIVE AND NEGATIVE VERBAL REINFORCEMENT AND TASK DIFFICULTY ON THE VERBAL DISCRIMINATION LEARNING OF PSYCHOPATHIC AND NON-PSYCHOPATHIC CRIMINALS.

Temple University, Ph.D., 1968
Psychology, clinical

University Microfilms, Inc., Ann Arbor, Michigan

Effects of Positive and Negative Verbal Reinforcement and Task Difficulty on the Verbal Discrimination Learning of Psychopathic and Non-psychopathic Criminals

Sheila M. Scott

May 1, 1968

Submitted to the Temple University Graduate Board in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

FORM IV

TEMPLE UNIVERSITY GRADUATE BOARD

Title of Dissertation: Effects of Positive and Negative Verbal Reinforcement and Task Difficulty on the Verbal Discrimination Learning of Psychopathic and Non-psychopathic Criminals

Author: Sheila M. Scott

Read and Approved by: John F. McBrearty
Richard E. Burke
Harold Gazzard

Date submitted to the Graduate Board May 1, 1968

Accepted by the Graduate Board of Temple University in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

Date June 8, 1968 George H. Huganir (Dean of Graduate School)

Table of Contents

List of Tables

Table | Page

List of Figures

Acknowledgments

This acknowledgement reflects only a fraction of the author's gratitude to the many people who cooperated to make this study possible.

To the chairman of my committee, Dr. John F. McBrearty I owe much for his unstinting and perceptive help, confidence, and encouragement so that this study was finally completed. I am indebted to Dr. Thomas E. Shipley, Jr. for his cogent suggestions and willing support in a complex field of study. To Dr. Richard E. Burke my deepest appreciation for providing encouragement and guidance in the use of statistical methods.

Sincere thanks are extended to Dr. Hughbert C. Hamilton without whose consideration and early support this study may have never been undertaken.

I am indebted to Superintendent of Prisons, Mr. Edward J. Hendrick, and to Warden Saul Bookbinder of Holmesburg Prison for their cooperation in providing subjects and facilities.

I also wish to acknowledge Danny Whitten, an inmate at Holmesburg, for his unfailing and faithful help in scheduling subjects and encouraging inmates to participate. The road would have been much rougher without him. To another inmate, Charles Reeves, who typed one draft after another, at times giving up his recreation to do so.

To all the inmates of Holmesburg Prison, particularly to those who participated in this study.

My thanks also to Nancy Rodgers and Dianne Garrison for typing under pressure and exactitude; and to Elsie, my sister, for her last minute help. Also to Dr. Claude B. Harms for his ability and willingness in the preperation of the graphs and tables.

Finally, to my daughter, Lesley, I wish to express deep gratitude for her forbearance and encouragement through the many years of study.

Chapter 1

The Problem

Introduction

The first description of the psychopathic personality was made by Pinel in 1835, who described a male patient who had thrown a woman into a well because she had used offensive language toward him. Pinel concluded that his patient suffered from "manie sans delire." (McCord and McCord, 1964). Since that time there has been a gradual accumulation of clinically descriptive material. Recent conceptions of the psychopathic personality have emphasized traits of guiltlessness and persistent patterns of self-defeat (Cleckley, 1955; 1959; Karpman, 1948; McCord and McCord, 1964). Lindner (1948) has stated: "Hydra-headed and slippery to the touch though it is, psychopathy represents the most expensive and most destructive of all known forms of aberrant behavior."

Despite the serious problems psychopathic behavior presents for society, surprisingly little controlled experimentation has been reported. Most observations and research have been limited to descriptions of the psychopath, his traits, background, and characteristics. Only a few empirical studies have been reported which attempt to understand some of these characteristics, and how they affect the behavior of the psychopath. Other attempts to understand the psychopath are largely speculative, and have little basis in controlled observation.

One reason for the lack of research appears to be confusion in attempts to clarify the concept of psychopathy. One tendency, for example, has been to define it in terms of causative factors. Karpman (1941) proposes that the term "psychopath" should be applied only when the disorder is the result of constitutional predisposition. Individuals so afflicted are referred to by Karpman as "idiopathic psychopaths." Karpman, however, does not suggest useable criteria to determine constitutional predisposition. Bender (1947), on the other hand, would apply the label when the "known" cause of the disorder is childhood emotional deprivation.

Another approach has been to view most and sometimes all deviant social behavior as psychopathic, to lump together, as psychopathic, all those who persist in any kind of anti-social behavior, and who seem unable (or unwilling) to select socially responsible modes of behavior even in the face of punishment (Frankenstein, 1959).

In spite of the difficulties encountered in attempts to clarify the concept of psychopathy, there is general agreement among workers in the field that the most striking characteristics of the psychopath are his lack of emotional responsiveness, his meager and fleeting emotional relationships with others, and his apparent inability to feel social anxiety, guilt, or shame about his anti-social acts.

The American psychiatric Association (1952) has recognized that all individuals who persist in anti-social behavior are not properly labeled "psychopathic," in the sense described above, because many of them are capable of emotional responsiveness, and feelings of anxiety and guilt. As a result, the term "psychopathic personality" has been replaced by the more general term, "sociopathic personality." The APA distinguishes several types of sociopathic personalities. One type, the "dyssocial," manifests disregard for the usual social codes, but is capable of feeling emotion, anxiety, and guilt. A second type is the "anti-social." This is the individual who has been described as being emotionally shallow and lacking in anxiety and guilt. Despite the term, "anti-social," most modern writers continue to use the term, "psychopathic." This term will be used throughout the present study.

The second reason that little controlled experimentation on the psychopath has been reported is that there has been little in the way of testable theory about the concept. Most therories are speculative and couched in terms not amenable to testing. Pritchard (1835), for example, hypothesized that the psychopath was suffering from "moral insanity" that he had a diseased moral sense. Others, such as Kahn, Karpman, and Kraepelin proposed various classification schemes which, unfortunately, led to no further understanding of the determinants of psychopathic behavior (McCord and

McCord, 1964). Psychoanalytic theories speak vaguely of lack of appropriate identification, underdeveloped super-egos, and emotional deprivation in the infantile period (Bender, 1947).

Theoretical Background

In an attempt to clarify the nature of psychopathy, Hervey Cleckley has presented an interpretation of psychopathic behavior, together with a theory attempting to account for its principal features (Cleckley, 1955; 1959).

He notes that psychopathic and psychotic behavior are very similiar in that both involve repeated self-damaging, disastrous, and inappropriate acts. The psychopath's behavior, however, is unaccompanied by delusions or hallucinations which often contribute to the understanding of the psychotic's behavior. Nor does the psychopath show the irrational and confused thinking commonly seen among psychotics. In addition, the deep depression or extreme over-elation seen in depressive and manic disorders is also absent in the psychopath. On the contrary, the psychopath seems to have little capacity for either depression or elation even in the appropriate circumstances (Cleckley, 1959).

Cleckley also contrasts the psychopath with the psychoneurotic, pointing out that the neurotic suffers from se-

vere, unreasonable, and nameless anxiety, but usually behaves in a rational and often highly successful manner in his relationships with other people. By contrast, one of the basic characteristics of the psychopath is the relative absence of neurotic anxiety and the associated phobias, compulsions, and other neurotic sysmptoms. His lack of anxiety appears related to his inability to feel guilt in connection with actions that ordinarily produce guilt.

Cleckley rules out cases in which there is only one kind of anti-social behavior, for example, alcoholism, drug addiction, sexual deviancy, in a person who has otherwise adopted acceptable social standards, and behaves in accordance with them. Where drug or alcohol use becomes extreme, its use can usually be traced to anxieties and emotional stresses. Excessive use by psychopaths, however, is rarely the result of anxieties and tensions, but is more a manifestation of disregard of social mores (Cleckley, 1959). He also rules out cases in which delinquency and criminal behavior have been adopted as an acceptable way of life. Such "public enemies" are capable of appropriate affective responses and strong loyalties to other individuals. Their activities can usually be understood in terms of strong motivation for such things as material gain, and positions of power. Furthermore, they usually make every effort to avoid detection. Other cases may be explained

in terms of acting out of neurotic conflicts. The psychopath, on the other hand, may often steal when he is financially well off, and commit other offenses for which there is no readily apparent motivation, and often in circumstances which make detection inevitable (Cleckley, 1959).

In an effort to understand the psychopath, Cleckley concentrates on the question of why a person who has all the necessary adaptive capabilities for a successful life should regularly indulge in behavior leading to dismal and disastrous consequences for himself and others. Cleckley suggests that the psychopath has developed in such a way that parental and social standards have never been introjected. He has never learned appropriate responses to the affective overtones of social situations. As a consequence, he is unable to react appropriately to the emotional and motivational components of normal experience. Responsiveness he has, but it is responsiveness to his own immediately felt needs, and which bears little relationship to the immediate social situation.

> The opinion maintained is that the psychopath fails to know all those more serious and deeply moving affective states which make up the tragedy and triumph of ordinary life, of life at the level of human personality....no normal person is so uninvolved, no ordinary criminal so generally unresponsive and distorted, but that he seems to experience satisfaction, love, hate, grief, and general participation in life at human personality levels, much more intense and more substantial than the affective reactions of the psychopath (Cleckley, 1955, p. 427).

The psychopath's lack of appropriate responsiveness receives support from the frequent clinical observation that he appears unable to respond with anxiety and guilt in social situations which normally arouse them. His verbalizations of the highest ethical standards and social morals are promptly contradicted by his behavior (McCord and McCord, 1964; Mahr, 1966). He can say what should be done, but these words bear little relationship to his actual behavior. He also knows, in words, how to modify his behavior, and can describe his circumstances with appropriate words. But, again there is little relationship between his words and his behavior.

This situation suggests for Cleckley a deep disorder of emotion in which the psychopath is unable to respond appropriately to the affective meanings of the phrases he verbalizes, or the phrases verbalized by anone else. Cleckley considers the psychopath's disorder analogous to semantic aphasia, in which a person can speak words intelligibly, but does not understand their meaning.

> In fact, it is probably accurate to say that speech in this disorder, however, well formulated, has no meaning and is not language at all. In the sense in which the term is used to designate this type of speech disorder, one might conceive of the psychopath as being disabled by a semantic personality disorder. The true abnormality is thoroughly masked by the surface, by the unimpaired mechanical operation of all functions that can be perceived by the observer. But, lacking the connections with, and the correct motivation from, a normal inner core, these peripheral facilities are not sanely employed. They produce, instead, only a mimicry or illusion of true sanity (Cleckley, 1959, p. 585).

Hence, the psychopath knows the dictionary meanings of words and phrases, and can use them appropriately; but, he is deficient in responding to their underlying affective meanings. One might say that the psychopath "knows the words, but not the music" (Johns and Quay, 1962).

Development of the Problem

An advantage of Cleckley's theory is its amenability to experimental testing. Thus, a task could be devised in which successful performance is affected by the kinds of social verbal reinforcers introduced. If it can be assumed that such reinforcers possess secondary affective meaning to which the psychopath presumably is unresponsive, then one would expect him to be less successful in his performance than the nonpsychopath.

In an effort to test this possibility, Kadlub (1956) compared the serial nonsense syllable learning of criminal psychopaths with a comparison group of criminal nonpsychopaths using verbal reward (praise from the experimenter). He found no significant differences between the psychopaths and nonpsychopaths. According to Cleckley's conception, one would expect the psychopathic group to learn the nonsense syllables less well than the nonpsychopathic group, since they would presumably be less affected by verbal praise. This failure to support Cleckley's interpretation is, in the opinion of Johns and Quay (1962) not surprising. Kadlub praised his sub-

jects regardless of whether their responses were correct or incorrect. Praise would have little effect on performance, since the subjects were well aware of the "rightness" or "wrongness" of their responses. Therefore, it was possible that praise from the experimenter was superfluous in influencing performance. To control for this possibility, Johns and Quay (1962) used a Taffel verbal conditioning procedure in which verbal reward was given only if the subject responded correctly. They found that a group of psychopathic prisoners showed a significantly smaller increase in the number of reinforced (Good) responses than a comparison group of neurotic prisoners. Quay and Hunt (1965) replicated these results. The authors concluded that their results supported the notion that psychopaths are less responsive than normals to the affective content of words.

Hetherington and Klinger (1964) took issue with this conclusion, largely because they felt the verbal conditioning procedure inadequate. They based their approach on Lykken's (1957) finding that criminal psychopaths learn correct choices of a maze as well as nonpsychopaths, but do not learn to avoid incorrect choices leading to electric shock as well as nonpsychopaths. In their study, Hetherington and Klinger took the position that psychopaths are lacking in specific responsiveness to punishment. Hence, psychopaths should not differ from nonpsychopaths when verbal praise is

used, but should be relatively insensitive when verbal punishment is used. In a serial nonsense syllable learning task, they compared the performance of college students scoring low on the MMPI Pd Scale with the performance of students scoring high on the Pd Scale. When the subjects were belittled and ridiculed, the performance of the low Pd subjects was significantly retarded as compared with the high Pd subjects. No differences, however, were found when their performance was praised. The authors interpret their results as supporting the hypothesis that psychopathy is reflected in specific responsiveness to punishment, rather than in responsiveness to general verbal reinforcement. The negative affect aroused by ridicule served to depress the performance of the low Pd subjects. Ridicule produced insufficient affect in the high Pd subjects to depress their performance. Praise appeared to have the same effect on both groups. The authors' conclusion looses force, however, because when the performance of the high Pd and low Pd groups is compared in the neutral condition (no comments by the experimenter) no differences were found. Thus, the neutral condition had the same effect on both groups as the praise condition, rendering ambiguous the results of the praise condition.

In the present study an attempt was made to evaluate further the effects of positive and negative verbal reinforcers on the behavior of psychopaths under two conditions of task difficulty.

Statement of the Problem

The present study was designed to investigate Cleckley's view that the psychopath is lacking in ability to respond appropriately to the affective properties of verbal communication. Groups of criminal psychopaths and criminal nonpsychopaths were compared on a verbal discrimination task under conditions of mild positive verbal reinforcement and mild negative verbal reinforcement.

According to Cleckley's view, psychopaths should be less responsive to both positive and negative verbal reinforcement than nonpsychopaths. Thus, in a verbal discrimination task in which Ss are informed as to the correctness or incorrectness of their responses by means of positive or negative verbal reinforcements, psychopaths should acquire them less rapidly than nonpsychopaths.

In addition, the variable of task difficulty was introduced because no studies have been found investigating its effects on the response acquisition of psychopaths. Task difficulty also permitted a broader evaluation of Cleckley's hypothesis.

Specifically involved was the comparison between psychopathic prison inmates, and a comparison group of nonpsychopathic inmates in their acquisition of the critical responses on a verbal discrimination task under the following conditions:

1. Positive reinforcement - E says, "Right," for correct responses, but nothing (blank) for incorrect responses.
2. Negative reinforcement - E says, "Wrong," for incorrect responses, but nothing (blank) for correct responses.
3. Both positive and negative reinforcement were examined using an easy task.
4. Both positive and negative reinforcement were examined using a difficult task.

Predictions

In the following set of predictions, acquisition refers to the number of correct responses, and the rate at which they are acquired over successive blocks of trials.

1. Acquisition of correct responses by the comparison groups should be superior to acquisition by the Pd groups.

This prediction is based on Cleckley's view that the distinguishing characteristic of the psychopath is his inability to respond appropriately to the affective components of experience (Cleckley, 1955; 1959), and that this characteristic can be demonstrated in situations in which social stimuli are used. Thus, psychopaths should be less responsive to overt verbal reinforcers than nonpsychopaths (Johns and Quay, 1962; Quay and Hunt, 1956). Preliminary studies by the present investigator supported the prediction as stated.

2. Acquisition of correct response in the Wrong-blank conditions should be superior to acquisition in the Right-blank conditions.

This prediction is consistent with the results of previous investigations showing the Wrong-blank results in consistently superior performance to Right-blank on tasks involving concept identification, verbal discrimination, and verbal conditioning (Buss and Buss, 1956; Buss, Barden, and Orgel, 1956; Buchwald, 1959; Lydecker, Pishkin, and Martin, 1961; Pushkin, 1963; Spence, 1964; Spence, Lair, and Goodstein, 1963). Pilot studies by the present investigator supported this prediction.

3. Acquisition of correct responses on the Easy task should be superior to acquisition on the Difficult task.

This prediction is based on the study by Marston, Kanfer, and McBrearty (1962), who showed that as the degree of association value discrepancy between pairs of CVC trigrams increased, the easier it was for Ss to discriminate between the critical and non-critical trigrams. Conversely, the greater the similarity between trigrams, the more difficult was the discrimination. Pilot studies by the author supported this prediction.

4. In the Right-blank condition, acquisition of correct responses by the Comparison groups should be superior to acquisition by the Pd groups.

Consistent with Prediction #1, Prediction #4 is based on Cleckley's view that the psychopath is less responsive to the affective content of verbal communication, and hence should be deficient in acquiring responses based upon affective content. (Cleckley, 1955; 1959). Preliminary studies by the author supported this prediction.

5. In the Wrong-blank condition, acquisition of correct responses by the Comparison groups should be superior to acquisition by the Pd groups.

The rationale for this predictions is the same as for Prediction #4. The theoretical basis for the present study makes no distinction between the effects of different kinds of verbal reinforcers, and therefore, no interactions between Pd-Comparison and Reinforcement were predicted. Preliminary studies by the present investigator left the issue in doubt.

6. On the Easy task, acquisition of correct responses by the Comparison groups should be superior to acquisition by the Pd groups.

Consistent with Predictions #1 and #4, Prediction #6 is also based on Cleckley's hypothesis that the psychopath lacks responsiveness to the affective components of words and phrases (Cleckley, 1955; 1959). Hence, response acquisition based upon affective content should be deficient in the psychopath. Pilot studies by the present author supported this prediction.

7. On the Difficult task, acquisition of correct responses by the Comparison groups should be superior to acquisition by the Pd groups.

The rationale for this prediction is the same as for Prediction #6. The theoretical basis for the present study makes no distinction between the effects of different levels of task difficulty, and therefore, no interactions between Pd-Comparison and task difficulty were predicted. Preliminary studies by the present investigator left the issue in doubt.

8. In the Right-blank condition, acquisition of correct responses on the Easy task should be superior to acquisition on the Difficult task.

The rationale for this prediction is the same as for Prediction #3. The greater the discrepancy between pairs of CVC trigrams, the easier it is to discriminate between the critical and non-critical trigrams (Marston, Kanfer, and McBrearty, 1962). Preliminary studies by the author supported this prediction.

9. In the Wrong-blank condition, acquisition of correct responses on the Easy task should be superior to acquisition on the Difficult task.

This prediction is consistent with Prediction #8, that increasing the association value discrepancy between CVC trigrams results in easier discrimination (Marston, Kanfer, and

McBrearty, 1962). Present theory makes no predictions concerning interactions between Difficulty and Reinforcement. Pilot studies by the present investigator supported this prediction.

Chapter 2

Survey of Related Literature

Introduction

In the 138 years since Pinel, many workers have researched and speculated on the basic characteristics of psychopathic behavior and its causes. In the following review, the highlights of some of this thinking is presented. At the outset, it should be emphasized that a great deal of confusion has existed in attempts to develop systematic theories, and in attempts to carry out meaningful research. Perhaps the greatest reason for confusion has been the lack of explicit diagnostic categories, and the fog of classification schemes. For a long time psychopathy included a bewildering array of anxiety reactions, obsessive-compulsives, hysterics and other neurotics, unstable personalities, alcoholics, sexual deviants, liars, swindlers, and even psychotics, or anyone found to have committed a criminal act. From a diagnostic point of view, many studies have used clinical judgments of psychiatrists, psychologists, and social workers to classify individuals. Others have used histories of aggressiveness and anti-social behavior; and still others have used psychometric criteria.

Thus, the conclusions reached by many, if not most, of the writers and researchers included in this review, must be tempered with the realization that many of the groups studied were incomparable with respect to the kinds of disorders included. Indeed, some writers have ignored the confusion by rejecting entirely the concept of psychopathy, saying that it refers to no specific behavioral entity at all, but is merely a waste-basket into which is relegated all unclassified personality disorders (Hunt, 1944). Despite the lack of diagnostic agreement, Cleckley has optimistically stated:

> At a meeting of the American Psychiatric Association, or at a staff conference at a state hospital, if a physician expresses an opinion about a psychopath, it is clearly, and at once, understood that he is not speaking of a cyclothymic or schizoid personality or of ordinary homosexuality, but of the grave character and behavior disorder so familiar to most psychiatrists as a distinct and easily recognized entity. What can be correctly said about a psychopath in this sense has little or no relevance to most of the other conditions lumped willy-nilly together under the general category personality disorders (p. 568).

In this chapter, some of the diverse viewpoints of psychopathy will be examined under the broad headings of hereditary-constitutional approaches, physiological approaches, psychosocial approaches, and learning and psychopathy. A summary of the literature on verbal reinforcement and verbal discrimination is also included.

Hereditary and Constitutional Approaches to Psychopathy

The earliest theoretical approach to the concept of psychopathy was concerned with hereditary and constitutional factors. This approach implies that psychopathy is the result of a constitutional pre-disposition or genetic defect. Pritchard (1835), for example, believed that the psychopath suffered from a defect of moral sense due to heredity. This inborn defect of moral sense was referred to as "moral insanity." Naecke, in 1906, suggested that the term "moral insanity" be replaced with the term "moral idiocy," because he felt the symptoms and behavior of the psychopath were not aberrant in themselves, but reflected a dissociation between moral and intellectual faculties (Maughs, 1941). Kraepelin also believed in the concept of moral insanity, and differentiated seven types: excitable, unstable, eccentric, anti-social, quarrelous, liars, and suicidal (McCord and McCord, 1964). Steen (1913) suggested that not all psychopathic behavior could be attributed to hereditary defect. For him, moral insanity was acquired, possibly through learning. Other psychopaths suffered from a congenital form of the disorder called "moral defect." Moral defect was supposedly due to the absence of the moral center in the brain. Tredgold (1917) suggested that moral imbecility was of two types, Primary, a congenital defect in the ability to develop a

moral sense; and Secondary, a lack of moral sense due to poor training.

What may have been the first systematic empirical study of the psychopath was conducted by Bernard Glueck (1918). He maintained that psychopathy was the result of the interaction between heredity and environment. He studied 608 inmates of Sing Sing Prison. Of these, he concluded that 19 percent were psychopathic. He found that this group had the earliest and longest history of delinquency, drug use, and drunkenness, and the highest rate of recidivism. Over 75 percent had serious behavior problems in school, 85 percent showed psychopathic symptoms at an early age, and employment records were poor. Glueck interpreted his results as supporting the hereditary-environment interaction hypothesis.

The major importance of Glueck's work was the stimulation it provided for other investigators to undertake systematic research on psychopathy. Sandoz (1919), for example, conducted the first study of psychopathic women. She concluded that their behavior was much the same as men, and attributed it to bad heredity.

Karpman (1946) limited psychopathy to behavior that was the result of hereditary dysfunction. He excluded individuals whose psychopathic-like behavior was the result of psychogenic causes. Such "symptomatic" types,

as Karpman called them, were basically neurotic personalities, and their behavior was symptomatic of neurotic conflicts and anxieties. The true, or "idiopathic" psychopath was unafflicted with neurotic conflicts. His behavior does not reflect a neurotic disorder, but is basically the result of deficiencies in constitution.

Henderson (1939) also attributed psychopathic behavior to an interaction between heredity and environment. He noted the similarity between much of the behavior of epileptics and psychopaths, but noted that psychopaths are asocial and lacking in feelings of guilt. He also suggested that a psychopathic character underlay some psychotic disorders. In addition, Henderson hypothesized an association between psychopathy and creativity and genius, and used Lawrence of Arabia as his prime example.

In spite of the problems that arise in testing the hereditary hypothesis, several investigators have attempted to do so. Partridge (1928) studied the lineage of 50 psychopathic personalities and found that approximately 50 percent had psychopathic traits in their family backgrounds. He concluded that this was rather strong support for the heredity hypothesis. Other investigators came to the same conclusion (Gottlieb, Ashley and Knott, 1946). Newkirk (1957) went so far as to say that psychopathy is definitely inheritable. Examination of these studies, however, suggests that the evidence is by no means so strong

as to permit a definite conclusion that psychopathic behavior is the result of heredity. None of the studies was able to disentangle the effects of heredity and environment, and the criteria used to define psychopathy were very loose, and lacked consistency from one study to the next.

Other investigators attacked the heredity-environment problem through the study of siblings and twins. Kallman (1939) found that nonpsychopathic parents had fewer children who turned out to be psychopathic themselves, than psychopathic parents. He attributed this to deterioration in the family following, in many cases, institutionalization of one or both parents. Kallman's study strongly suggests the importance of the home environment in contributing to psychopathic behavior. Lange (1930) attempted to show the dominance of heredity by studying monozygous (MZ) and dizygous (DZ) twins. He reported that 77 percent of the MZ twins were concordant for criminal histories, whereas only 12 percent of the DZ twins were concordant. Rosanoff (1943) found 86 percent concordance for juvenile records in MZ twins, and 75 percent concordance in DZ twins. In the Lange study, the criteria for selecting MZ and DZ twins were somewhat dubious. He used photographs and fingerprints. Rosanoff does not state his criteria. In both studies, some of the twins were raised together, and some apart. The criminal records of those raised apart were less similar

than those ra ;ed together. As a result, the effects of environment could not be adequately assessed.

Slater (Wheelan, 1951) made a detailed study of nine pairs of neurotic and psychopathic twins. Only two pair had similar personality traits. Slater concluded that psychopathic behavior may have some genetic basis, but that accident and personality factors play the dominant role. Even though the personalities of the twins were similar, the range of behavior was so wide as to suggest that while both of a pair might become larcenous, one could turn to crime, and the other could operate just within legal limits. The specific psychopathic symptoms, according to Slater, are precipitated by environmental factors.

Despite the obvious need for a meaningful theoretical approach that would be amenable to testing, some investigators suggested hypotheses that were purely speculative, and even approached the mystical. McDougall (1929) postulated that the cortex excercises control over the lower more primitive levels of the brain. The extraverted personality has an excess of a mysterious "antidotal" substance which acts on the nervous system to counteract the controlling mechanism of the cortex. While there is strong evidence that the cortex does excercise control over lower brain centers (Morgan and Stellar, 1950), no antidotal

substance has been found. While McDougall does not mention psychopathy specifically, it is well-known that the behavior of the psychopath is very similar to that of the extravert. Eysenck (1961) maintains that the psychopath is basically an extraverted individual.

Kahn (1931) hypothesized that some mysterious "Anlagen" which corresponds to the different leptosomatic body builds, was the causative factor in psychopathy.

Theorists of the "constitutional school" propose a relationship between physique and character which suggests for them that certain body types are associated with criminality. While they are concerned with criminals in general, rather than psychopaths in particular, the thinking of the constitutionalists appears relevant to the problems of psychopathic behavior.

An early formulation of a relationship between body build and criminality was presented by Lombroso, who maintained that born criminals show both physical and mental abnormalities which are partly due to atavisms. He considered the criminal a special type midway between the lunatic and the savage. He later added degeneracy and epilepsy as supplementary explanations.

Goring (1913) made a careful study of criminals in an effort to verify Lombroso's hypothesis. He found no evidence of a criminal type as suggested by Lombroso. Hooten (1939)

used anthropormorphic techniques (height, weight, size of head, etc.) to study criminal and noncriminal populations, and concluded the criminal displays a definite biological inferiority which predisposes him to crime, especially if he is in a poor social environment.

German criminologists in the 1920's following Kretschmer's typology, claimed that serious criminals tended to have an asthenic (light) body build and schizothymic characters (fluctuating between sensitiveness and coolness, and between stability and instability).

Sheldon (1949) used case histories of vagrant young men in Boston and concluded that the endo-mesomorph somatotype (heavy and muscular body build) tended to be associated with criminality.

Largely because of the contradictory findings of the constitutional school, it has had little influence in the field of criminology. One well-known study, however, should be mentioned. Glueck and Glueck (1930) made a detailed study of the differences in physique between 500 delinquent and non-delinquent adolescents. They found that the delinquents were essentially mesomorphic (solidly built and muscular). Temperamentally they were impulsive, hostile, aggressive, and defiant, poor learners, and products of poor social environments. The authors, however, did not view physique as being a dominant cause of delinquency, but as one factor that influences behavior.

As can be seen, the theories, hypothesis, and speculations concerning hereditary and constitutional factors in psychopathy have a long history. Furthermore, there is much disagreement among them. Research in an effort to resolve some of the disagreement has likewise resulted in contradictory findings. It appears that while hereditary and constitutional factors cannot be ruled out, the state of the present research methods and techniques do not yet permit an unambiguous evaluation of genetic and constitutional effects.

Physiological Approaches

One of the main approaches to the study of psychopathy has been an attempt to link psychopathic behavior with abnormalities of central nervous system functioning.

It has long been known that injuries to the brain sometime result in anti-social and psychopathic-like behavior. Ostrow and Ostrow (1946) discuss the cases of several individuals with good behavioral backgrounds and records as model citizens. After sustaining head injuries, their lives became an almost continuous series of delinquencies. Henderson (1939) describes similar cases. Prefrontal lobotomies in some patients have been known to result in impulsiveness, aggressiveness, and disappearance of social controls (Freeman and Watts, 1945). Other investigators have noted that some victims of encephalitis and epilepsy lose their social controls, and become aggressive, uninhibited people (Henderson,

1939). Stimulated by such findings, G. N. Thompson became convinced that psychopathy can always be related to brain damage. (Thompson, 1953).

Other investigators, encouraged by electroencephalographic findings of a high incidence of abnormal brain waves among brain damaged individuals, suggested that if abnormal tracings were found in the psychopath, this would be a strong indication that he was suffering from brain damage.

One of the most well-known and well-controlled studies of the relationship between electroencephalographic tracings and psychopathy was carried out by Ostrow and Ostrow (1946). They studied 440 federal prisoners. Only those who were impulsive, aggressive, uninhibited, and unable to accept social controls were labeled psychopathic. The authors compared the electroencephalographic tracings of these prisoners with those diagnosed as homosexuals, epileptics, and schizophrenics. They also used another group of conscientious objectors. Interestingly, the psychopaths showed the lowest percentage of abnormal patterns (50 percent). In increasing order of abnormalities were the homosexuals (56 percent), conscientious objectors (65 percent), schizophrenics (80 percent), and epileptics (98 percent). The conclusion drawn from this study was that psychopaths show a high incidence of abnormal electroencephalographic patterning, but that the type of abnormal behavior cannot be diagnosed from the patterning.

Silverman (1944), using extreme anti-social behavior as his criterion, studied 75 psychopathic prisoners in a federal penitentiary and found that 53 percent had abnormal electroencephalographic tracings. Hill and Watterson (1942) found abnormal brain waves in 65 percent of aggressive psychopaths, and 48 percent of a total of 151 psychopaths. Knott and Gottlieb (1943) found that 52 percent of their psychopathic patients had abnormal electroencephalographic tracings as compared with 10 percent for normals, and 27 percent for pstchoneurotics.

Findings similar to the above have been reported by other investigators. (Ehrlich and Keogh, 1956; Heppenstall, Hill, and Slater, 1945; Hodge, 1945; Hill, 1952; Pond, Bey, and Hill, 1950; Rioch, 1952; Sessions-Hodges, 1945; Simon, O'Leary, and Ryan, 1946; Stafford-Clark, and Taylor, 1950; Williams, 1941). In the opinion of Hill (1945) abnormal wave patterns are closely associated with pathological aggressive behavior. He suggests that the similarity between the wave forms of young children and aggressive psychopaths leads one to conclude that there was a failure in the development of the central nervous system in the psychopath.

Ellingston (1956) published a comprehensive review of the literature, and concluded that research has regularly shown that 47 to 58 percent of psychopaths show abnormal

electroencephalographic tracings. He notes that other mental disorders also show a higher electroencephalographic abnormality than would be expected in the general population. Though psychopathic and other disorders have yet to be differentiated by means of electroencephalographic tracings, there is a strong suggestion that abnormal brain functioning is associated with many, but not all psychopaths.

Other investigators have attempted to link psychopathy with epilepsy. Stafford-Clark, Pound, and Doust (1951), for example, found that 46 percent of the psychopathic prisoners studied by them had a history of epilepsy or head injury. Silverman (1944) found that psychopaths responded favorably to the drug, Dilantin. Leonardo (1947) concluded that psychopathy was a subclinical variety of epilepsy, i.e., epilepsy and psychopathy were two forms of the same disorder.

Still other researchers have suggested that psychopathy may be related to the damage of the hypothalamus (Henderson, 1939; Sessions-Hodges, 1945). This suggestion is based partly on the well known sham-rage experiments. Fulton and Ingraham (1929) showed that insult to the hypothalamus of healthy and friendly cats immediately produced violent, impulsive, and assaultive behavior. East (1945) reported that the removal of the entire hypothalamus of dogs produced a state of chronic anger. Alpers (1944), after close examination

of cases with verified hypothalamic damage, concluded that the patients showed a marked increase in aggressive and anti-social behavior, and marked loss of insight.

Studies of the psychopath's peripheral physiological mechanisms have occupied the time of several researchers. Lindner (1943) studied the galvanic skin responses of psychopathic criminals before, during, and after the application of electric shock. Shortly before and during shock, the magnitude of GSR was less for the psychopathic group than for the nonpsychopathic group. Yet, the psychopaths recovered more rapidly than the nonpsychopaths. Lindner interpreted his results as indicating that the psychopath is more alert and sensitive to changes in his environment than the nonpsychopath. Schachter and Latane (1964) studied the physiological responsiveness (measured by pulse rate) of psychopathic and nonpsychopathic criminals when injected with adrenalin. No differences in pre-injection pulse rate were found. After injection, however, the psychopathic group had a significantly higher pulse rate than the nonpsychopathic group. The authors interpret their results similarly to Lindner, that the psychopath is more responsive to practically every event that occurs around him, whether it is only mildly provoking or dangerously threatening. The physiological state that is considered "emotional" for the normal individual, is, for the psychopath, his normal state. Hence, it is presumed that for an

event to be perceived as emotional for the psychopath, it would have to be considerably more intense than it would for a nonpsychopath. Additional support for this view comes from a study by Ruilmann and Gulo (1950) who found that psychopaths exhibited significantly smaller GSRs and more rapid recovery than medical students in both neutral and emotion inducing situations. Relevant to these findings, Quay (1965) hypothesizes that the psychopath has an inordinate need for increases or changes in sensory input, either because his basal reactivity to stimulation is lower than normal, or because his adaptation to stimulation is more rapid than normal. Either of these conditions is unpleasant for the psychopath so that he is motivated to search for added or variable stimulation. The need for additional stimulation may make the psychopath more prone to anti-social behavior.

Hare (1965a) used the MMPI Pd Scale to separate subjects into high and low psychopathic groups. He found that under conditions of shock anticipation the skin conductance of low Pd subjects increased significantly more as the time for shock approached than the high Pd subjects. Hare (1965b) replicated these results, and hypothesized that psychopaths are unable to generate as much fear in anticipation of punishment as are nonpsychopaths. He further suggests that the psychopath's repeated failure to inhibit anti-social responses even when he is punished is a function of his lack of fear of

anticipated punishment. These studies suggest that the psychopath may be deficient in conditioning situations in which electric shock or some other fear-producing stimulus is used as an unconditioned stimulus. Studies of conditioning in the psychopath will be reviewed in the section on learning by the psychopath.

Psychosocial Approaches to Psychopathy

Writers in psychoanalysis and social psychology have, for a long time, emphasized the importance of early childhood experiences in the formation of the adult personality. In the last several decades a number of writers have increasingly applied the concepts of dynamic psychology and dynamic sociology to the problem of psychopathy. Only the major contributions from these areas will be considered here.

The psychoanalytic approach has sought to understand the psychopath as an individual who, for some reason, has a serious failure in the development of the ego and superego (Munro, 1955). The parental image which represents the ideals and morals of society, have not been adequately introjected so as to form the conscience, but remain on the outside as an external force. As a result, relationships with other people are usually poor and infantile, and instinctual drives are very close to the surface. Explanations of faulty ego and superego development center largely around interference with the process of early identification with parents or parent-substitutes.

Partridge (1928), for example, studied 50 reform school psychopathic delinquents and concluded they all had been rejected in childhood by their parents, hated them, and were thus unable to identify with them. Partridge also painted a picture of the psychopath as being restless and sensitive, having difficult social adjustment, and having an aggressive attitude toward their parents.

Alexander (1930) viewed the psychopath as being an essentially neurotic character who had strong ego-alien tendencies. The major symptom was hatred for the father and conflict with him.

Wittels (193[illegible]) proposed that the psychopath is fixated at the primary genital stage of development. At this stage sex has not yet become differentiated. Since the psychopath has not progressed beyond that point, there is no castration fear or oedipal conflict. Szurek (1942) suggested that if there was any rejection at all in the childhood of the psychopath, it was by the father. Mothers were overprotective and actually gave unconscious approval to the child's deviant behavior.

Lindner (1944; 1947) based his views on the hypnoanalysis of eight criminals, all of whom had been harshly treated by their fathers. He concluded that the psychopath had an under-developed superego because of a failure to introject the father image and the mores of society. The child has castration fears and hate toward the father,

which is generalized to society. The author says the psychopath knows the difference between right and wrong, but cannot feel the difference.

Halleck (1967) regards psychopathy as a "search for a painless freedom from object relations" (p. 103), which is the result of depriving or rejecting parents. The psychopath is constantly trying to rid himself of the normal ties of affection, dependency, and love for he sees such ties as leading only to intolerable feelings of helplessness. The only safe way to relate to others is by not needing them.

Many researches have been reported attempting to give support to the rejection hypothesis. As with most studies on psychopathy, these also are subject to the general criticism of inexact or faulty diagnosis and classification, so that individuals properly belonging in other categories were included among psychopaths.

One of the well known studies was performed by Jenkins and Hewlett (1944), who studied fifty psychopathic children receiving services from a child guidance center. He found that the psychopathic children were raised in a home atmosphere of almost constant conflict. They were generally unwanted by parents who subjected them to physical and psychological abuse. Other studies supporting the rejection hypothesis are Jenkins (1960); and Sears, Macoby, and Levin (1956), Lewis (1954); and Bender (1947). All conclude that rejection

of one sort or another contributes to the psychopathic personality structure.

Cleckley (1959), however, has taken issue with this conclusion stating that he has rarely seen in his cases a specific error in parent-child relationships that would lead to psychopathy. He goes on to note that he is more and more impressed with the difficulty of obtaining reliable information of events that occurred twenty or thirty years ago.

McCord and McCord (1964) admit the soundness of Cleckley's criticism, but present additional evidence gathered by them in a longitudinal study over twenty-six years beginning in childhood before the onset of delinquency. Again, support of the rejection hypothesis was obtained. The authors found the psychopathic character developed from a background of cruelty, parental conflict, neglect, and inconsistent punishment. Bandura and Walters (1959) again found parental neglect and childhood frustration as a factor in unsocialized aggressive behavior.

In practically all studies of the relationship between psychopathy and parent-child relationship, not all psychopaths were found to be the product of a rejecting home. Furthermore, not all individuals who were rejected became psychopaths. Burguem (1940), for example, studied twenty-five children who were well-adjusted and showed independent traits. They appeared to have a positive rather than a

negative reaction to rejection. The author suggests that the positive reaction might be attributed to high intellectual levels, and positive parental reinforcement of independence. The finding that not all rejected children become psychopathic, and not all psychopaths suffered childhood rejection may be due, in part, to faulty diagnosis and classification. More likely, however, factors other than rejection play an important role in psychopathic behavior. The possible role of hereditary and neurological factors has already been reviewed. The possible role of learning will be reviewed in the next section. Before turning to learning, however, the possible contributions of social and cultural environments will be examined.

Several studies demonstrate the role of social and cultural upheavals in contributing to anti-social, aggressive, and psychopathic behavior. Pritchard and Rosenzweig (1942) studied the effects of war-stress upon children in London. They found that the children reacted to the bombings with thievery, aggression, and generally disruptive behavior. Freud and Burlingham (1944) found that social crisis created by separation of children from their parents resulted in under-developed consciences and anti-socially aggressive behavior.

Social class may also play a role in delinquent and psychopathic behavior. Though not focusing specifically

on the psychopath, studies of social class may prove instructive. Hollingshead and Redlick (1958), for example, found more anti-social behavior among lower classes than among higher classes. They propose that it may be due to greater rejection of children (particularly maternal rejection) in the lower classes because of economic strain, poor learning, and general family disorganization. Sears, Macoby, and Levin (1956) also found a greater incidence of rejection in the lower class homes, than higher class homes.

Whiting and Childs (1953) studied child-rearing patterns in different cultures, and found that children who were punished by withdrawal of love developed strong feelings of guilt, while those who were subjected to physical punishment did not develop feelings of guilt.

Dubois (1944) studied child-rearing practices in the Alorese culture. Children in this culture are frequently left in the care of older siblings and as a result are often neglected. The parents usually ignore their children, or treat them with cruelty so that their biological needs are frustrated over long periods of time. The results are generally hostile behavior, and shallow emotional relationships with others.

McCord and McCord (1964) have attempted to integrate the diverse findings of hereditary, physiological, and psycho-social approaches to psychopathy. They suggest that

the most important factors in psychopathic behavior are to be found in childhood family relationships. Specifically, they view childhood rejection as most significant. Though the hereditary approach has yet to show a relationship between congenital defects and psychopathy, the authors do not rule out the possibility of hereditary taint.

McCord and McCord suggest three causal patterns. Severe rejection alone can cause psychopathy. Mild rejection with brain damage can cause psychopathy. Mild rejection without brain damage can cause psychopathy provided the environmental influences are conducive to it. It is apparent, however, that McCord and McCord have attempted to "cover all bets." If severe rejection is established, one need look no farther. If no rejection or only mild rejection can be established, then the important factors must be brain damage or "certain other influences in the environment." (McCord and McCord, 1964, p. 85). Failing the establishment of neurological damage, then environmental factors must be at fault. Unfortunately, what these other environmental factors might be are not clearly stated.

Learning and Psychopathic Behavior

Much of the interest in psychopathic behavior has centered around the frequent clinical observation that the psychopath appears unable to profit from experience, particularly of the punishing kind. Initially, this led

CONTINUED

1 OF 4

some observers to postulate that the psychopath suffers from a learning defect, or could not be motivated to learn (Henderson, 1939; Karpman, 1946). A review of experiments on learning in psychopaths, however, suggests that while the psychopath does not have a general learning deficiency, he may have a deficiency in certain circumstances, particularly those involving avoidance learning, and learning involving generalized social reinforcers. Tong and Murphy (1960) have pointed out that the psychopath is as well able to learn the rules of society (as evidenced by his easy verbalization of them) as is the nonpsychopath. His difficulty lies in not applying some of the rules to his conduct.

Gurvitz (1947) used the Wechsler-Bellevue Scale and the Revised Beta Examination to compare the intelligence of 851 psychopathic federal prisoners with 3649 nonpsychopathic prisoners. At all levels of intelligence from feebleminded to very superior no significant differences were found between the two groups, indicating that the distribution of intelligence among the psychopaths approximated that of nonpsychopaths. Kingsley (1960) also used the Wechsler-Bellevue Scale when he compared the verbal and performance IQs of psychopathic and nonpsychopathic military offenders. No differences were found between the groups. Thus, psychopaths appear able to acquire as much information about their environment as nonpsychopaths.

Also suggestive of the psychopath's ability to learn as well as nonpsychopaths is Sherman's (1954) finding that criminal psychopaths have superior memories as compared with criminal normals and criminal neurotics. The author used meaningful and nonsense verbal materials in a retroactive inhibition design. Psychopathic criminals evidenced significantly less retroactive inhibition than either the normal or neurotic criminals with both kinds of material. The author concludes that his results are compatible with the Spence (1952) hypothesis that a high degree of anxiety interferes with complex cognitive functions. Hence, increased anxiety should have a deleterious effect on retention, and reduced anxiety a beneficial effect. Since psychopaths are presumably much lower in anxiety than nonpsychopaths, their memories should be better.

Fairweather (1954) compared 90 psychopathic, psychoneurotic, and normal prisoners on a serial nonsense syllable learning task. Using cigarettes as a reward, he found that uncertainty of incentive (cigarettes were given to the subject only when he reached a criterion of learning which was unknown to him) resulted in best learning in all three groups. Non of the groups differed significantly from each other. Normative incentive (cigarettes were given to all subjects regardless of their performance) produced poorer learning, but again the groups did not differ significantly. No incentive produced the worst learning. When, however, the

three groups were compared without regard for the incentive condition, the normal group was far superior to either the psychopaths or psychoneurotics, who did not differ from one another. These results only partially support the notion that psychopaths learn as well as nonpsychopaths.

Painting (1961) compared psychopathic post-narcotic drug addicts with neurotics and college students, which he differentiated with the Welsh IR ration of the MMPI. Subjects were required to predict which of two stimuli was correct under conditions of varying predictability. Subjects were given an initial number of cigarettes. Correct responses were rewarded by the addition of cigarettes, and errors were punished by the loss of cigarettes. The performance of the psychopaths was superior to the other two groups when correct responses depended on the immediate previous reinforcement. When remote previous reinforcement had to be taken into account, however, the performance of the psychopaths was inferior. Behavior under conditions of avoidance was less adaptive in the psychopathic group, and appear to reflect the psychopath's insensitivity to punishment.

Kadlub (1956) tested Cleckley's (1955; 1959) hypothesis that the psychopath is unable to react appropriately to the affective content of words and sentences. He suggested that the psychopath does not react with the appropriate

secondary motivation ordinarily mediated in normals by implicit and explicit use of words and phrases. Kadlub compared the rote serial learning of nonsense syllables by psychopathic and normal criminals under conditions of verbal and concrete reward (cigarettes). In both conditions the groups did not differ significantly. The author concluded that psychopaths respond to verbal reinforcement in the same manner as normal people.

Johns and Quay (1962) interpreted Cleckley's formulation in a similar fashion. They also proposed that psychopathy represents a decrement in response to secondary reinforcements of a social nature. The authors suggest that Kadlub's results could be accounted for in terms of self-administration of rewards. Thus, the performance of Kadlub's subjects may have been independent of verbal rewards, since the rewards were given regardless of the correctness of incorrectness of the responses. The subjects knew whether their responses were correct or not, so could have administered rewards to themselves for being correct. Johns and Quay used a verbal conditioning procedure in order to enable the administration of rewards only to correct responses. Using psychopathic and neurotic military offenders, the authors found a significantly greater increase in the selection of correct responses for the neurotic group than for the psychopathic group. They concluded that these results supported Cleckley's conception

of the psychopath. These results were replicated by Quay and Hunt (1965). In this study the Maudsley Introversion-Extraversion scale was also used. The correlation between introversion-extraversion and performance in verbal conditioning was negative and barely significant.

In both the Johns and Quay, and Quay and Hunt studies, the authors suggest that the poorer performance of the psychopaths could be accounted for by the Spence-Taylor hypothesis (Taylor, 1951). According to this hypothesis, individuals low in anxiety should condition less rapidly than individuals high in anxiety. Thus, since psychopaths are presumably less anxious than nonpsychopaths, they should condition less rapidly. Some support for this hypothesis comes from a study by Taffel (1955). He used the Taylor Manifest Anxiety Scale to divide psychiatric patients into high and low anxious groups. In a Taffel verbal conditioning procedure, the high MAS groups had a significantly greater frequency of I and We responses than the low MAS groups.

Bryan and Kapche (1967) attempted to replicate the results of Johns and Quay and Quay and Hunt using military offenders and the same selection criteria. They found no differences between the psychopathic and nonpsychopathic groups.

In another study, Bernard and Eisenman (1967) again attempted to demonstrate a difference in verbal conditioning

between psychopaths and nonpsychopaths. They found a difference, but it was in the opposite direction. They divided female prison inmates into psychopathic and nonpsychopathic groups using the so-called 4-9 or 9-4 profile on the MMPI. In a Taffel verbal conditioning situation using verbal reinforcement (Good), and monetary reward (nickels, which the subjects were not allowed to keep at the end of the experiment), the psychopathic groups responded significantly more often with the reinforced pronoun, I, than the nonpsychopaths in both the verbal and monetary reward conditions. The authors make the important point that how a psychopath responds in a situation, be it social or non-social, may depend heavily on the specific characteristics of the situation.

Hetherington and Klinger (1964) took issue with Johns and Quay's view that the psychopath is less responsive to generalized social reinforcers than the nonpsychopaths. Basing their view on studies showing poor fear conditionability (reviewed below), Hetherington and Klinger suggest that psychopathy be viewed as a specific dimension of fear arousal and fear conditionability. If this is so, then punishment should interfere less in learning by psychopaths than nonpsychopaths. Furthermore, psychopaths should not differ from nonpsychopaths when verbal reward is used. The authors used groups of college students scoring high and low on the Pd scale of the MMPI. Subjects were required to learn a list of nonsense syllables under conditions

of verbal rewards (praise from the experimenter), verbal punishment (ridicule from the experimenter), and a neutral condition (no comments by the experimenter). In the punishment condition the psychopathic group learned the syllables in significantly fewer trials than the nonpsychopathic group. In the reward condition, both groups did equally well, as did both groups in the neutral condition. The authors concluded that their results directly support the poor fear conditionability hypothesis. Since, however, no significant differences between the reward and neutral conditions were found, Johns and Quay's hypothesis was not contradicted, and the issue remains in doubt.

Lykken (1957) expressed Cleckley's (1955) view of psychopathy in terms of poor anxiety arousal and suggested that fear could not be conditioned as easily in psychopaths as in nonpsychopaths, that psychopaths show little anxiety in social situations which normally produce anxiety, and that psychopaths should perform less well in an avoidance learning task than nonpsychopaths. Lykken used three groups of subjects, psychopathic criminals based upon psychiatric diagnosis according to criteria established by Cleckley (1955; 1959), neurotic criminals (those that were felt not to meet the criteria of psychopathy), and normals selected from college and high school populations. Using the GSR the author found that the normal group

conditioned significantly better to a buzzer with an electric shock as the unconditioned stimulus. In order to test the hypothesis that psychopaths have less social anxiety than nonpsychopaths, Lykken developed a social anxiety questionnaire. The psychopaths showed significantly less social anxiety than the nonpsychopaths. The author also had his subjects learn a twenty unit mental maze. At each choice point, one of four alternatives was correct. Of the remaining three incorrect alternatives, one lead to electric shock. Subjects had to learn not only the correct alternatives (manifest task) but also had to learn to avoid choices leading to shock (avoidance task). Psychopaths made significantly more errors on the avoidance task than the nonpsychopaths. Schachter and Latane (1964) replicated Lykkens avoidance task, and confirmed his results.

Hare (1965) further examined the poor fear conditionability hypothesis. Using an electric shock, he found that the GSR of psychopaths conditioned less rapidly to a tone than nonpsychopaths. He also found that generalization was less for the psychopath. Hare suggested that the psychopaths repeated failure to avoid punishment was a function of his poor fear conditionability. He based his hypothesis on Mowrer's (1960) formulation of passive avoidance learning. Hare assumes that stimuli associated with response produced punishment do not elicit enough fear in the psychopath for

him to inhibit the punished responses, and these responses are often anti-social ones. Hare (1965) proposed a conflict theory of psychopathy. According to this proposal the gradient of avoidance is steeper and lower for the psychopaths than for the normal. Thus, the psychopath is less likely to generate fear responses as a feared goal or punishment situation is approached. Furthermore, cues associated with feared objects or punishment are less likely to produce fear responses in the psychopath than in the normal.

Eysenck (1961) has suggested a theory based upon the work of Pavlov, in which he proposes two hypothetical cortical processes: One, an inhibitory process, and the other an excitatory process. These processes are associated with the personality dimension of extroversion-introversion. The extrovert has an excess of the inhibitory process, while the introvert has an excess of the excitatory process. Anxiety states are found among the introverts, and hysterics and psychopaths among the extroverts. He further postulates that extroverts condition less readily than introverts. To test this notion, Warren and Grant (1955) compared students scoring high on the MMPI Pd scale, with students scoring low on the Pd scale on the rate at which they formed a conditioned eye blink discrimination. The high Pd subjects formed a discrimination significantly slower than the low Pd

subjects. Franks (1956) found that a group of extroverts (hysterics and psychopaths from psychiatric diagnosis) conditioned slower, using eye blink and GSR reflexes than a group of introverts (anxiety state and other dysthymics). Franks (1961) makes the interesting suggestion that conditionability be used as a diagnostic tool to differentiate persistent, but nonpsychopathic offenders, from persistent but psychopathic offenders. Presumably, the nonpsychopathic offenders should condition more readily than the psychopathic offenders, and should be more amenable to rehabilitative efforts. As Franks points out, however, this proposal as yet rests on rather slender evidence.

About learning in psychopaths, it can be said that they do not have a generalized learning deficit. They are able to acquire general information about their environment as well as nonpsychopaths. In serial learning (verbal and maze learning) they seem able to do as well as nonpsychopaths, though their performance may depend on the type of reinforcement used.

Verbal conditioning studies, however, suggest that psychopaths may be less motivated by positive reinforcement than nonpsychopaths. So far as can be determined, the effects of negative social reinforcement in a verbal conditioning situation have not yet been studied. Other conditioning studies present evidence that psychopaths are less conditionable than nonpsychopaths when aversive unconditioned stimuli are used.

These outcomes suggest that considerable research is needed in which a greater variety of learning situations (particularly social situations) and a greater variety of incentive conditions are investigated.

Verbal Reinforcement and Verbal Discrimination

Several investigators have focused their attention on the relative effectiveness of verbal reinforcement, using the reinforcers, Right and Wrong. The great majority of these studies have shown that the experimenter saying "Wrong" for incorrect responses, but nothing (blank) for correct responses (Wrong-blank) results in significantly greater acquisition of the reinforced response than the experimenter saying "Right" for correct responses, but nothing (blank) for incorrect responses.(Right-blank). Buss, Braden, Orgel, and Buss (1956), for example, studied concept learning in psychiatric patients. Wooden blocks were used, which differed in height, shape, color, and top area. Subjects had to learn which combination of characteristics of the blocks was correct. In one condition they were told "Right" if they chose the correct block, but nothing if they chose the incorrect block. In another condition, subjects were told "Wrong" if they chose the incorrect block, but nothing if they chose the correct block. In a third condition, subjects were told either "Right" or "Wrong," depending on their choice. Both the Wrong-blank and the Right-Wrong conditions resulted in significantly better acquisition of the correct concept

but there were no significant differences between the two conditions. Buss and Buss (1956), using the same task obtained similar results. The authors concluded that saying nothing is nonreinforcing, and that saying "Right" is a weaker positive reinforcer than saying "Wrong" is a negative reinforcer. Buchwald (1959) and Pishkin, Smith, and Lundy (1962) also found that Wrong-blank produced better acquisition than Right-blank.

Spence (1964), and Spence and Lair (1965) reported using a verbal discrimination task in which the subject had to choose the correct word of two familiar words flashed on a screen. Subjects in the Wrong-blank condition made significantly more correct choices than subjects in the Right-blank condition.

In an attempt to explain these results, Spence, Lair, and Goodstein (1963) postulated that there was less informational value attached to blank when it was combined with Right than when it was combined with Wrong. They hypothesized that the superiority of Wrong-blank should disappear when subjects are given specific information that blank in combination with Wrong meant that the correct choice was clearly correct even though the experimenter said nothing; and blank in combination with Right meant that an incorrect choice was clearly wrong even though the experimenter said nothing. Using a verbal discrimination task, the hypothesis of these investigators was confirmed.

No differences were found when subjects were given complete information about the reinforcers and about the meaning of blank. Pishkin (1963), and Lydecker, Pishkin, and Martin (1961), however, found that schizophrenics informed as to the nature of the reinforcing conditions performed significantly better in the Wrong-blank condition than in the Right-blank condition on a concept formation task.

In a further test of the informational value hypothesis, Spence (1965) had subjects perform in a Taffel verbal conditioning situation under three kinds of instructions: 1) instructions about the task with an explanation of the reinforcers; 2) instructions about the task without explaining the reinforcers; and 3) no instructions. Results showed that under all three instructional conditions, Wrong-blank was superior to Right-blank.

The results of this experiment do not replicate those obtained by Spence, Lair, and Goodstein (1963), in which no differences in performance were found between the two reinforcing conditions. The explanation appears to lie in the possibility that in a two-choice verbal discrimination situation, it is easy to grasp the idea of what constitutes a correct response. The subject does not have much difficulty in using the information provided by the instructions to recognize the correct word of two presented to him. In concept formation tasks and Taffel verbal conditioning

procedure, more than two responses are available, and the subject is preoccupied with trying to find out what makes a response correct (Spence, 1965).

In the present study, a two-choice verbal discrimination task similar to the one used by Spence (1964), Spence and Lair (1965), and Spence, Lair, and Goodstein (1963) was used. Instead, however, of having subjects discriminate between two familiar words, as was the case in the Spence procedure, subjects in this study discriminated between two consonant-vowel-consonant (CVC) trigrams. Trigrams were used because they are relatively free of the social and personal implications associated with many English words, and because they permit more precise manipulation of task variables. In the present study, the association values of the trigrams were varied so that on one task there was a high discrepancy between the values of two trigrams to be discriminated, while on the other task there was a low discrepancy. It was expected, and confirmed by pilot studies, that discrimination would be easier with high discrepancies than with low discrepancies.

This expectation was based on an investigation by Marston, Kanfer, and McBrearty (1962), who showed that the distinctiveness between two CVC trigrams was an important variable in determining the amount and rate of acquisition on a modified verbal conditioning procedure. Increasing their distinctiveness resulted in more rapid acquisition

In another study, McBrearty, Kanfer, Marston, and Evander (1962) obtained similar results with word classes. They found that response acquisition in a modified verbal conditioning procedure was significantly greater for words judged to have high belongingness in the class of animal words as compared to animal words having low belongingness. They further found that acquisition of the critical animal word was greater when they were paired with neutral words (words belonging to no class in particular) as compared with animal words paired with shape words. Presumably, there was a greater discrepancy between animal and neutral words than animal and shape words. In an earlier study, Kanfer and McBrearty (1961) varied the degree of hostile connotation of hostile words and paired them with neutral words. Subjects were reinforced for selecting the hostile words with the expectation that the greater the discriminability between hostile and neutral words, the greater should be the learning. This prediction was only partially supported.

Marston, Kanfer, and McBrearty (1962) agree with Taffel (1955) that verbal conditioning is essentially a discrimination task. It can also be readily seen that a two-choice verbal conditioning task is very similar to a two-choice verbal discrimination task. The authors interpret their results in terms of Helson's (1964) adaptation level theory. In a discrimination procedure, responses

are a function of three variables, viz. focal, contextual, and residual. In a two-choice verbal discrimination task, the critical words are the focal stimuli, the words paired with the critical words are the contextual stimuli, and the characteristics of the subjects are the residual stimuli. In the McBrearty, Kanfer, Marston, and Evander (1962) study, acquisition of the critical animal words was a function of both the focal stimuli (animal words) and the contextual stimuli (neutral and shape words). It was also found that acquisition was a function of the degree of discrepancy between the focal and contextual words. In the Marston, Kanfer, and McBrearty study (1962) of CVC trigrams, discrepancy between association values was also found to be a clearly important variable. Thus, the greater the discrepancy between association values of CVC trigrams, the easier it was for subjects to discriminate between them.

Ease of discrimination as a function of discrepancy may also be explained in terms of Hull-Spence theory. The less the competition between two response tendencies in a two choice discrimination situation, the easier is the discrimination (Woodworth and Schlosberg, 1954). The stronger of the two response tendencies will dominate the other. Thus, the greater the discrepancy between association values of trigrams, the less is the response competition between them. The higher value is assumed

to dominate because it more closely resembles words, which, in turn, have been more often relinquished, than trigrams with lower association values.

Chapter 3

Method

Selection Instruments

Selection of the criminal psychopathic groups and the criminal comparison groups was based on psychometric criteria provided by the Minnesota Multiphasic Personality Inventory, the Activity Preference Questionnaire (Lykken, 1957; 1965), and the Revised Beta Examination (1957).

Minnesota Multiphasic Personality Inventory

This instrument was chosen because the Pd scale has been used in a considerable amount of research with prison inmates. Furthermore, it is useful in eliminating those individuals with psychotic tendencies accompanied by elevated Pd scores. Originally, the Pd scale was designed to discriminate the "asocial subgroups of persons with psychopathic personality disorders. The major features of this personality pattern include a repeated and flagrant disregard for social customs and mores, and inability to profit from punishing experiences as shown in repeated difficulties of the same kind, and an emotional shallowness in relation to others" (Dahlstrom and Welsh, 1960, p. 60). Later research with criminal populations, however, has shown that while the Pd scale has considerable accuracy in discriminating individuals with persistent patterns of anti-social behavior, it does not discriminate criminal psychopaths from criminal alcoholics, drug addicts, neurotics, and the like. In almost all studies reported, the mean T score on the Pd scale

was 70 or above. The individual scores, however, did not discriminate criminal psychopaths from other criminal groups also displaying persistent patterns of anti-social behavior. The Pd scale does, however, discriminate criminals from non-criminals (Fry, 1952; Hill, Haertzen, and Davis 1962; Lawton and Kleban, 1964; Lykken, 1957; Painting, 1961; Wilcock, 1964).

Activity Preference Questionnaire

Since the Pd scale appears not to discriminate psychopathic prison inmates from other inmates whose behavior patterns are accompanied by persistent anti-social activity, a second measure, the Activity Preference Questionnaire, was used (Lykken, 1957; 1965).

> The APQ is designed to discover individual difference in the extent to which anxiety operated to determine the subject's behavior choices in everyday life. The test consisted of a number of statements describing unpleasant situations or occurrences which are commonly experienced or at least easily imagined. Some of these situations are anxiety provoking (embarassing, frightening, irritating, etc.) but lack any anxiety content. Each test item contains an anxiety alternative paired with an onerous alternative; the subject is required to choose that alternative which he would prefer as a lesser of evils if one or the other happened to him.
>
> It is assumed that the more anxiety-prone subject will tend to regard the anxiety alternative as relatively more unpleasant and is therefore more likely to choose the onerous alternative as the lesser of evils. The anxiety reactivity score is simply the total number of times a given individual endorses the onerous alternative. In the present 100-item scale 60 are scored in this fashion with the other forty being either dummy items to help conceal the nature of the test or belonging to a stage-fright subscale.

Experience has shown that the purpose of this test is not readily apparent to the subject, even though each item is essentially a replication. A class of graduate students in clinical psychology was unable to discern the purpose of the test though they were able to identify the anxiety alternative easily when informed of the rationale of the test. Thus, we believe the scale is not as transparent as many of the paper and pencil personality questionnaires and should not be as subject to the problems of response set. The forced choice format and the innocuous title also lessen these dangers. In addition, the subject is not forced to reveal intimate details about himself or to make subtle comparison of his behavior with that of others. Instead, he is asked to imagine two common experiences and to determine which seems less repugnant to him at the time, a situation not unlike that which confronts him in everyday life.

A factor analysis demonstrated that the onerous alternatives contained no common factor, so that consistent choices of onerous alternatives indicate high anxiety proneness, rather than a single onerous factor such as tediousness or irritability (Lykken, 1965).

Reliability of the Activity Preference Questionnaire

Reliability coefficients have been reported by LeBlanc (1964) who found an internal reliability coefficient of .82 for 136 males and .86 for 176 females. Katzenmeyer (1966) reports an internal reliability of .88 and an equivalent forms correlation of .81 over a three week interval for a college student population. The author found a split-half correlation of .84 for 137 prison inmates.

Validity of the Activity Preference Questionnaire

The APQ was originally constructed for use in a study of criminal psychopaths (Lykken, 1957). In his study of criminal psychopaths, Lykken had prison psychologists select those inmates who most likely resembled the psychopath ac-

cording to the 14 criteria used by Cleckley (1955; 1959) to diagnose psychopathy. The APQ was then shown to discriminate successfully between the psychopathic group, a group of neurotic inmates, and a group of nonprisoner controls consisting of high school and college students. The psychopaths had significantly lower scores than either of the two control groups. The nonprisoners had the highest scores. The three groups were then compared on GSR conditioning, the Taylor Manifest Anxiety scale, and the Pd scale of the MMPI. All measures discriminated successfully among the groups. The psychopaths were the poorest conditioners, the neurotics next and the nonprisoners the best. The Taylor scale did not discriminate the psychopathic group from the nonprisoner group. The neurotic group, however, had significantly higher Taylor scores than either the psychopathic or the nonprisoner group. The Pd scale did not discriminate between the psychopathic and the neurotic groups. The nonprisoner group, however, scored significantly lower than the two inmate groups.

The results of the Lykken comparisons support the conclusion drawn above, that the Pd scale discriminates social deviance on a general level, but does not discriminate specific types of deviance. (Two prisoner groups, distinguished on the basis of other criteria, were not distinguished on the Pd scale, but scored significantly higher than a nonprisoner group.) The results of the Taylor scale were interpreted as indicating that the APQ is not a measure of neurotic anxiety,

but rather a measure of responsiveness to affect provoking situations, or "anxiety proneness", as Lykken calls it. Neurotic prisoners scored highest on the Taylor scale, but had APQ scores between those of the psychopathic criminal group and the nonpsychopathic and nonprisoner groups.

In view of these results, the use of the APQ as a measure of "emotional reactivity," in Cleckley's sense, seemed justified.

Selection of Subjects

Eighty male offenders currently confined in the Philadelphia County Prison served as subjects. Forty comprised the psychopathic group and forty the comparison group. The scarcity of subjects after screening made it necessary to use an age range from 18 to 40 years, and to use many newly admitted inmates. In order to minimize the effect of sentencing, new admissions were tested after they had a two week period or more of "acclimation." Unfortunately, the records accompanying new admissions do not permit an adequate evaluation of personal histories and criminal records.

Prison inmates with a T score of 75 or above on the MMPI Pd scale and a score below the median on the APQ were chosen for the psychopathic group. Inmates with a T score of 65 or below on the Pd scale and a score above the median on the APQ were chosen for the comparison group. The author administered the 100-item APQ to 137 inmates. The range of scores was from

23 to 60 with a mean of 40.6, a median of 41, and a mode of 41.

The rationale for this procedure of selecting subjects was based on a desire to maximize the differences between the psychopathic group and the comparison group. The Pd scale appears to discriminate between those who persist in anti-social behavior, and those who do not. Those who persist in anti-social behavior (high Pd), however, include both individuals who are lacking in emotional responsiveness (psychopaths, according to Cleckley's definition) and those individuals who are not (nonpsychopaths). The APQ was used to make this discrimination. Instead of using only individuals with high Pd scores, and then discriminating the psychopathic and comparison group with the APQ, individuals who had low Pd scores were used in the comparison group, provided they had high APQ scores. This was done in order to help minimize the presence of psychopathic characteristics in the comparison group. Furthermore, since individuals scoring low on the APQ are not necessarily psychopathic, using individuals with high Pd scores and low APQ for the psychopathic group, would help to maximize the presence of psychopathic characteristics in the psychopathic group. A correlation of -.05 between APQ scores and Pd scores was obtained on a sample of 125 inmates from the general prison population. Individuals with MMPI scores of 70 or above on the L,F,K,Sc, and Pa scales

were excluded. The nonsignificant correlation ($p>.10$) between Pd scores and APQ scores, suports the conclusion that those scoring high on the Pd scale are not necessarily lacking in emotional responsiveness, or that those scoring low on the APQ necessarily possess psychopathic characteristics.

The relatively high cutting scores on the Pd scale represents the fact already mentioned: prison inmates tend to make T scores of 70 or better. The author administered the MMPI to 229 inmates. The mean Pd score was 72.1. A cutting score of much less than 65, as used in this study, would have required an inordinate amount of testing in order to obtain a full complement of subjects for the comparison group. Additional restrictions imposed by the APQ and other criteria (see below) would have increased the amount of testing beyond that which was administratively feasible. Furthermore, on the assumption that psychopathy is a continuous personality dimension, the choice of cutting scores need be consistent only with the range of scores obtained in the population being studied.

Only individuals with Sc Scale and Pa Scale T scores below 70 on the MMPI were included in the groups, provided they met all other criteria.

The Revised Beta Examination (1957) was used to obtain an estimate of general intelligence. Only those with IQ

scores of 90 or above were considered for use as subjects. A mean of 98.5 was obtained on a sample of 241 inmates.

The Revised Beta Examination was administered to 829 inmates. Of this number 215 attained an IQ score of less than 90, and were eliminated. The remaining inmates were given the APQ. Those who received the median score of 41 were also eliminated, and the remaining were administered the MMPI. Of these, 259 were rejected because they did not meet the criteria. Thirty-eight had validity T scores of 70 or above. Hence, the usefulness of their protocals was in doubt. Thirteen had elevated Pa scores (T scores 70 or above); 40 had elevated Sc scores; 13 had elevated scores on both the Pa and Sc scales; 64 had a combination of elevated scores on the validity, Pa, or Sc scales. In addition 91 met all the MMPI T score criteria except that their Pd scores were between 66 and 74 inclusive, and therefore did not meet the criterion for the Pd scale.

Most of the remaining inmates were eliminated because they did not meet the combined criterion of high Pd T score - low APQ score, and low Pd T score - high APQ score. A few inmates who met all the criteria refused to serve as subjects or were discharged.

Materials

In the present study CVC trigrams with different association values were used in the task. Since, however,

the association values of CVC trigrams reported by Glaze (1928), Krueger (1934), and Archer (1960) were computed useing college student populations, they were considered inappropriate for use with a prison population. Consequently, new association values were calculated on a sample of 100 inmates of the Philadelphia County Prison.

Three-hundred high, medium, and low association value trigrams were selected, each of which appear on the lists of Glaze, Krueger, and Archer. The Archer values were used as a reference point because they represent the most recently computed values, and because he used all CVC combinations, whereas Glaze and Krueger did not. The high group consisted of the 100 trigrams with the highest association values on all three lists. The range of Archer values was from 93 to 100 percent. The medium group consisted of the 100 trigrams with association values closest to 50 percent on all three lists. The range of Archer values was from 47 to 53 percent. The low group consisted of the 100 trigrams of the lowest association values on all three lists. The range of values was from zero to eight percent.

All selected trigrams were arranged on 12 pages, 25 syllables on a page. They were arranged so that the high, medium and low trigrams were equally distributed over all 12 pages. No two successive trigrams contained the same letter and no two successive trigrams were of the same Archer association value. Pages were arranged following a Latin square pattern

and put together in booklets. Booklets were given to the standardization subjects to insure, as much as possible, that all page orders would be used the same number of times. Following Archer's procedure, subjects were instructed to check in the Yes column next to the appropriate trigram if they could answer "yes" to any one of the following questions: "Is it a word?" "Does it sound like a word?" "Can I use it in a sentence?" If the subjects were unable to answer "Yes," they were instructed to put a check in the No column. The percent of the subjects checking Yes for a trigram was defined as the association value for the trigram (Archer, 1960).

For the high Archer trigrams, the new (Scott) association values ranged from 44 to 99 percent. For the medium Archer trigrams, the Scott values ranged from 7 to 70 percent. For the low Archer values, the Scott values ranged from zero to 15 percent.

Correlation coefficients were computed between the Archer values and the Scott values. The overall correlation was .93. Because of the procedures used for selecting the trigrams, however, this correlation is spuriously high. A more realistic picture of the relationship is given by the correlations between Archer's high, medium, and low values and the Scott values separately. The correlation for the high trigrams was .37; for the medium trigrams .19; for the low trigrams .41. While these correlations partially represent the restriction in the range of association values of the

trigrams selected from the Archer, Glaze, and Krueger lists, they do indicate that association values based on a college student population can not be assumed to accurately reflect association values in a prison population.

One week after initial testing, 57 inmates were retested. The same procedure was followed. Each subject used the same order of pages in the booklets as he had used on original testing. The overall test-retest correlation was .98. Separate test-retest correlations using the trigrams corresponding to Archer's high, medium, and low values were computed. These coefficients were .95, .93, and .72, respectively.

The 300 CVC trigrams and their association values are presented in Appendix A.

Task

In the present study, a two-choice verbal discrimination task similar to the one used by Spence (1964); Spence and Lair (1965); and Spence, Lair, and Goodstein (1963) was used, Instead, however, of having subjects discriminate between two familiar words, as was the case in the Spence, et al studies, subjects in this study discriminated between two consonant-vowel-consonant (CVC) trigrams. Trigrams were used because they are relatively free of the social and personal implications frequently associated with English words, and because they permitted more precise manipulation of task difficulty. In the present study, the association values of the trigrams

were varied so that on one task there was a high discrepancy between the values of the two trigrams to be discriminated, while on the other task there was a low discrepancy. It was expected, and confirmed by pilot studies, that discrimination would be easier with high discrepancies than with low discrepancies.

Thus, the easy task was defined as the one in which trigrams of medium association value were paired with trigrams of high association value. The difficult task was defined as the one in which trigrams having association values midway between high trigrams and medium trigrams were paired with medium trigrams. Originally it had been planned to use medium trigrams paired with medium trigrams for the difficult task. In a preliminary study, however, the choice of the critical trigrams were no better than chance. Further tests showed that the high-medium task proved to be easier than the medium-high medium task.

In the present study, for the difficult task (M-MH) 15 trigrams with Scott association values ranging from 45 to 54 percent were paired with 15 trigrams ranging in association value from 65 to 75 percent. For the easy task (HM), 15 trigrams with Scott association values ranging from 90 to 98 percent were paired with the 15 medium trigrams of the M-MH task. For both tasks, the medium trigrams were arbitrarily designed as correct.

In the Right-blank condition, if S selected the medium trigrams E reinforced him by saying, "Right." If S chose the high or medium-high trigram, E said nothing. In the Wrong-blank condition, if S.selected the medium trigram, E said nothing. If S Chose the high or medium-high trigram E said, "Wrong."

For both tasks, the trigrams were paired, and each pair typed in capital letters on a white 4x6 inch card. In each pair of trigrams a given letter appeared only once. In order that half the time every reinforced trigram was on the right and half the time on the left, another set of cards was typed on which the order of trigrams was reversed. Cards were then combined in order to control for the position of the reinforced trigram. The trigram used and their association values are presented in Appendix B.

Procedure

Subjects sat at a table facing a 4x4 foot heavy cardboard screen. In the screen at eye level was a six inch square window into which the stimulus cards were inserted manually by the experinenter, who was sitting behind the screen.

In order to determine if subjects had a preference for trigrams of medium or high or medium-high association value, and whether this preference affected succeeding choices, the first block of trials were unreinforced. This, and all fol-

lowing blocks consisted of 15 trials. The following instructions were read to the subject:

> This is an experiment with nonsense words. I am going to show you cards with pairs of nonsense words on them. For each of the cards I want you to pick one of the words and spell it.

After the first block of 15 trials, subjects in the positive reinforcement condition were read the following instructions:

> Now, after you pick a word, I will say: "Right" if you pick the right one. If you pick the wrong one, I won't say anything. Remember if I don't say anything, you have picked the wrong word. Do as well as you can.

Subjects in the negative reinforcement condition were read the following instructions:

> Now, after you pick a word, I will say "Wrong" if you pick the wrong one. If you pick the right one, I won't say anything. Remember, if I don't say anything, you have picked the right one. Do as well as you can.

The experimenter inserted all 15 cards into the window of the screen. After the subject had responded to the first card, it was removed, exposing the next card, and so on. In addition to the first block of 15 trials, each subject was given ten more blocks during which responses were either positively or negatively reinforced. In an extensive series of pilot studies, the author found that by the fifth or sixth block of trials the great majority of subjects reached their maximum level of correct responding. The cards were shuffled before each block of trials.

In order to see if the task would discriminate between groups on the difficulty dimension, small groups (N, 6 to 8) were selected from the general prison population. Clear differences were obtained between the easy and difficult tasks, with better performance on the easy task. On the difficult task some doubt existed as to whether there was a progressive improvement in performance. An analysis of variance on the combined groups resulted in a highly significant F ratio for blocks of trials. The Wrong-blank condition resulted in better performance on the easy task. This difference, however, was smaller on the difficult task. No tests of significance were performed between the Right-blank and the Wrong-blank conditions. An effort was made to see if varying the amount of information contained in the task instructions would affect the difference between Right-blank and Wrong-blank. Complete information about the meaning of blank had little effect on the difference between the two conditions.

Experimental Design

Ten subjects were assigned to each of eight groups in a 2 x 2 x 2 x 11 repeated measures factorial design. Psychopathy, verbal reinforcement, and task difficulty were each varied at two levels. The fourth factor was blocks of trials. Each subject was tested across eleven blocks of trials.

Chapter 4

Results

The results of the data analysis are presented in two parts. The first part examines the variables used in the selection of subjects, i.e., age, Revised Beta Examination scores, APQ scores, and T-scores on the Pd Scale of the MMPI. In each case the analysis of variance was used, and was preceded by the F max test for homogeneity of variance (Edwards, 1960; Winer, 1962). The analysis of the performance data is presented in the second part.

Selection of Subjects

1. Age

The analysis of variance for age is presented in Table 1. For this analysis, F Max = 1.16. With 8 and 9 degrees of freedom it was not significant ($p > .05$). None of the F ratios reached the .05 level of significance, indicating that the groups did not differ with respect to age. The mean ages are presented in Table 2.

2. Revised Beta Examination

The analysis of the Revised Beta Examination scores is presented in Table 3. F Max = 1.10. With 8 and 9 degrees of freedom this value was not significant ($p > .05$). The between group F ratio was not significant ($p > .05$). Hence, the groups did not differ on the estimate of intelligence. The mean Beta scores are presented in Table 4.

3. Activity Preference Questionnaire (APQ)

The F Max for the APQ scores is 2.08. With 8 and 9 df it was not significant ($p>.05$). A complete factorial analysis was performed in order to determine the presence of interaction effects. The analysis is presented in Table 5. The F ratio for the Pd-Comparison condition was significant ($p<.001$), and reflects the method used to assign Ss to the Pd and Comparison groups. No other F ratios were significant ($p>.05$). Thus, the groups did not differ as a function of assignment to the Reinforcement condition or the Difficulty condition. No interaction effects were present. The mean APQ scores are presented in Table 6.

4. T-Scores on the Pd Scale of the MMPI

For this analysis F Max = 1.96. With 8 and 9 df, this value was not significant ($p>.05$). As with the APQ scores, a complete factorial analysis was performed to determine the presence of interaction. The analysis is presented in Table 7. The significant F for the Pd-Comparison condition ($p<.001$) was a function of the method used to assign Ss. No other Fs were significant ($p>.05$). The mean Pd T-scores are presented in Table 8. Mean T-scores for the remaining MMPI scales were calculated and a mean profile for each group prepared. It is presented in Appendix E. Inspection of Appendix E shows a marked similarity between the Pd and Comparison groups on all the MMPI scales except Pd.

Table 1

Analysis of Variance of Age

Source of Variation	SS	df	MS	F
Between Groups	480.01	9	53.33	1.68
Within Groups	2215.88	70	31.67	
Total	2695.89	79		

Table 2

Mean Age of the Experimental Groups

Groups	Easy Right	Easy Wrong	Difficult Right	Difficult Wrong	Total
Pd	27.2	27.4	27.2	27.4	27.3
Comparison	28.4	28.4	28.0	28.7	28.4
Total	27.8	27.9	27.6	28.1	27.85

Table 3

Analysis of Variance of the
Revised Beta Examination Scores

Source of Variation	SS	df	MS	F
Between Groups	635.95	9	70.66	1.02
Within Groups	4856.25	70	69.38	
Total	5492.20	79		

Table 4

Mean Revised Beta Examination Scores of the Experimental Groups

Groups	Easy Right	Easy Wrong	Difficult Right	Difficult Wrong	Total
Pd	103.0	101.2	101.7	101.0	101.7
Comparison	99.0	103.9	102.9	100.5	101.6
Total	101.0	102.6	102.3	100.8	101.65

Table 5

Analysis of Variance of the APQ Scores

Source of Variation	SS	df	MS	F
Pd-Comp	3836.45	1	3836.45	141.93***
Reinforcement	.80	1	.80	----
Difficulty	.80	1	.80	----
Pd-Comp x Reinforcement	8.45	1	8.45	----
Pd-Comp x Difficulty	22.05	1	22.05	----
Reinforcement x Difficulty	1.80	1	1.80	----
Pd-Comp x Reinforcement x Difficulty	8.45	1	8.45	----
Within Groups	1946.40	72	27.03	
Total	5825.20	79		

***$p < .001$

Table 6

Mean APQ Scores of the Experimental Groups

Groups	Easy Right	Easy Wrong	Difficult Right	Difficult Wrong	Total
Pd	32.8	32.9	35.0	33.2	33.5
Comparison	47.7	47.8	46.5	47.3	47.3
Total	40.2	40.4	40.8	40.2	40.4

Table 7

Analysis of Variance of the T-Scores on the Pd Scale of the MMPI

Source of Variation	SS	df	MS	F
Pd-Comp	9834.61	1	9834.61	32.38***
Reinforcement	5.51	1	5.51	-----
Difficulty	1.51	1	1.51	-----
Pd-Comp x Reinforcement	6.62	1	6.62	-----
Pd-Comp x Difficulty	37.82	1	37.82	-----
Reinforcement x Difficulty	6.62	1	6.62	-----
Pd-Comp x Reinforcement x Difficulty	1.00	1	1.00	-----
Within Group	2186.50	72	303.68	
Total	12080.19			

***$p < .001$

Table 8

Mean T-Scores of the Pd Scale of the MMPI of the Experimental Groups

Groups	Easy Right	Easy Wrong	Difficult Right	Difficult Wrong	Total
Pd	81.3	81.6	83.3	82.9	82.3
Comparison	59.7	61.6	59.4	59.7	60.1
Total	70.5	71.6	71.4	71.3	71.2

Analysis of the Performance Data

The performance data were treated by a triple classification (Pd-Comparison, Difficulty, Reinforcement) repeated measures analysis of variance. The form of the performance curves was then examined by applying linear and quadratic trend analyses (Winer, 1962). An analysis of the mean number of correct choices on the last four blocks of trials was also performed. The results bearing on each prediction stated in Chapter 1 are presented separately. For convenience of presentation, all remaining tables and their associated graphs are presented at the end of this chapter. Preliminary analyses were performed on the first block of 15 trials during which no reinforcement was given (NRF block). For these analyses the frequency of selection of the CVC trigrams which were subsequently reinforced (those with medium association values) was used. The mean frequency for each of the eight groups is presented in Table 9. This table also includes the mean number of correct CVC trigrams selected across the ten reinforced blocks of trials for each of the eight groups. The analysis of variance for the NRF block is presented in Table 10. The F ratio for Difficulty was significant ($p<.001$). Table 9 shows that Ss in the Difficult task selected more trigrams with medium association values than did Ss in the Easy task

In the present study, one would predict variation in responding to the initial non-reinforced block of trials because of the discrepancies between the association values of trigrams subsequently reinforced and those not reinforced, and because of differences in similarity to English words. Thus, the frequency of responding to syllables with low similarity to English (Medium in this case) would be expected to be low on the non-reinforced block, and lower as the discrepancy between reinforced and non-reinforced trigrams increases. Hence, Ss in the Easy task would be more biased against selecting the medium trigram because of the greater similarity of the high trigram to English, and because of the greater discrepancy between the medium and high trigrams. On the difficult task, however, the high-medium-high trigram is less similar to English, and is less discrepant with the medium trigram. Hence Ss should be less biased against selecting the medium trigram. This prediction was confirmed by Marston, Kanfer, and McBrearty (1962), and is supported by the results of the present study. These results also support the validity of the method used to vary task difficulty.

What effect does the initial response bias against selecting the medium trigram have on subsequent selection during the reinforced blocks of trials? Because of the response bias, increasing the selection of medium trigrams

with reinforcement should be more difficult on the easy task than on the difficult task.

In order to examine the effect of response bias on subsequent performance, analyses were performed on the total frequency of correct responses on the last four reinforced blocks of trials. In one analysis, covariance was used to adjust performance for the frequency with which the medium trigrams were selected on the NRF block. The analysis is presented in Table 11. As can be seen all the F ratios were significant ($p<.05$). The correlation between the mean number of medium trigrams selected on the NRF block and the mean number selected on the last four blocks of trials was .105, which was not significant ($p>.05$). Thus, there is little, if any, relationship between the number of medium trigrams selected on the NRF block and performance on the last four reinforced blocks. The analysis of variance of performance on the last four blocks unadjusted for the NRF block is presented in Table 12. All F Ratios were significant ($p<.05$). A comparison of the mean squares in Table 12 with those in Table 11 show considerable similarity between them. This supports the conclusion that the number of medium trigrams selected on the NRF block had little effect on performance during the last four blocks. In addition, performance on the easy task was significantly better ($p<.001$) than on

the difficult task, suggesting that any initial response bias against selecting the medium trigrams was overcome by at least the last four blocks of trials.

1. Acquisition of correct responses by the comparison groups should be superior to acquisition by the Pd groups.

The analysis of variance of the mean number of medium trigrams selected across the NRF and reinforced blocks is presented in Table 13. It shows that the effect of Pd-Comparison was significant ($p<.05$). The means presented in Table 17 show that the Comparison group selected more medium trigrams than the Pd Group.

The within groups interaction between Blocks and Pd-Comparison indicates that the performance of the Comparison and Pd groups over Blocks differed significantly ($p<.001$). Inspection of the performance curves in Figure 1 reveals that the performance of the Comparison group was superior to that of the Pd Group.

The F ratio for the Pd-Comparison effect in the analysis of covariance (Table 11) was significant ($p<.05$), indicating that when acquisition on the last four blocks of trials was adjusted for the number of correct trigrams selected on the NRF block of trials, the Pd and Comparison groups differed from one another. The analysis of variance of the last four blocks unadjusted for the NRF block is presented in Table 12. Again, it shows that the Pd and Comparison groups differed significantly ($p<.05$). Table

16 shows that the Comparison group selected more medium trigrams than the Pd Group.

The analysis of variance showing the linear and quadratic trends is presented in Table 14. The linear component of the Pd-Comparison groups was not significant ($p > .05$). This indicates that the rate of acquisition for the Pd group did not differ significantly from the Comparison group. The quadratic component of the trend for the Pd-Comparison groups was significant ($p < .01$). This shows that the shape of the acquisition curve of the Pd Group differed significantly from that of the Comparison group. Figure 1 shows that acquisition by the Comparison group was most rapid during the first few blocks of trials, after which it increased at a slower rate. For the Pd Group, acquisition over the first few blocks was not nearly so rapid.

2. Acquisition of correct responses in the Wrong-blank condition should be superior to acquisition in the right-blank condition.

The analysis of variance is presented in Table 13, and shows the between groups effect of Reinforcement was significant ($p < .01$). Table 15 indicates that a greater number of medium trigrams was selected in the Wrong-blank condition than in the Right-blank condition.

The significant within groups Reinforcement x Blocks

interaction ($p<.01$) shows that over blocks of trials acquisition in the Right-blank condition differed from acquisition in the Wrong-blank condition. Figure 2 shows that performance in the Wrong-blank condition was consistently superior to performance in the Right-blank condition.

The analysis of covariance of the last four blocks (Table 11) shows a significant effect on Reinforcement ($p<.01$). Table 16 shows that more medium trigrams were selected in the Wrong-blank condition than in the Right-blank condition.

The trend analysis is presented in Table 14, and shows a significant linear component for Reinforcement ($p<.01$). This indicates that the two reinforcement groups differed in their overall rate of acquisition. Examination of Figure 2 shows that acquisition was somewhat more rapid in the Wrong-blank condition than in the Right-blank condition. The quadratic component was not significant ($p>.05$), showing that the shape of the acquisition curves for the two reinforcement conditions did not differ significantly.

3. Acquisition of correct responses on the Easy task should be superior to acquisition on the Difficult task.

The between groups effect of Difficulty in Table 13 was significant ($p<.01$). Table 15 shows that a greater number of medium trigrams was selected on the Easy task than on the Difficult task.

The within groups Difficulty x Blocks interaction in

CONTINUED

2 OF 4

Table 13 was also significant ($p<.01$). Figure 3 shows that performance on the Easy task was better than on the Difficult task over blocks of trials.

The analysis of covariance of the last four blocks (Table 11) shows a significant Difficulty effect ($p<.01$). Table 16 indicates that more medium trigrams were selected on the Easy Task than on the Difficult Task.

The trend analysis is presented in Table 14. Both the linear and quadratic components for Difficulty were significant ($p<.001$). The significant linear component indicates that the rate of acquisition on the Easy and Difficult tasks differed over blocks of trials. Inspection of Figure 3 shows that the rate of acquisition on the Easy task was more rapid than on the Difficult task.

The significant quadratic component indicates that the shape of the acquisition curves of the Easy and Difficult tasks differed. Again, inspection of Figure 3 shows that acquisition on the Easy task increased most rapidly during the first few blocks of trials. Thereafter, it increased at a slower rate. On the Difficult task, however, there was no rapid improvement during the first blocks of trials. Rather, improvement was steady over all blocks.

4. In the Right-blank condition, acquisition of correct responses by the Comparison group should be superior to

acquisition by the Pd groups.

To test this prediction separate analyses were carried out on the performance data of the Right-blank condition.

The between groups main effect of Pd-Comparison was significant, $F(1,38) = 4.28$, $p<.05$. Table 17 shows that in the Right condition, the comparison group selected more medium trigrams than the Pd group. The within groups Pd-Comparison x Blocks interaction was also significant, $F(10,380) = 3.03$, $p<.01$. Figure 4 shows that in the Right-blank condition, acquisition by the Comparison group over blocks of trials was superior to the Pd group.

Analysis of covariance of the last four blocks of trials yielded a significant Pd-Comparison effect, $F(1,37) = 4.17$, $p<.05$. In Table 18 it can be seen that the Comparison group selected more medium trigrams on the last four blocks of trials than the Pd group.

A trend analysis of the data in the Right-blank condition resulted in a significant linear component, $F(1,38) = 77.53$, $p<.001$. This indicates that the combined performance of the Pd and Comparison groups in the Right-blank condition improved significantly over blocks of trials. The comparison between the linear components of the Pd and Comparison groups was not significant, $F(1,38) = 3.25$, $p>.05$. Thus, the Pd and Comparison groups did not differ in the rate of acquisition (Figure 4). A significant quadratic

component $F(1,38) = 22.73$, $p<.01$, shows that the combined performance of the Pd and Comparison groups in the Right condition did not improve at a steady rate. The comparison between the quadratic components of the Pd and Comparison groups was significant, $F(1,38) = 210.34$, $p<.01$. Figure 4 shows that the performance of the Comparison group improved rapidly over the first few blocks of trials, and then began to level off, while the Pd group did not show the rapid initial improvement, but a steady improvement over blocks.

5. In the Wrong-blank condition, acquisition of correct responses by the Comparison groups should be superior to acquisition by the Pd groups.

To test this prediction separate analyses was carried out on the performance data in the Wrong-blank condition.

The between groups main effect of Pd-Comparison was not significant, $F<1.00$. The within groups Pd-Comparison x Blocks interaction was significant, $F(10,380) = 2.02$, $p<.05$. Hence, the prediction is supported when the Comparison and Pd groups are compared over blocks of trials, but not when the total number of responses is compared. The analysis of covariance of the last four blocks of trials resulted in an F less than 1.00. Inspection of Figure 5 shows that up to the sixth reinforced block of trials, the performance of the Comparison group in the Wrong-blank condition was superior to the Pd group.

Beyond this, however, the two groups did not differ significantly.

A trend analysis of the Wrong-blank condition resulted in a significant linear component, $F(1,38) = 210.34$, $p<.001$, indicating that the combined performance of the Pd and Comparison groups in the Wrong condition improved significantly over blocks of trials. A comparison of the linear components of the Pd and Comparison groups yielded an F less than 1.00. Hence, the groups did not differ in the rate of acquisition (Figure 5).

A significant quadratic component, $F(1,38) = 32.72$, $p<.001$, shows that the combined performance of the Pd and Comparison groups did not improve at a steady rate. The comparison between the quadratic components of the Pd and Comparison groups was not significant, $F<1.00$, indicating that the shape of the acquisition curves of the two groups did not differ significantly. Figure 5 shows that both groups improved rapidly over the first several blocks of trials, after which improvement was considerably slower.

Summarizing the results under the fourth and fifth predictions, the Comparison group was consistently superior to the Pd group in the Right-blank condition. In the Wrong-blank condition, the Comparison group was initially superior to the Pd group. By the seventh block, however, the Pd Group did as well as the Comparison group, and continued to do so for the remaining three blocks. This

difference between the Pd and Comparison groups in the Right-blank and Wrong-blank conditions on the last four blocks is reflected by the significant Pd-Comparison x Reinforcement interaction ($p<.05$) in Table 11.

6. On the Easy task, acquisition of correct responses by the Comparison groups should be superior to acquisition by the Pd groups.

To test this prediction separate analyses were carried out on the performance data of the Easy task.

The between ups main effect of Pd-Comparison was significant, $F(1,38) = 8.04$, $p<.01$. Table 17 shows that the Comparison group selected a greater number of medium trigrams than the Pd group. The within groups Pd-Comparison x Blocks interaction was also significant, $F(10,380) = 10.35$, $p<.01$. Figure 6 shows that on the Easy task the Comparison group performed better over blocks than the Pd group.

Analysis of covariance of the last four blocks of trials resulted in a significant Pd-Comparison effect, $F(1,37) = 9.66$, $p<.01$. Table 18 shows that on the Easy task the Comparison group selected more medium trigrams than the Pd group.

A trend analysis of the Easy task resulted in a significant linear component, $F(1,38) = 237.66$, $p<.001$, indicating that the combined performance of the Pd and Comparison groups on the Easy task improved significantly

over blocks of trials. The comparison between the linear components of the Pd and Comparison groups was also significant, $F(1,38) = 11.13$, $p < .01$. This indicates that the rate of acquisition for the two groups was not the same. Figure 6 shows that the Comparison group improved more rapidly than the Pd group.

A significant quadratic component, $F(1,38) = 86.26$, $p < .001$, shows that the combined performance of the Pd and Comparison groups did not improve at a steady rate. The comparison between the quadratic components of the Pd and Comparison groups was significant, $F(1,38) = 10.45$, $p < .01$, indicating that the shape of the acquisition curves differed for the two groups on the Easy task. Figure 6 shows that most rapid improvement was made by the Comparison group during the first few blocks of trials, and then tapered off. Improvement by the Pd group, however, was more steady, but never approached that of the Comparison group.

7. On the Difficult task, acquisition of correct responses by the Comparison groups should be superior to acquisition by the Pd groups.

To test this hypothesis separate analyses were performed on the performance data of the Difficult task.

The between groups main effect of Pd-Comparison was not significant, $F<1.00$. The within group Pd - Comp x Blocks interaction was also not significant, $F<1.00$. Thus, on the

Difficult task, the Pd and Comparison groups did not differ with respect to the total number of medium trigrams selected, nor did they differ on the number of medium trigrams selected over blocks of trials.

The main effect of Pd-Comparison on the last four blocks was not significant, $F(1,38) = 3.66$, $p > .05$.

A trend analysis of the Difficult task resulted in a significant linear component, $F(1,38) = 124.34$, $p < .001$, indicating that the combined performance of the Pd and Comparison groups on the Difficult task improved significantly over blocks of trials. The comparison between the linear components of the Pd and Comparison groups, however, was not significant, $F(1,38) = 2.62$, $p > .05$. Hence, the Pd and Comparison groups did not differ in the rate at which their performances improved (Figure 7).

A significant quadratic component, $F(1,38) = 9.04$, $p < .01$, shows that the combined performance of the Pd and Comparison groups on the Difficult task did not improve at a steady rate. Figure 7 shows that the performance of both groups tended to improve more rapidly during the first few blocks of trials, and then less rapidly over the remaining blocks. The comparison between the quadratic components of the Pd and Comparison groups was not significant, $F < 1.00$, indicating that the two groups did not differ with respect to the shape of their

acquisition curves (Figure 7).

Summarizing the results under the sixth and seventh predictions, the performance of the Comparison group was superior to that of the Pd group on the Easy task, but not significantly different on the Difficult task.

These differences between the Pd and Comparison groups on the Easy and Difficult tasks are reflected by the interactions in Table 13. The Pd-Comp x Difficulty between groups interaction, and the Pd-Comp x Difficulty x Blocks within groups interaction were both significant ($p<.001$). Similar differences on the last four blocks were reflected in the analysis of covariance (Table 11), in which the Pd-Comp x Difficulty interaction was significant ($p<.001$).

The trend analyses revealed similar interactions. The rate of acquisition over blocks of trials on the Easy task was significantly more rapid for the Comparison group than the Pd group, but not significantly more rapid on the Difficult task. In addition, the shapes of the curves differed significantly on the Easy task, but not on the Difficult one. Both the significant linear and quadratic trends for the Pd-Comparison x Difficulty interaction ($p<.01$) in Table 14 reflect these differences.

8. In the Right-blank condition, acquisition of correct responses on the Easy task should be superior to acquisition on the Difficult task.

To test this prediction separate comparisons between the Easy and Difficult tasks were made in the Right-blank condition.

The between groups F ratio for Difficulty was less than 1.00 and hence was not significant. The within groups Difficulty x Blocks interaction was significant, $F(10,380) = 5.87$, $p<.01$.

Thus, while the groups did not differ on the total number of medium trigrams selected, their performance differed when examined over blocks of trials. In the analysis of covariance of the last four blocks of trials, task Difficulty was not significant, $F(1,37) = 3.62$, $p>.05$. Thus, while there was an initial difference between the Easy and Difficult tasks in the Right condition, performance on the Difficult task approached that of the Easy task on the final blocks of trials.

A trend analysis of performance in the Right-blank condition over the Easy and Difficult tasks yielded a significant linear component, $F(1,38) = 82.55$, $p<.01$. Hence, the combined performance on the Easy and Difficult tasks improved significantly over trials. In addition, the Easy and Difficult tasks differed significantly in the rate of acquisition, $F(1,38) = 5.92$, $p<.05$. Inspection of Figure 8 shows that the rate of acquisition was somewhat faster on the Easy task than on the Difficult task.

A significant quadratic component of the combined performance on the Easy and Difficult tasks indicates that the rate of acquisition was not uniform over blocks of trials, $F(1,38) = 9.79$, $p<.01$. Furthermore, the Easy and Difficult tasks differed significantly with respect to the shapes of their respective acquisition curves, $F(1,38) = 9.79$, $p<.01$. Figure 8 shows that the rate of acquisition on the Easy task was initially faster than on the Difficult task.

Thus, the prediction is supported when the Easy and Difficult tasks are compared over blocks of trials, but not when the total number of responses is compared, or when the final four blocks of trial are compared.

9, In the Wrong-blank condition, acquisition of correct responses on the Easy task should be superior to acquisition on the Difficult task.

To test this prediction separate comparisons between the Easy and Difficult tasks were made on the Wrong-blank condition only.

The between groups F ratio for Difficulty was 32.71. With 1 and 38 df, it was significant ($p<.001$). Table 17 shows that in the Wrong condition a greater number of medium trigrams was selected on the Easy task than on the Difficult task. The within groups Difficulty x Blocks interaction was also significant, $F(10,380) = 11.94$, $p<.01$. Figure 9 shows that on the Easy task, there was

a greater number of correct responses over trials than on the Difficult task. The analysis of covariance of the last four blocks of trials resulted in a significant Difficulty effect, $F(1,37) = 24.47$, $p<.001$. Table 18 shows that on the last four blocks of trials more medium trigrams were selected on the Easy tasks than on the Difficult task.

A trend analysis of performance in the Wrong-blank condition over the Easy and Difficult tasks yielded a significant linear component, $F(1,38) = 400.32$, $p<.001$. Thus, the combined performance in the Easy and Difficult tasks improved significantly over blocks of trials. Furthermore, the Easy and Difficult tasks differed significantly in the rate of acquisition, $F(1,38) = 34.31$, $p<.01$. Figure 9 shows that the rate of acquisition on the Easy task was faster than on the Difficult task.

The quadratic component of the combined performance on the Easy and Difficult tasks was also significant, $F(1,38) = 48.70$, $p<.01$, indicating that the rate of acquisition was not uniform over blocks of trials. Furthermore, the Easy and Difficult tasks differed significantly in the shapes or their curves, $F(1,38) = 22.06$, $p<.05$. Figure 9 shows that the rate of acquisition on the Easy task was initially faster than on the Difficult task.

Summarizing the outcome of the eighth and ninth predictions, the Easy and Difficult tasks did not differ in the total number of correct responses in the Right-blank condition, but were significantly different in the Wrong-blank condition. These differences are reflected in the significant Reinforcement x Difficulty between groups interaction in Table 13, $p < .05$. In both the Right-blank and Wrong-blank conditions, performance on the Easy task over blocks of trials was significantly better than on the Difficult task. On the final four blocks of trials, however, performance on the Difficult task approached that of the Easy task in the Right-blank condition, but not in the Wrong-blank condition. These differences are reflected in the significant Reinforcement x Difficulty interaction in the analysis of covariance presented in Table 11 ($p < .05$).

The Easy and Difficult tasks differed significantly in the linear and quadratic trends in both Reinforcement conditions. The overall rate of acquisition on the Easy task was more rapid than on the Difficult task. In addition acquisition on the Easy task was more rapid than on the Difficult task over the first several blocks of trials.

Post-hoc Comparisons Among Means

A more detailed examination of the performance data was made by using Duncan's Multiple Range Test for comparisons among means. Comparisons were made using the

mean total number of correct responses (Table 15), and the mean number of correct responses on the last four blocks of reinforced trials (Table 16).

The Comparison-Easy-Right group performed significantly better than the Psychopathic-Easy-Right group when the mean number of correct responses on the last four blocks of trials were compared ($p < .01$). None of the other comparisons between the individual Psychopathic and Comparison groups on the last four blocks of trials was significant ($p < .05$), suggesting that the superior performance of the Comparison group can be largely accounted for by the difference between the Psychopathic and Comparison groups in the Easy-Right condition. A comparison of the mean total number of correct responses showed that the Comparison-Easy-Right group also performed significantly better than the Psychopathic-Easy-Right group ($p < .01$). In addition, the Comparison group on the Easy-Wrong task had a significantly greater mean number of correct responses than the Psychopathic group ($p < .01$), further suggesting that the better performance of the Comparison group was largely a function of task difficulty. This suggestion is also supported by the superior combined performance of the Comparison-Right group on the last four blocks of trials. The Comparison-Wrong group, however, was not significantly different from the Pd-Wrong group. (See results under Predictions

4 and 5). Furthermore, the combined performance of the Comparison group on the Easy task was superior to that of the Psychopathic group, but not on the Difficult task. (See results under Predictions 6 and 7).

Further examination of the differences among the eight experimental groups suggests that task Difficulty can account for most, but not all, of the differences between the Psychopathic and Comparison groups. Thus, looking at the individual Psychopathic groups, significant differences between them occurred at levels of task Difficulty on both the last four blocks of trials and on the mean total number of correct responses ($p < .01$). The one exception, indicated by the superior performance of the Psychopathic-Easy-Wrong group over the Psychopathic-Easy-Right group, shows that differences in reinforcement played a partial role in the performance of the Psychopathic groups. The significant differences between the individual Comparison groups in Tables 15 and 16 occurred at levels of task Difficulty ($p < .01$). None occurred at levels of Reinforcement, hence supporting the conclusion that task Difficulty played a greater role in performance differences than did Reinforcement.

Finally, since significant differences between Reinforcement conditions occurred among the Psychopathic groups, but not among the Comparison groups, and since the difference occurred on the Easy task, suggests that the

effect of Reinforcement was greater on the Psychopathic group than on the Comparison group, and that the effect was greater on the Easy task than on the Difficult one, with Right accounting for greater differences than Wrong. Supporting the conclusion that Right accounted for greater differences than Wrong was the significantly better performance of the Psychopathic-Difficult-Right group on the mean total number of correct responses as compared with the Comparison-Difficult-Right group ($p < .05$).

Summary of Results

The performance data were treated by a triple classification repeated measures analysis of variance, and by trend analyses. An analysis of covariance was performed on the last four blocks of reinforced trials.

The combined performance of the Comparison groups was superior to the combined performance of the Psychopathic groups. Overall performance in the Wrong-blank condition was superior to the Right-blank condition. Overall performance on the Easy task was superior to the Difficult task.

The performance of the Psychopathic and Comparison groups was compared in the Right-blank condition, and then in the Wrong-blank condition. In the Right-blank condition, the performance of the Comparison group was consistently superior to the Psychopathic group. In the Wrong-blank condition, the performance of the Comparison group was initially superior to the Psychopathic group, but

during the last four blocks of trials, the performance of the Psychopathic group was not significantly different from the Comparison group.

Similar comparisons were made between the Psychopathic and Comparison groups on the Easy task and then on the Difficult task. The performance of the Comparison group was superior to the Psychopathic group on the Easy task, but not significantly different on the Difficult task.

The Easy and Difficult tasks were then compared in the Right-blank and Wrong-blank conditions separately. In the Right-blank condition, performance on the Easy task was initially superior to the Difficult task, but, on the last four blocks of trials, performance on the Difficult task approached that of the Easy task. In the Wrong-blank condition, performance on the Easy task was consistently superior to the Difficult task.

Individual comparisons among the eight experimental groups showed that differences between the Psychopathic and Comparison groups could be accounted for largely by the variable of task difficulty, and in small amount by reinforcement. Furthermore, reinforcement appeared to exert its greatest effect in the Psychopathic group. Reinforcement contributed most to differences between the Psychopathic and Comparison groups on the easy task.

Table 9

Mean Number of Medium CVC Trigrams Selected on the Non-Reinforced and Ten Acquisition Blocks of 15 Trials of the Experimental Groups

Group	Blocks of Trials										
	NRF	1	2	3	4	5	6	7	8	9	10
Pd											
Easy Right	2.0	4.1	5.5	5.5	6.0	6.6	6.7	6.7	6.5	7.1	6.8
Easy Wrong	2.5	7.8	9.5	11.0	11.6	12.2	12.7	12.8	13.3	13.9	14.4
Difficult Right	5.4	6.3	7.8	8.9	8.3	9.2	9.8	10.1	10.7	9.6	11.2
Difficult Wrong	5.3	6.0	6.4	8.9	9.9	8.1	9.8	9.6	9.3	11.0	11.6
Comparison											
Easy Right	2.5	3.1	11.4	12.5	13.5	12.4	13.6	13.5	14.0	14.1	14.2
Easy Wrong	2.5	13.7	13.4	13.5	14.2	13.9	14.1	14.4	14.5	14.5	14.5
Difficult Right	5.6	6.2	7.3	8.8	7.6	7.2	8.7	8.6	7.9	9.3	9.5
Difficult Wrong	5.0	6.3	7.2	7.6	8.9	9.4	10.0	8.2	8.9	10.3	10.8
Total	3.85	5.44	8.56	9.59	10.0	9.88	10.68	10.49	10.64	11.22	11.64

Table 10

Analysis of Variance of the Number of Medium CVC Trigrams Selected on the Non-Reinforced Block of 15 Trials

Source of Variation	SS	df	MS	F
Pd-Comp	.20	1	.20	----
Reinforcement	.05	1	.05	----
Difficulty	174.05	1	174.05	42.98***
Pd-Comp x Reinforcement	1.25	1	1.25	----
Pd-Comp x Difficulty	.45	1	.45	----
Reinforcement x Difficulty	1.80	1	1.80	----
Pd-Comp x Reinforcement x Difficulty	.00	1	.00	----
Within Groups	298.40	72	4.05	
Total	469.20	79		

***$p < .001$

Table 11

Analysis of Covariance on the Number of Medium CVC Trigrams Selected on the Last Four Acquisition Blocks of Fifteen Trials

Source of Variation	SS	df	MS	F
Pd-Comp	645.49	1	645.49	4.64*
Reinforcement	1274.92	1	1274.92	9.16**
Difficulty	1685.74	1	1685.74	12.12***
Pd-Comp x Reinforcement	554.35	1	554.35	3.98*
Pd-Comp x Difficulty	2178.85	1	2178.85	15.66***
Reinforcement x Difficulty	799.28	1	799.28	5.75*
Pd-Comp x Reinforcement x Difficulty	966.05	1	966.05	6.94*
Within Groups	9876.86	71	139.11	
Total	17981.54	78		

***$p < .001$
**$p < .01$
*$p < .05$

Table 12

Analysis of Variance of the Number of Medium CVC Trigrams Selected on the Last Four Acquisition Blocks of 15 Trials

Source of Variation	SS	df	MS	F
Pd-Comp	661.25	1	661.25	4.75*
Reinforcement	1264.05	1	1264.05	9.08**
Difficulty	1824.05	1	1824.05	13.11***
Pd-Comp x Reinforcement	594.05	1	594.05	4.27*
Pd-Comp x Difficulty	2226.05	1	2226.05	16.00***
Reinforcement x Difficulty	858.05	1	858.05	6.17*
Pd-Comp x Reinforcement x Difficulty	966.05	1	966.05	6.94*
Within Groups	10018.00	72	139.14	
Total	18411.55			

***$p < .001$
**$p < .01$
*$p < .05$

Table 13

Analysis of Variance of the Number of Medium CVC Trigrams Selected on the Non-Reinforced and Acquisition Blocks of Trials

Source of Variation	SS	df	MS	F
Between Groups	8506.63	79		
Pd-Comp	394.23	1	394.23	5.56*
Reinforcement	574.46	1	574.46	8.11**
Difficulty	568.01	1	568.01	8.02**
Pd-Comp x Reinforcement	205.25	1	205.25	2.90
Pd-Comp x Difficulty	854.19	1	854.19	12.06***
Reinforcement x Difficulty	438.23	1	438.23	6.18*
Pd-Comp x Reinforcement x Difficulty	370.51	1	370.51	5.23*
Within Groups (Error)	5101.75	72	70.85	
Within Groups	9524.55	800		
Blocks	4820.74	10	482.07	114.23***
Pd-Comp x Blocks	221.28	10	22.13	5.24***
Reinforcement x Blocks	109.35	10	10.94	2.59**
Difficulty x Blocks	768.80	10	76.88	18.22***
Pd-Comp x Reinforcement x Blocks	63.52	10	6.35	1.50
Pd-Comp x Difficulty x Blocks	360.68	10	36.07	8.55***
Reinforcement x Difficulty x Blocks	55.54	10	5.55	1.32
Pd-Comp x Reinforcement x Difficulty x Blocks	83.49	10	8.35	1.98*
Blocks x Subjects Within Groups (Error)	3041.15	720	4.22	
TOTAL	18031.18	879		

***p .001
**p .01
*p .05

Table 14

Analysis of Variance Showing the Linear and Quadratic Components of the Interactions with the Blocks Sums of Squares of Table 13

Source of Variation	SS	df	MS	F
Linear Components				
Within Subjects	4852.11	80		
Blocks	3637.83	1	3637.83	440.42***
Pd-Comp	27.29	1	27.29	3.30
Reinforcement	70.85	1	70.85	8.58**
Difficulty	289.46	1	289.46	35.04***
Pd-Comp x Reinforcement	29.32	1	29.32	3.55
Pd-Comp x Difficulty	132.54	1	132.54	16.05***
Reinforcement x Difficulty	9.56	1	9.56	1.16
Pd-Comp x Reinforcement x Difficulty	60.22	1	60.22	7.29**
Within Groups	595.04	72	8.26	
Quadratic Components				
Within Subjects	1969.90	80		
Blocks	795.63	1	795.63	87.34***
Pd-Comp	68.09	1	68.09	7.48**
Reinforcement	12.22	1	12.22	1.34
Difficulty	335.10	1	335.10	36.82***
Pd-Comp x Reinforcement	.06	1	.06	----
Pd-Comp x Difficulty	88.75	1	88.75	9.75**
Reinforcement x Difficulty	9.19	1	9.19	1.01
Pd-Comp x Reinforcement x Difficulty	5.27	1	5.27	----
Within Groups	655.59	72	9.10	

***p < .001
**p < .01

Table 15

Comparisons of the Mean Total Number of Medium CVC Trigrams for Each Experimental Group. Differences Between Means were Tested with Duncan's Multiple Range Test

Group	Comparison	Pd	Difference
Easy-Right	124.8	63.5	61.3**
Easy-Wrong	133.2	121.7	11.5**
Difficult-Right	86.7	97.3	10.6*
Difficult-Wrong	92.6	95.9	3.3
Mean	109.32	94.60	----

Group	Right	Wrong	Difference
Comp-Easy	124.8	133.2	8.4
Comp-Difficult	86.7	92.6	5.9
Pd-Easy	63.5	121.7	58.2**
Pd-Difficult	97.3	95.9	1.4
Mean	93.08	110.85	----

Group	Easy	Difficult	Difference
Comp-Right	124.8	86.7	38.1**
Comp-Wrong	133.2	92.6	40.6**
Pd-Right	63.5	97.3	33.8**
Pd-Wrong	121.7	95.9	25.8**
Mean	110.80	93.12	----

**p<.01
*p<.05

Table 16

Comparisons of the Mean Number of Medium CVC Trigrams on the Last Four Blocks of Trials for Each Experimental Group. Differences Between Means were Tested with Duncan's Multiple Range Test

Group	Comparison	Pd	Difference
Easy-Right	55.8	27.1	28.7**
Easy-Wrong	57.9	54.0	3.9
Difficult-Right	35.3	41.6	6.3
Difficult-Wrong	38.2	41.5	3.3
Mean	46.80	41.05	----

Group	Right	Wrong	Difference
Comp-Easy	55.8	57.9	2.1
Comp-Difficult	35.3	38.2	2.9
Pd-Easy	27.1	54.0	26.9**
Pd-Difficult	41.6	41.5	.1
Mean	39.95	47.90	----

Group	Easy	Difficult	Difference
Comp-Right	55.8	35.3	20.5**
Comp-Wrong	57.9	38.2	19.7**
Pd-Right	27.1	41.6	14.5*
Pd-Wrong	54.0	41.5	12.5*
Mean	48.70	39.15	----

**$p < .01$
*$p < .05$

Table 17

Mean Total Number of Medium CVC Trigrams for the Experimental Groups

Group	Comparison	Pd
Right	105.8	80.4
Wrong	112.9	108.8
Mean	109.3	94.6

Group	Comparison	Pd
Easy	129.0	92.6
Difficult	89.6	96.6
Mean	109.3	94.6

Group	Easy	Difficult
Right-Blank	94.2	92.0
Wrong-Blank	128.0	94.2
Mean	111.1	93.1

Table 18

Mean Total Number of Medium CVC Trigrams on the Last Four Blocks of Trials for the Experimental Groups

Group	Comparison	Pd
Right	45.6	34.4
Wrong	48.2	47.8
Mean	46.9	41.1

Group	Comparison	Pd
Easy	56.8	40.6
Difficult	36.7	41.5
Mean	46.9	41.1

Group	Easy	Difficult
Right-blank	41.4	38.4
Wrong-blank	56.0	39.8
Mean	48.7	39.1

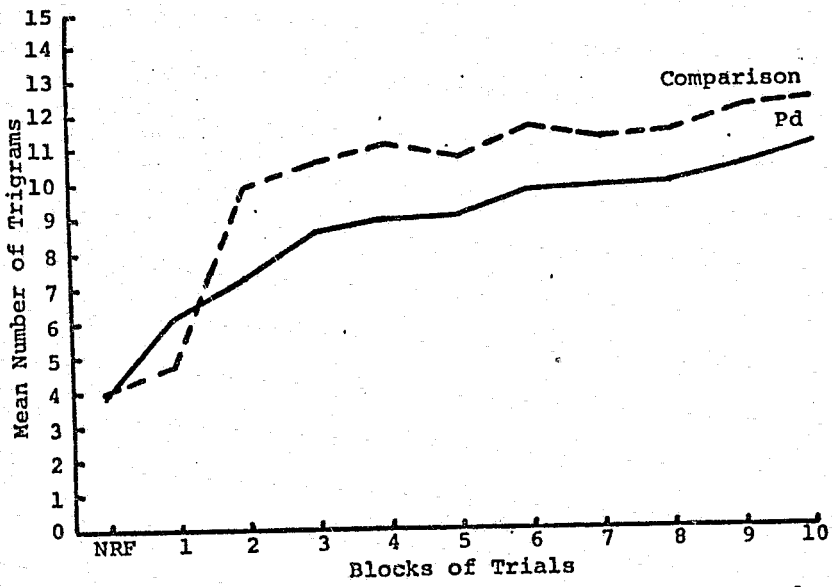


Fig. 1. Mean number of medium CVC trigrams selected in blocks of 15 trials for the Pd and Comparison groups.

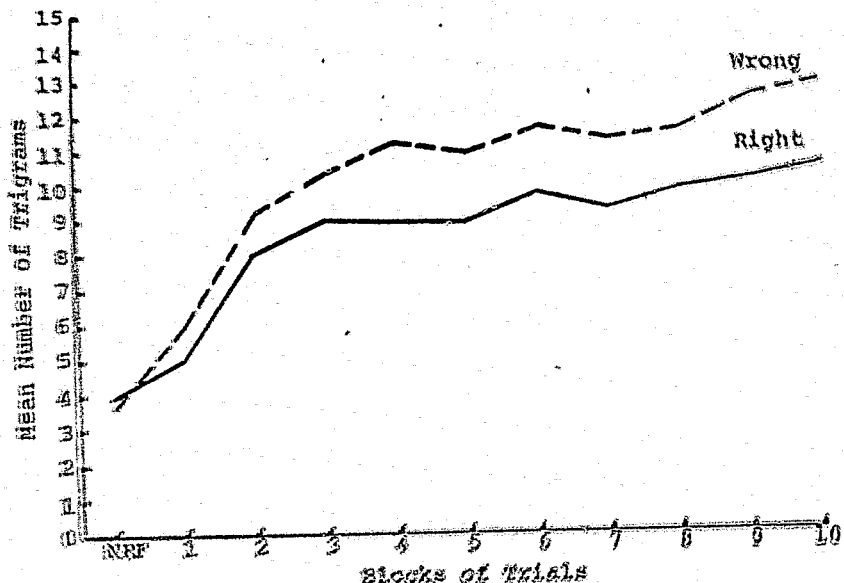


Fig. 2. Mean number of medium CVC trigrams selected in blocks of 15 trials in the *Right-blank* and *Wrong-blank* conditions.

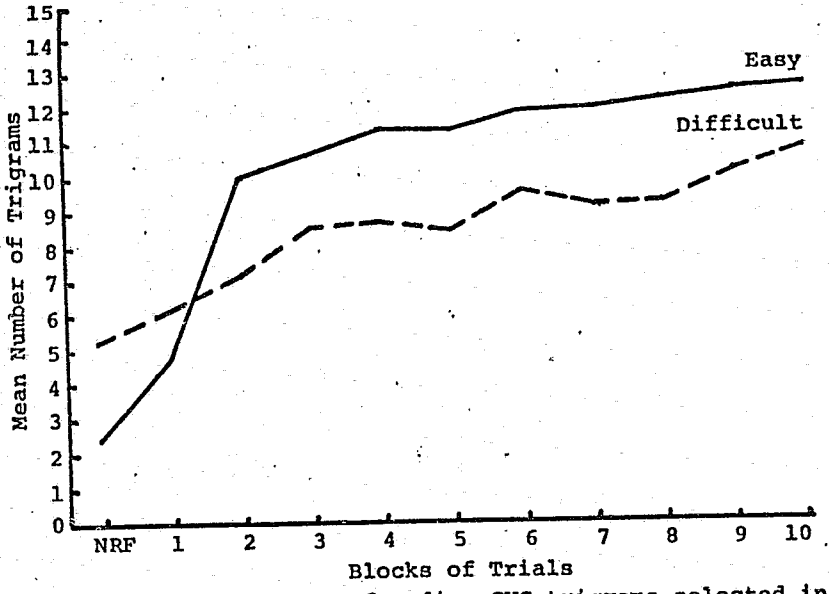


Fig. 3. Mean number of medium CVC trigrams selected in blocks of 15 trials on the Easy and Difficult tasks.

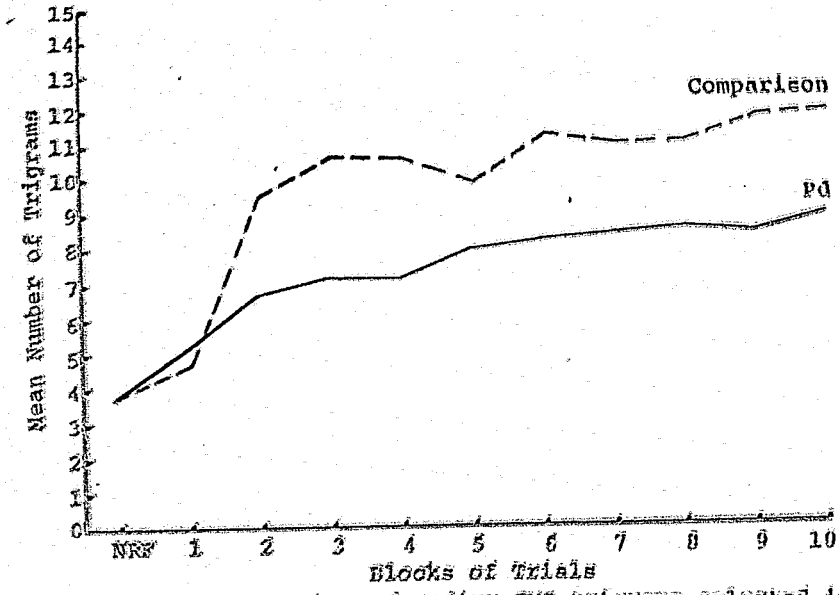


Fig. 4. Mean number of medium CVC trigrams selected in blocks of 15 trials for the Pd and Comparison groups in the Right-blank condition.

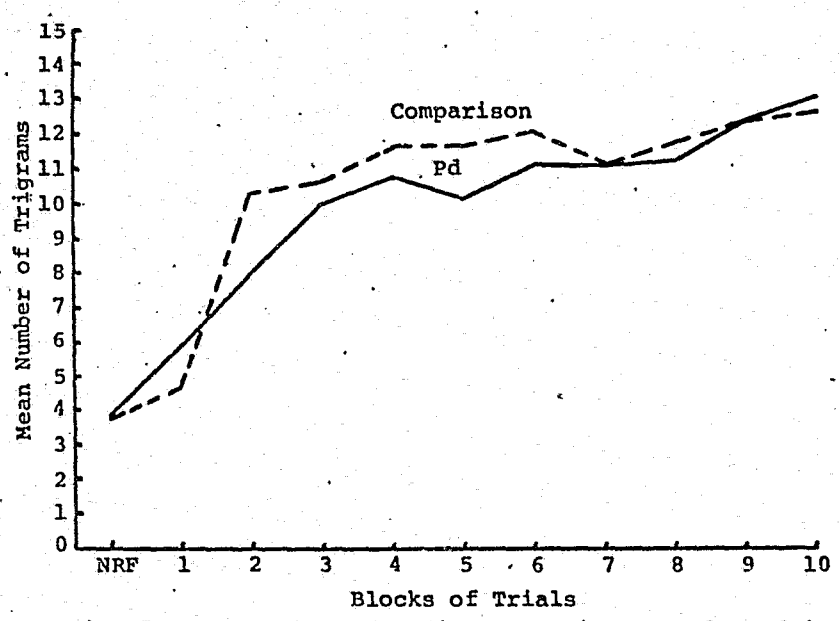


Fig. 5. Mean number of medium CVC trigrams selected in blocks of 15 trials for the Pd and Comparison groups in the Wrong-blank condition.

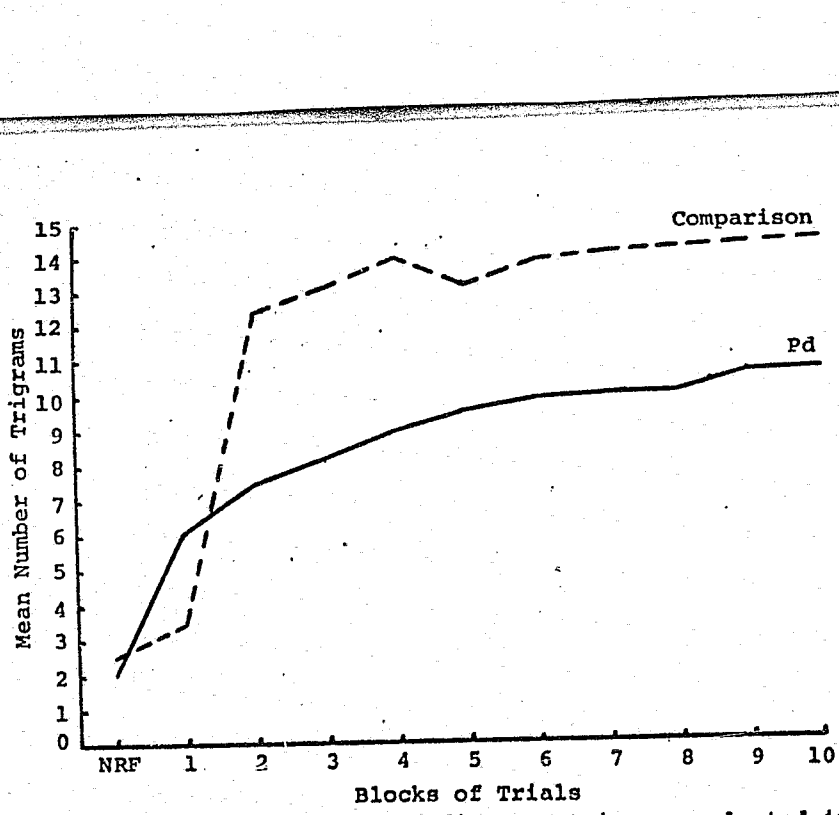


Fig. 6. Mean number of medium CVC trigrams selected in blocks of 15 trials for the Pd and Comparison groups on the Easy task.

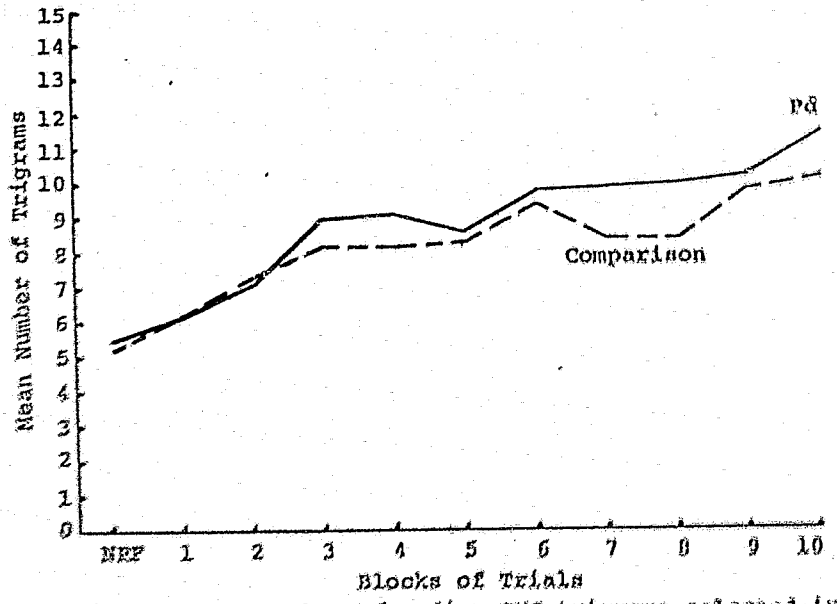


Fig. 7. Mean number of medium CVC trigrams selected in blocks of 15 trials for the Pā and Comparison groups on the difficult task.

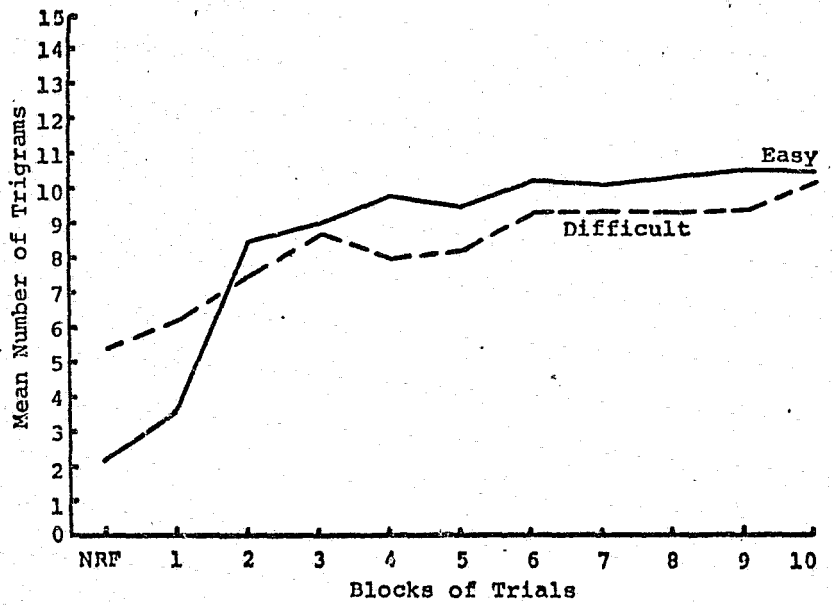


Fig. 8. Mean number of medium CVC trigrams selected in blocks of 15 trials for the Easy and Difficult tasks in the Right-blank condition.

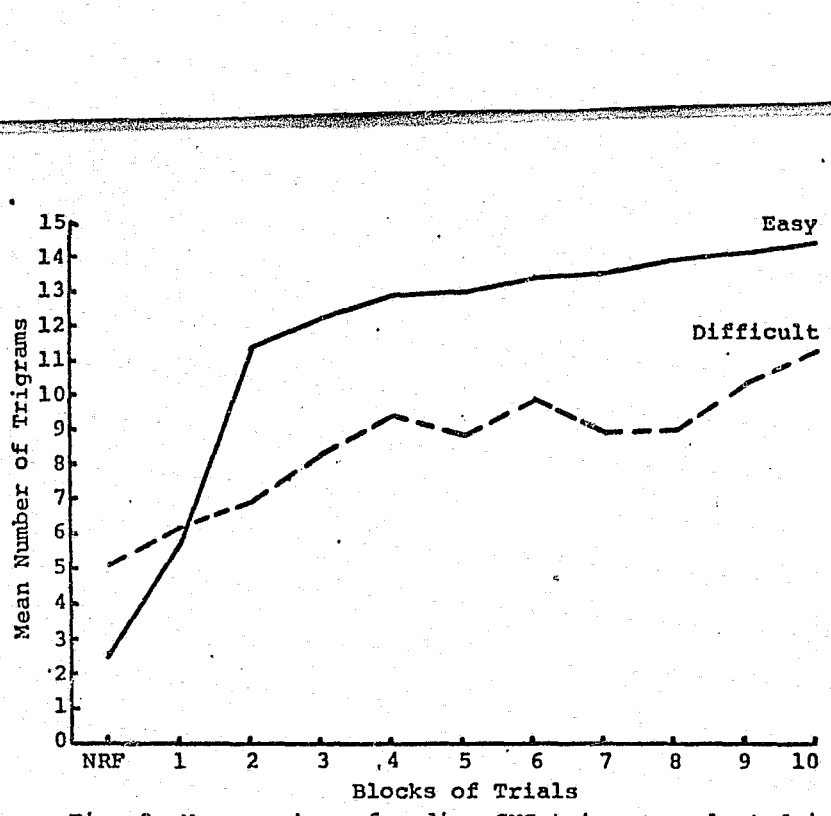


Fig. 9. Mean number of medium CVC trigrams selected in blocks of 15 trials for the Easy and Difficult tasks in the Wrong-blank condition.

Chapter 5

Discussion

The major emphasis of this study was to investigate Cleckley's hypothesis of semantic dementia (Cleckley, 1955, 1959). According to this hypothesis, psychopathic personalities do not respond appropriately to words and phrases. They understand their meanings, but do not respond to them in the way normal people do. This discrepancy between understanding and action is frequently seen in the contradiction between the psychopath's ability to verbalize accepted standards of behavior, and his actual behavior. Cleckley proposes that the psychopath does not behave in accordance with his verbalizations because he does not respond appropriately to connotative meanings (particularly affective meanings) of words and phrases. Johns and Quay (1962) and Kadlub (1956) have interpreted this as a decrement in responsiveness to generalized social reinforcing properties of language.

In the present study the verbal discrimination of psychopaths was studied under conditions of positive and negative verbal reinforcement. Task difficulty was introduced as another variable because no studies have been found investigating this variable with psychopaths.

When the performance of the comparison group was compared with the psychopathic group without regard to reinforcement or difficulty, the results were consistent with Cleckley's hypothesis that the psychopath is less respon- to verbal reinforcement than the nonpsychopath. This

result, however, is also consistent with an explanation based on poorer discriminative ability in the psychopath. Nevertheless, the data suggest that an explanation similar to Cleckley's may be more plausible.

On the easy task, the comparison groups performed significantly better than the psychopathic groups not only in the frequency of correct responses over trials, but also in the rate of acquisition. The more rapid rate of acquisition for the comparison groups, however, can be accounted for by a rapid initial increase over the first two blocks of trials. The psychopathic group, however, did not show the initial rapid increase, suggesting that they did not respond in the same way to reinforcement as the comparison groups. Despite that on the difficult task with Right the psychopathic groups had a significantly greater number of total correct responses, no significant differences between the comparison and the psychopathic groups were found on the rate of acquisition or on the final four blocks of trials. Again, this suggests that the psychopathic and comparison groups did not differ with respect to their ability to discriminate in the verbal discrimination situation (Figure 7).

The most striking outcome of this study was the differential effect of task difficulty. On the easy task the comparison group consistently performed better than the psychopathic group, which result is consistent with Cleckley's hypothesis. On the difficult task, however, no significant differences were found except that the psychopathic group with Difficult-Right had a significantly greater total mean number of correct responses. Task difficulty, therefore, appears to be

an important variable in the performance of psychopathic offenders as compared with nonpsychopathic offenders in the kind of task used in the present study.

Cleckley offers no ready explanation for this result, nor can one be easily formulated from his theory, One partial explanation may lie in the Spence-Taylor hypothesis concerning the effects of task difficulty. According to this hypothesis, high anxious subjects should perform better an an easy task than low anxious subjects. On a difficult task, however, low anxious subjects should perform better than high anxious subjects. The present study was arranged, and it is a common clinical observation that psychopaths are relatively free of anxiety in situations which normally arouse anxiety in nonpsychopaths. Thus, according to the Spence-Taylor hypothesis, one would expect that on an easy task, nonpsychopaths who have more anxiety, should do better than psychopaths, whereas on a difficult task, psychopaths should do better than nonpsychopaths. The better performance of the comparison group on the easy task is consistent with the Spence-Taylor explanation. On the difficult task, however, the psychopathic group was superior only with right, and only when the mean number of total correct responses was compared. No differences were found on the final four acquisition blocks. These results suggest that organismic and situational factors in addition to anxiety may be functioning. These results further suggest that Cleckley's interpretation may be incomplete. Psychopaths may well be unresponsive to the impact of verbal communication, but how they respond on a behavioral level

may be partially a function of the situation in which they find themselves. The results of the present study clearly indicate that task difficulty is an important variable. In addition, the results of the present study suggest that the differences between the comparison subjects and the psychopathic subjects may be partially accounted for by the overt verbal reinforcer.

The finding that the psychopathic group did not respond as well when the reinforcer, Right, was used on the easy task but responded as well or better on the difficult task is only partially consistent with Cleckley's hypothesis, and only partially consistent with the conclusions of Johns and Quay (1962) and Quay and Hunt (1965) that psychopaths are not as responsive to social reinforcement as nonpsychopaths. By the same token, this finding is only partially supportive of Bernard and Eisenman (1967), Bryan and Kapche (1967), Hetherington and Klinger (1964), Kadlub (1956), Lykken (1954), and Schachter and Latane (1964), who have suggested that psychopaths respond as well as nonpsychopaths when positive reinforcement is used. In the present study, this occurred on the easy task but not on the difficult one. The poorer overall performance of the psychopathic group in the Right-blank condition was a function of their significantly poorer performance on the easy task as compared with the comparison group. The comparison group with Right, on the other hand, performed significantly better on the easy task than they did on the difficult task.

Examining the performance of the comparison and psychopathic groups in the combined Wrong-blank conditions, it was

found that the performance of the comparison group was significantly superior to the psychopathic group up to the sixth block of trials. On the last four blocks, however, no significant differences were found. In addition, the comparison group performed significantly better on the easy task than they did on the difficult task with both Right and Wrong. With Wrong, the psychopathic group, on the other hand, performed significantly better on the easy task than they did on the difficult task. With Right they performed significantly better on the difficult task.

Summarizing the results to this point, it appears that when task difficulty and reinforcement are combined, psychopathic prison inmates do not respond to general verbal reinforcement in a verbal discrimination task as well as non-psychopathic inmates; and that they are less responsive to the experimenter saying, "Right," than they are to the experimenter saying, "Wrong." More importantly, it appears that how they respond to verbal reinforcement depends a great deal upon the difficulty of the verbal discrimination task. An easy task combined with Right resulted in poorer performance than a difficult task combined with Right or an easy or difficult task combined with Wrong. Just as important is the fact that the psychopathic group did as well with Right as they did with Wrong on the difficult task.

If it can be assumed that saying, "Right," carries with it mild positive affect, and saying, "Wrong," mild negative affect, an assumption which appears reasonable, then the results of the present study are partially inconsistent with the views of Hare (1965); Hetherington and Klinger (1964);

Lykken (1957); and Schachter and Latane (1964) who have concluded that psychopaths do not differ from nonpsychopaths when their responses are positively reinforced. When responses are negatively reinforced, however, the psychopath is inferior to the nonpsychopath. The psychopathic groups in the present study were inferior to the comparison groups with positive reinforcement on the combined tasks. While they were initially inferior with negative reinforcement, a result consistent with the views of the above authors, the performance of the psychopathic group equaled the comparison group on the last four blocks of trials. Thus, psychopaths appear less responsive to positive verbal reinforcers than nonpsychopaths when the tasks are combined. Under the same conditions they appear more responsive to negative verbal reinforcers than the above authors have suggested. With the combined tasks, the above results are also inconsistent with Cleckley in that in the Wrong condition the psychopathic and comparison groups performed equally well on the last four blocks of trials.

The most immediate explanation for these divergent results as compared with others appears to lie in the nature of the tasks employed. How a psychopath, or anyone else for that matter, performs in a given task depends greatly on the kind of task and nature of the reinforcers used. Thus, in serial learning tasks, such as maze learning and learning lists of nonsense syllables, where positive verbal

reinforcement is applied indiscriminately without regard for the correctness or incorrectness of responses, and is applied in the form of encouragement, psychopaths appear to show no decrement in correct responding. When, however, the positive verbal reinforcer is applied only when responses are correct, psychopaths appear to show a decrement in responding on the easy task, but not on the difficult task, suggesting that task difficulty may be an important variable.

If verbal conditioning is essentially a discrimination task, as suggested by Marston, Kanfer, and McBrearty (1962), and by Taffel (1955), then the results of the present study are consistent with Johns and Quay (1962), and Quay and Hunt (1965) when an easy task is used. The study of Johns and Quay, however, has also been criticised as not being a clear-cut demonstration that psychopaths are less responsive to positive verbal reinforcement than nonpsychopaths (Bryan and Kapche, 1967). While Johns and Quay's psychopathic group showed no increase in the number of I and We responses across conditioning blocks as compared with the nonpsychopathic groups, they did respond with a higher frequency on each conditioning block than any of the other groups. Bryan and Kapche (1967) partially replicated Johns and Quay and found no significant differences between psychopaths and nonpsychopaths either in the increase in the number of I and We responses across conditioning blocks, or in the frequency of responses. The inconsistency between these results and

those obtained in the present study may be partially explained in terms of differences in the task, particularly of differences in the response class used in the two studies. In verbal conditioning studies, the response class is frequently a pronoun. The subject is positively reinforced when he responds with either I or We. From all the available descriptions of the psychopath, it is very clear that he is egocentric, self-centered, and uncaring about other people. Thus, in a verbal conditioning situation where I and We are the critical responses, it may not be surprising that he uses these pronouns at least as often as nonpsychopaths. According to this interpretation, one might expect him to use I and We even more often than nonpsychopaths. Examination of the data of the verbal conditioning studies might reveal that the psychopath used I more often than We, and that he used I more often than nonpsychopaths. Some support for this interpretation comes from the study of Bernard and Eisenman (1967) who compared the verbal conditioning of psychopaths and nonpsychopaths when the critical response was only the pronoun, I. The psychopathic group responded significantly more often with I than the nonpsychopathic group.

In the present study, the response class was the spelling of trigrams. This response class is presumable free of the self-centered implications of I and We, and hence permits a better evaluation of the effects of positive verbal reinforcement.

In the Wrong-blank condition, the differences between

the psychopathic and comparison groups were not as striking as in the Right-blank condition. Over the first six blocks of trials, the comparison groups performed significantly better than the psychopathic groups. From the seventh to the tenth blocks, however, there was no difference. Thus, when negative verbal reinforcement was used under the conditions of the present study, the inferiority of the psychopathic groups was not so great as is implied by Hetherington and Klinger (1964); Lykken (1957); and Schachter and Latane (1964).

The differences may be partially accounted for by these investigators' use of electric shock for incorrect responses, whereas in the present study negative verbal reinforcement was used for incorrect responses. The only study beside the present one in which negative verbal reinforcement was used was in the study of Hetherington and Klinger (1964), in which they ridiculed the performance of their subjects regardless of the correctness or incorrectness of their responses. These authors concluded that psychopaths are relatively unaffected by verbal punishment. The present study, however, suggests that psychopaths are responsive to negative verbal reinforcement provided it is specific to incorrect responses, and not applied indiscriminately to all responses as was done in the Hetherington and Klinger study.

Why then did the psychopathic groups do poorly in the Right-blank condition, but better in the Wrong-blank condition? Looking at the performance of the individual subjects

in the Pd-Easy-Right group, four of the ten subjects never responded correctly, and the majority of the subjects in this group showed no evidence of an increase in the rate of acquisition. Upon completion of the study, many of the subjects spontaneously indicated that they knew what was expected of them, and that they knew which trigrams had been correct. Apparantly, most of the subjects in this group were indifferent to the task.

Consistent with this result, a possible explanation comes from a study by Sarbin, Allen, and Rutherford (1965). These authors compared the effectiveness of positive social reinforcement between socialized (as measured by a socialization scale) and non-socialized delinquents. No differences were found when delinquents were compared with non-delinquents without regard to socialization. When high and low socialization was compared in the delinquent and non-delinquent groups, however, the low socialization groups were significantly retarded in their responsiveness to social reinforcement. The authors suggest that in the childhood of chronic delinquents, conditions are such as to impede the development of effective social reinforcers. Friedlander (1947); Glueck (1955); and Rabinovitch (1952) suggest that the delinquent receives much more negative reinforcement than he does positive, and that both are inconsistent. Thus, it is possible, and has been suggested in Chapter 2, that the childhood of the psychopath is filled with more

punishment than reward, and that both are inconsistent. Thus, the better performance of the psychopaths in the Wrong-blank condition as compared with their performance in the Right-blank condition, could be partially accounted for by a greater amount of negative reinforcement received during childhood. That the psychopath is inferior in both the Right-blank and Wrong-blank conditions with the easy task as compared with the comparison groups, may be accounted for by the inconsistency of both positive and negative reinforcements received during early childhood. That the inconsistency hypothesis is plausible is suggested by the rapid increase in correct responding between acquisition blocks one and two for the comparison groups in Figures 1, 4, 5, and 6. The psychopathic groups increased more slowly, possibly because they were not as sure of the meaning of the reinforcers as the comparison groups. Nevertheless, both reinforcers were effective in altering the responding of the psychopaths. Results on the difficult task, however, are not consistent with the above suggestion. On the difficult task, reinforcement did not differentiate the groups as consistently as it did on the easy task. Again, this points up the importance of task difficulty.

To recapitulate, Cleckley's hypothesis about the psychopathic personality was partially upheld. The results suggest that certain modifications of his hypothesis appear necessary in order to take account of the difficulty of the

task. On an easy task, the psychopath seems to be considerable less responsive to overt verbal reinforcement than on a difficult task. A positive verbal reinforcer of the kind used in this study appears less effective than a negative one, and the lack of effectiveness appears particularly evident on the easy task. A possible explanation consistent with Cleckley's view is that the psychopath uses positive and negative verbal reinforcers more as neutral cues to keep track of his performance, and does not pay as much attention to the affective content as the nonpsychopath. This not to say that the psychopath lacks affective responsiveness, but rather that he does not pay much attention to it or does not respond to it in the same way as nonpsychopaths do.

It becomes apparant that present knowledge is insufficent to make general statements about the behavior of psychopaths as compared with nonpsychopaths in controlled situations. Not until a greater variety of tasks has been investigated at different levels of difficulty, and more thorough research on the effectiveness of both positive and negative reinforcement carried out will generalizations be possible.

Chapter 6

Summary and Conclusions

Summary

The major emphasis of this study was to investigate Cleckley's hypothesis that psychopathy can be viewed as a semantic personality disorder. According to this hypothesis psychopaths do not respond appropriately to words and phrases. They understand their denotative meanings, but do not respond appropriately to their connotative meanings, particularly their affective meanings.

The verbal discrimination of 40 psychopathic prison inmates was compared with 40 comparison inmates. The MMPI and the Activity Preference Questionnaire were used to differentiate psychopathic from comparison inmates. Ss were required to discriminate between series of two CVC trigrams under conditions of positive and negative verbal reinforcement. Trigrams were taken from a list for which new association values had been calculated for a prison inmate population by the author. Two levels of task difficulty were included as another variable. Difficulty was defined as the degree of discrepancy between the association values of two trigrams to be discriminated. In the positively reinforcing condition, Ss were reinforced by E saying, "Right," if they chose the arbitrarily designated correct trigram. If the incorrect trigram was selected, E said nothing. In the negative reinforcing condition, Ss were reinforced by E saying, "Wrong," if they chose the incorrect trigram. If they chose the correct one, E said nothing.

The results showed that when verbal reinforcement and task difficulty were combined, the performance of the comparison Ss was significantly superior to the psychopathic

CONTINUED

3 OF 4

Ss. When psychopathic and comparison Ss and task difficulty were combined, negative verbal reinforcement resulted in significantly superior performance. When psychopathic and comparison Ss and reinforcement were combined, the easy task resulted in significantly superior performance.

Separate comparisons between psychopathic and comparison groups revealed that on the easy task the comparison groups performed significantly better than the psychopathic groups, but on the difficult task there was no significant difference, except that the psychopathic group with positive reinforcement on the difficult task had a significantly greater total number of correct responses than the comparison group. Final acquisition, however, was the same. The interaction was accounted for largely by the poor performance of the psychopathic group on the easy task with positive reinforcement. The poor performance of this group also contributed largely to the over all poorer performance of the psychopathic group in the positive reinforcement condition.

With negative reinforcement, the performance of the psychopathic group was initially below that of the comparison group. As acquisition proceeded, however, their performance equaled that of the comparison group. The performance of the psychopathic group with negative reinforcement was significantly better than their performance with positive reinforcement on the easy task, but not on the difficult task.

These results were interpreted as being inconsistent with previous investigations that have suggested that positive

verbal reinforcement should not result in a differential effect between the performance of psychopaths and nonpsychopaths, but that negative verbal reinforcement should have a detrimental effect on the performance of psychopaths as compared with nonpsychopaths. This study suggests that negative verbal reinforcement may have a more potent effect on the behavior of psychopaths than previously thought. These divergent results were explained largely in terms of differences in the tasks used, and the classes of reinforcers used and how they are applied.

It was concluded that task difficulty must be taken into account when assessing the behavior of psychopaths under conditions of positive and negative reinforcement. It was also concluded that the results partially supported Cleckley's hypothesis, but that his and other existing hypotheses are in need of reevaluation with more attention given to the types of tasks and classes of reinforcers used.

Conclusions

The conclusions drawn below refer to the performance of psychopathic and comparison prison inmates in the verbal discrimination task with the verbal reinforcers used in the present study.

1. When reinforcement and task difficulty were combined, the Comparison group selected a greater number of medium trigrams than the Psychopathic group.

2. When the performance of the Psychopathic and Comparison groups were combined with task difficulty, Ss in the Wrong-blank condition selected a greater number of medium trigrams than Ss in the Right-blank condition.

3. When the performance of the Psychopathic and Comparison groups was combined with reinforcement, Ss in the Easy task selected a greater number of medium trigrams than Ss in the Difficult task.

4. In the Right-blank condition with the combined tasks, the Comparison group selected a greater number of medium trigrams than the Psychopathic group. The poorer performance of the Psychopathic group may be accounted for by their poor performance in the Easy-Right condition.

5. In the Wrong-blank condition with the combined tasks, the Comparison group selected a greater number of medium trigrams than the Psychopathic group over the first six blocks of trials. On the last four blocks of trials the performance of the two groups was the same.

6. On the Easy task with combined reinforcement, the Comparison group selected a greater number of medium trigrams than the Psychopathic group. Again, this may be accounted for largely by the poorer performance of the Psychopathic group in the Easy-Right condition.

7. On the Difficult task with combined reinforcement, no differences were found between the Psychopathic and Comparison groups. In the Difficult-Right condition, however, the Psychopathic group selected a greater total number of medium trigrams than the Comparison group in the same condition. Final acquisition, however, was the same.

8. In the Right-blank condition with the Psychopathic and Comparison groups combined, Ss in the Easy task selected a greater number of medium trigrams than Ss in the difficult task.

9. In the Wrong-blank condition with the Psychopathic and Comparison groups combined, Ss in the Easy task selected a greater number of medium trigrams than Ss in the Difficult task.

10. Both the Psychopathic and Comparison groups were able to discriminate correct responses on the verbal discrimination task.

11. Both the Psychopathic and Comparison groups increased their rate of acquisition in the positive and negative verbal reinforcement conditions.

12. The personality dimension of psychopathy interacted with task difficulty. Acquisition of correct responses by the Psychopathic group was below that of the Comparison group on the Easy task. On the Difficult task, however, acquisition of correct responses by the Psychopathic group was the same as that of the Comparison group, except that the Psychopathic group had a significantly greater total number of correct responses than the Comparison group on the Difficult-Right condition. Final acquisition, however, was the same for both groups. Most of the interaction can be accounted for by the poorer acquisition by the Psychopathic group on the Easy task with Right.

13. Task difficulty and verbal reinforcement had a greater differential effect on the Psychopathic group than on the Comparison group.

14. Task difficulty must be taken into account when evaluating the behavior of psychopaths under conditions of positive and negative verbal reinforcement.

15. The results of the present study partially support

Cleckley's hypothesis. His and other hypotheses, however, are in need of reevaluation with more attention given to the types of tasks and classes of reinforcers used.

16. Discrepancies in the association values of CVC trigrams differentiated the Easy and Difficult tasks for both the Psychopathic and Comparison groups.

Limitations

1. Conclusions drawn in this study are not easily generalizable to populations other than psychopathic prison inmates as defined here. Comparable non-prison inmates would prove valuable.

2. The criteria used to differentiate psychopathic and non-psychopathic inmates limits the comparability of this study with others. There has been, and still is lack of consistency across studies in so far as diagnostic instruments are concerned.

3. Broader generalizations would have been possible had groups been included which were subjected to nonverbal reinforcers, for example, lights or buzzers.

4. Most studies with psychopaths have used a male experimenter. A female experimenter was used in this study and may have had some effect on the results.

Suggestions for Further Research

1. Since a female experimenter was used in this study, it might be well to investigate the differential effects of male and female experimenters on the behavior of psychopaths.

2. An investigation of the differential effects of verbal and nonverbal reinforcement with tasks similar to the one used in this study would be useful.

3. The investigation of difficulty level with tasks other

than the one used in this study seems very important. Furthermore, such investigations should use different kinds of reinforcers in addition to those used in the present study.

4. In this study a fixed number of trials was used in the task. The number of reinforcements, both positive and negative, were permitted to vary. Thus the differential effects of positive and negative reinforcement may also be affected by the number of reinforcements received.

5. The introduction of a third level of task difficulty might serve to clarify the effects of task difficulty.

6. Replication of all or part of this study with psychopathic and nonpsychopathic nonprisoners appears indicated.

References

Alexander, F. The neurotic character. International Journal of Psychoanalysis, 1930, 11, 292-313.

Alpers, B. Hypothalamic destruction. Psychosomatic Medicine, 1944, 2, 286.

Archer, J. E. A re-evaluation of the meaningfulness of all possible CVC trigrams. Psychological Monographs, 1960, 74, NO. 497.

Bender, L. Psychopathic behavior disorders in children. In R. Lindner, & R. Seliger (Eds.), Handbook of correctional psychology. New York: Philosophical Library, 1947.

Bernard, J. L., & Eisenman, R. Verbal conditioning in sociopaths with social and monetary reinforcement. Journal of Personality and Social Psychology, 1967, 6, 203-206.

Bryan, J. H., & Kapche, R. Psychopathy and verbal conditioning. Journal of Abnormal Psychology, 1967, 72, 71-73.

Buchwald, A. M. Extinction after acquisition under different verbal reinforcement combinations. Journal of Experimental Psychology, 1959, 57, 43-48.

Burgum, M. Constructive values associated with rejection. American Journal of Orthopsychiatry, 1940, 10, 319.

Buss, A. H., Braden, W., & Orgel, A Acquisition and extinction with different verbal reinforcement combinations. Journal of Experimental Psychology, 1956, 52, 288-295.

Buss, A. H., & Buss, E, H, The effect of verbal reinforcement combinations on conceptual learning, Journal of Experimental Psychology, 1956, 52, 283- 287.

Cleckley, H. The mask of sanity. St. Louis: Mosby, 1955.

Cleckley, H. Psychopathic states. In S. Arieti (Ed.), American Handbook of Psychiatry. New York: Basic Books, 1959.

Committee on Nomenclature and Statistics of the American Psychiatric Association. Diagnostic and statistical manual: Mental disorders. Washington, D. C.: American Psychiatric Association, 1952.

Dahlstrom, W. G., & Welsh, G. S. An MMPI handbook. Minneapolis: University of Minnesota Press, 1960.

Dubois, C. The people of Alor. Minneapolis: University of Minnesota Press, 1944.

East, W. N. Psychopathic personality and crime. Journal of Mental Science, 1945, 91, 426-466.

Edwards, A. L. Experimental design in psychological research. New York: Rinehart, 1960.

Ehrlich, S. K., & Keogh, R. P. Culture and mental disorders. Glencoe, Ill.: Free Press, 1955.

Ellingson, R. J. Incidence of EEG abnormality among patients with mental disorders of apparently non-organic origin. American Journal of Psychiatry, 1954, 3, 263-275.

Eysenck, H. J. Handbook of abnormal psychology. New York: Basic Books, 1961.

Fairweather, G. W. The effect of selected incentive conditions on the performance of psychopathic, neurotic, and normal criminals in a serial rote learning situation. Dissertation Abstracts, 1954.

Frankenstein, C. Psychopathy: A comparative analysis of clinical pictures. New York: Grune & Stratton, 1959.

Franks, C. M. Recidivism, psychopathy and personality. British Journal of Delinquency, 1956, 6, 192-201.

Freeman, W., & Watts, J. W. Prefrontal lobotomy: The problem of schizophrenia. American Journal of Psychiatry, 1945. 101, 739-748.

Freud, A., & Burlingham, D. Infants without families. New York: International Universities Press, 1944.

Friedlander, K. The psychoanalytic approach to juvenile delinquency. London: Kegan, Paul, Trench, & Tribner, 1947.

Fry, F. D. A normative study of the reactions manifested by college students and by state prison inmates in response to the MMPI, the Rosenzweig P-F study and the TAT. Journal of Psychology, 1952, 34, 27-30.

Fulton, J. F., & Ingraham, F. D. Emotional disturbances following experimental lesions of the base of the brain. Journal of Physiology, 1929, 90, 353.

Glaze, J. A. The association value of nonsense syllables. Journal of Genetic Psychology, 1928, 35, 255-269.

Glueck, B. A study of 608 admissions to Sing Sing Prison. Mental Hygiene, 1918, 2, 85-151.

Glueck, S., & Glueck, E. 500 criminal careers. New York: Knopf, 1930.

Goring, C. The English convict. London: His Majesty's Stationery Office, 1913.

Gottlieb, J. S., Ashley, M. C., & Knott, J. R. Primary behavior disorders and the psychopathic personality. Archives of Neurology and Psychiatry, 1946, 56, 381-400.

Gurvitz, M. S. The intelligence factor in psychopathic personality. Journal of Clinical Psychology, 1947, 17, 194-196.

Halleck, S. L. Psychiatry and the Dilemmas of crime. New York: Harper & Row, 1967.

Hare, R. D. Acquisition and generalization of a conditioned fear response in psychopathic and nonpsychopathic criminals. Journal of Psychology, 1965, 59, 367-370.

Hare, R. D. A conflict and learning theory analysis of psychopathic behavior. Journal of Research in Crime and Delinquency, January, 1956, 12-19.

Hare, R. D. Temporal gradient of fear arousal in psychopaths. Journal of Abnormal Psychology, 1965, 70, 442-445.

Helson, H. Adaptation-level theory. New York: Harper & Row, 1964.

Henderson, D. Psychopathic states. New York: Norton, 1939.

Heppenstall, M. E., Hill, D., & Slater, E. The EEG in the prognosis of war neurosis. Brain, 1945, 68, 17.

Hetherington, E. M., & Klinger, E. Psychopathy and punishment. Journal of Abnormal and Social Psychology, 1964, 69, 113-115.

Hill, D. EEG in episodic psychotic and psychopathic behavior. EEG Clinical Neurophysiology, 1952, 4, 419-442.

Hill, D. The relationship of electroencephalography to psychiatry. Journal of Mental Science, 1945, 91, 281.

Hill, D., & Watterson, D. Electroencephalographic studies of the psychopathic personality. Journal of Neurology and Psychiatry, 1942, 5, 47-64.

Hill, H. E., Haertzen, C. A., & Davis, H. An MMPI factor analytic study of alcoholics, narcotic addicts and criminals. Quarterly Journal of Studies of Alcohol, 1962, 23, 411-431.

Hodge, R. S. The impulsive psychopath: A clinical and electrophysiological study. Journal of Mental Science, 1945, 91, 472.

Hollingshead, A. & Redlick, F. Social class and mental illness. New York: Wiley, 1958.

Hooten, E. Crime and the man. Cambridge, Mass.: Harvard University Press, 1939.

Hunt, J. McV. Personality and the behavior disorders. New York: Ronald, 1944.

Jenkins, R. L. The psychopathic or antisocial personality. Journal of Nervous and Mental Diseases, 1960, 131, 318-334.

Jenkins, R. L., & Hewitt, L. Types of personality structure in child guidance clinics. American Journal of Orthopsychiatry, 1944, 14, 84-94.

Johns, J. H., & Quay, H. C. The effect of social reward on verbal conditioning in psychopathic and neurotic military offenders. Journal of Consulting Psychology, 1962, 26, 217-220.

Kadlub, J. K. The effects of two types of reinforcement on the performance of psychopathic and normal criminals. Dissertation Abstracts, 1956.

Kahn, E. Psychopathic personalities. New Haven, Conn.: Yale University Press, 1931.

Kallman, F. J. The genetics of schizophrenia. New York: Augustin, 1939.

Kanfer, F. H., & McBrearty, J. F. Verbal conditioning: Discrimination and awareness. Journal of Psychology, 1961, 52, 115-124.

Karpman, B. Conscience in the psychopath: Another version. American Journal of Orthopsychiatry, 1948, 18, 455-491.

Karpman, B. On the need of separating psychopathy into two distinct clinical types: The symptomatic and the idiopathic. Journal of Criminal Psychopathology, 1941, 3, 137.

Karpman, B. Psychopathy in the scheme of human typology. Journal of Nervous and Mental Disease, 1946, 103, 276-288.

Katzenmeyer, C. Personal communication. University of Minnesota, Minneapolis, Minnesota, 1966.

Kingsley, L. Wechsler-Bellevue patterns of psychopaths. Journal of Consulting Psychology, 1960, 24, 378.

Knott, J. R., & Gottlieb, J. S. Electroencephalogram in psychopathic personality. Psychosomatic Medicine, 1943, 5, 139.

Krueger, W. C. F. The relative difficulty of nonsense syllables. Journal of Experimental Psychology, 1934, 17, 145-153.

Lange, J. Crime and destiny. New York: Boni, 1930.

Lawton, M. P., & Kleban, M. H. Prisoners' faking on the MMPI. Journal of Clinical Psychology, 1964.

LeBlanc, B. A comparative study of some arousal-related measures in psychiatric patients. Unpublished Ph.D. thesis, University of Minnesota, 1964.

Leonardo, R. A. Criminal psychopaths and the electroencephalogram. Medical World, 1947, 56, 101-104.

Lewis, H. Deprived children. London: Oxford University Press, 1954.

Lindner, R. Experimental studies in constitutional psychopathic inferiority, Part I. Journal of Criminal Psychopathology, 1943, 3, 252-276.

Lindner, R. Experimental studies in constitutional psychopathic inferiority, Part II. Journal of Criminal Psychopathology, 1943, 4, 484-500.

Lindner, R. Psychopathy as a psychological problem. In Encyclopedia of psychology. New York: Philosophical Library, 1948.

Lindner, R. Rebel without a cause - The hypnoanalysis of a criminal psychopath. New York: Grune & Stratton, 1944.

Lindner, R. M., & Gurvitz, M. Revised Beta Examination Manual, 1946 restandardization, 1957 revision. New York: Psychological Corporation, 1957.

Lydecker, W. A., Pishkin, V., & Martin, B. Effects of different feedback conditions on the concept identification of schizophrenics. Psychological Reports, 1961, 9, 557-563.

Lykken, D. T. A study of anxiety in the sociopathic personality. Journal of Abnormal and Social Psychology, 1957, 55, 6-10.

Lykken, D. T. Instructions for experimental users of the Activity Preference Questionnaire (APQ), a scale of anxiety reactivity. Minneapolis, Minnesota: University of Minnesota, 1965. Unpublished.

Maher, B. A. Principles of psychopathology. New York: McGraw-Hill, 1966.

Marston, A. R., Kanfer, F. H., & McBrearty, J. F. Stimulus discriminability in verbal conditioning. Journal of Psychology, 1962, 53, 143-153.

Maughs, S. B. A concept of psychopathy. Journal of Criminal Psychopathology. 1941, 2, 329-356; 465-499.

McBrearty, J. F., Kanfer, F. H., Marston, A. H., & Evander, D. Focal and contextual stimulus variables in verbal conditioning. Paper presented at the American Psychological Association meeting, St. Louis, Missouri, 1962.

McCord, W., & McCord, J. The psychopath. Princeton, N. J.: Van Nostrand, 1964.

Morgan, C. T., & Stellar, E. Physiological psychology. New York: McGraw-Hill, 1950.

Mowrer, O. H. Learning theory and behavior. New York: Wiley, 1960.

Munroe, R. L. Schools of psychoanalytic thought. New York: Dryden, 1955.

Newkirk, P. R. Psychopathic traits are inheritable. Diseases of the Nervous System, 1957, 18, 52-54.

Ostrow, M., & Ostrow, M. Bilaterally synchronous paroxysmal slow activity in the encephalograms of non-epileptics. Journal of Nervous and Mental Diseases, 1946, 103, 346-358.

Painting, D. H. The performance of psychopathic individuals under conditions of positive and negative partial reinforcement. Journal of Abnormal and Social Psychology, 1961, 62, 352-355.

Partridge, G. E. A study of 50 cases of psychopathic personality. American Journal of Psychiatry, 1928, 7, 953-973.

Pishkin, V. Experimenter variable in concept identification feedback of schizophrenics. Perceptual and Motor Skills, 1963, 16, 921-922.

Pishkin, V., Smith, E., & Lundy, R. M. Verbal concept identification with schizophrenics and psychopaths. Journal of Clinical Psychology, 1962, 18, 198-203.

Pond, D. A., Rey, J. H., & Hill, D. Biological correlates of constitutional EEG abnormalities of the temporal lobes. EEG Clinical Neurophysiology, 1950, 2, 111.

Pritchard, J. C. A treatise on insanity. Philadelphia: Haswell, Barrington, & Haswell, 1835.

Pritchard, R., & Rosenzweig, S. The effect of war stress upon childhood and youth. Journal of Abnormal and Social Psychology, 1942, 37, 329-344.

Quay, H. C. Psychopathic personality as pathological stimulation seeking. American Journal of Psychiatry, in press.

Quay, H. C., & Hunt, W. A. Psychopathy, neuroticism and verbal conditioning: A replication and extension. Unpublished study, Northwestern University, 1965.

Rabinovitch, R. D. Round table on psychopathic behavior in children. American Journal of Orthopsychiatry, 1952, 22, 223-267.

Rosanoff, A. J. The etiology of child behavior. Psychiatric Monographs, 1943, 1.

Ruilmann, C. J., & Gulo, M. J. Investigation of autonomic responses in psychopathic personalities. Southern Medical Journal, 1950, 43, 953-956.

Sandoz, H. Child psychopathic personalities. Journal of Nervous and Mental Diseases, 1919, 49, 136-143.

Sarbin, T. R., Allen, V. L., & Rutherford, E. E. Social reinforcement, socialization, and chronic delinquency. British Journal of Social and Clinical Psychology, 1965, 4, 179-184.

Schachter, S., & Latane, B. Crime, cognition, and the autonomic nervous system. In D. Levine (Ed.), Nebraska symposium on motivation. Lincoln, Neb.: University of Nebraska Press, 1964.

Sears, R., Maccoby, R., & Levin, H. Patterns in child rearing. New York: Evanston, Row, & Peterson, 1956.

Sessions-Hodges, R. The impulsive psychopath: A clinical and electrophysiological study. Journal of Mental Science, 1945, 91, 476-482.

Sheldon, W. H. Varieties of delinquent youth. New York: Harper, 1949.

Sherman, L. J. A study of retroactive inhibition with meaningful and nonsense material in criminal psychopathic, criminal normal, and autoplastic neurotic subjects. Dissertation Abstracts, 1955.

Silverman, D. The electroencephalogram of criminals. Archives of Neurology and Psychiatry, 1944, 5, 439-466.

Simon, B., O'Leary, J. L., & Ryan, J. J. Cerebral dysrhythmia and psychopathic personalities: A study of ninety-six consecutive cases in a military hospital. Archives of Neurology and Psychiatry, 1946, 56, 677-685.

Spence, J. T. Effects of verbal reinforcement combinations and instructional condition on performance of a problem solving task. Journal of Personality and Social Psychology, 1966.

Spence, J. T. Verbal discrimination performance under different verbal reinforcement combinations. Journal of Experimental Psychology, 1964, 67, 195-197.

Spence, J. T., & Lair, C. V. The effect of different verbal reinforcement combinations on the verbal discrimination performance of schizophrenics. Journal of Personality and Social Psychology, 1965, 1, 245-249.

Spence, J. T., Lair, C. V., & Goodstein, L. D. Effects of different feedback conditions on discrimination learning in schizophrenic and nonschizophrenic subject. Journal of Verbal Learning and Verbal Behavior, 1963, 2, 339-345.

Spence, K. W., & Taylor, J. Anxiety and strength of the UCS as determiners of the amount of eyelid conditioning. Journal of Experimental Psychology, 1952, 42, 183-188.

Stafford-Clark, D., & Taylor, F. H. Clinical and electroencephalographic studies of prisoners charged with murder. Journal of Neurology, Neurosurgery, and Psychiatry, 1950, 12, 325.

Stafford-Clark, D., Pond, D., & Doust, J. W. L. The psychopath in prison: A preliminary report of a cooperative research. British Journal of Delinquency, 1951, 2, 117-129.

Steen, R. Moral insanity. Journal of Mental Science, 1913, 59, 478-486.

Szurek, S. A. Notes on the genesis of psychopathic personality. Psychiatry, 1942, 5, 1-6.

Taffel, C. Anxiety and the conditioning of verbal behavior. Journal of Abnormal and Social Psychology, 1955, 51, 496-501.

Taylor, J. A. The relationship of anxiety to the conditioned eyelid response. Journal of Experimental Psychology, 1951, 41, 81-92.

Thompson, G. N. The psychopathic delinquent. Springfield, Ill.: Thomas, 1953.

Tong, J. E., & Murphy, I. C. A review of stress reactivity research in relation to psychopathology and psychopathic behavior. Journal of Mental Science, October, 1960, 1273-1295.

Tredgold, A. Moral imbecility. Practitioner, 1917, 99, 39-47.

Warren, A. B., & Grant, D. A. The relation of conditioned discrimination to the MMPI Pd personality variable. Journal of Experimental Psychology, 1955, 51, 23-27.

Wheelan, L. Aggressive psychopathy in one of a pair of uniovular twins: A clinical and experimental study. British Journal of Delinquency, 1951, 2, 130-143.

Whiting, J., & Child, I. L. Child training and personality: A cross-cultural study. New Haven, Conn.: Yale University Press, 1953.

Wilcock, K. D. Neurotic differences between individualized and socialized criminals. Journal of Consulting Psychology, 1964, 28, 141-145.

Williams, D. The significance of an abnormal electroencephalogram. Journal of Neurology and Psychiatry, 1941, 4, 257.

Winer, B. J. Statistical principles in experimental design. New York: McGraw-Hill, 1962.

Wittels, F. The criminal psychopath in the psychoanalytic system. Psychoanalytic Review, 1937, 24, 276-291.

Woodworth, R. S., & Schlosberg, H. Experimental psychology. New York: Holt, 1954.

Appendices

Appendix A

Association Values of 300 CVC Trigrams. Glaze, Krueger, and Archer Values Are Shown Together with Those Obtained by the Author

	SCOTT	ARCHER	GLAZE	KRUEGER
QYV	0	5	7	59
XIW	0	3	0	16
XYG	0	7	7	28
XIJ	1	2	7	29
XUK	1	5	0	35
XUY	1	3	0	29
XYB	1	2	0	36
XYD	1	5	7	37
XYJ	1	2	0	21
XYN	1	6	47	40
XYQ	1	2	7	23
XYV	1	3	0	30
ZYW	1	7	0	31
JYQ	2	5	0	41
QIJ	2	5	0	40
QOJ	2	4	7	29
QYJ	2	3	0	18
QYW	2	7	20	39
VYJ	2	5	0	24
XEZ	2	7	7	36
XIB	2	6	33	36
XIQ	2	5	7	39

	SCOTT	ARCHER	GLAZE	KRUEGER
XOJ	2	2	7	14
XOQ	2	6	20	53
XUH	2	4	0	24
XUQ	2	3	7	19
XYH	2	1	0	19
ZUJ	2	5	13	30
KYH	3	7	0	51
QIH	3	6	0	40
QUJ	3	3	0	22
QYG	3	6	20	32
XEF	3	3	0	23
XEJ	3	3	0	18
XIH	3	2	0	30
XYF	3	3	0	22
XYK	3	6	0	34
XYW	3	4	7	30
YIJ	3	3	13	24
ZYF	3	7	13	49
JYH	4	5	7	45
KYJ	4	4	7	38
QYF	4	7	0	43
VYF	4	7	0	64
XAH	4	5	7	27

	SCOTT	ARCHER	GLAZE	KRUEGER
XIY	4	4	7	19
XUV	4	4	0	26
XYC	4	5	20	32
ZIJ	4	4	27	46
ZYH	4	7	13	33
CIJ	5	8	0	44
HYJ	5	7	13	61
QEF	5	8	13	33
QEJ	5	6	33	24
QOH	5	8	20	57
XEQ	5	6	0	42
XEV	5	6	27	28
GYO	6	3	0	34
SYJ	6	7	13	46
WYJ	6	6	27	62
XOH	6	7	20	40
ZOJ	6	3	0	41
DYJ	7	7	40	51
PYX	7	53	47	88
XAF	7	8	20	31
XAJ	7	5	7	42

	SCOTT	ARCHER	GLAZE	KRUEGER
XAZ	7	2	13	39
XIK	7	6	33	55
XIZ	7	6	27	30
XUF	7	3	13	23
XUW	7	5	0	32
ZYX	7	6	20	56
JYF	8	47	40	76
JYG	8	53	47	77
NYJ	8	7	7	58
SYX	8	50	67	80
VUQ	8	6	0	25
VYM	8	47	47	89
WUJ	8	8	7	39
XOK	8	7	20	43
XOY	8	6	27	47
XUG	8	6	20	42
ZEJ	8	6	0	42
GYX	9	6	27	52
JYK	9	6	13	54
KUJ	9	7	33	48
XEH	9	5	0	23
XEY	9	6	13	35

	SCOTT	ARCHER	GLAZE	KRUEGER
XIF	9	5	7	41
XOV	9	3	13	36
XUL	9	7	7	51
NIJ	10	7	20	55
XUD	10	6	7	51
YEJ	10	4	27	54
YEQ	10	4	33	35
BYJ	11	7	13	54
GYL	11	48	60	89
ROQ	11	52	87	91
WYF	11	48	40	88
XAD	11	7	0	42
XOF	11	6	20	29
MYV	12	5	0	43
QIK	12	50	67	91
XUS	12	6	20	50
LYK	13	47	73	91
XEG	13	5	13	34
XEW	13	7	20	48
DUQ	14	48	67	85
HYL	14	50	60	84
XOP	14	7	27	45
ZIY	14	8	13	42

	SCOTT	ARCHER	GLAZE	KRUEGER
BYK	15	47	67	73
PYT	15	53	73	90
XUT	15	8	20	55
BYC	17	51	73	85
RYG	17	47	53	86
HEJ	18	48	27	76
JOQ	18	52	27	88
JYN	19	50	87	95
SYG	18	52	60	68
BYG	20	49	60	83
GUC	20	47	13	46
TAQ	20	51	67	91
SIQ	21	47	53	89
QAC	24	47	73	90
SOQ	24	49	47	86
GUK	26	50	7	50
PYR	26	50	80	87
DYR	28	48	73	86
NUW	28	52	27	89
LOH	29	50	67	80
PAJ	30	48	53	65
YUC	30	51	27	53

	SCOTT	ARCHER	GLAZE	KRUEGER
WUP	31	47	13	72
BYR	32	52	47	87
MUW	33	48	13	77
NEF	35	49	47	72
CYR	36	50	53	81
KIZ	36	48	20	78
POF	39	53	67	58
RUC	39	47	33	65
HEF	40	52	47	87
JIS	42	50	47	74
MOX	42	50	20	76
QAL	42	48	73	79
FAH	43	50	47	70
VOS	43	52	67	76
WOH	43	50	40	33
MEG	44	95	67	90
BIV	45	49	40	60
ZIT	46	53	33	79
LUF	47	50	67	94
MEK	47	53	67	88
NAZ	47	51	80	80
SUX	47	51	40	86

	SCOTT	ARCHER	GLAZE	KRUEGER
HAX	48	51	47	89
LEH	48	52	47	77
MEZ	48	52	20	84
NOY	48	48	47	79
SAZ	48	52	60	84
YAH	48	93	27	88
CIB	49	47	27	64
NIF	50	53	60	88
GOM	51	47	67	87
ROH	51	50	67	82
TUL	51	47	87	82
VUL	52	48	60	93
KES	53	50	60	83
NUS	53	49	60	77
YOM	53	51	7	63
POT	54	52	80	86
MUZ	54	49	73	87
QIN	54	50	33	75
ROK	54	94	87	97
CUZ	55	93	73	91
VID	55	50	40	57
ZAR	55	52	67	79

	SCOTT	ARCHER	GLAZE	KRUEGER
GIF	56	52	67	86
MIF	57	52	7	60
VOD	57	50	47	68
ZIM	58	53	47	64
RAH	59	99	60	100
LEZ	60	52	33	84
NIM	60	53	67	74
VEP	60	48	20	65
SAH	61	50	60	81
ZIN	61	47	13	69
DAK	62	52	47	72
RAX	62	47	67	90
TAY	62	52	60	89
TEL	62	99	93	99
JEY	63	52	33	65
KIX	63	95	47	80
LER	63	53	53	86
POY	63	48	53	79
SAK	63	94	93	98
SEB	63	48	13	51
HAZ	64	94	100	95
FID	65	52	73	94

	SCOTT	ARCHER	GLAZE	KRUEGER
GEY	65	52	47	85
JOP	65	51	67	80
NIL	65	98	87	97
FOW	67	50	80	85
TUX	67	97	80	96
LEB	68	49	20	62
MAB	68	50	80	81
RAZ	68	94	87	99
VIT	68	53	67	88
DEZ	69	53	67	67
REW	69	48	73	74
BEM	70	50	60	65
PAC	70	93	87	98
SIC	70	95	93	93
SUG	70	47	87	89
WAC	70	99	67	89
TIC	71	99	100	98
FUZ	72	94	93	96
NAW	72	94	47	91
REF	72	94	93	93
DIC	74	94	100	91
JEL	74	97	100	98

	SCOTT	ARCHER	GLAZE	KRUEGER
PIC	74	99	93	96
TOG	74	97	73	97
GOB	75	97	93	97
PUR	75	94	93	96
TUN	75	94	73	98
WIS	75	94	100	94
YAP	75	95	40	89
BEV	76	94	100	90
SOC	76	97	100	98
WAT	76	94	100	95
JAG	77	99	67	97
KIS	77	93	87	99
TAC	78	97	100	98
BAS	79	93	100	97
LOV	79	94	100	100
MAG	79	95	87	96
PIX	79	94	67	88
SOY	79	96	80	87
VIC	80	97	100	97
HIL	81	94	100	99
PIL	81	93	100	99
REC	81	93	80	91

	SCOTT	ARCHER	GLAZE	KRUEGER
VEL	81	96	87	92
KAN	82	94	87	96
GYM	83	98	100	97
YUM	83	97	33	89
JIL	84	95	87	98
MIL	84	95	93	96
DIL	84	94	80	94
BEL	85	99	100	97
BIL	85	93	80	94
FIL	85	93	80	94
GIL	85	95	87	94
JAZ	85	95	93	97
MIS	85	97	80	99
DUZ	86	99	47	80
GOV	86	95	93	95
JON	86	99	93	96
MAL	86	94	93	98
PUB	86	100	93	85
GAB	87	98	93	100
TUM	87	98	83	97
WIL	87	97	100	96
LES	88	98	87	97

	SCOTT	ARCHER	GLAZE	KRUEGER
LIN	88	93	87	95
MEL	88	97	67	95
DEB	89	97	87	99
HON	89	97	100	98
SOL	89	94	93	100
DEC	90	96	100	94
LOS	90	93	100	97
MIN	90	94	93	99
TIL	90	97	80	100
VET	90	100	93	99
LAM	91	95	87	99
TEX	91	100	100	97
DEM	92	94	73	98
DOZ	92	98	100	94
BOP	93	98	53	69
KIM	93	98	60	89
LIZ	93	100	80	94
MID	93	99	87	99
BUZ	94	99	93	96
MAX	94	99	80	98
PAM	94	97	80	90
POW	94	100	60	95

	SCOTT	ARCHER	GLAZE	KRUEGER
RON	94	99	80	85
FAB	95	97	93	92
KEN	95	100	100	99
LEN	95	95	87	92
MAC	95	99	80	100
MED	95	100	93	98
SID	95	98	87	97
TAM	95	98	100	100
DEL	96	97	80	97
KAY	96	100	60	97
SUB	97	98	100	91
JAN	98	99	100	99
MON	99	97	100	98

Appendix B

CVC Trigrams and Their Association Values Used for the Easy and Difficult Tasks

Easy Task

Trigram	Association Value		
FOT	54	MIN	90
CIB	49	KAY	96
HAX	48	MED	95
NIF	50	SUB	97
NAZ	47	DEL	96
LEH	48	RON	94
SUX	47	JAN	98
KES	53	MOX	94
MEK	47	TIL	90
GOM	51	BUZ	94
YAH	48	LEN	95
NUS	53	FAB	95
BIV	45	TAM	95
RAH	51	KIM	93
VUL	52	DEM	92

Difficult Task

Trigram	Association Value		
FOT	54	RAZ	68
CIB	49	FAW	67
HAX	48	JEL	74
NIF	50	SUG	70
NAZ	47	GEY	65
LEH	48	YAP	75
SUX	47	WAC	70
KES	53	FID	65
MEK	47	TUX	67
GOM	51	REF	72
YAH	48	TIC	71
NUS	53	BEM	70
BIV	45	FUZ	72
RAH	51	LEB	68
VUL	52	DEZ	69

Appendix C

Age and Revised Beta Examination Scores for Each Subject by Groups

Group	Comparison			Pd		
	Subject	Age	Beta	Subject	Age	Beta
Easy Right	1	30	94	41	25	95
	2	26	101	42	30	90
	3	29	105	43	23	96
	4	23	102	44	24	105
	5	23	90	45	27	92
	6	30	99	46	25	97
	7	34	115	47	38	110
	8	38	90	48	33	111
	9	26	91	49	19	109
	10	25	103	50	28	125
Easy Wrong	11	24	99	51	28	112
	12	25	98	52	34	92
	13	32	124	53	21	94
	14	38	112	54	23	100
	15	21	107	55	28	101
	16	25	91	56	24	104
	17	34	93	57	27	95
	18	23	112	58	35	115
	19	34	100	59	27	99
	20	28	103	60	27	100
Difficult Right	21	35	95	61	28	100
	22	39	93	62	23	117
	23	20	110	63	31	90
	24	22	111	64	28	94
	25	28	106	65	23	104
	26	20	117	66	36	91
	27	36	110	67	29	105
	28	35	90	68	21	101
	29	24	100	69	24	102
	30	21	97	70	29	113
Difficult Wrong	31	37	102	71	39	94
	32	31	90	72	24	106
	33	36	107	73	38	112
	34	18	94	74	23	107
	35	20	98	75	22	91
	36	38	99	76	33	104
	37	20	112	77	33	105
	38	30	106	78	19	94
	39	24	96	79	21	95
	40	33	101	80	22	102

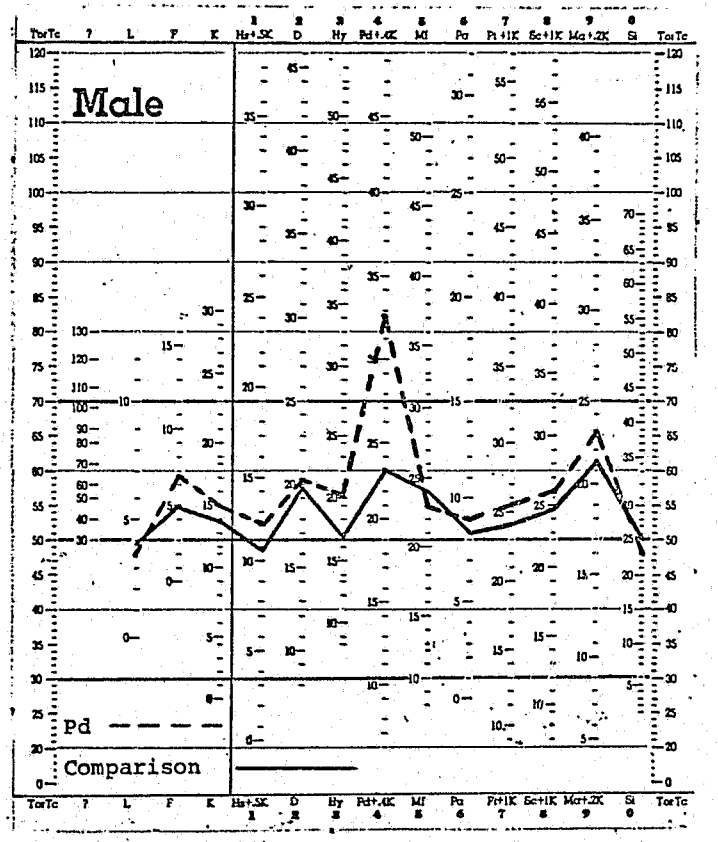
Appendix D

MMPI Pd Scale Scores, and Activity Preference Questionnaire Scores for Each Subject by Groups

Group	Comparison			Pd		
	Subject	Pd	APQ	Subject	Pd	APQ
Easy Right	1	60	45	41	76	35
	2	62	54	42	76	34
	3	60	53	43	77	40
	4	64	53	44	76	37
	5	41	45	45	77	38
	6	64	45	46	79	33
	7	65	47	47	88	17
	8	64	47	48	81	40
	9	62	45	49	88	31
	10	58	43	50	95	23
Easy Wrong	11	56	49	51	79	25
	12	62	44	52	83	38
	13	60	48	53	81	30
	14	62	42	54	76	39
	15	62	52	55	95	36
	16	62	43	56	75	27
	17	63	50	57	89	37
	18	64	54	58	78	33
	19	64	43	59	79	28
	20	61	53	60	81	36
Difficult Right	21	64	54	61	88	37
	22	53	46	62	87	37
	23	64	48	63	87	37
	24	61	49	64	79	40
	25	62	42	65	93	31
	26	57	43	66	78	40
	27	55	42	67	77	26
	28	64	54	68	85	38
	29	54	43	69	76	29
	30	60	44	70	83	35
Difficult Wrong	31	60	46	71	84	38
	32	62	45	72	81	39
	33	60	45	73	95	17
	34	60	48	74	82	38
	35	55	44	75	76	33
	36	60	46	76	76	28
	37	60	50	77	79	36
	38	63	46	78	87	33
	39	63	55	79	76	33
	40	54	48	80	93	37

Appendix E

Mean MMPI Profiles for the Comparison and Pd Groups


Male
Pd
Comparison
TorTc
?
L
F
K
Ha+SK
D
Hy
Pd+4K
Mf
Pa
Pt+1K
Sc+1K
Ma+2K
Si

Appendix F

Number of Medium CVC Trigrams Selected by Subjects Across Blocks of 15 Trials by Groups

Group	Subject	Comparison Blocks										
		NRF	1	2	3	4	5	6	7	8	9	10
Easy Right	1.	5	3	6	11	13	7	15	14	15	14	15
	2.	2	3	14	14	15	15	15	14	14	15	15
	3.	7	8	9	5	10	8	9	10	12	13	13
	4.	0	0	14	14	13	14	14	14	15	15	15
	5.	5	1	13	15	15	15	15	15	15	15	15
	6.	0	10	15	15	15	15	15	15	15	15	15
	7.	3	2	1	12	13	12	13	13	13	12	14
	8.	1	1	14	13	13	11	13	12	14	14	12
	9.	2	3	13	14	13	13	14	14	14	13	15
	10.	0	0	15	12	15	14	13	14	13	15	13
Easy Wrong	11.	0	4	15	15	15	14	15	15	15	14	15
	12.	1	1	12	14	15	14	15	14	15	15	15
	13.	1	9	12	15	15	15	15	15	15	15	15
	14.	3	12	14	15	15	15	15	15	15	15	15
	15.	0	0	15	15	14	15	13	15	15	15	15
	16.	5	5	11	6	10	8	10	12	12	12	11
	17.	7	0	14	15	14	15	15	15	15	15	15
	18.	1	0	15	15	15	15	15	14	14	15	15
	19.	1	0	15	14	15	14	14	15	15	15	15
	20.	6	6	11	11	14	14	14	14	14	14	14
Difficult Right	21.	6	6	9	8	8	6	9	9	7	11	10
	22.	7	6	6	7	9	6	8	7	8	7	8
	23.	7	7	8	10	9	9	10	9	10	11	12
	24.	3	7	7	11	12	9	11	8	11	10	11
	25.	6	4	8	6	3	2	8	5	5	9	8
	26.	6	7	10	11	9	8	9	9	9	11	11
	27.	3	5	5	5	5	5	5	5	5	5	5
	28.	7	8	8	8	6	7	9	9	9	10	10
	29.	4	4	3	11	6	8	7	13	5	9	10
	30.	7	8	9	11	9	12	11	12	10	10	10
Difficult Wrong	31.	7	10	6	7	7	6	8	8	7	7	7
	32.	6	6	9	6	10	7	8	8	8	7	9
	33.	6	6	9	10	7	8	8	8	7	7	9
	34.	6	11	11	9	10	10	11	12	11	12	14
	35.	2	4	11	11	14	14	15	15	14	15	15
	36.	4	3	4	7	7	10	10	6	7	9	10
	37.	5	6	5	9	9	10	10	9	11	11	10
	38.	3	4	4	4	10	6	11	4	5	8	12
	39.	6	6	8	10	5	11	6	9	8	9	9
	40.	5	7	7	5	11	11	12	8	12	13	13

Group	Subject	Pd									
		Blocks									
		NRF	1	2	3	4	5	6	7	8	9	10
	41.	0	8	14	15	13	15	14	13	14	15	14
	42.	2	1	2	2	2	2	1	2	2	2	2
	43.	0	0	0	0	0	0	0	0	0	0	0
	44.	6	6	6	6	7	14	12	13	14	14	13
Easy	45.	0	0	0	0	0	0	0	0	0	0	0
Right	46.	7	8	8	7	11	7	10	9	6	10	9
	47.	0	0	0	0	0	0	0	0	0	0	0
	48.	3	5	11	11	13	14	15	15	14	15	15
	49.	0	0	0	0	0	0	0	0	0	0	0
	50.	2	13	14	14	14	14	15	15	15	15	15
	51.	4	5	3	6	9	7	8	6	9	14	14
	52.	0	5	15	15	14	14	14	14	14	14	14
Easy	53.	3	7	7	4	8	5	12	12	11	13	13
Wrong	54.	2	8	11	15	15	15	15	15	15	15	15
	55.	3	11	14	15	15	15	15	15	15	15	15
	56.	6	7	8	7	10	12	11	10	14	12	15
	57.	1	12	15	14	14	15	14	14	15	15	15
	58.	0	6	3	15	14	15	14	15	15	14	15
	59.	4	2	10	10	4	9	9	12	10	12	13
	60.	2	15	9	9	13	15	15	15	15	15	15
	61.	7	3	4	6	7	6	7	6	7	3	11
	62.	7	8	10	8	9	8	8	8	9	8	9
Difficult	63.	3	4	6	12	7	11	13	10	9	8	10
Right	64.	3	3	3	11	11	9	12	14	14	11	11
	65.	4	6	6	5	6	7	11	11	11	11	10
	66.	5	7	7	7	8	9	7	9	11	11	11
	67.	7	10	10	10	10	11	8	10	10	9	13
	68.	7	12	11	12	8	13	10	11	11	10	11
	69.	5	6	11	10	11	12	14	11	13	13	13
	70.	6	4	10	8	6	6	8	11	12	12	13
	71.	4	4	5	9	11	4	6	8	5	11	11
	72.	7	8	12	13	14	13	13	15	14	13	15
Difficult	73.	5	4	4	11	9	9	9	9	8	11	6
Wrong	74.	6	5	3	11	9	6	6	4	8	11	11
	75.	4	9	10	10	9	8	10	8	9	11	11
	76.	5	5	5	8	7	9	12	10	10	11	13
	77.	5	6	6	9	11	10	11	11	11	11	15
	78.	6	5	5	4	8	8	13	10	9	10	11
	79.	4	7	9	10	12	8	10	10	10	11	11
	80.	7	7	5	4	9	6	8	11	9	10	12

Appendix G

Activity Preference Questionnaire

ACTIVITY PREFERENCE QUESTIONNAIRE

by D. T. Lykken, Ph.D.

DIRECTIONS: In each of the items below you will find two choices. Each choice describes what for most people would be an unpleasant experience. Some of these experiences are quite unusual while others may have actually happened to you or to people you know. For each item, try to imagine yourself in both of the situations described and decide which of the two choices would seem worse to you and which would seem less bad. Choose the one which you would prefer as the lesser of evils if one or the other happened to you. If you choose the "Y" choice, put a circle around the "Y" beside that item. If you feel that the "N" choice is better, circle the "N". Answer every item.

Example: 0. (Y) Having to work late one night.
(N) Being run over by a train.

Most people (!) will feel that "Y" is the lesser evil and will put a circle around the "Y".

Remember: indicate the choice that you would prefer.

1. (Y) Being interviewed for a job.
(N) Mowing the lawn.

2. (Y) Making a parachute jump.
(N) Saying "hello" to a friend and having him look at you and walk on without speaking.

3. (Y) Having to permanently give up eating sweets.
(N) Having an accident with a borrowed car.

4. (Y) Wash 3 storm windows on both sides.
(N) Taking a roller-coaster ride.

5. (Y) Telling a lie to somebody.
(N) Jumping from a 3rd story window into a fireman net.

6. (Y) Copying 4 pages of the dictionary.
(N) Having a badly burned back.

7. (Y) Getting up to answer the phone and finding it's a wrong number.
(N) Knocking over a glass in a restaurant.

8. (Y) Losing a book that you borrowed from a teacher and which can't be replaced.
(N) Losing your wallet to a pickpocket.

9. (Y) Being put to sleep by ether.
   (N) Putting out a match by squeezing it between your fingers.

10. (Y) You stand up at a meeting to ask a question and realize you have forgotten the question.
    (N) Upsetting the gravy on a friend's tablecloth.

11. (Y) Riding a Motorcycle.
    (N) Sweep the kitchen floor.

12. (Y) Walking barefoot in a room where some glass has been broken.
    (N) You want to join a social club but the members vote not to let you in.

13. (Y) Running out of gas and having to flag down a stranger for a lift to town.
    (N) Coming home hungry and having to eat a cold supper.

14. (Y) You slip in the mud and get your new spring clothes soaked and dirty.
    (N) You're on stage in the school play and realize that you have forgotten your lines.

15. (Y) Finding out you've overslept and missed an important appointment.
    (N) Going into a dark rat-infested cellar.

16. (Y) Having to return a purchase to a store.
    (N) Having to testify as a witness at a jury trial.

17. (Y) Peel a bushel of potatoes.
    (N) Refusing to loan money to a friend because you know he won't repay it.

18. (Y) Having the pilot announce that the wheels are jammed and he is about to make a belly landing.
    (N) Finding yourself in the midst of a fighting mob.

19. (Y) Giving blood for the blood bank.
    (N) Memorizing something for a test in school.

20. (Y) Watch someone make a fool of themselves on a television quiz program.
    (N) Having to get out of bed earlier than usual.

21 (Y) Swimming in very rough ocean water.
    (N) You wave back at someone and then realize he was waving at the person behind you.

22. (Y) Letting a large but harmless spider run up your arm.
    (N) Having a baby cry in the next row at the movies.

23. (Y) You pick up an article in a store but forget to pay for it and are stopped.
(N) Spending a month in bed at a rest home.

24. (Y) Going to work or to school with a black eye.
(N) Coming out of a movie in your summer shoes to find it's snowed a foot deep.

25. (Y) Rowing out in a boat to bring in a drowned body you've seen floating off shore.
(N) Joking about how homely Mary is and then hearing Mary's voice behind you say "I heard that."

26. (Y) Finding that you have been short-changed and having to return to the store to ask for the rest.
(N) Cutting out the spoiled parts of a bushel of potatoes.

27. (Y) Being held motionless in a straight jacket.
(N) Walking into a room full of people, you stumble on a footstool and sprawl on the floor.

28. (Y) Asking a friend for a small loan and being refused.
(N) Being caught in a blizzard.

29. (Y) Visiting someone with a contagious disease.
(N) Upsetting the gravy on a friend's tablecloth.

30. (Y) Riding a long stretch of rapids in a canoe.
(N) Whitewashing a long board fence.

31. (Y) Your hands shake and mouth goes try as you try to talk before a group.
(N) Having your car swing into a skid on an icy corner.

32. (Y) Shine 4 pair of shoes.
(N) Having to blow your nose while in a group of strangers.

33. (Y) Riding a runaway horse.
(N) Having your tooth pulled.

34. (Y) Having to ask the person behind you at a movie to stop kicking your seat.
(N) Watching a long headache-pill commercial on TV.

35. (Y) Having your grocery bag break and spill on a crowded street.
(N) A friend accidently cuts a wrist artery and you have to do something.

36. (Y) Cleaning paint off your hands.
(N) Being called on in school.

37. (Y) Hitting your thumb while hammering a nail.
(N) After eating in a restaurant, finding that you can't pay the bill.

38. (Y) Waiting in line for two hours to pay a parking ticket.
    (N) Finding a wrecked car in the ditch with three occupants unconscious and bleeding.

39. (Y) Introducing yourself to a total stranger.
    (N) Having to stand up on the bus.

40. (Y) Distributing 1,000 handbills in mailboxes from door to door.
    (N) "Having it out" with someone.

41. (Y) Being given an electric shock as part of a medical experiment.
    (N) Waiting for someone who's late.

42. (Y) Walking on stage as a contestant in a TV quiz show.
    (N) Carry a heavy bag of groceries 4 blocks from the store.

43. (Y) Having a nightmare.
    (N) Discovering at a party that there is a big hole in the heel of your stocking.

44. (Y) Being threatened by a much bigger and more powerful person.
    (N) Carrying a ton of coal from the backyard into the basement.

45. (Y) Making a speech to 100 people.
    (N) Falling out of a boat.

46. (Y) Waiting for an overdue bus.
    (N) Meeting a friend on the street and not being able to remember their name.

47. (Y) Having to go without meat for a week.
    (N) You go to a party and find that you're the only one who dressed up.

48. (Y) Having someone say loudly to you at a party, "Why don't you go home? Nobody wants you here."
    (N) Stay home for a week with a bad case of poison ivy.

49. (Y) Driving a car at 95 miles an hour.
    (N) Washing the windows at home.

50. (Y) Walking a mile when it's 15 degrees below zero.
    (N) Clean the keys of a piano with a toothbrush.

51. (Y) Having to return a purchase to a store.
    (N) Write a letter to a relative.

52. (Y) Having to testify as a witness at a jury trial.
    (N) Spending a day helping someone move.

CONTINUED

4 OF 4

53. (Y) Having the phone ring when you're taking a bath.
(N) Being unexpectedly asked at a church dinner to stand up and introduce the speaker.

54. (Y) Having to stay home every night for two weeks with a sick relative.
(N) Making a parachute jump.

55. (Y) Wedged in a crowded bus, discovering suddenly that you're going to vomit.
(N) Sleeping out on a camping trip and awakening to see a rattlesnake coiled in a corner of your tent.

56. (Y) Having your hands shake and your mouth go dry as you try to talk in front of a group.
(N) Having a sick headache.

57. (Y) Run a steam presser in a laundry for a week.
(N) Finding you've lost your bus fare when it's time to pay and get off.

58. (Y) You walk into a public wash room and find that it's the wrong one.
(N) Counting to 10,000 by threes.

59. (Y) Spending a week in solitary on bread and water.
(N) Stepping on the car brakes at an intersection and finding that they don't work.

60. (Y) Addressing fifty Christmas cards.
(N) Being asked for a contribution when you haven't any money.

61. (Y) Upsetting the gravy on a friend's tablecloth.
(N) Spending a hot summer afternoon painting a bedroom ceiling.

62. (Y) Falling out of a boat.
(N) The person you're with at the movies turns around and loudly tells the people behind you to stop talking.

63. (Y) Being sick to your stomach for 24 hours.
(N) Standing on a ledge of the 25th floor of a building.

64. (Y) Find where someone else parked your car in a big lot at the state fair.
(N) Being balled out by the teacher.

65. (Y) Having a friendly dog jump on you with wet and muddy feet.
(N) Turning on a light switch when you hand is wet and you might get a shock.

66. (Y) Having the car refuse to start when you're ready to leave in the morning.
(N) Having to complain to the neighbors about being too noisy.

67. (Y) Belching in church during prayer.
(N) Being lost in the woods at night.

68. (Y) Wet mopping the floor of a hospital corridor.
(N) Being broke and having to beg money on the street for a meal.

69. (Y) Jumping feet first from the 20 foot diving tower at the beach.
(N) Getting up to go to work in the morning.

70. (Y) Having someone get mad and tell you off.
(N) Starting off in the morning, you step in a puddle and get your shoe and stocking soaking wet.

71. (Y) Wash a car.
(N) It is the first day in a new class and the teacher asks each person to stand up and give his name.

72. (Y) Getting stuck in traffic when you're in a hurry.
(N) Having your car swing into a skid on an icy corner.

73. (Y) Asking your employer for a raise.
(N) Eating a slice of lemon, skin and all.

74. (Y) Picking up a rattlesnake by the back of the neck.
(N) Having someone say loudly to you at a party, "Why don't you go home? Nobody wants you here."

75. (Y) Being in the back seat of a driverless car rolling downhill.
(N) You're on stage in the school play and realize that you have forgotten your lines.

76. (Y) Putting 1000 names in alphabetical order.
(N) Unscrewing a broken light bulb with your fingers from a "live" socket.

77. (Y) Jumping down fifteen feet into soft earth.
(N) Put on a shirt or blouse and finding a button missing.

78. (Y) Having your date at a dance leave without you.
(N) Walking around all day on a blistered foot.

79. (Y) You stand up at a meeting to ask a question and realize that you've forgotten the question.
(N) Spilling something on your new clothes.

80. (Y) Spend half a day in a locked closet.
(N) Your club bazaar has hired a knife throwing act and you are chosen to be the "target."

81. (Y) Reading a dull book for a school report.
(N) Overhearing someone comment on how strangely you are dressed.

82. (Y) Getting a Christmas present from someone you didn't give one to.
(N) Sitting through a long sermon.

83. (Y) Being caught on a sandbar by the rising tide.
(N) Breaking a lamp in someone else's home.

84. (Y) Picking up a spilled box of carpet tacks.
(N) Help push a stalled car on a winter morning.

85. (Y) Riding a long stretch of rapids in a canoe.
(N) You are unexpectedly asked at a church dinner to stand up and introduce the speaker.

86. (Y) Having to tell someone you know they're lying.
(N) Clean up the popcorn and candy wrappers in the neighborhood theater.

87. (Y) Having to run until your throat is sore and there's a pain in your side.
(N) Discovering your feet are dirty when you undress for a medical examination.

88. (Y) Going to a party where no one knows you.
(N) Doing school homework on Saturday night.

89. (Y) Working all day when it's 90 in the shade.
(N) Standing on the very top rung of a ladder in order to wash a 2nd floor window.

90. (Y) You pass someone on the street and say, "Hi, Charley," and then realize it isn't Charley.
(N) Getting out of a warm bed in a room so cold that you can see your breath.

91. (Y) Making a speech to 100 people.
(N) Scrubbing the kitchen floor on hands and knees.

92. (Y) Counting the beans needed to fill a 4 quart candy jar.
(N) You're watching the circus and suddenly two lions get loose down in the ring.

93. (Y) Washing 20 storm windows on both sides.
(N) Trying to sell Christmas cards to your neighbors to make money for a club.

94. (Y) In school, having to give a report in front of the class.
(N) Spend two hours simonizing a car.

95. (Y) Painting a large frame house.
(N) Having someone walk in while you are absent-mindedly picking your nose.

96. (Y) Lick stamps for 1,000 letters.
(N) Being in the back seat of a driverless car which suddenly starts rolling downhill.

97. (Y) Banging your head on a cabinet door.
(N) Dancing with someone for the first time and accidently stepping painfully on their foot.

98. (Y) Waiting in line for two hours to pay a parking ticket.
(N) Running out of gas in the middle of a crowded downtown intersection.

99. (Y) Having a bad head cold.
(N) Riding a runaway horse.

100. (Y) Asking someone to pay you money that he owes you.
(N) Going without anything to eat from lunch until breakfast next morning.

END